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DEVELOPMENT OF THE COTTON INDUSTRY IN THE USSR

CHAPTER II

RAW MATERIAL BASE OF THE COTTON INDUSTRY IN THE USSR

The state of cotton-growing in Russia during World War I.-Rehabilitation of cotton-growing.-The development of new cotton-growing areas.-The technical equipment of cotton-growing.-Cotton crop capacity in the USSR.-Labor costs in cotton cultivation.-Special importance of mechanization in cotton-growing.-Problems of complex mechanization in cotton-growing.-Labor productivity in cotton-growing.-Quality of cotton fiber and its utilization.-Development of cotton-growing in the USSR in the Third Five-Year-Plan.

We have already mentioned that in prerevolutionary Russia the textile industry was dependent to a considerable extent on other countries not only in regard to equipment but also in terms of raw materials; before World War I, almost the half of cotton used in the industry has been imported. Due to the outbreak of war in 1914, Russia's demand for cotton rose, and in the first war years the cotton acreage as well as the cotton crop showed some increase. But this trend did not continue for long. In the following years a considerable decline in cotton-growing took place; an especially low drop occurred in 1917. To a certain degree, the way to this deterioration to cotton-growing in Russia was paved by the war-time economic policy of the Czarist government. It was caused by

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the fact that in 1915 - 1916 cotton prices were stabilized in a way which insured huge profits for manufacturers but did not satisfy cotton growers, because the fixed price of cotton lagged more and more behind the price of wheat, the most important equivalent of cotton. The correlation between the wheat price and the cotton price, which to a certain degree represents labor costs in cultivation of these crops, was changing unfavorably for the cotton. The cotton-growers responded to the establishment of ceiling prices by curtailment of the cotton acreage.

Cutting down of crop acreage was aggravated by war-time conditions in general, particularly by the constantly increasing bread shortages in the cotton-growing areas.

"Due to the general food crisis in the Empire and to some irregularity in railroad traffic", says a report of the Cotton Committee, "transportation of grain from the Volga region to the main Central Asiatic cotton area, Fergana Oblast, is taking place on a limited scale." The grain crops and the demand for bread in Turk-estan Oblast in the 3 war years are shown by the Table 27.

TABLE 27

GRAIN CROPS AND BREAD DEMAND IN TURKKESTAN IN 1915-1917 ⁽¹⁾ (in poods)

Years	Grain Crops	Bread Demand	Deficit
1915	95,319,116	107,177,880	12,158,764
1916	89,017,657	111,557,083	22,539,226
1917	52,590,251	110,023,205	57,432,954

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(1) NKTP Archives, Main Economic Administration (VSNKh),
Shelf 63, File 7.

The increasing bread shortages in cotton-growing areas during the war years, becoming extremely acute in 1917, was the main cause of the enormous drop in cotton crops.

Destruction of the transportation system, decrease in exchange of goods with Central Russia, dilapidation of irrigation systems, deterioration of seed-growing, drop in cattle-breeding, etc., -- all this was detrimental to cotton-growing in that period.

The general changes which have taken place in cotton growing in the USSR are shown in Table 28.

[see table 28 on following page]

Data on cotton crop acreage before the revolution are probably somewhat underestimated, since they have been computed on the basis of tax statistics. Cotton output before the Revolution was computed on the basis of railroad data; they refer to gross weight and, according to the authors of the handbook, apparently include linters also.

The Civil War period and the first years after the start of peaceful work of rehabilitation of national economy are marked by a big decrease in cotton acreage and crops. Only beginning in 1923, on the basis of the new economic policy, on the basis of the improved supply of the cotton-growers with bread and seeds, of cooperation of cotton-growers, of contraction of grown crops, did a general revival of this most important branch of agriculture begin.

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TABLE 28

COTTON CROP ACREAGES AND CROPS IN THE USSR IN 1913-1917⁽¹⁾

Year	Acreage (in 1,000 hectares)	Percent (1913= 100)	Fiber Crop (in 1,000 tons)	Percent (1913=100)
1913	701.6	100	239.2	100
1914	806.2	114.9	275.5	115.2
1915	825.7	117.7	327.7	137.0
1916	845.9	120.6	259.8	108.6
1917	522.8	74.5	137.5	57.5
1918	147.4	21.0	34.8	14.5
1919	150.9	21.5	17.6	7.4
1920	127.4	18.2	12.6	5.3
1921	98.9	14.1	5.6	2.3
1922	70.3	10.0	12.8	5.4
1923	213.1	30.4	41.9	17.5
1924	447.4	63.8	97.6	40.8
1925	591.0	84.2	158.6	66.3
1926	653.7	93.2	163.5	68.4
1927	764.6	109.0	215.9	90.3
1928	925.3	131.9	244.1	102.0
1929	1,055.4	150.4	261.3	109.2
1930	1,519.5	216.6	328.6	137.4
1931	2,081.3	296.7	400.4	167.4
1932	2,154.8	307.1	388.2	162.3
1937	2,090.9	298.0	716.7	299.6

(1). Statistical handbook on Cotton-Growing in Central Asia, compiled by Nikonovich, Tashkent, 1934, pp. 4-5; Results of the Fulfillment of the Second Five-Year Plan for the Development of the National Economy of the USSR, 1939, pp 85 and 92.

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At that time, Soviet authorities took the first steps towards replacing the ketman and omach (pick and shovel) in the cotton-growing industry with agricultural machines and tools. In Central Asia, a plant was built for manufacturing specific cotton-growing equipment (seeders, cultivators, hillers, etc); repair base was organized with a system of repair shops for tractors and automotive vehicles. The necessity of speeding up the development of socialist cotton-growing and the labor shortage in cotton-growing areas called for an increased mechanization of the cotton-growing industry. Shipments of tractors and other machines to the republics of Central Asia were started. However, the parcel nature of the farms was detrimental to the utilization of machines. Liquidation of private land ownership, curtailment of Kulak holdings, and distribution of land to landless and small hold^{ings} cotton farmers played an enormous role in the rehabilitation of the cotton-growing industry. By 1927 the acreage under cotton crops was exceeding that of 1913, and the total amount of cotton picked was approaching the 1913 yield. At that time the cotton crop capacity had not yet reached the level of 1913.

By the beginning of the First Five-Year Plan the cotton-growing industry was rehabilitated to its prewar level; all cotton-growers were united in cooperatives, and all cotton crops were contracted for in advance.

Tsk VKP (b), in its decision of 18 July 1929, emphasized the exceptionally great importance of cotton growing in the industrialization of the USSR and in the creation of a raw material base for the textile industry, and noted:

"... (a) a certain improvement in their irrigation systems;

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(b) the creation of a bank of high-grade seeds, and supply of a considerable part of the peasant farms with these seeds;

(c) providing ~~and~~ the bulk of peasant farms with mineral fertilizers, tractors, European agricultural implements;

(d) doubtless progress in technical reconstruction and innovations in the cotton-cleaning industry;

(e) union of all the cotton growers in cooperatives, and contraction of all cotton crops." (M. Savel'yev and A. Poskrebyshv, VKP (b) Directives on Economic Problems. 1931, p. 548)

Together with this progress in the development of the cotton-growing industry in the USSR, the TSK VEP 9b) also noted the still slow increase in cotton crop acreage on irrigated soil, as well as insufficient development of the cotton-growing industry in the new and remote regions of the USSR such as ZSFSR [sic], Kazakhstan, Tadzhikistan, etc., and a low yield capacity of cotton fields.

In this decision the TSK VEP 9b) outlined measures to be taken in the struggle for further increase in cotton output, for liberation of the USSR, in the terms of this raw material, from dependence upon foreign countries. Measures taken in the field of irrigation, mechanization, increase of the yield capacity, construction of the Turkestan-Siberian Railroad, etc., made it possible to raise the output of cotton fiber in 1932 by 60 percent as against 1913.

As a result of the First Stalin Five-Year Plan, new cotton-growing areas were developed in Turkestan and Transcaucasia. Cotton-

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growing was intensified in many areas in the Crimea, Lower Volga, Ukraine, and Northern Caucasus.

In these years, the technical basis of the cotton-growing industry of the USSR underwent a real revolution. Introduction of tractors and horse-drawn implements in the cotton-growing industry changed its technical basis, almost completely supplanting the archaic implements.

Especially great progress took place in the cotton-growing industry during the period of socialist reconstruction of agriculture. In the second Stalin Five-Year Plan, the cotton-fiber crop rose from 388,200 tons in 1932 to 716,700 tons in 1937. Yield capacity of the cotton fields also showed a noticeable increase. Considerable progress was achieved in cotton-growing in the Uzbek Republic. The Party and Government properly appreciated this; 350 kolkhoz farmers, tractor drivers, combine operators, etc, were decorated with orders and medals.

This successful development of the cotton-growing industry was the result of the Party's and the Government's rendering immense help to this most important branch of agriculture. The primitive old equipment of the cotton-growing industry has been replaced by the modern implements of socialist agriculture.

The enormous change in the technical equipment of the cotton-growing industry in the USSR is illustrated in Table 29.

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TABLE 29

TECHNICAL EQUIPMENT OF THE USSR COTTON-GROWING INDUSTRY

YEAR	MTS	TRACTORS		SEEDERS	CULTIVATORS
		NUMBER	HP in 1,000		
1933	190	7,947	115.1	3,841	278
1937	399	29,801	237.6	7,162	6,041
1938	480	41,000	611.6	11,726	10,111

In the Second Five-Year Plan, the number of MTS more than double^d, while tractors had an almost fourfold increase. New specialists -- several thousands of tractor drivers, mechanics, etc --^{were trained.} The growth of the chemical industry made it possible to extend the use of mineral fertilizers in the cotton-growing industry. In 1932 nitrites and phosphates were employed in fertilizing of only 64,000 hectares of cotton crops; in 1938-825,400 hectares.

An especially important factor in increased harvesting and delivery of cotton in recent years has been the establishment by the government of special bonuses for increased deliveries of cotton. The cotton-growing industry in the USSR is expanding at a gigantic rate. In 1938, the gross output of raw cotton in the USSR amounted to 26,900,000 metric centners as against 7,400,000 metric centners in 1913; in other words it showed a more than 3½-fold increase.

As a result of this rapid growth, the cotton-growing industry of the USSR now occupies in terms of output, third place in the

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world, second only to the US and British India, whereas before World War I, Russia had occupied fifth place.

To give an idea of the achievements of socialist cotton-growing industry, we need only say that the annual increase in cotton output in recent years alone has almost been equal to the whole cotton crop in Russia before World War I. Cotton-growing has become the main branch of agriculture in a number of republics of the Soviet Union.

The most important factor in rehabilitation and reconstruction of the cotton-growing industry in the USSR was the irrigation of cotton fields. The construction of new and the reconstruction of the old irrigation systems made it possible for the cotton-growing collective and state farms to enlarge their acreage of irrigated soil.

In 1939 alone, the Uzbekistan kolkhoz farmers completed construction of 52 irrigation projects, including the 270-kilometer Fergana irrigation canal. The Tadzhik people, with the aid of the great Russian people, also achieved a great success in development of the cotton-growing industry, particularly in the field of irrigation, where investments during two Five-Year Plans amounted to 205,400,000 rubles. The Vakhsh irrigation system, which provides an accretion of 22,000 hectares of new soil, and a regular water supply to 72,000 hectares of old soil is now in operation. The kolkhoz farmers of the Gissar Valley built a 41-kilometer canal in 50 days. SMK USSR and TsK VKP (b) in their decisions of 22 December 1939, 28 February 1940, and 21 April 1940 outlined an enormous program for further development of the cotton-growing industry (irrigation, agricul-

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tural technics, mechanization, etc) in the Uzbek, Tadzhik, and Turkmen SSRs.

The construction of the Turkestan-Siberian Railroad has also contributed to the extension of the cotton crop acreage.

In the struggle for a further increase in the yield capacity, the main problems of our cotton-growing industry are the improvement of soil tillage and the introduction of regular rotation of crops. Extension of the technical equipment of the cotton-growing industry the mineral-fertilizer supply and adoption of agricultural engineering methods are the most important conditions for increasing cotton yield capacity. It is worth mentioning that very low yield capacity is characteristic of the new cotton-growing areas, whose increasing share in the cotton output has been influencing the yield capacity indexes of the cotton-growing industry in the USSR.

During the second Five-Year Plan, the number of areas with low cotton yield capacity dropped; nevertheless, higher yield capacity and stable cotton crops still remain the most important goal of Soviet cotton growing.

In 1938 the cotton yield capacity in the USSR in irrigated areas reached 14.9 metric centners per hectare as against 7.6 metric centners per hectare in 1933; in nonirrigated areas, 3.6 metric centners per hectare as against 0.5 metric centners per hectare in 1933.

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TABLE 30

COTTON YIELD CAPACITY USSR (IN CENTNERS PER HECTARE)¹

	1933	1938
Uzbek SSR	8.8	16.1
Turkmen SSR	7.7	15.3
Tadzhik SSR	5.5	16.6
Kirgiz SSR	6.4	17.0
Kazakh SSR	3.5	11.1
Azerbaydzhan SSR	6.9	9.5
Armenian SSR	5.2	16.4
Georgian SSR	3.0	13.0
Irrigated Areas	7.6	14.9
Nonirrigated Areas	0.5	3.6
USSR Average	6.3	12.1

(1) See Soviet Cotton, ^{No} 3, 1939

The yield capacity level achieved so far is only the beginning of the realization on a mass scale of those immense reserves which have been laid bare by the Stakhanovites of the cotton-growing industry. Possibility of a further increase in the yield capacity of our cotton-growing industry is indicated, in the first place, by the fact that the average level of yield capacity in the republics is still much behind the yields obtained by advanced rayons,

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kolkhozes, and individual brigades. In 1938 the cotton yield capacity in Uzbek SSR amounted to 16.1 centners per hectare; in some better rayons, to more than 30; and in better kolkhozes and brigades, to more than 100 centners per hectare.

It is necessary that the experience of the Stakhanovite workers become widely known and adapted to every collective and state farm.

The textile industry is one of the branches of industry having high raw-material costs. The proportion of raw and other materials in the prime cost of the cotton industry gross output amounts to about two-thirds of all expenditures.

In 1934 the share of raw and other materials amounted to 63.7 percent of the total outlay in the prime cost of the gross output of the cotton industry; that of fuel, 2.4 percent, electric power, 2.2 percent; depreciation, 2.4 percent; wages and related costs, 25.4 percent; other expenses, 3.9 percent. (See Socialist construction, 1936, p. 33)

According to our approximate computation, the following ratio of labor expenses exists for different stages of production and treatment of cotton: the average labor cost of 100 meters of cotton fabric is made up of about 25 man-hours at the agricultural stage and about 21 man-hours at the manufacturing stage, including about 7 in spinning, 12 in weaving, and 2 in finishing, the total amounting to roughly 46 man-hours. As we see, more than the half the labor is spent in agricultural work. This still does not include the expenses for initial treatment of the raw material and its trans-

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portation to the place of industrial use.

This is why analysis of labor productivity in the cotton-growing industry is of such an immense importance. The main factor of its increase consists of thorough and consistent mechanization of labor. Increased labor consumption in cotton cultivation and existence of peak periods at the time of the product's processing assign a high priority to the mechanization of this branch of our national economy. The high prices of agricultural machinery in prerevolutionary Russia, low wages and the predominance of small parcel farms retarded the progress of mechanization in the cotton-growing industry. In those times labor was so cheap that machines sometimes were not able to stand the competition.

"If a machine is looked upon exclusively as a means of reducing the cost of production the limit of its application is defined by the requirement that labor spent in its manufacture be less than the labor replaced by its use. For capital, this definition has a narrower sense. Since capital remunerates not the applied labor but the value of the employed manpower, it deems the application of a machine expedient only within the limits of the difference between the value of the machine and the value of the manpower for which it is substituted." (K. Marx, Capital. Volume 1, 1935. p. 298)

Mechanization of labor on cotton fields was reducing the demand for manpower, i.e., the labor cost per one desyatina [2.70 acres] of cotton acreage. In spite of the economic efficiency of mechanization, use of machines in the cotton-growing industry in prerevolutionary Russia was as already mentioned -- very slight. The high

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prices of machinery, and the smallness of the plots under cotton crops were the main cause of retarded mechanization of the cotton-growing industry. (The total cost of tillage per 1 desyatina of cotton crops sown broadcast in Turkestan prior to World War I amounted to 150 rubles. Introduction of the iron plough as well as of drill sowing and machine tilling reduced the labor expenses and the total cost of tillage per 1 desyatina of cotton crop down to 111.6 rubles. Adoption of machine tilling of cotton crops led to a considerable reduction in cost -- from 185.4 rubles for [dzhoyachnyy] sowing down to 150 rubles for broadcast sowing and down to 111.5 rubles for drill sowing and machine tilling. With [dzhoyachnyy] sowing, one desyatina of cotton field required 121 working days and 31 half days (See V. Yuferev, Cotton-Growing in Turkestan, 1925, pp. 147-148). These figures are a summary of data obtained from experimental institutions, model farms, and notes by various writers, and hence they give only an approximate picture of labor cost. Depending on various conditions, costs will vary in this or that direction. S. Ponyatovskiy set the tillage cost of one desyatina of cotton field before World War I at 196 rubles 20 kopecks; V. Karavayev, at 139 - 169 rubles (See. S. Ponyatovskiy, A Study on Cotton-Growing in Turkestan and Transcasplan Region, 1913 p. 230 and V. Karavayev, Hunger Steppe in Its Past and Present, 1914 p. 220).

Due to the industrialization of the country and the technical equipment of the MTS' and state farms, the mechanization plan for the second Five-Year Plan has been completed considerably ahead of schedule. By the end of the second Five-Year Plan, work was almost

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entirely mechanized on state cotton farms; ^{on} MTS's more than half the work was mechanized.

The main problem of a further reconstruction of the cotton-growing industry lies in the mechanization of cotton harvesting, which is still in a primitive state. This kind of work is characterized by especially high labor costs. Our designer will have to solve this important problem, since we, like the US, still do not have satisfactory cotton-harvesting machines. Cotton harvesting remains the least mechanized stage of cotton production, and a large part of the total labor input is spent during the harvest period. For instance, on three kolkhozes in Kirovogradskiy Rayon, labor expenses in cotton harvesting amounted to 39.1 - 50.7 percent, and in Alibayramlinskiy Rayon, to 42.7 - 56.2 percent. (See Soviet Cotton, No 7, 1937, pp. 46-47.) Even with the correction for the increase in labor productivity which took place in Soviet cotton-growing industry during recent years, the proportion of labor cost in cotton harvesting remains very high. Moreover, the intensive mechanization of the cotton-production processes, with the exception of the one with the highest labor cost -- harvesting, -- predetermines the higher proportion of labor costs in harvesting the cotton. The average labor expense per hectare of cotton crop in 1937 in four krais and oblasts -- Rostov, Dnepropetrovsk, and Odessa oblasts and Krasnoyarsk Kray amounted to 82 man-days, of which 54 man-days were spent during the harvest.

Labor expense in tillage of one hectare of cotton field varies considerably with different collective and state farms

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due to differences in the intensification of agriculture.

On the Kolkhoz imeni K. Marx, tillage of one hectare of cotton field cost 170 man days; on the Kolkhoz imeni Dzerzhinskiy (Brigade No 1), 242; in the Avangard Kolkhoz (Brigade No 2), 304; and in the Idzhtymoyat Kolkhoz, 487 man-days (See Soviet Cotton, No 5, 1938, p. 48) It is characteristic that, whereas the labor input on the Idzhtymoyat Kolkhoz was 2.8 times as great as on the Kolkhoz imeni K. Marx, the yield capacity on the former was 4.5 times larger. The increase in the labor cost in tillage of one square unit of cotton field signified, in this case, an increase in the productivity of labor.

Lenin pointed out that "In agriculture, technical progress and intensified farming often leads to an increase in the amount of labor needed for tillage of a given area." (See V. I. Lenin, Works, Vol II, p. 432) In 1936, labor costs per hectare of irrigated cotton fields (on state farms) amounted to 129.1 days, and on nonirrigated fields 42.1 days. (Figures of the Division of State Cotton Farms of the People's Commissariat of Agriculture USSR. The prime cost of one centner of cotton dropped in 1936 to 119 rubles 08 kopecks as against 156 rubles 30 kopecks in 1935 (irrigated cotton fields), and for the nonirrigated fields, to 188 rubles 77 kopecks from 269 rubles 20 kopecks, respectively. In 1924-1925, the Main Cotton Committee estimated the average amount of labor needed for tillage of one desyatina of cotton field to be 129 man-days (See NKTP Archives, figures of the Price Bureau, Presidium of VSNKh USSR).

