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RESTRICTED**RUSSIA'S ECONOMIC PROBLEMS AND PERSPECTIVES**

A Lecture delivered by
by Dr. D. B. Shimkin
at the Naval War College
on 4 September 1951

Since 1928, Soviet economic development has, in essence, represented the progressive realization of the patterns foreshadowed by the First Five-Year Plan. This has been particularly true in the emphasis laid on heavy industry, in the organizational forms of agricultural enterprises, in the geographical distribution of industrial centers, and in the lay-out and functioning of the nation's transportation system. In the last five years, however, fundamental new problems have become evermore pressing. The rigidity of agricultural organization has become a bottleneck, hindering rapid growth of the non-agricultural labor force. Droughts in 1946 and 1950 brought out once more the paucity and indifferent quality of developed agricultural resources. The unevenness of economic growth throughout the Soviet Union has permitted no relaxation in the heavy pressure upon the country's transportation network. The limits in productive capacity from developed mineral deposits and operating industrial plants have been closely approached. Satellite territories in Eastern Europe and the Far East now demand increasing economic integration and development to serve effectively as outer bastions of Soviet power. Above all, challenging the western world, so greatly superior in economic potential, would call for an utmost effort in direct military production.

An examination of Soviet alternatives in economic action and an evaluation of indicated plans, viewed from the standpoint of these growing problems, are the objectives of this review of Russia's economic potential. It comprises four parts: a delineation of the general accomplishments of the Fourth Five-Year Plan

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of 1946-1950; a summary of the major economic problems faced by USSR today; an evaluation of known aspects of Soviet and satellite economic plans; and an indication of the broad possibilities for further economic expansion by the Soviet sphere.

POSTWAR ECONOMIC ACCOMPLISHMENTS: In March, 1946, less than a year after the end of World War II, the Soviet Union promulgated a Fourth Five-Year Plan of economic reconstruction and expansion. The plan was fundamentally aimed at achieving in 1950 the goals laid down for 1942 by the Third Five-Year Plan, which had been interrupted by the war. The differences between the two plans were few, notably postwar reductions in petroleum and fertilizer production targets.

By the end of 1950, the goals of the Fourth Five-Year Plan in mineral production had been substantially achieved, except for a definite failure in natural gas output (See Figure 1). Electrical-power production and railroad ton-mileage slightly exceeded the anticipated levels. In contrast, the manufacturing of non-military commodities, from farm tractors and civilian trucks, to window-glass, cotton cloth and paper, failed by appreciable margins to reach the 1950 goals. Non-agricultural employment in 1950 totalled 35 million persons, or some 18% more than had been foreseen. This fact reflected corresponding failures to meet man-year productivity goals; it also meant far greater pressure upon the meager housing facilities of the Soviet Union than anticipated. In agriculture, only cotton production exceeded plan; however, grain and sugar-beet outputs were only slightly below target levels. On the other hand, the hay, flax and sunflower seed programs were marked failures. The increases in livestock numbers between 1945 and 1950 averaged less than two-thirds of those planned. Finally, while the reconstruction of manufacturing and transportation facilities in the war-devastated regions was successfully accomplished, extrem-

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ly little progress was realized in the construction of new plants and rail lines. Such important projects as the Orsk and Rustavi steel mills, the Novosibirsk Automotive Plant^{1/}, and the South Siberian Railroad remained unfinished.

By the end of 1950, Soviet mining manufacturing and railroad ton-mileage had reached levels 40 to 50% higher than the pre-war peaks. Especially important advances were realized in aluminum and electrical power output which reached over thrice and nearly double the pre-war peaks, respectively. The number of farm tractors produced in 1950 (81,000) was considerably more than achieved in 1937 to 1940, but far under the peak of 103,000 reached in 1935. Man-year productivity in non-agricultural pursuits exceeded that of 1940 by some 10%, a gain entirely ascribable to post-war increases in the work week, to 48 hours. In agriculture, the only important rise above pre-war production was in cotton^{2/}. This was desperately needed to supply mills in the satellite areas and China; domestic output of cotton cloth in the USSR failed to regain the pre-war figure.

The most important effect of World War II on the Soviet economy was to force a tremendous eastward shift. During the Fourth Five-Year Plan period, the major effort changed from new development east of the Volga to reconstruction in the west. Nevertheless, the net result of the past decade has been to increase the significance of the Volga, Urals, Siberian and Turkestan economic regions to the following degrees:

^{1/} In the South Urals, Georgian Soviet Socialist Republic and Western Siberia, respectively.