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The labor cost per square unit of nonirrigated field is considerably less than that on irrigated fields. However, the productivity of labor, i.e. the cotton output per worker, is higher, due to higher yield capacity, on the irrigated state farms. As a result of the enormous mechanization and the socialist organization of labor, the labor expense per one unit of cotton in the USSR is less than that in the cotton-growing industry of prerevolutionary Russia. The socialist reconstruction of the cotton-growing industry, while changing the distribution in the cotton production process, simultaneously reduces costs, thus raising the productivity of labor in this most important branch of agriculture.

In order to further the raise of the labor productivity in the cotton-growing industry in the USSR, it is necessary to speed up more energetically the mechanization of the cotton-harvesting work by providing the cotton-growing industry with first-rate harvesting machines meeting the requirements of the socialist agriculture. [It is interesting to trace back the progress of reduction of labor costs per one unit of tilled cotton acreage in the US. In 1841, the labor input of tillage per one acre of cotton field amounted to 148.6 man-hours; in 1895, to 102.4 man-hours; and in 1930, to only 71.8 man-hours. Labor input was reduced for all agricultural operations, especially for bedding up, sowing, cultivating, etc. The least reduction of labor cost took place in cotton-harvesting work where the proportion of labor expenses rose from 40.4 percent of all expenses in 1841 to 69.6 percent in 1930, due to a low mechanization of cotton-harvesting work in the US. The reduction of labor costs in the main operations in cotton cultivation has been due mainly to

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the improvement in implements used in the cotton-growing industry. The labor expenses in cotton cultivation in 1841 and 1895 are deemed by the author of these data to be representative of the whole cotton-growing zone of the US, whereas the data for 1930 refer only to southern Texas where growing cotton on large plots is extensively practiced. With the exception of several farms where the large-plot method and the most modern equipment are employed, the labor expenses for 1930 are the same on the average as for 1895. Thus the US cotton industry exhibits an enormous discrepancy between the technical level and productivity of labor of big capitalist farms and smallholdings. The reduction of labor costs per one unit of tilled cotton acreage in the capitalist countries, and particularly in the US, is also evidence of a deterioration in soil tillage, since a considerable portion of the cotton growers in the US are leaseholders who have little interest in any steady improvement of soil tillage. This has been the main reason for the lower cotton yield capacity in the US compared with the level prior to World War I. (The afore-cited data on labor expenses per one acre are from Harst and Church, Power and Machinery in Agriculture, United States, Department of Agriculture, Miscellaneous Publications, No 157, April 1933).

We have already mention that in prerevolutionary Russia the cotton industry was working to a considerable extent with imported raw materials. Before World War I cotton imports amounted to about 50 percent of the yearly demand. This dependence of the textile industry could not be done away with at once. During the period of industrial rehabilitation, the proportion of imported cotton

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was still quite high. In 1926 - 1927, the proportion of imported cotton amounted to 53 percent; in 1928-1929, to 30.2 percent; in 1929-1930, to 17.8 percent and in 1932, to 6 percent. (See Socialist Construction, 1936, p. 193)

Before the patriotic War the textile industry of the USSR was not only fully supplied with cotton but was not able to cope with processing it all. On the basis of socialist reconstruction of the cotton-growing industry it was possible not only to achieve a 3 $\frac{1}{2}$ -fold increase in cotton output, but also to improve the quality of the harvested cotton. The main index of this is the increased proportion of long-fiber cotton (see Table 31).

TABLE 31

QUALITY OF THE COTTON FIBER IN THE USSR
(CONTENT OF FIBER OF DIFFERENT LENGTH)

<u>Fiber Length (in mm)</u>	<u>Percentage of Fiber in Total Cotton Crop</u>				
	1932	1934	1935	1936	1937
29-30 and more	6.07	26.42	51.69	65.60	80.8
28-29	16.45	18.87	8.63	7.3	5.6
27-28 and less	77.48	54.71	39.68	27.10	13.6
Average Fiber Length	27.52	28.30	29.20	29.52	30.33

This table gives a sufficiently clear idea of those changes which took place in recent years as far as the quality of cotton

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fiber was concerned. Suffice it to say that the proportion of long-fiber cotton (29-30 millimeters and longer) increased from 6.07 percent in 1932 to 80.8 percent of the total cotton crop in 1937, and that the average fiber length increased from 27.5 millimeters in 1932 to 30.3 millimeters in 1937. In this respect the quality of our cotton is better than that of the US. To be sure, the cotton quality is sometimes lowered through the unsatisfactory cleaning due to unsatisfactory work of cotton-cleaning plants. This is just what often lowers the spinning qualities of our cotton -- its strength, grade, uniformity, and so on.

The aim of the cotton industry is to secure efficient utilization of high quality cotton. However, an examination of the operation of the industry before the Patriotic War shows that many cotton mills did not utilize their raw materials satisfactorily. Indeed, in spite of the increased amount of long-fiber cotton, the cotton industry was lowering the fiber count of the yarn produced; in other words, it was impairing the variety of the manufactured fabrics. The unsatisfactory utilization of cotton manifested itself also in the fact that the cotton mills were turning out too many rejects and second rate products. In 1940, the 2nd and 3rd main administrations Ivanovo Oblast cotton industry alone turned out 150 million meters of reject and second-rate products. The cost of raw materials constitutes more than half the prime costs in the production of the cotton-industry.

For this reason particular attention must be given to the efficient utilization of cotton. For instance, the Yakhroma Factory used to produce packing cloth not from refuse but from high quality

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raw materials. It is clear that such inexpedient use of first-rate fiber raises the cost of production. Such practises in use of raw materials should not take place in Soviet industry.

Achievements in mastering new technical equipment, in developing the skills of the specialists in the industry, etc, have led to a reduction of raw material waste. Nevertheless the cotton industry has to increase steadily the yield of yarn from cotton. In 1932 the yield of yarn from cotton amounted to 90 percent; in 1933, to 92.6 percent; in 1934, to 92.7 percent; but in 1937, to only 91.9 percent. (The yield of fiber in Soviet cotton-growing industry amounted in 1932-1933 to 30.61 percent of the total raw cotton output; in 1933-1934, to 28.34 percent; in 1934-1935, to 22.34 percent; and in 1935-1936, to 27.72 percent. (See Soviet Cotton Handbook, 1937, p.457.) One reason for this is an excessive amount of reject product. Cutting down on grade inconsistencies and improving the initial treatment of cotton are essential for reducing the waste of cotton and raising the yield of yarn. Maintaining regular cotton deliveries to the plants to provide for economical blends which secure good quality of yarn, constant checking of the efficiency of cotton utilization, etc, reduce refuse and increase the yield of yarn from the cotton.

The XVIII Party Congress set a big objective before the socialist cotton-growing industry in the Third Five-Year Plan: to harvest, in 1942, 32,900,000 centners of raw cotton, and to increase the yield capacity of irrigated cotton fields up to 19 centners per hectare, which would provide a sufficient amount of raw material for the textile industry.

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Simultaneously with an increase in output, the Third Five-Year Plan made provisions for improving the quality of cotton, increasing the proportion of firstgrade cotton, and so on. In the industry measures were carried out towards improvement of inspection, storage, and initial treatment of cotton: check of quality of delivered cotton by state inspectors has been established at all cotton-cleaning plants; a standard specification for raw cotton and fiber has been developed and approved; the capacity of the cotton cleaning plants has been increased.

On the basis of technical equipment adoption of thorough mechanization, improvement in agricultural skills, further broadening of the Stakhanovite movement, and mobilization of all available reserves, the socialist cotton-growing industry was able, by pursuing the goals set by the XVIII Congress of the VKP (b), to occupy at the end of the third Five-Year Plan second place in the world, after the US, in output of cotton.

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CHAPTER III

DISTRIBUTION OF THE COTTON TEXTILE INDUSTRY IN THE USSR

Changes in the distribution of cotton industry in foreign countries. - Cotton producing areas in the US. - Distribution of the cotton industry in the USSR in the First and the Second Five-Year Plans. - Decisions of the XVIII Congress of the VKP (b), and the outlook for distribution of the cotton industry. - The character of the main cotton producing areas in the USSR. - Areas consuming cotton fabrics. - Specialization in the cotton industry, and the problem of crosshauls and long-distance shipments.

The development of the capitalist economy takes place unevenly. This can be illustrated in the textile -- and particularly in the cotton textile industry.

Table 32 gives an idea of the changes which took place in the distribution of cotton industry in foreign countries in the period of 1913-1937.

[see Table 32 on following pages]

The table shows how much England's share in cotton manufacture has dropped during these years. The number of spindles employed in England dropped from 41 to 27.8 percent of the total number of spindles in foreign countries. Lancashire, the cradle

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TABLE 32

DISTRIBUTION OF THE COTTON TEXTILE INDUSTRY IN THE MAIN CAPITALISTIC COUNTRIES

(From International Cotton Bulletin, International Cotton Statistics)

Principal Capitalistic Countries	SPINDLES (on 31 July)				LOOMS			
	1913		1937		1913		1936 (December)	
	Amount in 1,000 Spindles	Percent	Amount in 1,000 Spindles	Percent	Amount in 1,000 Spindles	Percent	Amount in 1,000 spindles (8)	Percent (9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Capitalist World	135,781	100.0	139,425 ²	100.0	2,593.4	100.0	2,820.4	100.0
<u>Including:</u>								
England	35,652	41.0	38,753	27.8	805.5	31.1	504.8	17.9
United States	31,505	23.2	26,983	19.4	696.4	26.9	573.5	20.3
Germany	11,186 ⁽³⁾	8.2	10,236	7.3	230.2	8.9	200.5	7.1
France	7,400 ⁽⁴⁾	5.5	9,783	7.0	108.0	4.2	193.5	6.9
British India ⁽⁵⁾	6,084	4.5	9,876	7.1	94.1	3.6	189.7	6.7
China	1,009	0.7	5,071	3.6	-	-	-	-

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Japan (6)	2,300	1.7	11,880	8.5	-	-	337.1	12.0
Other Capitalist Countries	20,645	15.2	26,843	19.3	659.2	25.3	821.3	29.1

(2) Data on Italy taken as of 31 July 1935.

(3) In boundaries prior to World War I. Includes Alsace with about 1,500,000 spindles

(4) In boundaries prior to World War I.

(5) In the British India, there are also a considerable number of handlooms.

(6) Japan proper and Korea.

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of the industrial revolution in the 18th century, renowned for its abundance of textile mills and for its highly skilled spinners and weavers, has lost to a considerable extent its outstanding role in the manufacture of cotton textiles. This fact stands in a definite correlation with the general line of development in British industry. Greater development has taken place, due to the enormous exploitation of workers, in the cotton textile industry in Japan. This branch of industry has also been taken up and developed in a number of colonial and semicolonial countries.

Considerable changes have taken place in distribution not only of world but also of national centers of cotton textile industry. In the first place this applies to the US. The cotton goods industry, which originated in the US right in mill form compared with this type of industry in Europe, was concentrated initially in the North in the area of the first white settlements far from raw materials and fuel. This area had less generous soil than that of the southern states; of natural resources it had only water power. Intensive development of cotton textile industry in the south of the US in cotton-growing areas began very much later. Slavery, which had been dominant in the South, and its after-effects were the main causes impeding the development of the cotton textile industry in that part of the country.

Table 33 provides a clear picture of the changes which have taken place in the distribution of the cotton industry in the US within the past 100 years.

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Table 33
 DISTRIBUTION BETWEEN SOUTH AND NORTH US IN SPINDLES IN OPERATION IN
 THE COTTON INDUSTRY

<u>Years</u>	Total Spindles Installed	I n O p e r a t i o n			
		US	Cotton States	New England	Other States
(1)	(2)	(3)	(4)	(5)	(6)
1840	-	2,285	181	1,597	506
1850	-	3,998	265	2,959	775
1860	-	5,236	324	3,859	1,053
1870	-	7,132	328	5,498	1,306
1880	-	10,653	561	8,632	1,460
1890	-	14,384	1,570	10,934	1,880
1900	-	19,472	4,368	13,171	1,933
1910	28,929	28,267	10,494	15,735	2,038
1920	35,834	35,481	15,231	18,287	1,963
1922	36,946	35,708	15,906	17,939	1,863
1923	37,409	36,260	16,310	18,054	1,896

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(1)	(2)	(3)	(4)	(5)	(6)
1924	37,804	35,849	16,944	17,066	1,839
1925	37,929	35,032	17,292	15,975	1,765
1926	37,586	34,750	17,574	15,526	1,650
1927	36,696	34,410	17,894	14,995	1,521
1928	35,540	33,570	18,282	13,815	1,473
1929	34,820	32,417	18,541	12,538	1,339
1930	34,025	31,245	18,586	11,351	1,308
1931	32,673	28,989	18,073	9,655	1,251
1932	31,709	27,272	17,630	8,566	1,076
1933	30,893	26,895	17,929	8,205	761
1934	30,942	27,742	18,511	8,457	774
1935	30,093	26,701	18,212	7,763	726
1936	28,147	24,664	17,834	6,092	738
1937	26,982	25,419	18,244	6,425	751
1938	26,372	24,774	18,128	5,919	727

(1) Statistical Abstract of the United States, 1938, p. 800

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In 1840 the southern states' share in the industry in total number of spindles in the US amounted only to 7.92 percent; in 1890, to 10.91 percent; at the beginning of the 20th century, 22.43 percent; and in 1936, to almost three quarters -- 72.3 percent. What accounts then, for these extraordinary changes in the US cotton textile industry? What were the reasons for the deterioration of the importance of the northern areas, which have more skilled workers and technical personnel, are closer to markets, and enjoy a climate more conducive to cotton textile production? Some authors, as for instance the economist Professor Faulkner (A History of the National Economy of the US, 1932, p. 405.), explain this southward movement as a rush toward the sources of raw materials.

If the main market for cotton fabrics were in the southern US, the mills of the cotton-growing states would enjoy some economic advantages as far as the cost of transportation of the fabrics as well as of the cotton is concerned. But since a considerable part of unbleached cotton produced in the South and transported to the North for finishing comes back into the South in the form of finished fabrics, advantages accruing from geographical proximity of mills to raw materials become at least questionable. The fact is that the cleaned cotton being easily transported, its delivery from the southern states to New England is, as tariff computations show (See Pokshishevskiy, Problems of Industry Distribution, 1932, p.76), less expensive than delivery of finished fabric.

Other economists believe that the main force which attracts cotton textile factories to the South is the cheaper man power.

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To explain this shift in the cotton industry of the US by any single factor would be superficial and wrong. Only an analysis of the mode of production on the whole can explain this phenomenon.

The rate of profit is the main force which attracts capital to different branches and areas of capitalist production.

As long as slavery existed in the South, where it was abrogated only after the war between the northern and the southern states, the textile industry was located in the north of the country. In the southern US, there was no proletariat, the main condition for development of large-scale capitalist industry.

Just as the remnants of serfdom in Russia hampered the development of industry in the Urals where the richest natural resources were, in the southern US states, due to slavery and its after-effects, the cotton textile industry remained undeveloped until the end of the 19th century and did not play any noticeable role in spite of an abundance of cotton. Lack of organization of the working class in these areas as well as the absence of developed large-scale industry were among the factors which caused a lower wage level in the southern US than in the New England area.

According to the US Bureau of Labor Statistics, in the northern states, average hourly wages of cotton textile industry workers amounted in 1937 (April) to 48.9 cents -- for men up to 52.1 cents, women up to 44.5 cents; in the southern states, 38.1, 39.6, and 35.2 cents respectively. In 1938 (August), average hourly

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wages in the northern states amounted to 44.58 cents, and in the southern states, to 36.54 cents. International Cotton Bulletin, 1939, January, Vol XVII No 66 pp.230-231.)

The wages in the South as illustrated by the data adduced are much lower than in the northern US, while the duration of a working day in the South is longer than in the North. Industrialists take advantage of the poor organization of the southern workers to exploit most intensely the landless Negroes and the so-called poor whites. In particular, the workers' labor is much more intensified in the South with the broader application of the automatic loom, which together with the general automatization of production in US industry, disqualifies the worker by further reducing him to an appendage of the machine. In some southern states there is almost no legislation to regulate working conditions (insufficient limitation of night work for women; exploitation of child labor; etc). The 8-hour work day exists in almost no southern state.

Another incentive for capital was the fact that taxes were lower in the South. So despite the lower productivity of labor and the lower quality of production at factories in the South, cotton textile manufacturers obtained higher profits there.

The question of the socialist distribution of productive forces was brought up by Lenin in the first months after the Great October Socialist Revolution. In his Outline of a Plan of Scientific and Technical Work, Lenin pointed out that a plan of reorgani-

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zation of the industry must provide "an expedient distribution of industry in Russia from the viewpoint of proximity to raw materials and minimal loss of labor along the whole way from treatment of the raw material through all the consecutive stages of treatment of the semimanufactured goods up to the release of the finished product." (V. I. Lenin, Works, Vol XXII, p.134)

Elimination of the deep incongruity in the distribution of the productive forces inherited from old Russia and creation of a new geography of industry, particularly of the textile industry constitutes a most important economic objective. The distribution of industry in the USSR has developed along the lines of bringing industry nearer the sources of raw materials, fuel, power and the areas of demand for the product, and along the lines of locating industry in national regions, and so on.

At the time of the Civil War and the subsequent rehabilitation of the national economy, capital construction still was not developed enough, and no essential changes took place in the distribution of the industry, including the textile industry. The First Five-Year Plan with its historic beginning of the shift in USSR industry to the East, a shift which eclipsed in grandiosity and speed the greatest redistribution of industry in the capitalist world -- the redistribution in industry in the US -- brought about radical changes not only in the volume and the structure of industrial production but also in its distribution among different areas of the USSR.

In the First Five-Year Plan the foundation was laid for two new bases of textile industry, Central Asia and Western Siberia.

As a result of the First Five-Year Plan, the cotton textile industry was distributed over the USSR as follows:

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TABLE 34

DISTRIBUTION OF USSR COTTON TEXTILE INDUSTRY IN 1932 ⁽¹⁾

Production of Yarn and Fabrics in Different Areas

Areas	Yarn		Unbleached Fabrics		Finished Fabrics	
	(1,000 tons)	(Percent)	(1,000,000 meters)	(Percent)	(1,000,000 meters)	(Percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Central Region	343.7	96.8	2,617.2	97.3	2,376.7	98.3
North Caucasus and Azov Black Sea Kray	0.9	0.2	7.9	0.3	3.3	0.1
Volga Region	2.1	0.6	11.6	0.4	10.9	0.5
Siberia	-	-	-	-	-	-
Belorussian SSR	-	-	4.9	0.2	4.0	0.2

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ukrainian SSR		-	-	2.2	0.1	-	-
Transcaucasian Republics		6.0	1.7	32.2	1.2	14.6	0.6
Central Asiatic Republics		2.4	0.7	13.7	0.5	7.6	0.3
USSR		355.1	100.0	2,689.7	100.0	2,417.1	100.0

(1) See Socialist Construction in the USSR, 1935, p. 196.

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The direction of redistribution of cotton textile industry which had been outlined in the First Five-Year Plan was adhered to in the Second Five-Year Plan. To be sure the share of the Central Region in the output of cotton fabrics dropped only slightly -- from 97.3 percent in 1932 to 94.68 percent in 1937. The share of Transcaucasia and Central Asia rose, and a new cotton textile industrial area with broad prospects for development came into being in the east of the USSR, in Siberia. However, due to the still insufficient skill in managing new mills, and to non-fulfillment of the plan for capital construction in the cotton textile industry (the latter being to a considerable extent the result of sabotage) the changes in distribution of this industry were not accomplished as called for by the Second Five-Year Plan.

Due to the need for bringing mills nearer the sources of raw materials and to the areas of demand, as well as for developing industry in economically backward areas, the following cotton textile mills were built in new areas: the Fergana, Leninakan, Kirovabad, and Ashkhabad mills and the Barnaul and Tashkent Combines. By the end of the Second Five-Year Plan, the new areas already had cotton mills of considerable capacity, as illustrated in Table 35.