^{2/} Nearly 40% in comparison with 1940, a poor year; only some 15% above the average for 1937-40. Data from L. Volin, U. S. Department of Agriculture.

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In mineral production, from 25% to 50% of the nation's total.

In electrical power output, from 24% to 37%.

In rail-freight originated and terminated, from 28% to 41%.

It must be noted, however, that the share of these eastern regions in both total and urban population, and in developed agricultural land is no greater today than it was fifteen years ago. Another point is significant: within European Russia, the Central Regions and the Ukraine have maintained a fairly steady development, while economic stagnation has marked not only the war-damaged western frontiers but also the Caucasus.

How did Soviet economy, at the completion of the Fourth Five-Year Plan, compare in stature with the American? In mineral consumption, electrical power production, and, evidently in total industrial output, civil and military combined, the Soviet: American ratios in 1950 closely approximated 1:4. Even with the production of the Eastern European satellites added to the Soviet total, the ratio in comparison with the United States did not exceed 1:3; or, in comparison with the Atlantic Powers jointly, 1:5. The Soviet Union manifested relatively greater strength than a quarter of the American output in coal and lead, and in the production of cotton cloth, but exhibited much greater comparative weakness in petroleum and natural gas, and in a wide series of civilian manufactures, ranging from trucks to paper. In agriculture, forestry and fishing, the mean ratio was about 6:10; on a per capita basis, however, the supplies of these products available to the Soviet Union was less than half the American. The outstanding Soviet weaknesses lay in cotton and, surprisingly, timber production.

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SOVIET ECONOMIC PROBLEMS: As was indicated earlier, many serious economic problems confront the Soviet Union today. These difficulties must, however, be viewed in proper perspective. They are unquestionably serious enough to hamper and delay the achievement of many Soviet economic and strategic objectives, and they might prove dangerous in an all-out war or comparable extraordinary emergency. But under present conditions they cannot stop a growth in the total power of the Soviet sphere, and certainly they presage no collapse.

In my opinion, the most important adverse factor in the Soviet economy since the end of World War II has been the great load of armaments, including the atomic energy program. This military burden seems clearly to have exceeded even Soviet anticipations. Lags in construction, and gaps between goals and performances in civilian manufacturing, simultaneously with excellent records in mineral production, electrical power output and transportation, give clear evidence on this point. Heavy militarization has cut deeply into supplies of labor, electrical energy, metals, chemicals and tools available to the civilian economy. Large-scale stockpiling has also been an indubitable factor in reducing civilian supplies.

Factor	Unit	Reached in 1950	Ratio 1950 to		
			Planned Goals	1939/ Peak	U.S. 1948 Output
<i>Mineral production:</i>					
Coal (bitum. equiv.)	Mill. m.t.	220	1.06	1.6	0.35
Petroleum	" "	35.0	0.99 $\sqrt{}$	1.2	0.12
Natural gas	" m. $\sqrt{}$	2.51	0.28	1.2	0.02
Steel ingots $\sqrt{}$	" m. t.	2.48	0.97	1.4	0.31
Copper (electrolytic)	Thous. m. t.	(2.90)	1.12	1.8	(0.30)
Lead, primary	" "	(144)	0.92	(1.6)	0.39

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Factor	Unit	Reached in 1950	Ratio 1950 to		
			Planned Goals	1939/ 1940 Peak	U.S. 1948 Output
Zinc, primary	" "	(128)	0.99	(1.6)	0.26
Aluminum, primary	" "	(180)	1.00	3.2	0.31
Cement	Mill. m. t.	10.6	1.01	1.8	0.30
Total ^{2/}	Bill. U. S. 1937 doll.	1.57	(1.0)	1.5	(0.25)
<i>Manufacturing:</i>					
Farm tractors	Thous. Units	81 ^{3/}	(0.74) ^{3/}	3.0	0.12
Trucks and cars ^{4/}	" "	400	0.80	1.9	0.08
Superphosphate	Mill. m. t.	2.6	0.96 ^{5/}	1.7	(0.30)
Window glass	" m. ^{2/}	66	0.82	1.1	—
Cotton cloth	" m.	3.98	0.83	1.0	0.44
Paper	" m. t.	1.23	0.92	1.5	0.14
<i>Agriculture, Forestry and Fisheries:</i>					
All grains	Mill. m. t.	(95.0)	(0.93)	1.0	0.60
Wheat	" "	30.2	—	—	0.85
Sugar beets	" "	23.4	0.90	1.1	1.3 ^{6/}
Unginned cotton	" "	3.7	1.2	1.1	(0.25)
Cattle	Mill. head	57.2	0.87	1.0	0.73
Fish catch	Mill. m. t.	1.72	0.78	1.1	0.82
Timber cut (roundwood)	Mill m. ^{3/}	155	0.86	1.4	0.43
<i>Electrical Power</i>					
Output	Bill. kw-h	90	1.0	1.9	0.27
Railroad Freight	Bill. m. t. kw-h	594	1.1	1.4	0.64
<i>Civilian Non-Farm Employment</i>					
	Millions	(34.5)	1.2	1.3	0.80