The table shows that, by the end of the Second Five-Year Plan, mills of the new areas had about 400,000 spindles and 10,500 looms. The technical equipment of these mills is modern: 21 percent of the spindles are provided with high and 32.5 percent with extra-high spools; 86 percent of all looms are automatic. In these areas was concentrated about 5 percent of all the equipment of the USSR cotton textile industry.

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TABLE 35

CAPACITY OF COTTON MILLS AND COMBINES IN NEW AREAS AT THE END OF THE
SECOND FIVE-YEAR PLAN

Name of Mill or Combine (1)	Operative Spindles (in 1,000)		Operative Looms
	(2)	Total (3)	of which, Automatic (4)
CENTRAL ASIA			
Tashkent Textile Combine imeni Stalin	111.7	3,264	3,265
Fergana Mill imeni Dzerzhinskiy	19.9	906	906
Ashkhabad mill imeni Dzerzhinskiy	11.5	420	420
Total	143.1	4,590	4,590
TRANSCAUCASIA			
Leninakan Mill	41.2	1,166	844
Kirovabad Mill imeni Ordzhonikidze	66.0	1,967	1,967

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Baku Mill imeni Lenin	46.0	1,219	no data
Total	153.2	4,352	2,811

WESTERN SIBERIA

Barnaul Mixed Fibers Combine	100.4	1,584	1,584
Total for the New Areas	396.7	10,526	8,985

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In 1937, the following amounts of cotton fabrics were produced: Central Asia, 67,800,000 meters; Transcaucasia, 57,400,000 meters; Western Siberia, 18,500,000 meters.

Due to the necessity of bringing industry nearer the sources of raw materials and to the areas of consumption of the product, as well as with the aim of further development of former economically backward areas, the XVIII Party Congress made the decision "To create a new large industrial base in the East of the USSR for manufacturing textiles from Central Asiatic cotton." (Decisions of the XVIII Congress of the VKP (b), 1939, p.26) The eastern part of the USSR is an extensive market with great demand for fabrics. In 1938 about 225 million meters of fabric was delivered just to Western and Eastern Siberia and the Far Eastern Kray.

The shift of industry to the east even before the patriotic War meant an intensive increase in population of that area. The eastern part of the USSR also has local raw materials for textiles (wool), and the Turkestan-Siberian Railroad provides economically expedient transportation of cotton from Central Asia, the transportation of cotton being at Soviet freight rates much less expensive than the transportation of fabrics. (The transportation of one ton of cleaned cotton from Tashkent to Moscow in 1938 cost 95 rubles, and that of one ton of cotton fabric about 269 rubles. (See Tariff Manual, No 1 and 3, 1938, NKPS)

The presence of an extensive area with demand for fabrics, having fuel and manpower; and the possibility of producing dyestuffs

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on the spot from waste from the coke industry; the possibility of developing a machine-building base for the textile industry in Western Siberia -- all these factors are conducive to a rapid growth of the textile industry in the eastern USSR. The Third Five-Year Plan made provisions for putting in operation new cotton mills in Barnaul, Novosibirsk, and the Kuznetsk Basin.

Provision was also made for building and putting in operation cotton mills in other areas of the USSR and particularly for completing the construction of the Tashkent and Barnaul combines, the Leninakan Spinning Mill, and the Stalinabad Textile Mill which were begun in the Second Five-Year Plan.

In cotton industry, the Third Five-Year Plan Made provisions for a faster pace in the development of new areas leading to an increase in the share of the new areas in production of fabrics as illustrated in Table 36.

[see Table 36 on following page]

The Third Five-Year Plan provided for a considerable increase in the share in production of cotton fabrics for such economic areas as Siberia, the Volga Region, the North Caucasus, Transcaucasia, and Central Asia.

The more rapid development of the textile industry in West Siberia, Central Asia, Transcaucasia, and other new areas leads to a relative reduction in the share of the cotton industry for the central region although an absolute growth of the textile

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TABLE 36

CHANGES IN DISTRIBUTION OF COTTON INDUSTRY IN THE USSR IN THE THIRD FIVE YEAR PLAN (1)

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<u>Basic Areas</u>	Share	(Percent)
	1937	1942
Central Region	94.68	83.25
North Caucasus	0.22	1.79
Volga Region and the Urals	0.58	1.07
Siberia	0.54	3.13
Belorussian SSR	0.27	0.26
Ukrainian SSR	0.21	1.08
Transcaucasian Republics	1.66	2.49
Central Asiatic Republics and Kazakh SSR	1.84	6.93
	100.0	100.0

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(1) For 1942, not the actual but the plan data are given

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of the textile industry of these regions is to take place according to the Third Five-Year Plan.

However, the center of the country, which has available skilled cadres of textile workers, an extensive market for fabrics, local fuel (peat), and cheap waterpower is still the main textile region of the USSR. Even though the share of this area in the output of fabrics was to decrease, the central region according to the Five-Year Plan had to produce over 80 percent of the total output of cotton fabrics in the USSR, and besides that, fabrics of higher quality. In particular, the central region provide the electrotechnical, automobile, aviation and other branches of industry with industrial fabrics.

To improve the efficiency of textile mills of the central regions it is necessary in the first place to eliminate a number of disparities in the field of production. To that purpose, the XVIII Party Congress decided "to undertake construction of small spinning mills in the old textile-producing areas." (Decisions of the XVIII Congress of the VKP (b), 1939, p.30) This decision is of great importance for our national economy. The distribution of the cotton industry in prerevolutionary Russia showed (as already mentioned above) enormous disparities between the spinning and weaving manufactures, causing considerable transportation expense which the textile bosses tried to recoup by further cuts in the already low wages of the workers.

In spite of the construction of a number of large spinning mills (the Mill imeni Lakin, Mill imeni Dzerzhinskiy, and the

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Krasnaya talka mill), the lag in the spinning industry has not been fully overcome as yet. Moreover as a result of the increased demand for cotton yarn in a number of industries, disparities between the capacities of the spinning and weaving industries have even increased. Building of small spinning mills in the central textile areas will be conducive to elimination of the numerous cases of cross-hauled semifinished goods, which increases the cost of production; to utilization of idle looms; to expansion of production volume; and to improvement in the quality of the product. Within the first years of the Third Five-Year Plan the cotton industry of some areas eliminated to a certain extent disparities between the spinning and weaving phases. Nevertheless shortage of year was one of the reasons for the slow expansion of production value in the cotton textile industry. Early in 1940 the No II Main Administration of Ivanovo Oblast alone had 3,000 idle looms on that account; 4,000 looms were not working full-time in producers' cooperatives of Ivanovo Oblast; and so on.

After having solved the problem as to the general area where a textile factory should be located, the most serious attention must be paid to the precise locality on which to construct it. The guiding principle in this case must be that of the economical expediency, that of the least waste of labor.

A thorough consideration of the technical and economical details of the projects (transportation, raw materials, fuel, area of the demand for the product, variety, etc.) and coordination of the development of the planned mill with that of the

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local industry (power supply, water supply, garages, repair and service shops, etc) are a sine qua non for the proper distribution of industry.

Creation of new production bases for the textile industry and a quicker development of this branch in new areas will help to reduce the average transportation distance for cotton fabrics.

In its decisions, the XVIII Congress repeatedly stressed the necessity of eliminating "the inexpedient and excessively distant transport, "which is unfortunately, still taking place in our national economy. Despite the comparatively low proportion of fabrics and yarn transportation in the freight turnover of the railroads of the USSR (For instance, in 1932 the proportion of different goods on commercial freight trains was as follows: coal and coke, 21.1; petroleum products, 6.3; timber material 12.1; rye 1.9; fabrics (511,000 tons), 0.2; yarn (various), 0.1; cotton 0.3. See Railroads of the USSR in Figures, 1935, pp 125-128), increase in expediency of textile goods transport is of great importance to the national economy.

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TABLE 37

TRAFFIC OF COTTON FABRICS (MARKETED GOODS) BETWEEN THREE COTTON TEXTILE INDUSTRY CENTERS IN 1938 (IN 1,000 METERS) (1)

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	Printed Calico (1)	Coarse Calico (2)	Underclothing				Spring and Autumn (7)	Dress			Coating				Winter (15)
			Coarse Calico (3)	Calico (4)	Special (5)	Sateen (6)		Striped and Checked Calico (8)	Winter (9)	Summer (10)	Plain Dyed (11)	Special Fabric (12)	Printed (13)	Melange and Interwoven (14)	
Fabrics sent from Ivanovo Oblast to Moscow Oblast	3280	746	5834	208	58	1730	1414	--	552	518	1174	30	--	2174	122
Fabrics sent from Moscow and Kalinin Oblasts to Ivanovo Oblast	--	16	46	126	212	378	440	--	94	234	164	52	--	24	102
Fabrics sent from Ivanovo Oblast to Leningrad Oblast	8148	1636	4934	428	330	1942	1790	--	558	900	2138	482	--	2148	246
Fabrics sent from Leningrad Oblast to Ivanovo Oblast	--	--	--	22	--	8	42	--	38	322	--	--	--	--	--
Fabrics sent from Leningrad Oblast to Moscow Oblast	--	--	--	336	--	152	106	--	224	4114	118	--	--	--	--

	Melange and Interwoven	Wool	Lining	Interwoven	Upholstering tick	Oriental	Teasled	Kerchief	Towel	Blanket	Fabric with Silk	Unbleached	Total
3)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
2174		122	116	262	608	48	--	68	--	2	62	4	19550
24		102	10	50	78	2	62	36	284	38	34	--	2482
2148		246	352	234	730	556	--	534	--	8	56	620	28770
--		--	2	--	--	--	--	56	--	--	50	--	540
--		--	28	--	--	--	--	214	--	--	962	--	6254

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10 METERS) (1)

	Coating				Winter (15)	Lining (16)	Interwoven (17)	Upholstering tick (18)	Oriental (19)	Teasled (20)	Kerchief (21)	Towel (22)	Blanket (23)	Fabric with Silk (24)	Unbleached (25)	Total (26)
	Plain Dyed (11)	Special Fabric (12)	Printed (13)	Melange and Interwoven (14)												
1174	30	--	2174		122	116	262	608	48	--	68	--	2	62	4	19550
164	52	--	24		102	10	50	78	2	62	36	284	38	34	--	2482
2138	482	--	2148		246	352	234	730	556	--	534	--	8	56	620	28770
--	--	--	--		--	2	--	--	--	--	56	--	--	50	--	540
118	--	--	--		--	28	--	--	--	--	214	--	--	962	--	6254

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(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17)

Fabrics sent from Moscow and Kalinin

1002 616 426

Oblasts to Leningrad Oblast

6952 1610 2354 2494 868 4614 3566 34 764 2074 2488 884 12 330

has been computed

(1) According to figures by the Textile Marketing Committee of the People's Commissariat for Textile Industry USSR (the year's total)

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(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	1002	616	426	558	158	416	194	1612	218	160	452	34856

330

has been computed on the basis of the actual shipping in the second half of 1938 multiplied by two.

total

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TABLE 38

SHIPPING OF COTTON FABRICS (MARKETED GOODS) FROM MILLS OF IVANOVO, MOSCOW, AND KALININ OBLASTS, FROM THE BARNAUL COMBINE, FROM MILLS

OF CENTRAL ASIA AND T

Shipping Mill	R E G I O N S O F						D E S T I N A	
	Total	Center ²	Northwestern RSFSR ³	Northeastern RSFSR ⁴	West-European Part of RSFSR ⁵	Volga Region	Ukrainian SSR	Byelorussian SSR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mills of Ivanovo Oblast:								
Amount	715,640	80,893	31,655	23,872	5,826	38,705	104,348	11,260
Percent	100.0	11.3	4.4	3.4	0.8	5.4	14.6	1.6
Mills of Moscow and Kalinin Oblasts:								
Amount	623,499	183,630	38,461	8,056	17,078	39,524	121,646	11,572
Percent	100.0	29.5	6.2	1.3	2.7	6.3	19.5	1.9
Mills of Leningrad Oblast:								
Amount	87,755	11,016	23,706	1,325	2,257	3,943	14,928	2,270
Percent	100.0	12.5	27.0	1.5	2.6	4.5	17.0	2.6
Barnaul Combine:								
Amount	14,248	123	--	--	--	484	--	--
Percent	100.0	0.9	--	--	--	3.4	--	--

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LINE, FROM MILLS

OF CENTRAL ASIA AND TRANSCAUCASIA TO DIFFERENT REGIONS OF THE USSR IN 1938 (IN 1,000 METERS)⁽¹⁾

S O F

D E S T I N A T I O N

Ukrainian SSR	Byelorussian SSR	Urals	West Siberia	East Siberia	Far East Kray	Northern Caucasus and The Crimean ASSR	Transcaucasian Republics	Kazakh SSR	Republics of Central Asia	
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
38,705	104,348	11,260	61,745	54,044	45,220	33,836	36,735	21,546	40,260	125,694
5.4	14.6	1.6	8.6	7.6	6.3	4.7	5.1	3.0	5.6	17.6
39,524	121,646	14,572	37,068	18,084	16,570	13,566	58,370	14,062	14,040	28,772
6.3	19.5	2.3	6.0	2.9	2.6	2.2	9.4	2.3	2.2	4.6
3,943	14,928	2,270	3,756	2,678	1,216	2,224	7,328	1,774	2,084	7,250
4.5	17.0	2.6	4.3	3.0	1.4	2.5	8.4	2.0	2.4	8.3
484	--	--	2,925	2,582	2,058	1,247	199	--	1,544	3,086
3.4	--	--	20.5	18.1	14.4	8.8	1.4	--	10.8	21.7

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>Mills of Central Asia</u>									
Tashkent Combine:									
Amount		38,016	--	--	--	--	--	--	--
Percent		100.0	--	--	--	--	--	--	--
Fergana Mill:									
Amount		12,392	--	--	--	--	--	--	--
Percent		100.0	--	--	--	--	--	--	--
Ashkabad Mill:									
Amount		5,040	--	--	--	--	--	--	--
Percent		100.0	--	--	--	--	--	--	--
<u>Mills of Transcaucasia</u>									
Kirovabad Mill imeni									
S. Ordzhonikidze:									
Amount		5,769	--	--	--	--	--	2,772	--
Percent		100.0	--	--	--	--	--	48.1	--

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(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
--	--	--	--	--	--	--	--	--	--	14.8	37,868
--	--	--	--	--	--	--	--	--	--	0.4	99.6
--	--	--	--	608	1,684	--	--	--	--	2,194	7,906
--	--	--	--	4.9	13.6	--	--	--	--	17.7	63.8
--	--	--	--	--	--	--	--	--	--	--	5,040
--	--	--	--	--	--	--	--	--	--	--	100.0
--	--	--	--	--	--	--	--	--	--	--	--
--	--	2,772	--	--	--	--	--	1,064	1,933	--	--
--	--	48.1	--	--	--	--	--	18.4	33.5	--	--

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leninakan Mill:							
Amount	8,368	--	--	--	--	--	5,424
Percent	100.0	--	--	--	--	--	64.8
Baku Mill:							
Amount	26,506	--	--	--	--	--	8,408
Percent	100.0	--	--	--	--	--	31.7

- (1) According to figures by the Textile Marketing Committee of the People's Commissariat for Textile Industry USSR.
- (2) Center comprises Ivanovo, Moscow, Yaroslavl', Gor'kiy, Ryazan', Tula, Orel, Kursk, Voronezh, and Tambov Oblasts.
- (3) Northwestern RSFSR comprises Leningrad and Murmansk oblasts and the Karelian ASSR.
- (4) Northeastern RSFSR comprises Arkhgel'sk and Vologda oblasts, Komi ASSR, and Kirov Oblast.
- (5) The West-European part of the RSFSR comprises Smolensk and Kalinin oblasts.

(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	5,424	--	--	--	--	--	--	2,944	--	--
	64.8	--	--	--	--	--	--	35.2	--	--
	8,408	--	--	--	--	--	6,608	11,490	--	--
	31.7	--	--	--	--	--	24.9	43.4	--	--

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Elimination of inexpedient, and particularly crosshaul transportation which raises the costs of production and lowers the social productivity of labor is a major objective for the textile industry.

Our press has pointed out crosshauls of metals, timber, and coal, but it has not as yet drawn attention to excessively distant transportation and crosshauling of fabrics and yarn.

Table 37 gives a picture of cotton fabrics traffic in 1938 for three main centers of textile industry.

As the table shows crosshauls cannot always be explained by the diversity in the assortment of products. In many cases, between Ivanovo, Moscow, Kalinin, and Leningrad oblasts crosshauls of the very same grade of fabric was taking place. Take for instance the case of underclothing: calico fabrics were being transported from Leningrad Oblast to Moscow Oblast and vice versa; in the case of dress fabrics, spring and autumn fabrics were being shipped from Ivanovo Oblast to Moscow Oblast and vice versa; summer fabrics from Moscow Oblast to Leningrad Oblast and vice versa; and so on.

Much attention is to be paid to improved planning of commercial traffic in fabrics; this will help raise additional reserves in this sector of the economy.

The mills of Ivanovo, Moscow, and Leningrad oblasts ship their fabrics, as it is shown in Table 38, to every corner of the country.

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Creation of new textile mills in Central Asia, Transcaucasia and West Siberia, whose products are marketed mainly in the same regions, has undoubtedly been conducive to reduction of the average transport distance for cotton fabrics. However, the output of the new mills is not consumed completely by those regions. Part of the cotton fabrics produced go from the Fergana mill to the Urals and to Western Siberia and a considerable part of the mixed fabrics from the Barnaul Combine (West-Siberia) go to the republics of Central Asia. In this case crosshaul of fabrics is taking place, but of fabrics of different kinds.

The area where fabrics of the Barnaul Combine are marketed is rather large: the bulk of them (32.6 percent) is consumed in West and East Siberia, a considerable portion in the republics of Central Asia and in the Urals, a part in the Volga Region, and even (though not much) in the oblasts of the central black earth region, in Kursk, Orel, and Voronezh Oblasts.

Fabrics shipped from the Barnaul Combine to the Volga Region and the central regions cross the traffic of fabrics from the central regions sent to Siberia, the Far East Kray etc.

The marketing area of the output of textile mills depends also on the degree of specialization of the mills.

The narrower the specialization of a mill, the broader the marketing area for its output.

For determining the degree of specialization of a cotton mill, it must be kept in mind that an excessively narrow and one-sided specialization leads to too distant and crosshaul transportation of the product.

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C H A P T E R I V

THE SIZE AND STRUCTURE OF FACTORIES IN
THE COTTON INDUSTRY OF THE USSR

Concentration and combination level in the cotton textile industry. - Developments in the size of mills in the US cotton textile industry. - Structure of the cotton textile industry of the US, England, and Germany. - Efficiency of cotton mills of different size. - Size of enterprises in the cotton industry of the USSR.

Due to the historical conditions of its development, the cotton industry of prerevolutionary Russia was distinguished, as has already been mentioned, by a high level of concentration of production, which exceeded the concentration in a number of other branches of Russian industry. Whereas the average number of workers in an industrial enterprise in Russia in 1913 amounted to approximately 140, and in the metalworking branch to 170, in the cotton industry the figure was 827. (See Industrial Factories and Plants in the Period 1913 - 1918. 1925, Vol XXVI, p.84 [Introduction].)

The average size of a cotton mill in Russia was larger than that in the US, England, and Germany.

However, due to a lower organic structure of capital and poorer technical equipment, the productivity of labor in this industrial branch was, as has been mentioned, considerably lower than in the US and England.

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Let us examine the developments in the size of cotton mills in US industry.

[See Table 39 on following page]

The figures for 1899, 1904, and 1919 must be compared only with each other; they cannot be compared with the data for 1927 and the following years, because prior to 1921 US censuses registered small enterprises (prior to 1921 the lower limit for an enterprise to be registered was set at 500 dollars, while from 1921 on it was raised to 5,000 dollars). (Orlanis, History of American Censuses, 1938, pp. 154-155) From 1899-1919 a growth of the size of mills took place in the US cotton industry. In recent years, as shown in Table 39, the average size of all types of cotton mills has decreased; spinning-and-weaving combines shrank from 42,938 spindles and 1,036 looms in 1927 to 40,240 spindles and 930 looms in 1935; the size of weaving mills fell from 112 to 88 looms; the size of spinning mills fell in this period, too, from 17,434 to 16,730 spindles, although this trend was interrupted, particularly, in 1929 and 1931.

In American economic literature not inconsiderable attention is paid to the problem of the most expedient size of textile mills. One author, stating that the most important structural features of the US cotton industry are its high degree of specialization and small size of mills, writes about this size as follows:

"In the cotton textile industry, there are no operations whose efficiency depends on large-scale manufacture. The largest-

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TABLE 39

AVERAGE SIZE OF A MILL IN THE US COTTON INDUSTRY
(in units of equipment per one mill) (1)

Factory Type	1899	1904	1919	1927	1929	1931	1935
Spinning-and-Weaving Combines							
(a) Spindles	31,637	32,494	42,801	42,938	40,816	40,590	40,240
(b) Looms	864	885	1,065	1,038	968	969	930
Spinning Only (Spindles)	11,409	13,494	17,801	17,434	18,760	20,216	16,730
Weaving Only (Looms)	105	110	106	112	108	95	88

(1) The table has been compiled from The Census of the US Manufactures for 1919, 1929, and 1935.

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scale operation at cotton mill -- the operation of sizing -- does not require, for attainment of high productivity, a mill any larger than 10,000 spindles. The trend towards creation of larger mills can be explained, as far as production itself is concerned, by the tendency to reduce the cost per unit of product by applying the management and non-productive costs to a larger production volume. It is considered an established fact that a calico mill of about 60,000 spindles enjoys all possible economy by way of size, and that further enlargement does not result in proportional economy. With a mill producing fabrics from coarser yarn, the maximum efficiency may be reached at about 30,000 spindles, the economy being mainly that on account of management and organization and not of technical efficiency. As far as technical operations are concerned, small mills may be regarded as equally efficient." (S. Kenedy, Profits and Losses in Textiles, 1936, p. 105)

Thus, in the opinion of this author, the optimum size of a cotton-spinning mill is 60,000 spindles, and of mills producing coarser fabrics, 30,000 spindles.

Balderston gives data on production cost of calico (without the cost of cotton) for 20 mills in the US (southern states). All these mills employ, basically, the same methods of mass production. The lowest production costs per one yard of calico (2.3 cents) were those with a mill with 2,016 looms, and the highest of those a mill with 232 looms. However, a strict relation between the size and the production cost level of these mills cannot be discovered.

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For instance at a mill with 1,920 looms, production costs per one yard of calico amounted to 3.05 cents, at a factory more than 4 times as small. (444 looms), they amounted to 2.81 cents. The author who gives these data explains the difference in production costs at these various mills as follows: "One of the main reasons for losses is bad management and insufficient productivity of labor, the latter being due to various causes: poor skill or poor training, bad wage policy, lack of proper equipment or appropriate working conditions." He points out that at five out of twenty mills inspected, some technically important modern machines are missing (See C. Balderston, Management of a Textile Business, Washington, 1938, pp I-2. The same data are given in the book by Nichi, The Textile Industry, Washington, 1938, p. 92)

Due to the cotton textile industry's having worked 1929-1937 considerably below its full capacity because of intensive shrinkage of fixed capital and too strong competition among enterprises in foreign countries, etc, preference is sometimes given to small to medium mills in the cotton textile industry. (Textile World, reporting a special study by the University of Pennsylvania on the expedient mill size in the wool industry, writes: "investigation has shown that with a large combined enterprise things are not always handled properly in the field of management and administration. To build a large mill is not difficult, yet it is difficult to run it so that it works with the exactitude of a mechanism. Moreover, a large enterprise is considerably less flexible than a small one. A very large enterprise presupposes big orders; it is unprofitable for a large enterprise

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in time of a crisis, shaky or falling prices, when wholesale dealers are afraid of placing big orders.

But the general conclusion is this: small and large enterprises each have an activity field of ~~the~~^{their} own, and there can be no yardstick for considering one more profitable than the other [The Wool Record and Textile World. Vol 54, August 1938].)

The size of the mills in US industry has also to do with the fact that the cotton textile industry has shifted to the southern area of the US where cotton mills do not reach the size of those located in the North of the country. Intensive construction of cotton mills has recently been taking place, exactly in the southern areas of the US, which undoubtedly has had a bearing on the average size of enterprises.

Combined enterprises in the ^{US} cotton textile industry are of a considerably larger average size than the noncombined ones. In 1929 a spinning and weaving combine used to have an average of 40,816 spindles and 968 looms, whereas a noncombined spinning mill had only 18,760 spindles, and a weaving mill only 108 looms. A spinning and weaving combine in the North was in 1899 more than thrice, and in 1929 more than twice as large as a similar enterprise in the southern states. While the weaving mills are of approximately the same size, the spinning mills of the North are considerably larger than those in the South. Thus, with the exception of weaving mills, the average size of mills in the North away from the cotton is considerably larger than that of enterprises located in the cotton-growing southern areas of the US.

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It is worth mentioning that the size of a mill also depends to a certain extent on its structural character, particularly, on the degree of specialization of the enterprise.

Diversity of grades of goods (fabrics, yarn) produced by a mill has a certain bearing on the size of the mill.

In size, an average English cotton textile mill is smaller than an American one and is structurally more complicated. The English cotton industry produces a larger variety of fabrics by using more varied counts of yarn, whereas the US textile industry, along with its other industrial branches, is dominated by specialized mass production. In the majority of cases the lower the number of grades and the more rigorous the specialization of the capitalist textile enterprise, the larger the enterprise, all other things being equal. Stronger competition within the cotton industry, the growing competition between this branch and the rayon industry, etc, are pressing towards broadening the variety of grades in the cotton industry, which cannot be without bearing on the average size of enterprises in this branch of industry.

The size of textile factories stands in some relation not only to the degree of their specialization but also to the degree of combination of different enterprises within the cotton industry.

The mass character of production in the US cotton industry is one of the reasons for the high combination level of spinning and weaving production in this branch of industry.

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TABLE 40

COMBINATION LEVEL IN THE US COTTON TEXTILE INDUSTRY

Census Year (1)	Total Number of Mills (2)	Number of Mills			Share of Equipment Installed (Percent of Total Amount)			
		<u>Including</u>			<u>Spinning and Weaving</u>		<u>Spinning</u>	<u>Weaving</u>
		and Weaving Combines	Spinning Only	Weaving Only	Combines	Looms	Only	Only
		(3)	(4)	(5)	Spindles (6)	Looms (7)	Spindles (8)	Looms (9)
1935	1,042	533	305	140	80.8	97.6	19.2	2.4
1931	1,140	589	297	181	79.9	97.1	20.1	2.9
1929	1,281	652	341	207	80.6	96.6	19.4	3.4
1919	1,288	632	409	181	78.8	97.2	21.2	2.8
1899	973	502	274	168	83.6	96.1	16.4	3.9

(1) Compiled from The Census

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Since the noncombine enterprises in the US are of smaller size than the combined, their numerical share is higher than their share in the equipment installed; in 1929 the number of purely spinning enterprises amounted to about 34 percent, and that of purely weaving enterprises to about 24 percent of the total number of enterprises having operative spindles or looms. Over 96 percent of all looms in the US cotton textile industry are concentrated, in contrast with the textile industry of England and Germany, in the spinning and weaving combines, and only about 3 to 4 percent of the looms are installed in purely weaving factories. A high degree of combination is also found in the spinning industry, where four fifths of the spindles are concentrated in the spinning and weaving combines. The noncombined cotton-spinning mills in the US supply yarn to the stockinet, silk, and other branches of industry.

Of the foreign countries combination in the cotton textile industry is practised on the largest scale in the US; the share of the spinning and weaving combines in British and German industries is considerably smaller: it is worth mentioning that in England, due to some peculiarities in the development of this branch of industry, the share of the combined enterprises has in some particular years even decreased.

It is characteristic of the British as well as of the German cotton textile industry in contrast with the American spinning is largely separated from weaving. The economist Ruz'ye (?), in his studies on combination in industry, comes to the conclusion that the machine techniques undermine and re-

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strain the combination process in the textile industry. However, the practice of American industry is the first to disprove this assertion. Instead of unraveling the causes restraining the combination process (production concentration level, technical level, influence of the market, etc), Ruz'ye sees the limitation of the combination, the "integration," in machine production.

The German textile industry is marked by an enormous number of small enterprises, poor specialization, and slight combination of production. In 1933 the German textile industry comprised 68,000 enterprises with 857,000 workers, and a power consumption of 1,500,000 HP. (Wirtschaft and Statistik, 1935, No 11). The major share of the total number of enterprises consists of various domestic craft enterprises. An especially large number of domestic workers are engaged in stockinet production.

The crisis of 1929 reduced the number of enterprises in the German textile industry 45 percent, and the number of workers 358,000 men. The decrease in the number of enterprises resulted to a considerable extent, from the petering out of the so-called homework industry.

In 1933 the German cotton textile industry comprised 2,829 enterprises, 215,000 workers, and 600,000 HP of machine power, which constituted 39.9 percent of the total machine power in the German textile industry. Small enterprises (up to 5 workers) employed 2,600 men. In the same year, enterprises with up to 200 workers employed 58,000 men, or about 26 percent of the total number of workers in this branch of industry. One enterprise

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employed an average of 76 workers.

Statistical conditions make it impossible to isolate the large industrial enterprises, but the fact that more than a quarter of the number of workers of the cotton textile industry were employed in small enterprises (up to 200 workers) indicating their high proportion in the German cotton goods industry. The combination level of the German cotton industry is considerably lower than in the US, as well as lower than in other branches of Germany industry.

According to the census of 1925 the German cotton goods industry comprised 386 purely spinning mills with 34,294 workers, 6,157 purely weaving mills with 130,775 workers, including a great number of homework enterprises, and 164 spinning-and-weaving enterprises. According to the census of 1933, out of a total of 215,000 workers occupied in this industrial branch, 82,000 (38 percent) were employed in purely weaving enterprises, and 62,500 (29 percent) in spinning-and-weaving ones. The total number of persons engaged in weaving amounted to 112,000, and in spinning to 92,000.

[See Table 41 on following page]

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TABLE 41

COMBINATION IN THE GERMAN COTTON TEXTILE INDUSTRY IN 1933⁽¹⁾

Kind of Enterprise	Number of Enterprises		Number of Persons		Reduction in Persons in 1933 as Against 1925	
	Amount	Percent	Amount	Percent	Amount	Percent
Cotton Textile Industry as a Whole	2,829	100	215,460	100	82,609	27.7
Including:						
Yarn-Spinning	258	9.1	60,392	28.0	23,904	28.4
Yarn-Twisting	372	13.2	10,448	5.0	4,297	28.8
Spinning-and-Weaving	122	4.3	62,454	29.0	5,475	8.1
Weaving	2,077	73.4	81,966	38.0	48,933	37.4

(1) See Wirtschaft and Statistik, 1935, No 11.

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Thus in 1933 almost 40 percent of all workers in German cotton textile industry were employed in noncombined weaving enterprises, which condition was leading, due to this industrial branch's being scattered all over the country (as against England, where the cotton industry is concentrated in a small area), to additional expenses for transportation of semimanufactured goods.

The German cotton goods industry, as well as the whole German textile industry from the viewpoint of production management and technique, is (in contrast with branches such as chemistry, electrical engineering, and others) a rather backward branch, marked by a low level of automatization, by the presence of many small enterprises, insufficient specialization, and poor combination of production.

In the USSR the average size of enterprises in the cotton textile industry has somewhat increased as compared with pre revolutionary Russia. This is due partly to the closing down of certain small cotton textile mills in the first years of industrial reconstruction. But the main reason for this is that capital construction in the Soviet cotton textile industry was directed in the industrialization period and in the First and Second Five-Year Plans towards construction of large spinning and weaving mills.

As shown by Table 42, the proportion of enterprises with a gross output of over 10 million rubles a year (comprising 22.3 percent of the total number of large-scale industrial enterprises) amounted in 1935 to 74.4 percent of the workers and 81.2 percent of the gross output of the whole large-scale cotton textile industry in the USSR.

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TABLE 42
 CONCENTRATION OF THE COTTON TEXTILE INDUSTRY IN THE USSR IN 1935 (IN PERCENT)

Index	Total	Enterprises with Gross Output in 1926/27 Prices (in 1,000 rubles)								
		Up to 49	50-99	100-249	250-499	500-999	1,000-1,999	2,000-4,999	5,000-9,999	Over 10,000
Enterprises	100.0	6.2	9.2	12.6	11.3	9.9	6.2	12.8	9.5	22.3
Workers	100.0	0.1	0.3	0.7	0.9	1.5	1.3	7.2	13.6	76.4
Gross Output	100.0	0.1	0.1	0.3	0.6	1.0	1.2	5.7	9.8	81.2

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In regard to manpower, the average size of enterprises in Soviet cotton textile industry is considerably larger than in the US industry. Workers employed in enterprises with up to 100 workers amounted in the US cotton textile industry to 5.1 percent, while in Soviet (large-scale cotton textile industry, to 1.4 percent in 1935; US factories with up to 1,000 workers employed the bulk of the manpower -- 68.9 percent -- whereas in the Soviet cotton textile industry only 13.7 percent of all workers of that industrial branch; simultaneously, the largest enterprises (with over 1,000 workers) of Soviet industry employed 86.3 percent of all workers as against 31.1 percent employed by similar enterprises in the US (USSR and the Capitalist Countries, p.50)

We do not have data available with which to judge the level of concentration of equipment at Soviet as well as at American cotton textile mills. However, a particular level of enterprise concentration relative to manpower implies -- depending on the number of machines operated -- a certain concentration level relative to means of production, also. The technical level of the American cotton textile industry (automatization of weaving, introduction of stretching [vytyazhka], etc) is very high. At cotton textile mills in the US a worker operates on the average more spindles and looms [sic]. The US cotton textile industry is for the time being still better supplied with technical equipment and particularly with power equipment than Soviet cotton textile industry. In this connection, the concentration levels/in the US and USSR cotton textile industries are somewhat different. The difference in scale of enterprises in point of equipment is less than in point of manpower.

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The size of enterprises in the USSR cotton textile industry is closely connected with their production structure, particularly with combination, which stimulates the enlargement of cotton textile mills. The average size of combined enterprises is considerably larger than that of the noncombined (spinning and weaving mills). The smallest enterprises in the USSR cotton textile industry are noncombined spinning and weaving mills, and the largest enterprises are spinning-weaving-and-finishing, spinning-and-weaving, and weaving-and-finishing combines.

[See table 43 on following page]

In 1935 noncombined spinning, weaving, and finishing mills of the cotton textile industry comprised about 50 percent of the total number (264 out of 533) of enterprises, but they had only 34 percent of the workers and 31 percent of the fixed industrial funds of the whole large-scale cotton textile industry in the USSR. If the total number of enterprises is not to include band-weaving, thread and cotton-wool enterprises, as well as enterprises not grouped according to type of production, the share of the noncombined enterprises in the total number of enterprises will amount to about 72 percent; in number of workers, to about 37 percent; and in industrial assets, to about 32 percent. Thus 63 percent of the workers and 68 percent of the fixed assets of large-scale cotton textile industry of the USSR fall on the combined enterprises, which indicates a rather high combination level within this branch of Soviet industry. In the USSR textile industry, a considerable degree of combination is found not only in spinning-

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TABLE 43
COMBINATION LEVEL IN THE USSR COTTON TEXTILE INDUSTRY IN 1935 (1)
LARGE-SCALE INDUSTRY

Enterprises (1)	Number of Enterprises		Yearly Average Number of workers		Fixed Industrial Funds by End of the Year; in 1,000,000 Rubles	
	Amount (2)	Percent of Total (3)	Amount (4)	Percent of Total (5)	Amount (6)	Percent of Total (7)
Total Enterprises	533	100.0	466,384	100.0	1,805.4	100.0
Including						
Spinning	45	8.4	58,617	12.6	217.6	12.1
Thread-Spinning	2	0.4	5,119	1.1	18.9	1.0
Spinning-and-Weaving	66	12.4	174,247	37.4	699.5	38.8
Weaving	195	36.6	83,136	17.8	193.4	10.7
Weaving-and-Finishing	12	2.2	23,153	4.9	73.3	4.0
Spinning-Weaving-and- Finishing	18	3.4	73,891	15.8	369.4	20.4
Spinning-and-Finishing	1	0.2	3,062	0.7	16.9	0.9
Finishing	24	4.5	18,013	3.9	147.7	8.2
Others	170	31.9	27,166	5.8	68.7	3.9

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and-weaving production but also in finishing enterprises. The high combination level of the USSR cotton textile industry conforms with the high concentration of production in this industrial branch.

What is the economical efficiency of our cotton textile mills of various sizes? It is very hard to answer this question. The difficulty lies in the fact that the technical and economic characteristics of mills are influenced by a number of elements: the technical level, the skill of the workers, the organization of production, and other factors. Besides, cotton textile mills manufacture products at different labor costs, which again makes the answer to the question raised more difficult.

Let us first consider the productivity level of the workers and the use of equipment in mills. An analysis of these indexes is of great importance; however, in this particular case, they are a relative factor of a conditional nature and are advanced by us for a very general technical and economic evaluation of the mills.

The most highly synthesized characteristic of an enterprises is its prime cost of production; that is why in analyzing the economic efficiency of factories one of the central places must be given to examination of the prime cost of the product, and the same kind of product at different factories. In investigating these factors, it is necessary not only to analyze the level of industrial prime cost, but to take into consideration other labor costs, as for instance those for transportation of finished goods from the place of their production to the place of their consumption.

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We have taken the weaving mills under All-Union jurisdiction. These mills have been divided for our purposes into four groups: 1st group -- mills having from 100 to 750 looms (small); 2nd group -- having from 750 to 1,500 looms (medium); 3rd group -- from 1,500 to 3,000 looms (large); and 4th group -- from 3,000 to 5,000 looms (giants). A considerable part of the weaving mills in Ivanovo Oblast belong to the "large" group, which comprises 46.54 percent of the total number of looms.

[See Table 44 on following page]

Table 44 shows that the maximum output of wool threads per worker per hour takes place in small and medium enterprises. If the level of utilization of looms is measured by the number of wool threads produced by the loom in a unit of time it must be admitted that the productivity per loom per hour decreases at these mills with the enlargement of the enterprises. In small enterprises this number amounted in 1937 to 10,444 threads; in medium ones, to 10,892 threads; in large ones, to 9,808 threads, and in giants, to only 9,077 threads per hour.

It must be generally kept in mind that these technical and economical indexes are strongly influenced by the variety of goods produced and by the kind of equipment installed in the mill. The relationship in the utilization of the equipment is due to a certain degree to the higher proportion of automatic looms in large enterprises. As the table shows, larger mills produce more dense fabrics with higher labor costs involved. The average wool density of fabrics

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TABLE 14
 TECHNICAL AND ECONOMIC CHARACTERISTICS OF WEAVING MILLS OF DIFFERENT SIZE
 IN IVANOVO OBLAST IN 1937 AND 1939⁽¹⁾

Size of Mills	Number of Mills	Number of Looms in the Mills	Average Number of Looms per Mill	Looms in the Total	Output in 1,000 Meters	Average Wool, Density in Threads	Productivity per Loom/Hour (in Wool Threads)	Output per man (Wool Threads per Hour)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Small (100-750 Looms)	(a) 16	7,796	487	8.92	211,046	19.1	10,953	33.4
	(b) 19	9,237	486	10.75	218,437	21.21	10,444	31.8
Medium (751-1,500 Looms)	(a) 23	25,670	1,116	29.37	526,525	26.4	11,217	34.5
	(b) 23	25,810	1,122	30.03	530,685	25.28	10,892	31.8
Large (1,501-3,000 Looms)	(a) 21	42,467	2,022	48.58	748,057	27.0	10,238	31.7
	(b) 20	40,003	2,000	46.54	660,182	26.57	9,808	27.6
Giants (3,001-5,000 Looms)	(a) 3	11,476	3,825	13.13	156,197	32.0	9,755	28.9
	(b) 3	10,900	3,653	12.68	149,143	32.62	9,077	21.9

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total in	(a) 63	87,409	1,387	100.0	1,641,825	26.3	10,538	32.3
Ivanovo Oblast	(b) 65	85,950	1,322	100.0	1,558,447	25.98	9,967	28.4

(1) The table has been compiled from annual reports of mills; (a) 1939, (b) 1937.

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amounted in small enterprises to 21.2 threads; in the medium, to 25.2; in large, to 26.5; and in the giants, to 32.6 threads per 1 centimeter.

The technical and economic indexes of weaving mills in Ivanovo Oblast in 1939 are similar to those of 1937, the only difference being that the medium weaving mills showed in 1939 not only a higher output per worker but also a higher productivity of equipment. Let us consider the utilization of equipment and the output per worker at cotton-weaving mills in Moscow Oblast.

[See Table 45 on following page]

The medium and small weaving mills in Moscow Oblast are characterized on the whole (with considerable variation within these two groups) by a larger number of wool threads produced per loom, by a higher hour output of wool threads per worker and by a lesser density of fabrics produced in comparison with the giants and the large cotton textile mills.

The highest output of wool threads per worker takes place in medium enterprises. It should also be mentioned that the average density of fabrics is higher in this group of factories than in the small ones.

The technical and economical indexes of cotton mills of the Union-level industry in 1939 are shown in Table 46.

For the purpose of elaboration, 104 mills with a total number of 151,000 looms were considered. The table shows that the highest per hour productivity per loom and output per worker was found in medium factories, and the highest density in fabrics in giant mills. In general the same picture has been observed in the cotton textile industry of other areas.

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TABLE 45
 TECHNICAL AND ECONOMICAL INDEXES OF WEAVING MILLS IN
 MOSCOW OBLAST IN 1937 AND 1939

Size of Mills	Number of Mills	Number of Looms in the Mills	Average of Looms per Mill	Looms in the Total	Output in 1,000 Meters	Average Wool Density in Threads	Productivity per Loom/Hour (in Wool Threads)	Output per man (Wool Threads per Hour)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Small (100-750 Looms)	(a) 6	2,570	428	6.16	41,457	26.3	9,158	19.5
	(b) 3	1,590	530	3.52	33,902	21.73	9,807	23.1
Medium (751-1,500 Looms)	(a) 9	11,135	1,237	26.70	186,742	30.2	10,093	28.8
	(b) 9	11,597	1,289	25.69	192,494	26.73	9,293	23.5
Large (1,501-3,000 Looms)	(a) 10	20,735	2,073	49.71	270,135	33.1	9,685	27.4
	(b) 10	20,853	2,085	46.20	239,369	33.60	9,113	23.01
Giants (3,001-5,000 Looms)	(a) 2	7,271	3,636	17.43	70,444	28.3	8,799	21.8
	(b) 3	11,099	3,700	24.59	101,872	37.78	8,449	18.9

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total	(a) 27	41,711	1,543	100.0	568,778	32.3	9,629	26.2
	(b) 25	45,139	1,806	100.0	567,637	31.31	9,036	22.1

(1) The table is compiled from the annual reports of mills.

(a) 1939

(b) 1937

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TABLE 46
 TECHNICAL AND ECONOMIC INDEXES OF WEAVING MILLS IN 1939⁽¹⁾
 (Cotton Textile Mills Under All-Union Jurisdiction)

Mill Group	Number of Mills	Number of Looms in the Mills	Average of Looms Per Mills	Proportion of Looms in the Total	Output in 1,000 Meters of Thread	Average Wool Density per 1 Centimeter	Productivity per Loom/Hour in Wool Threads	Output per man (in Wool Threads) per Hour
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Small (100-750 Looms)	25	11,093	444	7.35	265,622	19.95	10,368	25.6
Medium (751-1,500 Looms)	37	43,145	1,166	28.58	812,570	27.10	10,657	30.8
Large (1,501-3,000 Looms)	35	70,842	2,024	46.92	1,165,648	28.10	9,920	29.8
Giants (3,001-Looms and more)	7	25,892	3,699	17.15	330,724	33.91	9,386	26.97
Totals	104	150,972	1,452	100.0	2,574,584	27.69	10,078	29.24

(1) Compiled from annual reports of mills.

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Of the total of 104 mills, we picket out 47 purely weaving noncombined mills. Within this group, we obtained the following data: the highest productivity per one loom hour and the highest output of woof threads per worker were found in mills having from 751 to 1,500 looms. Besides the output of woof threads per worker, we also considered the gross output of goods per worker in enterprises of different size. The yearly gross output of goods per worker amounted, at the medium weaving mill factories, to 11,018 rubles; at the small to 6,932; and at the giants, to 9,352 rubles.

Let us now turn our attention to spinning mills. For the purpose of analysis, let us take, in the first place, spinning mills in Moscow Oblast, which are more or less uniform in regard to technical equipment, whereas in Ivanovo Oblast, the recently built large spinning mill (Imeni Dzerzhinskiy, Krasnaya talka, and others) are outstanding in this respect as compared to other mills in the oblast. As in the case of weaving mills, let us subdivide the spinning mills into four groups: small (from 10,000 to 40,000 spindles); medium (from 40,000 to 80,000 spindles); large (from 80,000 to 120,000 Spindles); and finally giants (over 120,000 spindles). Twenty three of the spinning mills in question employed 1,900,000 spindles in 1937. which constituted almost one fourth of all the spindles employed in the cotton textile industry of the USSR. The share of the small factories amounted in 1937 to only 3.8 percent of the total number of spindles in the Oblast: that of the medium, 19.16; of the large 34.57; and of the giants, 42.47 percent. Thus in Moscow Oblast the large and the giant cotton-spinning mills predominate, as shown in Table 47.

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TABLE 47

TECHNICAL AND ECONOMIC CHARACTERISTICS OF SPINNING MILLS IN
MOSCOW OBLAST IN 1937 AND 1939 (1)

Mill Size	Number of Mills	Number of Spindles in the Mills	Average of Spindles in the Mill	Proportion of spindles in the Total	Average Count of Yarn	Productivity of 1,000 spindles per Hour (in Kilocounts)	Output of Yarn per Hour by one Worker /1/
Small (10,000-40,000 Spindles)	(a) 7	109,700	15,671	6.04	33.18	599.2	64.1
	(b) 4	71,808	17,952	3.80	34.18	481.27	51.95
Medium (40,000-80,000 Spindles)	(a) 7	377,138	53,876	20.74	38.0	539.7	72.8
	(b) 7	361,560	51,651	19.16	39.69	543.74	70.72
Large (80,000-120,000 Spindles)	(a) 7	670,596	95,799	36.88	40.9	533.3	78.0
	(b) 7	652,234	93,176	34.57	42.90	483.38	69.34
Giants (Over 120,000 Spindles)	(a) 4	660,668	165,167	36.34	51.6	460.5	72.8
	(b) 5	801,364	160,273	42.47	48.66	452.09	65.25
Total	(a) 25	1,818,102	72,724	100.0	42.29	513.0	74.1
	(b) 23	1,886,966	82,042	100.0	43.66	482.75	67.23

(1) Annual reports of mills (a) 1939 (b) 1937.

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In 1937 in Moscow Oblast spinning mills having from 40,000 to 80,000 spindles showed the highest output of product (in kilocounts) per worker and per unit of equipment.

In 1937 these mills produced per 1,000 spindle-hours 543.7 kilocounts of yarn; per worker per hour 70.72 kilocounts of yarn as against 452.09 and 65.25 kilocounts respectively with the giants, and 481.27 and 51.95 kilocounts with the small mills. The lower productivity of spindles with the giant weaving mills can be partially explained by a higher role of mule spindles at these factories. Yarn produced at the giant mills involves higher labor expenses than the yarn produced at medium mills. A lower output level per worker is quite natural in production of yarn of higher counts, involving higher labor expenses.

In 1939 in a somewhat different group of mills, the highest productivity per worker was shown by large, and the highest productivity of equipment by small mills.

When subdivided into groups, the spinning mills of Ivanovo Oblast (those under ALL-Union jurisdiction) show almost no difference in productivity of equipment with different groups of mills, but the productivity of labor rises with the enlargement of mills, in spite of the fact that the average count of yarn increases, also.

In 1939 one worker was producing 98.5 kilocounts of yarn per hour as against 80.2 kilocounts in the medium, and 82.1 in the large mills. The higher productivity of labor in the large and the giant spinning mills in Ivanova Oblast finds its main explanation in the fact that these groups include new spinning mills -- Krasnaya talka,

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imeni Dzerzhinskiy, the Mixed-Fibers Combine, and others, whose technical level considerably exceeds the average level of the USSR cotton textile industry. A higher technical level accounts in this case for the better technical and economic indexes of this group of mills.

In 1939, 69 spinning mills of the People's Commissariat of Textile Industry had technical and economic indexes as follows: In small mills the productivity per 1,000 spindles amounted to 600.3 kilocounts per hour, and the output per worker to 62.0 kilocounts per hour; in the medium mills, they amounted to 569.5 to 78.6 respectively; in the large mills to 551.3 and 81.1; and in the giants, to 522.3 and 80.6.

The kind of equipment, the nature of the assortment produced, as well as the level of organization of production are the main factors influencing the technical and economic indexes.

We have already mentioned the importance of prime cost in consideration of economic efficiency of mills. Below, we shall dwell on this question in more detail. In this connection we are interested in finding out how the size of a mill influences the prime cost of the product. To solve this problem, let us analyze some data on the prime cost in 1939. Prior to that, let us mention a peculiar fact: in 1937, the medium-size spinning mills in Moscow Oblast showed a lower prime cost than the small ones in spite of the labor expenses in producing yarn being higher in the first group of mills.

Of course, one must compare prime costs of the same, or

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similar products. Later, we shall take up this question. Now we shall preliminarily consider the prime cost of the nonitemized product, keeping strictly in mind all the vagueness and relative nature of such a consideration.

[See Table 48 on following page]

The discrepancy in the prime cost with different groups of mills is to be explained chiefly by the fact that each group of mills turns out products different from those of the other groups. The table indicates that an increase in the average size of cotton mills is followed by an increase in the average count of the yarn produced and in the density of the fabrics, i.e., by a raise in the labor cost of production.

Since the labor cost of production is not the same, it would be wrong to assume, as suggested by the table, that the prime cost of production is highest in the large mills. These data even give some reasons for a contrary conclusion. Indeed, the prime cost of one ton of yarn is lower in the medium and the large mills than in the small ones, although they were producing higher counts of yarn, with higher labor costs than the small mills, having from 10,000 to 40,000 spindles.

[See Table]

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TABLE 48
FACTORY-PLANT PRIME UNIT COST IN THE COTTON TEXTILE INDUSTRY IN 1937 (1)

Mills (According to Size)	Spinning			Weaving		
	Number of Mills	Prime Cost of 1 Ton of Yarn in Rubles	Average Count of Yarn	Number of Mills	Prime Cost of 1 meter Raw Fabric in Rubles	Average Density of Raw Fabric (Threads in 1 cm)
Group I	5	8,663	34.7	18	1.03	21.1
Group II	13	8,110	37.0	26	1.25	27.9
Group III	12	8,304	43.6	25	1.28	29.2
Group IV	9	9,110	49.0	4	2.26	38.3
	39	8,577	43.6	73	1.32	28.1

(1) From four main administrations of the Cotton Textile Industry.

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As to the prime cost of weaving production the data in Table 48 do not permit any definite conclusion, because with increasing average density a higher prime cost per meter of nonitemized raw fabric is in itself not surprising.

To arrive at any definite conclusions we must analyze the prime cost of the same or^a similar product.

Let us consider the data in Table 49.

[See Table 49 on following page]

The cost of processing, as well as the whole prime cost of calico differs with the mills mentioned in the table. This conclusion, although to a lesser degree, is correct in regard to the cost of raw material used for production of a unit of product. The lowest cost of processing and the least prime cost of product was shown by the Mill imeni Kirov, and the highest by the Nizhnyaya-Sereda Mill. It is characteristic that both these mills are large enterprises, with more than 2,000 looms each. The relatively low cost of processing at the BIM can to a certain extent be explained by the fact that this enterprise is a combine, where overhead costs are partially shared by both stages of production.

If we tentatively agree to subdivide the mills mentioned in the table into two groups, those with less and those with more than 1,500 looms, it will turn out that the processing cost of one unit of product is almost the same with both groups of mills, and that the prime cost of product is higher with the second group.

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TABLE 49
MILL PRIME COST OF 100 METERS OF CALICO (50 ART.581) PRODUCED AT MILLS IN IVANOVO OBLAST IN 1939⁽¹⁾

Name of the Mill	Number of Looms on 1/1/1940	Cost of Raw Material	Cost of Processing (in Rubles and Kopecks)	Mill Prime Cost
BIM (Bol'shaya Ivanovskaya Mamfaktura)	866	63.62	20.11	83.77
Imeni 8th of March	1,082	63.34	27.44	90.89
Imeni Kirov	2,220	63.19	18.87	81.80
Verkhnyaya-Sereda	1,724	62.55	23.68	86.45
Nizhnyaya-Sereda	2,324	75.38	28.13	102.68
Kolobovo	2,068	65.10	26.51	91.10
Nizhniy-Gorkiy	2,676	65.72	26.43	92.12
Lezhnevo	993	64.04	21.60	85.48
Serp i molot	1,456	64.26	24.14	87.92
Pistsovo	1,661	65.11	23.72	88.83
Kineshma No 1	668	65.52	22.16	87.81
Imeni Volodarskiy	1,090	67.06	22.19	89.25
Training Factory imeni Varentsova	517	63.04	32.68	95.92

(1) The data have been obtained from mill cost computations on various grades of fabric. In some mills cost of raw material plus cost of processing does not equal the factory-plant cost. This small discrepancy is due to losses through rejects.

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The latter is mainly due to the higher cost of the raw material used by the mills of this group. However, such subdividing is not quite proper, because, in regard to the production structure, the mills are not quite the same: in such circumstances, the number of looms installed at combined mills cannot serve as a comprehensive yardstick for the size of the enterprise. So for instance, the BIM and the Lezhnevo mills fell, according to the number of looms installed, into the group of relatively small enterprises. But these are not purely weaving mills, and by the number of workers they must be placed among relatively large enterprises.

If we subdivide the mills mentioned in Table 49 into two groups, those with less and those with more than 1,500 workers, we find that the average processing cost at the relatively large mills was approximately by 8 percent higher, and the average prime cost of the product by approximately 2 percent lower than at the mills having less than 1,500 workers. It should also be mentioned that the highest cost, and prime cost took place at the largest, -- the Nizhnyaya-Sereda Mill.

The level of prime cost of product is influenced, in different mills by different elements: technical equipment, organization of production, etc. It is theoretically clear that concentration of means of production also reduces expenses in some components of the prime cost. Thus in order to find out the influence of the mill size on prime cost of production, it is necessary to eliminate that of all other factors. Table 49 shows the prime cost of calico produced with the same kind of equipment (Platt looms) at mills located in the same area. The latter is also important,

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since the wage rate in the cotton textile industry, in different areas is not the same. However, this circumstance does not do away with all obstacles, because the rates per product unit are not the same even at different mills in the same area. This must be taken into consideration while analyzing the cost of processing at various mills. Cotton enterprises can have different production structure: among them there are weaving, weaving-and-spinning, weaving-finishing, etc. This again increases the difficulty of analyzing the influence of concentration of production means upon prime cost level in the cotton textile industry. The economy from the concentration of production means finds its expression in the cotton textile industry mainly in the cost of processing. The cost of raw material, which constitutes the most important item in the prime costs of the textile industry, is almost unrelated to the size of the mill; efficiency in the use of raw material depends on the general technical level and organization of production. It is clear, theoretically, that concentration of means of production leads to cutting down on management expenses, that a large mill cuts down its labor costs in such item as various structures, storehouses, heating and lighting expenses, power and driving mechanisms, etc. (See K. Marx, Capital, 1932, Vol III, P.42)

These expenditures appear in the established calculation forms under the heading of shop and mill expenses, which we are now going to analyze.

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TABLE 50

SHOP AND MILL EXPENSES AT WEAVING MILLS IN 1939 (1)

Name of Mill	Volume of Shop and Mill Expenses per 100 Meters of Calico in Rubles and Kopeks
Group I - Mills with More than 1,500 Workers	
Imeni Kirov	3.16
Verkhneye-Furmanovo	4.85
Nizhneye-Furmanovo	6.68
Shuya Consolidated [Ob"edinennaya]	5.31
Lezhnevo	4.98
Average for Mill Group I	4.99

Group II - Mills with Less than 1,500 Workers

Kineshva	5.06
Serp i molot	6.14
Imeni Volodarskiy	4.86
Imeni 8th of March	6.71
Pistsovo	5.46
Kolobovo	6.60
Nizhniy Gorkiy	6.46
Average for Mill Group II	5.90

(1) The data have been obtained from mill cost calculations for various fabric grades.

(2) The data for this mill refers to 1940.

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Examination of the calculation reports of these mills shows that large cotton mills have lower shop and general mill expenses than the comparatively small enterprises. Indeed, per 100 meters of product, these expenses amounted in the first group of mills to 4 rubles 99 kopecks as against 5 rubles 90 kopecks with the second, i. e., to approximately 20 percent less. If the second group were to comprise still smaller mills (unfortunately, no data are available) overhead expenses in the large mills would probably be relatively even lower. It is characteristic that when mills (mentioned in the table) are grouped according to the amount of weaving equipment installed, larger enterprises show no cuts in overhead expenses. Such contradictory outcome is due to the different structure of these mills, which results in the fact that when grouped by the number of looms large combined enterprises fall in the group of the relatively small mills. Therefore it is more proper under such circumstances to group the mills according to the number of workers.

Analysis of the data given above shows that the larger cotton mills had overhead expenses per one product unit up to 20 percent, cost of processing up to 8 percent, and the total expenses 2 percent lower than the smaller enterprises.

This conclusion remains valid even when it is taken into consideration that the wage rate per meter of raw fabric is not the same in these mills (See Manual on Piece and Day Wage Rates for workers in the Cotton Industry of the People's Commissariat of Textile Industry USSR. 1940), and the productivity of looms is not the same in spite of their being of the same kind. The different

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productivity of equipment, as soon as it influences the economic indexes of enterprises, indicates a certain relativity in the above-made conclusion.

The lower processing cost at larger mills apparently is an expression of the economy due to the combined nature of production.

We have already mentioned above that the economy from large textile mills should find its expression mainly in reduction of the overhead costs (amounting to about 4-7 percent of the prime cost) per unit product. Nevertheless some large enterprises have not taken advantage of that economy: in some mills, it is outweighed by other excess expenses, due to which potential economic advantages of some large mills have not been realized, so that the prime cost in these mills, as shown by the above data is higher than with comparatively smaller enterprises.

In spinning, as in weaving the cost of processing and the prime cost of a similar product show strong variations also.

[See Table 51 on following page]

The table shows that the highest cost of processing was found in the small Kineshma Spinning-and-Weaving mills. The lowest cost of processing and prime cost was found with the new large Krasnaya talka Factory. Next lowest to it was the prime cost at another new large mill -- imeni Dzerzhinskiy. In spite of the high technical level of both mills, their processing costs as well as the whole prime cost of their products show considerable difference, which is due in the first place to the different level of organization of production.

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TABLE 51

COST OF PROCESSING AND PRIME COST OF 100 KILOGRAMS OF YARN (WARP NO 54)
AT FACTORIES IN IVANOVO OBLAST IN 1939 ⁽¹⁾

Name of the Mill (1)	Number of Spindles in 1,000 on 1/1/1940 (2)	Cost of Processing	Industrial
		on Jennies High-Tension (3)	Prime Cost (4)
Imeni Dzerzhinskiy	157	176.67	791.07
Krasnaya talka	120	153.68	750.25
Verhnyaya-Sereda	132	161.68	805.73
Kokhma Combine	64	214.29	868.54
Yuzha	119	243.49	894.69
Teza-Shuya	41	215.18	864.89
Privolzhskaya Kommuna	77	239.86	885.24
Imeni Nogin	84	246.08	916.85
Imeni Shagov No 1	72 ⁽²⁾	192.28	837.83

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(1)	(2)	(3)	(4)
Kineshma No 1	43	263.65	905.82
Rodniki Combine	91	222.98	868.08

- (1) The data have been obtained from mill cost calculations for various fabric grades.
- (2) The number of spindles refers to all three mills imeni Shagov.

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If we divide the mills mentioned in the table in two groups (first group comprising of mills with less, the second with more than 80,000 spindles), we obtain the following: the cost of processing and the prime cost at the mills of the first group are higher than at the relatively large enterprises.

We come to the same conclusion if we group the mills not according to the number of spindles installed but according to the number of workers. However this conclusion needs some elaboration. The fact is that although we have taken equipment of a very similar kind (the same tension system), the technical level of some mills is rather outstanding as against the general level. To such enterprises belong the mills imeni Dzerzhinskiy and Krasnaya talka in the large-enterprise group. Without these two new mills, the findings will be as follows: larger mills generally show a lower cost of processing and a somewhat higher prime cost of production as against relatively smaller enterprises. The conclusion is to a certain extent paradoxical but it is in conformity with the actual state of things. It indicates that the lesser cost of processing at the large mills, i.e., the lesser overhead expenses in the first place was outweighed by the higher cost of raw material which resulted in a higher total prime cost at the relatively large enterprises.

[See Table 52 on following page]

Large cotton mills such as Nizhnyaya-Sereda, Verchnyaya-Sereda, imeni Dzerzhinskiy, and Krasnaya talka Factories show the lowest

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TABLE 52

SHOP AND GENERAL MILL EXPENSES PER 100 KILOGRAMS OF YARN
(WARP NO 54) AT FACTORIES IN IVANOV OBLAST IN 1939 (1)

Name of Mill	Rubles and Kopecks
Krasnaya talka	43.98
Imeni Dzerzhinskiy	46.17
Yuzha	61.55
Kokhma Combine	51.28
Nizhnyaya-Sereda	40.29
Toza-Shuya	62.63
Lezhnevo	83.19
Imeni III International	76.99
Imeni Sverdlov	48.52
Bob ^{shaya} Shuya	58.62
Imeni Shagov	65.75
Kineshma No 1	88.52
Imeni Balashov	67.46
Verkhnyaya-Sereda	33.45
Imeni Negin	65.75

(1) The data has been obtained from mill cost calculations for various fabric grades.

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rate of shop and mill expenses per unit product. At the same time, the table also contains large enterprises where the overhead costs are considerably higher than in the small mills.

For instance the mill imeni Nogin has more than twice as many spindles and workers as the Teza-Shuya Mill, and still its overhead expenses per 100 kilograms of product are higher. However the highest overhead expenses are found at small spinning and weaving enterprises. At the four smallest mills mentioned in the table (Teza-Shuya, Lezhnevo, imeni Shagov, and Kineshma mill No 1), the overhead expenses amounted to an average of 75 rubles 02 kopecks per 100 kilograms of yarn, whereas in the rest of the mills to only 54 rubles; without the mills imeni Dzerzhinskiy and Krasnaya talka, to about 56 rubles.

Thus at large mills in weaving as well as spinning production the shop and mill expenses, in which the economy from the large-scale production is mainly reflected, are lower than at small enterprises.

However it must be kept in mind that the shop and mill expenses constitute only about 5-7 percent of the prime cost of the product in the cotton textile industry, and that the labor saved by cutting down these expenses at a relatively large mill is often "swallowed" by, for instance, unsatisfactory use of raw materials which constitute in prime cost in the cotton textile industry over half of the total outlay.

We have, in addition, analyzed the cost of treatment of wool No 34, 65 and warp No 54 in a number of mills in Ivanovo and Moscow

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oblasts. On the whole the large mills have lower overhead expenses and a lower processing cost than the small enterprises. Of course the level of processing cost is influenced by a number of elements, but there is no doubt that, other things being equal the large and the medium mills have, as compared with the small ones, somewhat lower expenses due to the scale of production and, mainly, to the resulting decrease in the shop and mill costs. However in reality these potential economic advantages sometimes remain untaken. We already showed instances to the effect that the cost of processing of product at some relatively large enterprises is higher than at small mills. The technical levels being the same, this finds its explanation mainly in the different level of organization of labor and production.

Determination of the economically efficient size of textile mills is a very important problem of Soviet national economy. While determining the size and the structure of an enterprise (combined or not, degree of specialization, etc), it is necessary to take into consideration the prime cost level and the cost of capital construction, the level of labor productivity, as well as the return rate on the invested capital by various enterprises since their economic merits are not the same. An approach from the standpoint of national economy demands a consideration of labor expenses outside the enterprise, expenses connected for instance with transportation of the product, the raw material, etc. From this viewpoint, the negative sides of erection of giant mills may be understood; it leads to an increase in transportation range of raw materials, fuel, and manufactured goods, to tying up of capital investments, and to difficulties in running new enterprises, es-

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pecially in new areas; whereas the problem of speeding up the turnover of capital is of great importance in the textile industry also. Taking into consideration local conditions while designing a mill (marketing area for the product, development level of the textile industry, availability of skilled manpower, resources of raw material, etc) constitutes a necessary prerequisite to a correct solution of the question concerning the size of the mill.

Modern technical conditions, the extensive automatization of production, and electrification also cannot be without influence upon the size of enterprises in the textile industry.

In order to facilitate the running of new enterprises, to speed up putting them into operation, and hence, to speed up the turnover of capital within the Soviet national economy; in order to distribute the new mills among the main economic areas of our country, the Third Five-Year Plan made provisions for construction chiefly of medium and small industrial enterprises which was aimed at bringing industry closer to marketing areas of the product and to the sources of raw materials.

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COTTON TEXTILE INDUSTRY

The Dynamics of yearly and hourly output in the cotton textile industry of the USSR, and its level in comparison with that in prerevolutionary Russia. - Factors of growth in labor productivity. - Technical reconstruction. - Socialist innovations in production. - Stakhanovite movement in the cotton textile industry. - Utilization of equipment in the cotton textile industry. - Preventive measures against labor turnover in the cotton textile industry. - Organization of wages. - Technical training.

Before the Patriotic War an enormous number of workers were employed in the USSR cotton textile industry. This is why study of problems of labor in this industrial field is of high importance for Soviet national economy.

The structural development which took place in the cotton textile industry, the arising of new branches, technical reconstruction, etc, brought about essential changes in the structure of labor in the textile industry: a number of new trades came into existence in connection, for instance, with the automatization of production; the cultural and technical standard of workers had risen; the proportion of engineers and technicians in the textile industry personnel increased; etc.

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The qualitative changes in the composition of the industry personnel were one of the main reasons for the increase in productivity of labor in this industrial field.

Rise in labor productivity is determined by a number of elements: scientific and technical development, social organization of the production process, the skill of the workers, natural conditions, and others.

The rate of increase in labor productivity is not the same in different industrial branches in the USSR. It depends on the range and the speed of the technical reconstruction, on the degree of adoption of new technical equipment, on the level of organization of production, and on the skill of the personnel.

In the cotton textile industry, the rate of increase in labor productivity was, in the First and Second Five-Year Plan, lower than the average rate in industry as a whole in the USSR. In the First Five-Year Plan (from 1928 to 1932), the productivity of labor in the cotton textile industry rose (in monetary terms) only 25 percent, (Results of the Fulfillment of the First Five-Year Plan for Development of the National Economy of the USSR, 1933, p.177, i.e., the rate of increase in productivity of labor in this industrial branch was twice as low as in industry as a whole. During the Second Five-Year Plan, the productivity of labor rose, in USSR industry, already mentioned above, 82 percent, whereas in the cotton textile industry, only 42.5 percent. The increase in the output per worker in the USSR cotton textile industry was, in the First and the Second Five-Year Plans, considerably lower than on the average in the whole industry of the USSR.

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Also, the degree of renovation of industrial equipment was lower in the cotton textile industry than in any other industrial field.

The achieved rate of increase in productivity of labor in the cotton textile industry is far from being a result of taking full advantage of all the opportunities which present themselves in this field of industry. This has been shown especially by the growth of the Stakhanova movement which enabled the USSR cotton textile industry to raise the yearly output per worker during 1936 alone (in 1926-1927 prices) more than 20 percent; as a result, the average yearly output per worker was by the end of the Second Five-Year Plan almost 2.5 times as high as in 1913. It should be kept in mind at the same time that the years 1913-1920 were marked not by an increase but by a decrease in the productivity of labor in this branch of industry.

The rate of increase in the average yearly output per worker in the USSR cotton textile industry from 1928 until 1937 (in the 1926-1927 fixed prices) is shown in the following table.

[See Table 53 on following page]

The data above give only an approximate picture of the growth of productivity of labor in the cotton textile industry; first of all, due to changes which took place within the period in question in the methods of recording various elements of production and particularly to some changes in kind of personnel registered as workers; and secondly, due to some changes in the very nature of production. But still the data given above give a correct idea of

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TABLE 53

DEVELOPMENT OF THE YEARLY OUTPUT PER WORKER IN THE
COTTON TEXTILE INDUSTRY IN THE USSR IN 1928-1937 (1)
(Percent of Preceeding Years)

Year	Percent
1928	107.9
1929	115.3
1930	94.1
1931	112.0
1932	98.9
1933	107.1
1934	103.3
1935	105.3
1936	121.2
1937	95.6

(1) See Socialist Construction 1936, p. 39, and Planned Economy, No 3, 1939.

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the growth of productivity of labor in the cotton textile industry.

The yearly output per worker in the textile industry of the USSR rose in 1938, as against 1913, 250.6 percent; and as against 1933, 139.3 percent. [The study of the productivity of labor requires an analysis of numerous interdependent factors, a consideration of the conditions of production, and a proper correction if these conditions are different. No single index taken alone is apt to provide a complete picture of the change in the productivity of labor. Therefore it is necessary, as far as the sources allow, to compute both the yearly and the hourly output per worker in goods as well as in their monetary expression. For illustration of the growth of productivity of labor in the cotton textile industry in the USSR, we adduce data obtained by the method of monetary computation of productivity of labor from the gross output in fixed prices, which has advantages as well as several shortcomings. The main shortcoming of this method is the chance of the product's being counted twice. The productivity of labor computed by this method is influenced by any change in the outlay for raw material, fuel, etc, per unit of product, since the gross output includes all these elements. Besides, the productivity of labor computed by this method can also be influenced by changes in the organization of production which take place in industry, such as forming of trusts and combines. Sometimes new brands whose production is just started and has never taken place before, are priced, when the gross output is being computed, actually not in the 1926-1927 prices but in prices of the year when these new brands were introduced. Thus, the relative labor cost of goods is not always estimated correctly.]

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In the cotton textile industry, the output per worker (in 1926-1927 prices) amounted in 1913 to 3,905 rubles; in 1937 to 9,204 rubles; and in 1939 to 10,801 rubles.

After the beginning of the peaceful work of rehabilitation of the national economy, i.e., from 1921 on, the textile industry in the USSR gradually raising the number of operative spindles and looms; by improving the material position of the workers; by overcoming fuel, raw material, and in some years, marketing difficulties; and by improving organization within the sphere of production as well as circulation gradually began to raise the volume of production and the level of productivity of labor. In 1928, the yearly output per worker in the cotton textile industry rose, as against the preceding year, more than 80 percent; in 1923, approximately 14 percent; in 1924, 29 percent, in 1925, by 27 percent, in 1926, 18 percent, and in 1927, 8 percent. Only the years 1930, 1932, and 1937 showed a certain decrease in the annual output per worker as compared to the preceding years.

Besides the relaxation of the labor discipline, the decisive factor which influenced the average yearly output per worker in 1930 was a considerable decrease in the number of days of actual work (from 260 days in 1929 down to 223.6 in 1930). This decrease was caused mainly by a shortage at that time in domestic cotton. The monetary computation of the output per worker was also influenced by a decrease in the average count of yarn.

The drop in the productivity of labor in the cotton textile industry in 1932 was caused by a number of reasons: turnover of labor,

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bad organization of wages, wage leveling, lack of personal responsibility, relaxed attention to cost-accounting, the functional organization of labor in the textile industry, etc. This harmful system of organization of production was done away with by a special decision of the TsK VKP (b).

A high turnover of workers, engineer-technical, and administrative personnel, an unsatisfactory system of wages, as well as dilapidation and neglect of the equipment were hampering the growth of labor productivity in this industrial field in 1937.

The growth of labor productivity has been influenced by various interdependent factors: technical equipment of labor, intensity of labor, the organizational level of labor and production, quality of raw material, improvement of cultural and living conditions of the working class, and others.

Introduction of new technical practices; growth of the [electric] power supply to labor; increase in the skill of workers; improvement, however slow, in utilization of old equipment; specialization of enterprises; and finally, spreading of shock work and of socialist competition in its highest form -- the Stakhanov movement -- all these factors called forth the growth of productivity of labor in the textile industry in the USSR.

Below, we shall dwell on these factors in more detail; and now we shall consider the development of the hourly output per worker in the cotton industry (Table 54). The hourly output supplement the general picture of development of labor productivity, since it eliminates the influence of different duration of working time; the number of working days in a year and the duration of a working day were changing in the cotton industry, as well as in the whole industry of the country.

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TABLE 54
 DEVELOPMENT OF THE HOURLY PRODUCTIVITY OF LABOR IN
 THE COTTON TEXTILE INDUSTRY OF THE USSR FROM
 1910 UNTIL 1939 (1)

Years	<u>Spinning</u>	<u>Weaving</u>	
	Output of Yarn Per One Industrial Worker Per Hour (in Kilocounts)	Output of Fabric Per One Industrial Worker Per Hour (in Meters)	(in Wool Threads)
1910	44.3	-	0
1922-1923	25.7	3.73	-
1923-1924	36.2	4.11	-
1925-1926	52.8	5.45	-
1926-1927	58.0	5.86	15,960
1927-1928	61.3	5.88	17,380
1928-1929	66.5	7.04	20,060
1930	72.0	8.25	23,550
1932	64.7	7.70	21,042
1935	64.4	7.88	21,540
1936	73.8	9.12	25,400
1937	75.69	9.29	25,770
1938	77.97	10.29	26,760
1939	80.64	-	29,030

(1) The data for 1910 have been computed according to Statistics of Cotton Spinning and Weaving Industry, 1911; the data for 1922 - 1923 and 1923 - 1924 have been computed according to the publication Industry of the USSR in 1924, 1925, p.353; for 1925-1926

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and 1927 - 1928, according to the publication Technical and Industrial Data and Statistical Materials on the Textile Industry in 1927 - 1928, Moscow, 1929 (published as a manuscript); for 1928-1929 and 1930, according to the publication Technical and Industrial Data and Statistical Materials on the Textile Industry and Trade in 1929 - 1930, 1932; for years from 1932 until 1930, according to the materials of the NKLP USSR.

However, with the exception of few certain years, the amount of days of actual work in the cotton textile industry does not show much variation. In 1931 and 1932, there were big losses in working time from absenteeism, which could not be without influence on the yearly output per worker during these years.

The above data on the hourly labor productivity are not claimed to be absolutely exact, first because the range of the enterprises considered was not the same during all these years. However, these data are sufficient for drawing conclusions as to the development of the hourly productivity of labor. The hourly output per worker in the spinning industry (in terms of product) grew in 1937 to almost 3 times as high as in 1922-1923 and a little less than 2 times as high as the output in the spinning industry of prerevolutionary Russia. The hourly output per worker in the spinning industry was increasing steadily from 1922-1923 until 1930, after which the output curve was showing some fluctuation in certain years.

The hourly output per worker in the weaving industry was, in 1937, approximately 2.5 times as high as in 1922-1923, and 2 times as high as the hourly output per one worker in the industry of prerevolutionary Russia. In 1932, a decrease in the yearly as well as the hourly output

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per worker took place both in the spinning and weaving industry. The most important causes of that were a considerable turnover of labor, as well as the functional organization of labor in these industries.

The index of hourly output per worker in Soviet cotton textile industry does not always coincide with the yearly index, which is true not only in regard to spinning but also to other spheres of production. In 1930 the yearly output per worker dropped, as we have already said, but the hourly output considerably rose that year as against the preceeding year. In the following table, we give, starting with the year 1926-1927, additional data for the weaving industry -- the hourly output per worker expressed in woof threads. This supplements the picture of the development of the productivity of labor in the weaving industry within this period of time. The hourly output of weavers expressed in this way rose, in 1937, by 61.3 percent as compared with 1926-1927, whereas in the spinning industry the hourly output per one worker (in kilocounts) rose within this period of time only 30 percent. Thus the labor productivity of one worker was rising during this time somewhat slower in the spinning than in the weaving industry, chiefly due to the fact that the labor cost reduction rate per one equipment unit was lower in the spinning than in the weaving industry.

It is worth mentioning that, in this period the development of the hourly output per weaver, when expressed in meters and in woof threads, is approximately the same throughout the whole cotton textile industry. However, in some mills (Trekhgornaya manafaktura, the BIM) the index of productivity of labor computed by the number

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of wool threads is, naturally, considerably different from the index of productivity of labor computed by meters.

Both in the spinning and in the weaving branches of the cotton industry, the increase in the output of one worker was different at different mills. It suffices to say that from 1926-1927 to 1936, the hourly output per worker at the Tsekhgornaya manufaktura imeni Dzerzhinskiy rose from 4.57 meters in 1926-1927 to 9.4 meters in 1936 (106 percent); at the BIM it increased from 8.6 meters to 16.97 meters (97.3 percent); at the mill imeni 8th of March, from 6.79 to 9.55 meters (40.6 percent); and at the mill imeni Abel'man, from 5.6 to 6.89 meters (23.0 percent).

The rate of growth of the hourly output per worker (in terms of the product) is influenced by the technical reconstruction of some mills, by the level of organization of labor, by changes in the assortment produced.

In the weaving industry, higher rates of growth of the productivity of labor are found with the new mills having the most modern equipment (factories imeni Dzerzhinskiy, Krasnaya talka, imeni Lakin). The hourly output at the mills imeni Dzerzhinskiy and Krasnaya talka is approximately twice as high as the average output level in the spinning branch of the cotton textile industry in the USSR. Even if it is partly due to the fact that these mills produce higher counts of yarn, the productivity of labor with them is still considerably above its average level in the cotton textile industry.

The rate of growth of the hourly output per worker at the Ivanovo Melenging [melange: to print colors on wool] Combine may

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be illustrated by the following data: in 1930 one weaver produced 42,000 woof threads per hour; five years later, 95,000; and in 1939, 219,00 woof threads per hour. Thus the output at this mill showed a more than 5-fold increase.

In rate of growth of hourly output of workers in the cotton textile industry of the USSR as against the level prior to World War I, first place is occupied by the finishing, second by the weaving, and third by the spinning branches. In the finishing branch, the output of finished goods per 1,000 working hours amounted at the outbreak of World War I, to 291 pieces, or 0.29 pieces per hour. At the Konshin Dying and finishing mills one worker produced before World War I, 0.30 pieces per hour (See Proceedings of the Industry and Commodity Circulation Section, Moscow, 1920, Vol 1, p.66). By the end of the Second Five-Year Plan the hourly output of finished goods per worker (in piece expression) was about 4 times as high as before World War I.

The growth of labor productivity at some finishing mills within a decade (from 1926-1927 to 1936) is shown in Table 55.

[See Table 55 on following page]

The table shows that, with almost all of these mills, the hourly output per worker was more than twice, and with the Teykovo Factory, almost 3 times as high as in 1926-1927. Even if a part of such a quick growth of the output in the finishing branch might be due to some inaccuracy of these data, the difference is still large enough to provide good grounds for the conclusion that there

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TABLE 55

HOURLY OUTPUT PER ONE INDUSTRIAL WORKER (IN PIECE EXPRESSION) (1)

Name of the Mill	1926-1927	Amount	1936
			Percent of 1926-1927
Teykovo	0.43	1.25	290.7
Kokhma	0.53	1.0	188.7
Big Ivanovo Manufactory (BIM)	0.56	1.21	216.0
Imeni III International	0.57	1.2	210.5
Imeni V October Anniversary	0.53	1.11	209.4
Trekhgornaya manufaktura	0.63	1.33	211.1

(1) Productivity of Labor in the Industry of the USSR, edited by P. A. Khromov, 1940, p. 270

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was a considerable growth in labor productivity within this branch of the cotton textile industry. A number of technical measures, among them combination of machinery, and, in the first place, improvement in the organization of production brought about this increase in the output of the worker. The speed of machines was considerably increased in finishing and dyeing shops, a number of improvements of a technological nature were carried out, etc.

Now let us go over to a more detailed analysis of facts dealing with the growth of productivity of labor in the textile industry of the USSR.

Above, we already gave a detailed characterization of the direction and the extent of the technical reconstruction of Soviet cotton industry. Besides the introduction of new technical developments, the socialist organization of labor is the most important condition of growth of its productivity; in particular one of the main factors of this growth was the increase in the number of machines attended by one worker.

The textile industry of prerevolutionary Russia was marked by an extremely backward organization of labor based on very cheap manpower. New attitudes towards work, elimination of unemployment, normalization of working conditions (improved safety measures, etc), reduction of working hours, and finally, technical reconstruction of the textile industry brought about a change in the organization of production in this industrial field, in particular by contributing to a reduction of the expenses in manpower per one equipment unit.

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TABLE 56

CHANGES IN THE NUMBER OF WORKERS PER ONE UNIT OF EQUIP-
MENT IN THE COTTON INDUSTRY IN THE USSR (1)

Y E A R S	Number of Industrial Workers per 1,000 Spindles	Number of workers Per 1 Loom
1910	9.0 - 9.5	0.60 - 0.65
1922 - 1923	15.8	0.76
1923 - 1924	12.03	0.75
1925 - 1926	8.52	0.63
1926 - 1927	7.93	0.59
1927 - 1928	7.85	0.55
1928 - 1929	7.35	0.49
1929 - 1930	6.66	0.41
1930	6.78	0.40
1935	7.77	0.44
1936	6.80	0.37
1937	6.98	0.37
1938	6.97	0.36
1939	6.75	0.35

[(1) In 1910, the spinning branch of the Russian cotton textile industry had 8,306,000 spindles, and 145,000 workers (or 17.4 workers per 1,000 spindles). Per 213,000 looms there were 254,000 workers, or 1.19 workers per 1 loom. But these expenses of manpower per one equipment unit do not take into consideration the coefficient of shift labor; this being done, the number of workers per 1,000 spindles amounts to an average of about 9.0 - 9.5, and per 100 looms in

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the weaving branch, to 60-65 workers (See Statistics of Cotton-Spinning and Weaving Industry for 1900-1901). The data for the rest of the years have been taken from the following sources. Industry of the USSR in 1924, 1925; Technical and Industrial Data on Statistics of the Textile Industry in 1927-1928, 1929 edition, as well as that of 1932, for the years 1935-1939, from materials of the NKLP USSR.]

It should be mentioned that the above figures give only an approximate estimate of the number of workers per one equipment unit due to some difference in the methods of computation of these data in different years (caused by certain changes in the range of the enterprises considered, in the definition of the category of industrial workers, etc.). Nevertheless, on the whole, they give a correct picture.

These data on the number of workers per one unit of equipment do not represent in full the changes in the intensity of labor, since introduction of new machines (automatic looms, jennies, etc.) and modernization of old equipment reduce the demand for manpower per one equipment unit.

In the cotton textile industry of prerevolutionary Russia, one weaver attended, in the majority of cases, one to two looms. Labor was cheap; productivity of labor and wages were low; automatic looms did not play any noticeable role; over 40 percent of all spindles were in mules.

According to the Koz'min-Lenins, who investigated 4,584 male and 11,812 female weavers at mills in Moscow Guberniya 72 percent of

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the male and 84 percent of the female weavers in 1908 were attending two looms; three looms were attended by about 1/7 of all male and somewhat over 1/10 of all female weavers. Thus, in the majority of cases, the weavers of prerevolutionary Russia were attending two looms.

During World War I and the Civil War, due to decreased skill of workers, deterioration of organization of production, and other changed conditions, the number of workers per equipment unit in the cotton textile industry increased drastically. For instance, the average number of industrial workers per 1,000 spindle-hours at the Serpukhov Mill amounted in 1913-1914 to 9.6; in 1920-1921, to 24; and in 1921-1922, to 12.1. (NKTP Archives, GEU Fund, VSNKh, File No 46, No 159). The number of industrial workers at the Serpukhov Mill amounted in 1920 to more than twice, and the number of helpers to 6 times as many as in 1913-1914. The number of industrial workers per loom increased at this mill too -- although to a lesser degree -- from 0.61 in 1913-1914 to 0.86 in 1920-1921. (Ibid.)

In 1921 the rehabilitation of the national economy of the USSR, including its cotton textile industry began; simultaneously with the increase of the volume of production, its technical and economic indexes began to improve.

The need of an increase in productivity of labor and wages of workers, the shortage of skilled manpower, etc, stimulated the workers to attend a larger number of equipment units. This was preceded by drastic measures aimed at cleaning up working conditions in the cotton textile industry (installment of ventilation,

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enlargement of lighting areas, improvement of mill surroundings in general). During 1924-1925 alone the number of looms operated in three and in fours increased from 99 (September 1924) to 34,027 (September 1925), and the number of frame spindles operated in 3 and 4 lines increased from 202,000 to 1,425,000 respectively; as a result of that, the number of workers per 1,000 spindles decreased to 8.52 in 1925-1926 as against 15.8 in 1922-1923, and the number of workers per loom decreased from 0.76 to 0.63 respectively.

Introduction of the 7-hour working day in the textile industry in 1927-1928 was accomplished by further changes in the organization of labor and, in particular, by a more efficient utilization of labor. As a rule, attendance of a larger number of machines was taken over by better skilled workers, the shortage of such workers in the textile industry having been the main hindrance in this respect. By the end of 1927, judging from a selective investigation of the cotton industry, two looms were attended by slightly more than a half, and three looms by about 40 percent of the total number of weavers. By that time a considerable step forward had already been made in overcoming the organization of labor which had been developed in the textile industry of prerevolutionary Russia based on low wages and long working hours. The technical reconstruction of industry, accompanied by a decrease in the role of mule spindles and by automatization of equipment, was conducive to the workers' attending a large number of looms and spindles. Data on the number of workers per unit of equipment at some mills in Ivanovo Oblast during the last 12 years are given in Table 57.

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TABLE 57

NUMBER OF INDUSTRIAL WORKERS PER LOOM

Name of the Mill	1926 - 1927	1936	1937	1938
Imeni Abel'man	0.57	0.342	0.337	0.320
Imeni Sverdlov	0.59	0.264	0.261	0.255
Kommunisticheskiy avangard	0.50	0.435	0.436	0.391

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Weaving production with low level of automatization involves very high labor expenses in the cotton textile industry; this is why lowering of labor costs in weaving is so important. Depending mainly on the degree of automatization of weaving and on improved organization of production, the speed of lowering of these costs is not the same with different mills, but it is characteristic for the whole weaving industry.

Together with the improved organization of production and labor, automatization is the main way of lowering the costs per one unit of equipment. In 1929, as we have seen, a large increase in the output per one worker took place in the cotton textile industry. By that time, the labor expenses per equipment unit were considerably lower than before World War I. Shock brigades, particularly, youth shock brigades were at that time the initiators of efficiently planned work in our textile industry.

As early as late ~~in~~ 1928, Pravda began a review of production conferences. While preparing themselves for the review and during the review itself, many workers started to organize their work more efficiently. Several years later, at the time of the full development of the Stakhanov movement, weaver Vinogradova set a world record for attendance of looms.

In April 1929 the XVI Conference of the VKP(b) appealed to all workers and toiling peasants, calling upon them to organize socialist competitions. Answering this call, the textile workers of Ivanovo, Moscow, and Kalinin concluded socialist agreements for fulfillment of the industrial and financial plan. This

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appeal was a mighty stimulus for increasing the output by the workers, and for attendance of a larger number of machines.

When it spread late in 1938 the Stakhanov movement revealed enormous reserves of productivity of labor in socialist industry. In the textile industry, the Stakhanovite-Vinogradova movement brought about -- besides an improved utilization of equipment and raw materials, besides lower prime cost and better quality of the product, -- a further reduction of labor expenses per one unit of equipment, and was thereby conducive to the growth of productivity of labor. As a result of attending a larger number of machines, the number of industrial workers per 1,000 spindles amounted in 1936 to an average of only 6.8; and the number of workers per 100 looms, to 37.

Table 59 shows the intensity of work of female spinners and weavers with the trusts of the Ivanovo Cotton Textile Administration by the beginning of 1937. (Data on the yearly report by the Main Administration of Cotton Textile Industry of Ivanovo Oblast)

[See Table 58 on following page]

As we see, in different trusts and combines the number of both regular mechanical and of automatic looms varies considerably. This variation, which is even larger with different mills, depends on the degree of automatization of weaving and on the nature of the assortment of the product. But at the same time, an important role is also played by the level of organization of labor at different enterprises.

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TABLE 58

Name of Trust or Combine	Number of Frame Spindles per One Spinner	Number of Looms Per one Worker		
		Simple	Automatic	Northrop
1st Ivanovo Trust	788	4.01	20.90	39.9
2nd Ivanovo Trust	949	5.94	13.78	64.5
Vladimir Trust	862	5.71	17.5	-
Melanging Combine	744	-	-	16.6
Sereda Combine	868	4.85	7.56	-
Shuya Trust	900.8	6	20.07	-

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However, these average figures do not represent the intensity of work of some individual workers. Some stakhanovites attended, before the Patriotic War, a much larger number of automatic looms and spindles. While in 1929 the most advanced skilled workers attended 12 and 16 automatic looms, in 1935 the originator of the Stakhanov movement in the textile industry, weaver Vinogradova, was attending 216 and 3 years later 284 automatic looms at the Vichuga Cotton Mill, which became the cradle of the Stakhanov movement in this branch of industry.

When tending 216 looms, the brigade consisted of 12 workers including, 1 weaver, 2 breakers, 4 assistant foremen, 4 loaders, and 1 primer. When attending 284 looms, the brigade consisted of 16 workers. With such organization of work, the weaver carries out the following basic functions: fixes breaks in threads, starts and stops the looms, controls and guides the work of the members of the brigade. The main duty of the breakers; catching of broken threads (over 20 threads), sorting of rejects, and maintenance of the loom after priming. The loader -- a new trade called into existence by automatic looms -- loads the drums. Assistant foremen see that looms are in good working order, etc.

At the beginning of the Second Five-Year Plan, such attendance rate in the cotton textile industry as attending 16, 20, and 24 looms was achieved only with automatic looms. In 1939 Stakhanovites Shuvandina, Kraynova, Polyakova, and Yegorova were working at 20 simple Platt looms; weavers Orlova, Bol'shakova, and Podsoblyayeva were tending 284 automatic looms each.

Shuvandina,
Whereas in 1934 weaver Taisiya/of the Ivanovo Mill imeni

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Fedor Zinov'yev tended 4 looms and weaved 19,750 meters of fabric during the year, in 1938 she produced at 20 looms 106,500 meters. In many mills, workers tend 20, 18, and 12 simple looms. Lyubov' Bol'shakova, weaver at the Mill imeni Negin in Vichuga, was working in 1934 at 24 automatic looms and weaved 73,000 meters of fabric; in 1938 she produces 98,700 meters, having worked almost 12 carloads of cotton. The best weaver of the Barnaul Melanging Combine, Tanygina, began to attend 48 looms instead of 36 while the average attendance was 20 looms.

The decision of the plenary session of the TsK VKP(b) in December 1935 concerning the Stakhanov movement stated the necessity for a spreading of the Stakhanov movement in the cotton textile industry, in the first place in its spinning branches because the potentials of the latter were, primarily, setting the limit to expansion of the volume of the cotton textile industry. The spinning shops of cotton mills determine not only the work of the weaving and the finishing shops of this branch but also the work of almost all other branches of the textile industry.

The main condition of the high productivity of labor is consistently carrying out the socialist division of labor. The division of labor, as a method of Stakhanovite work, aims at raising the productivity of labor not only of workers of the main industrial vocations (weavers and spinners) but also of helpers, whose share in both the weaving and the spinning branch is very high. The Stakhanovite division of labor in the textile industry is marked by the fact that the main vocations (weavers, spinners) do not lose their importance as skilled workers. By delegating

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a number of secondary, auxiliary functions (fixing breaks, loading, unloading, etc) to less skilled workers, they raise the share of skilled operations within their working hours. The Stakhanovite division of labor in the textile industry, as against the harmful functional system which did away with the main trades in the textile industry, intensifies the role of the skilled workers in the production process, and thus ensures a general increase in the productivity of labor.

Mastering the technical equipment and improving its utilization was one of the main factors in increasing the productivity of labor in the cotton textile industry. The textile industry of the USSR surpassed the industry of a number of countries in regard to utilization of equipment. In American cotton textile industry, the yearly number of working hours per one spindle amounted in 1929 to 3,285; in 1930, to 2,813; and in 1937, to 3,970 (International Cotton Bulletin, April 1938, Vol XVI, No 63, p. 406), whereas in Soviet industry, the average number of working hours of a primed spindle amounted, in 1933, to 4,556, and in 1934, to 4,594. A part of the equipment in the US cotton textile industry was not working at all during the period 1929-1937, the proportion of idle spindles amounting, in some years to about 30 percent.

The degree of utilization of equipment in the cotton textile industry is illustrated in Table 59.

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TABLE 59

UTILIZATION OF EQUIPMENT IN THE USSR COTTON TEXTILE INDUSTRY

Years	Amount of Yarn Produced Per 1,000 Spindle-Hours (in Kilocounts)	Amount of Wool Threads Per 1 Loom-Hour
1910	420.8	-
1922-1923	416.0	-
1923-1924	436.12	-
1925-1926	473.36	-
1926-1927	463.18	9,452
1927-1928	480.81	9,489
1928-1929	489.28	9,743
1929-1930	484.20	9,542
1930	488.60	9,531
1935	500.0	9,470
1936	514.04	9,600
1937	531.7	9,499
1938	544.0	9,763
1939	550.0	9,959

[(1) In 1910, the average count of yarn produced by the Russian cotton textile industry was 27.9 (English count), or 47.1 (metric count). In the same year, the output of yarn per 1,000 spindle-hours amounted to 420.8 kilocounts, and that of raw fabric per 1 loom-hour - to 0.316 kilograms. Since we do not have more recent data on utilization of equipment in the cotton textile industry of prerevolutionary Russia, we tentatively use the 1910 data as pre-World-War-I data on utilization of equipment in this field

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of industry. The data are computed according to Statistics of Cotton-Spinning and Weaving Industry for 1900-1910, 1911, p. 2-3. The data on other years are obtained from the following sources. On 1922-1923, from Industry of the USSR in 1924, 1925, p. 353; on the period between 1925-1926 and 1927-1928, from Technical and Industrial data and Statistical Materials on the Textile Industry in 1927-1928, Moscow, 1929; on the period between 1928-1929 and 1930, from Technical and Industrial Data and Statistical Materials on the Textile Industry, 1932, and from the magazine Light Industry, No 8-9, 1937, and No 11-12, 1940.

The amount of product per spindle-hour in Soviet cotton industry rose in 1937 as compared with the level before World War I about 25 percent, and the output of raw fabrics (in weight per loom hour) rose about 30 percent.

As shown in Table 59, from 1922 on utilization of spinning and weaving equipment has been intensified. It has grown constantly with the exception of the years 1927-1928 and 1929-1930. The lowering of utilization of equipment in 1927-1928 is also indicated by other sources. In the joint work Innovating USSR Industry (Innovating USSR Industry, edited by V. V. Kuybyshev, 1928, p. 57), the following data are found on the output per loom in 8 hours of work.

[See Table 59a on following page]

The decrease in the output per unit of equipment in the weaving industry in 1927-1928 was due partly to the increased den-

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TABLE 59a

OUTPUT OF RAW FABRIC P/R LOOM IN 8 HOURS (IN METERS)

Y e a r s	M e t e r s
1925-1926	27.26
1926-1927	27.75
1927-1928	25.71

sity of fabrics produced, but mainly to unsatisfactory utilization of the equipment caused by insufficient preparedness for the introduction of the three-shift system in the textile industry brought fresh manpower into the production process, a considerable part of this man power being unskilled or semi-skilled workers. That is why the equipment was standing idle so often and its utilization becoming worse on the whole. Besides, the intensification of labor in connection with the introduction of the three-shift system being carried out without satisfactory preparation had a bad influence on the utilization of equipment in the first quarter of 1927-1928.

At that time, the productivity of labor even decreased in some mills.

The introduction of a third shift in the textile industry made it possible to bring new workers into the production process and thus to reduce unemployment, which still existed at that time, as well as to considerably enlarge the Volume of production with an unchanged amount of fixed capital. However, it is worth men-

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tioning that night shifts in the textile industry show a lower productivity of labor and less intensive utilization of equipment than day shifts.

Especially unsatisfactory utilization of equipment in the weaving industry took place in the last year of the Second Five-Year Plan, which was connected particularly with the fact that the equipment of the cotton textile industry was standing idle more often in that year. It should be mentioned that the increasing relative number of automatic looms was decreasing the output per one loom-hour because automatic looms, as compared with Platt looms, still make a lesser number of strokes per minute, which often means -- other things being equal -- a lower output per one loom.

So with the Bol'shevik Mill, the output of the product (sateen, stockinet) per loom-hour amounted to 1,263 meters on Platt Looms, and to 1.072 on Northrop looms; in the Krasnyy Profintern Mill, No 1, to 4.77 meters and 3.93 meters (diagonal) respectively; with the mill imeni Nogin (1st Ivanovo Trust). 1.84 and 1.74 (moleskin), and 4.61 and 4.1 (diagonal). The same situation also existed at a number of mills in Moscow Oblast. In January 1936 the productivity of an automatic loom at the mill imeni Nogin amounted to 2.12 meters per hour, and the productivity of an ordinary mechanical loom, to 2.66 meters per hour, and so on. Thus the increasing relative number of automatic looms in weaving production was raising the productivity of labor and lowering the prime cost, but reducing, to a certain extent, the average output of product per loom. This should be kept in mind when we compare the output per equipment unit in the cotton textile industry in prerevolutionary Russia, where auto-

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matic looms played almost no role, with that in the cotton textile industry of the USSR, where the relative number of automatic looms amounted in 1937 to almost one fifth of the whole pool of looms. In this connection, it is to be desired that our machine-building industry speed up the designing of a high-speed automatic loom. The facts mentioned above indicate also that Soviet cotton textile industry has not as yet fully managed to operate automatic looms.

By the end of the Second Five-Year Plan, the hour productivity of a spindle rose as against 1926-1927 by approximately 10 percent, but the hour productivity of a loom (in wool threads) remained almost the same. In the utilization of equipment, the spinning industry achieved within the time somewhat more than the weaving industry did. The increase in the productivity of spinning equipment per time unit was not only a result of improved utilization of equipment already installed but also a result of introduction of more new, technically improved equipment, particularly of frame spindles, which are more productive than mule spindles.

Especially intolerable are the cases of idleness of the equipment, which became more numerous by the end of the Second Five-Year Plan.

It would be false to assume that the increase in intensity of utilization of equipment was the same at all mills. Materials indicate that in the new spinning mills (Mill imeni Dzerzhinskiy, Krasnaya talka, and others) this increase was considerably above the average for the cotton industry.

Soviet cotton industry can considerably intensify the util-

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ization of its equipment if the maintenance of the latter is improved, idleness is reduced, etc. It suffices to mention the huge, sometimes quite unwarrantable gaps in the productivity of machines in different mills producing the same grade of yarn and of raw fabric. For instance in production of the No 34 yarn the output per 1,000 spindle-hours varies with mills of Ivanovo Oblast between 826 and 572 kilocounts (Mill imeni Abel'man and Krasnaya talka); the output of sateen per one loom-hour varies between 2.64 and 1.85 meters (imeni Sverdlov and the Teza-Shuya Mill); that of calico between 4.9 and 3.2 meters (Mill imeni KIM and Mill imeni Liebknecht).

An extreme diversity in the utilization of equipment also took place during the Third Five-Year Plan. One of the ways of improving the utilization of equipment is the elimination of discrepancies in its utilization in different periods of time. For instance the difference between the highest and the lowest productivity of equipment at the III International Mill amounted in 1939 in output of No 54 Warp to 18 percent; and in the output of No 65 woof, to 30 percent.

The amount of goods produced by spinning and weaving equipment within a time unit varies also considerably with different areas of the cotton textile industry. The technical side of production, the skill of the manpower, the quality of cotton, the assortment of goods produced, etc, undoubtedly have an influence on the degree of utilization of the equipment. But decisive in this respect are the technical level and the level of organization of labor.

Attendance of a higher number of machines has not always been

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followed by an improvement in the utilization of equipment in the cotton industry.

One of the main causes hampering the utilization of equipment in Soviet cotton textile industry is a too high amount of breaks in the thread. Breaks are the main obstacle impeding increased productivity of labor in this industrial field. They limit the rate of speed of the utilization of equipment, keep it idle more often, hamper the attendance of a higher number of machines, and in the end lower the productivity of labor. The output of a worker depends not only on the number of looms attended by him but also on the number of stoppages. It is known that "the less often the thread breaks, the more looms can be attended." (Yo. and M. Vinogradova and Ye. Lebedeva, Our Working Method, 1935, p. 9.)

Breaks take place at Soviet spinning and weaving mills several times as often as in the industry of the US. Textile Weekly reports that at American mills the break rate per thousand spindles per hour amounted with No 20 yarn (woof) at 8,400 revolutions of spindle per minute, to 35 cases; with No 21 warp at 9,400 revolutions per minute, to 27 cases; with No 16 and 9 warp at 9,800 revolutions per minute, to 45 cases; and so on. (Textile Weekly, 1935, No 374.)

The minimum break rate in the spinning branch of our cotton textile industry is 79 cases per thousand spindle-hours. The average break rate at our mills is, however, considerably higher.

The average break rate for all mills of Ivanovo Oblast amounts to about 165 cases. Both in spinning and weaving shops, the break

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rate remained high in 1937. What is more, due to dilapidation of the equipment and to unsatisfactory organization of the technological process, it even increased at a number of mills, which was one of the causes hampering the growth of productivity of labor. In March 1938, in nine Leningrad mills the lowest break rate was found at the Oktyabr'skaya mill producing No 85 wool (104 cases per thousand spindle-hours), and the highest at the Ravenstve Mill (220 cases). See Textile Herald No 1, 1938, p. 21.) The break rate is high both with frame and with mule spindles.

Analysis of the break rate leads to conclusion that the main causes of breaks lie in the imperfection of the technological side of production, in the non-observance of discipline in the technological process, and in unsatisfactory utilization of equipment. Errors in blending of cotton for spinning as well as lack of control of humidity and temperature in the shops also belong to main causes of breaking.

The Trekhgornaya manufaktura imeni Dzerzhinskiy, the Mill imeni Lakin, and the Ivanovo Melanging Combine managed to lower the break rate considerably in improving the technological process. The example of these advanced mills should be followed by other mills in the Soviet Union. Reduction of the break rate is extremely important for the growth of productivity of equipment and labor. It must be kept in mind that a break at one spindle means a loss in productivity of the whole machine, which has about 200 spindles.

Most careful choice of the size formula, installation of high tension [vytyazhka] devices, through priming of the equip-

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ment, and improvement of all preparatory work processes is the proper way of combating high break rate, and intensifying the utilization of equipment in the USSR cotton textile industry.

The American cotton textile industry pays much attention to preparatory processes. A very important factor in lowering the break rate is the high quality of yarn. The low break rate achieved by American mills has its explanation in good priming, correct blending and carding of cotton, etc. As a result, the US cotton mills utilize their equipment better.

The growth of productivity of labor in the USSR textile industry was greatly hampered by high idleness of the equipment. In the last year of the Second Five-Year Plan, the yearly output per worker in the cotton textile industry showed a decrease as compared to the preceding year as a result of an intolerable increased number of cases of idleness of the equipment in 1937 (Table 60).

[See Table 60 on following page]

Irregularities in the cotton supply were one of the main causes of high idleness of equipment in the cotton textile industry during the First Five-Year Plan.

Turnover of labor, dilapidation of equipment due to sabotage, irregularities in supply of mills with fuel, raw materials, electric power, caustic soda, etc, were the main causes of idleness in textile equipment at the end of the Second Five-Year Plan.

Acceleration (in a number of cases) of working speed of

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TABLE 60

IDLENESS OF EQUIPMENT IN THE COTTON TEXTILE INDUSTRY
OF THE USSR IN 1927-1928 AND 1932-1939⁽¹⁾ (PERCENT)

Years	Idleness of machines	
	Spinning	Weaving
1927-1928	5.46	4.07
1932	14.9	12.03
1933	6.4	8.4
1934	6.8	7.6
1935	4.84	5.76
1936	6.92	7.64
1937	9.96	11.34
1938	10.57	-
1939	8.30	-

(1) Industry of the USSR, 1936, p. 473; the magazine Light Industry, No 7 - 8, 1938; and data on the NKLP USSR.

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machines without preliminary preparation and repair often lowered the intensity of utilization of equipment and increased idleness. For instance at the mill imeni Molotov (Ivanovo Oblast), without any preparation the speed of regular looms was increased from 228 to 250 sley strokes per minute. As a result, the efficiency and the productivity of looms dropped and idleness increased; the parts wore out at such a rate that within 3 months the mill spent its 3 year stock of gears. Regulating of working speeds in the textile industry is the main condition for lowering idleness of equipment, and of further developing the Stakhanovite movement in this branch of industry. As shown in Table 60, idleness of the equipment in the cotton textile industry reached a high level in the last year of the Second Five-Year Plan in the spinning it amounted to 9.95 percent, and in weaving, to even more -- 11.34 percent. At mills of the Main Cotton Administration of Moscow Oblast idleness of looms reached 15 percent; and at mills of the Main Cotton Administration of Leningrad Oblast, to 14.6 percent, both with looms and with spindles. At some mills, idleness was even higher.

One of the main causes of idleness of weaving equipment in 1937 was shortage of yarn due to a discrepancy between spinning and weaving production capacity. Another cause was the faulty system of wages in the cotton industry (which was abrogated by decision of the SNK of 15 August 1936), when progressive wages were computed on the basis of the duration of work without any consideration of the idleness factor which actually encouraged idleness of machines and created no personal interest on the part of the workers and assistant foremen in lowering it. Abrogation of this progressive bonus system of wages eliminated one of the causes ham-

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pering the intensification of utilization of equipment.

The idleness rate also could not remain uninfluenced by the practice of mess priming of the equipment. Besides, many mills had not as yet eliminated the lack of personal responsibility in attendance of machines. Not infrequently workers were regularly reassigned from one machine to another (Krasnyy profintern mill, Gus'Khrustal'nyy).

"It is clear that where personal responsibility is lacking one cannot expect any considerable growth in productivity of labor, any improvement in the quality of the product, any careful treatment of machinery, tools and instruments." (I. V. Stalin, Problems of Leninism, P. 337)

Acceleration of the working speed of machines in the wake of the Stakhanov movement as well as introduction of three-shift work in textile mills naturally led to increased wear and tear on equipment. Under these circumstance the importance of proper organization of all kinds of equipment repair increased immensely; however, until recently the latter remained in an unsatisfactory condition. Dilapidation of equipment as well as neglect of its repair were one of the main causes of high idleness in the cotton industry and thus one of the causes of slow growth of the productivity of labor as compared with other branches of Soviet industry.

The struggle for efficient organization of labor is a matter of highest importance. "To learn how to work -- this is the objective which the Soviet regime must present to the people in all possible broadness." (V. I. Lenin, Works, Vol XXII, p. 454)

In the field of organization of production, the textile

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industry has not utilized all the reserves which it has at its disposal. One of the resources for increasing the productivity of labor is elimination of the intolerably high turnover of labor. The years of increased labor turnover in the cotton textile industry are marked by the slowest growth of labor productivity and the years of extremely high turnover (1932 and 1937) do not show any growth in productivity of labor in this branch at all.

The highest turnover took place in the cotton industry in 1932. The rate of workers leaving their jobs reached 72.2 percent. In the same year, as we already said, the productivity of labor in the cotton industry of the USSR dropped too. Increased turnover and no growth in labor productivity are also characteristic of the year 1937; as a result of an unsatisfactory organization of labor and of dilapidation of equipment at a number of mills, workers were not fulfilling their output quotas, which lead to reduction of wages; this, in turn, increased the turnover of labor.

The high turnover of labor which took place in the cotton industry prior to promulgation of the Ukase of 26 June 1940 was one of the main hindrances to the growth of productivity of labor in this industrial branch. Due chiefly to the turnover of labor the USSR was several hundred million meters of cotton fabric short in 1938.

For instance, after more than 1,500 workers quit the Trekhgor'naya manufaktura in 1938, the weaving mill was over 1,500,000 meters, and the cotton-pring mill over 6 million meters short of the planned output of fabrics.

The Ivanovo Melanging Combine -- the pride of Soviet textile

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industry, which produced about 35 million meters of fabrics a year -- was about 3 million meters of fabrics short in 1938 due to the intolerable labor turnover, so harmful to our national economy.

Exceptionally high was the labor turnover among newly hired workers, as well as among unskilled workers in the cotton industry. 589 workers quit the Dedovskiy mill in the first quarter of 1939, i.e., 149 workers more than in the first quarter of 1938. By length of service, they fell in the following groups; the group with length of service up to 6 months comprised 298 workers, that with up to one year service comprised 98 workers, and that with up to 2 years of service comprised 75 workers, etc.

As we see, 80 percent of workers who quit were those who had been working less than 2 years. Among these 18 percent were skilled and 82 percent unskilled workers.

The textile industry employs mainly women. Therefore in order to combat the labor turnover, their living conditions (public dining establishment, nurseries, kindergartens, etc.) must be given a special attention. Improvement in the wage system, in the organization of production, as well as enlargement of the housing facilities at textile mills are the main ways of reducing the turnover of labor. The fluctuation of manpower was especially high during summer periods, which was largely responsible for seasonal drops in the volume of production. For instance in June 1938 and in April 1939, Soviet cotton industry was over 20,000 workers short.

In the textile industry of prerevolutionary Russia, the main reason for seasonal fluctuation lay in the ties of a considerable part of textile workers with the country.

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Now the situation has changed considerably. As a result of the increased technical equipment of agriculture, an overwhelming majority of Kolkhozes not only are not in want of manpower but have the opportunity of releasing workers to industry.

The performance of Soviet cotton industry in 1939 completely refuted the "theory" concerning inevitable seasonal drops in production during summer periods. At mills which properly prepared themselves for summer conditions the work not only did not deteriorate but improved. The decision of the SNK USSR of 17 September 1939, made provisions for completing during 1940 and 1941 the installment of ventilating and humidifying equipment in all spinning mills of the cotton industry, to help eliminate seasonal influences on production. Correct working out of the leave schedule, improvement of the cultural conditions for workers in the mill, particularly preparation of the children's nursing facilities for the summer period, in order to relieve working mothers -- all contribute to the elimination of drops in the volume of production in summertime.

The enormous turnover led not only to losses in working hours but had a bad effect upon the whole production process. In particular, it forced the technical and the administrative management of mills to spend an enormous amount of time on combating all the negative concomitants of turnover. No small harm was done by turnover to the extension training of workers; with the workers changing branches or mills, the funds spent for training and extension training of personnel did not bring about the desired economic effect. At the same time, the role of worker skill in the improvement of quality of product and in raising labor productivity is enormous.

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A properly worked out system of wages which stimulates extension training of workers and the growth of the productivity of labor is also a most important factor in improved functioning of industry. Proper organization of wages, dependence of pay on the quantity and quality of work, combating of wage levelling --- these are the necessary conditions for quick growth of labor productivity in industry.

The years of the Second Five-Year Plan are marked by a regular growth of wages in all branches of USSR industry. The leading branches of industry -- coal, metallurgy, machine-building --- were brought to the top spot as to level of wages. Wages also grew in the textile industry, this growth being during the years of the Second Five-Year Plan higher than the average for all of industry, so that this branch occupied by 1937 12th place on the wage scale level, as against 16th which it occupied at the end of the First Five-Year Plan.

In 1932 and 1937, as we mentioned, the cotton textile industry showed some decrease in yearly output per worker. At the same time however wages were rising. The payment of workers was very involved. The mills were applying more than 70 different pay scales; the management paid little attention to pay problems. Pay scales and pay computing manuals were both obsolete and extremely complicated and involved. All this was conducive to wage levelling, so that as a result different rates were set for the same kind of work withing the same city.

In Serpukhov, for instance, the daily wages of a weaver attending 8 looms (producing calico) amounted at the mill imeni Rogin

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to 9 rubles 65 kopecks; at the Zanarskaya mill, to 8 rubles 69 kopecks, at the Novotkatskaya mill, to 9 rubles 25 kopecks. Such a practice led to a turnover of labor and had a bad effect on the productivity of labor. The 18-grade wage scale put in operation in 1932 provided for a 1 - 4.8 ratio between the lowest and the highest grade. As a result of changes in the wage scale made in 1933-1935 (raise in wages of the lower paid workers), the ratio between the last and the first grade was considerably reduced.

The difference in the wages of skilled and unskilled workers fell from 4.8 times in 1932 to 2.8 times in 1935; thus the stimuli to extension training of workers and to increased productivity in labor were undermined to a great extent. The practice of remunerating a number of trades not in accordance with the pay scale, of mass revision of planned rates of output, as well as other similar measures were conducive to the harmful wage levelling.

Of great importance was the decision of the SNK USSR of 15 August 1938 concerning regulation of wages in the cotton industry.

A new scale manual based on new principles was put in force. Old scales and grades were revoked. For mass trades, concrete piece rates per 1 kilogram of yarn and per 1 meter of fabric (for weavers and frame spinners) were worked out. For the rest of the trade, concrete daily rates were set. So-called unified rates of output, which lead to wage levelling, were abolished.

Radical changes were also brought into the progressive bonus system of wages. Formerly, progressive wages were computed on the basis of time spent, without due consideration for the idleness of equipment, which was actually apt to increase idleness

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and thus hamper the growth of productivity of labor.

The harmful practice of transferring unskilled workers to attending a high number of looms and machines was done away with. Transfer to higher-rate attendance was allowed only among workers who regularly overfulfilled the planned rate of output.

The wages provided for by this decision were made dependent directly on the amount of goods produced and on the number of machines attended by the worker. Piece rates with rare exceptions did not have to be changed when the worker was transferred to attending a high number of machines, which created a stimulus for him to turn to the standard tending of machines. A definite personal material interestedness of assistant foremen in having their teams tending more machines was established.

This government decision played a large part in development of the cotton industry.

In 1939 the textile industry had an increase in the output as against 1938 amounting to 257 million meters of cotton fabrics, 3,260 tons of yarn, 6,800,000 meters of woolen fabrics, and so on.

Proper organization of "the wages of workers, foremen, and engineers and technicians, with due material stimulus for raising the productivity of labor" (Decisions of the XVIII Congress of the VKP(b), 1939, p. 35), elimination of wage levelling, broader application of the piece-rate and bonus systems -- these are the main conditions for growth of productivity of labor and lowering of prime cost of product in the textile industry.

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Raising the educational and cultural level of the working class is an important factor in raising the productivity of labor. In recent years the technical and cultural level of Soviet workers, especially of those in the cotton industry, has radically changed. The textile workers, who were as a majority illiterate before the Revolution, have now raised their educational and cultural level. A considerable portion of them have acquired a minimum of technical education. The technical training of textile workers became especially intensive after the decision of the plenary session of the TsK VKP (b) in December 1935. During 1936 alone, about 60,000 workers passed the state technical examination. The relative number of engineers and technicians in the total personnel of the cotton textile industry was increasing. The number of engineers and technicians rose from 4,000 in 1925 to over 15,000 at the end of the Second Five-Year Plan. In 1934-1938, the whole textile industry employed 657,000 workers graduated from the schools of minimum technical education [tekhnikums]. This is the most important evidence of the rising cultural and technical level of the working class.

The development of the Stakhanov movement brought not only an increased number of textile workers participating in technical studies but a better quality of study. For instance, of 988 workers who passed the state technical examinations at the Mill imeni Dzerzhinskiy in 1938, 278 workers obtained "excellent," 370 "good," and 340 "satisfactory" marks.

Disseminating and improving the technical education of workers leads to structural and vocational changes in the technical personnel; the relative number of skilled workers grows, which results in a

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higher productivity of labor due to increased automatization of production.

Equipment of the cotton industry with high-speed single-process cotton gins and other improved machines, with high tension devices, with automatic looms, as well as with instruments controlling and regulating the technical process implies higher requirements relative to technical skill of the textile industry personnel, both of the workers and of the engineers and technicians. That is why the problems of technical education acquire a special urgency in this field of industry.

The skill of workers and the total length of their service in a given branch at a given plant unit are the most important factors in utilization of equipment and factors in productivity of labor.

The importance of the technical education in raising the productivity of labor can hardly be overestimated. The higher output by Stakhanovites is due to their having acquired technical knowledge -- i.e., to the level of their skill. All Stakhanovites lay stress on the enormous role of technical training in fulfilling the planned rates of output and in improving the industrial work in general.

Early in 1939 Stakhanovites comprised in the cotton industry of Ivanovo Oblast 24.2 percent, and in Moscow and in Leningrad Oblasts as well as in new areas, 21.7 percent of the total number of workers.

Some progress in the organization of a mass Stakhanovite move-

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ment late in 1938 and early in 1939 was the main cause of an improvement in the functioning of the cotton industry.

One of the most important forms of the Stakhanovite movement is the movement of multi-loom workers, which has its aim in attending a higher number of looms and spindles. Before the Patriotic War a movement had started among female workers of the cotton industry aimed at acquiring trades which up to them had been considered "men's" vocations.

During the period from 15 February to the end of 1939, 3,721 female cotton-mill workers took the place of the lacking male workers, including 742 assistant foremen, 139 mule spinners, 167 fitters, 159 repairmen, etc.

Finally, in the cotton industry as well as in a number of other fields, the Stakhanovite movement develops also along the lines of combining a number of different trades. The opportunity for reasonable combining of different trades in this branch of industry is quite great, especially, among helpers.

Let us give some examples. The Vandyshevo Spinning Mill, kept on its staff 42 coilers and 30 revers. At the same time, at the mills located in Ivanovo (Krasnaya talka, Melanging Combine, and others) both functions are carried out by the same people. A group of greasers at the Rodniki Bol'shevik Combine learned how to twist ropes; now they carry out two operations simultaneously, which made it possible to reduce the number of helpers. At the Mill Privolzhskaya rommana, (Ivanovo Oblast) the number of workers was reduced, due to combining of trades, by 65; at the Mill imeni Krasin,

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by 27; and at the Oktyabr' Combine, by 129 workers. New forms of the Stakhanovite movement helped to moderate the shortage of skilled workers (weavers, frame spinners, etc) in the cotton textile industry of the USSR, and to fulfill, with fewer workers the industrial plan for 1939.

However, it should be mentioned that in some mills, combination of trades used to be of an incorrect, accidental nature. For instance, at the Kommunisticheskiy Avangard Mill, the trade of assistant foreman was "combined" with the duties of a yarn carter. Such a combination of trade is incorrect, because it leads not to raising but to lowering of the productivity of labor.

The Third Five-Year Plan made provisions for productivity of labor to be raised in the whole USSR industry, 65 percent; in the textile industry, 35 percent.

During 1938 and 1939, the yearly output per worker in the textile industry rose by 17.2 percent.

Some enterprises, as for instance the Novoivanovskaya manufaktura, fulfilled the Third Five-Year Plan in the point of productivity of labor ahead of time. Increase in the number of multi-loom workers was one of the main factors which ensured such a rapid growth of productivity of labor.

At this mill each weaver was attending 10.87 looms, which exceeded the standard rate of attendance by 36 percent; at this mill, high-speed looms have been adopted, which brought the productivity per loom per hour in 1939 to 12,600 woof threads as against 11,000 in 1936 and 12,500 in 1938.

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An extremely important factor in the raising of the productivity of labor at the Novoivanovskaya Manufaktura was the weavers' full compliance with the planned rates of output. Planning the output rates is the most important condition of raising the productivity of labor.

In 1939 the fulfillment of planned rates of output amounted in the whole textile industry to an average of 105 percent; and in the cotton textile industry, to 105-107 percent. At the same time, however, planned rates of output were complied with by only 66 percent of all piece-rate workers. High idleness of the equipment, reject of product, insufficient skill of the workers -- these were the main obstacles impeding compliance with planned rates of output.

The revision of output rates in the cotton textile industry early in 1940 concerned chiefly the workers of subsidiary and auxiliary shops, whose part in the textile industry is very great.

The output and the intensity of labor of the basic industrial workers (weavers, frame spinners, and others) in Soviet textile industry is relatively high; the organization of their labor is also, on the whole, higher than among helpers. That is why raising the productivity of labor of the latter deserves special attention.

Mechanization of auxiliary operations, particularly of inside-mill transport, draw-in work, etc, as well as combining of trades among helpers may considerably raise the average productivity of labor in the cotton textile industry.

Consistent realization of the principle of "material stimulation of good workers, "improvement of production organization

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(elimination of irregularities in the output of goods, struggle for observance of "strict discipline in the technological process," etc), improvement of the utilization of cotton, wool, fuel, electric power, elimination of absenteeism, and further extension training of all workers in the industry -- these are the most important factors in raising the labor productivity and in lowering the prime cost of product in the textile industry as a whole.

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