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Factor	Unit	Reached in 1950	Ratio 1950 to		
			Planned Goals	1939/ 1948 U.S. Output	
<i>Men, 15-59, in Agriculture, Forestry and Fishing</i>	Millions	(35.2)	—	1.1	4.4

Notes:

1. Probably includes a substantial proportion from scrap.
2. Excludes gold, silver, stone, sand and gravel.
3. Converted from "15-h.p." units; average calculated power per tractor - 33 h.p. Percentage of plan achieved, for the entire period 1946-1950.
4. Excludes an equivalent of 25% additional in spare parts.
5. Reduction from 1942 goal in Third Five-Year Plan.
6. Includes cane sugar.

Finally, the severe restrictions on trade which the western nations have imposed as counters to the Soviet threat have had a gradually cumulative adverse affect.

Next in significance appear to be the great Soviet shortages in productive capacity of all descriptions. Blast and open-hearth furnaces, electrical-power stations, housing and factory space, transportation, and farm equipment are all being used with great intensity. In general, the production reserves available to the USSR today are far smaller than in 1940, and negligible by comparison with the United States. Shortages in capacity are, of course, inherent in any rapid industrialization. However, they have been aggravated in the Soviet Union by substandard construction and manufactures, poor maintenance practices, and inadequate allowances for amort-

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ization. Also significant since 1937 has been the great lag in new construction resulting from the diversions of materials and labor to direct military ends.

Closely allied to the problem of inadequate reserves of capacity are the continuation of obsolete and inadequately diversified production, as well as slow growth in labor productivity. Transportation and agricultural equipment have been especially characterized by the continued output of a limited range of old models. The attempt to achieve maximum production with minimum investment has led to frequent deficiencies in belt lines and other internal transportation systems; in the diversification of machine tools; in the adequacy of control devices, which has in turn prevented the wide use of automatic production and, especially, quality control; and in space-allocation, lighting, ventilation and heating. These factors, combined with poor living conditions and a very high proportion of women and children in industry, have resulted in low productivity.

Low man-hour productivity both in urban occupations and on farms has resulted in a severe labor shortage, aggravated by the tremendous losses of men in World War II and by the maintenance of a huge standing army. To meet this problem, the Soviets have put great pressure on workers, prohibiting unauthorized changes of employment and making compulsory not only a 48-hour basic work week but also overtime within wide limits. Labor discipline has been extremely harsh, backed by criminal penalties for violations. The Soviets accelerated the entry of urban women into the labor market by the currency conversion of 1947, which virtually wiped out individual savings. In consequence, the present proportion of women in non-agricultural employment, nearly half, closely approximates the World War II peak. Further growth of urban employment, to a degree unanticipated in 1946, has been

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maintained by the conscription of 14 to 17-year olds, largely farm children, for industry and the railroads. Up to now, the growth of city population by the mass transfer of adult farmers, as happened during the collectivization of agriculture in the 1930's, has been inhibited by the following factors.

First, the losses in power suffered from the slaughter of horses and the destruction of mechanical equipment during World War II have not yet been made good. Second, even by Soviet standards, urban housing and service conditions are too limited for much additional crowding. Third, the collective farmer, enjoying somewhat greater political and economic freedom, a greater security of subsistence, than his city cousin has been reluctant to leave the land. His rights to a place on the farm have been guaranteed by a charter in perpetuity. Nevertheless, the revocation of these rights which began in 1950 may be the beginning of a new era of forced urbanization.

Many raw materials have also been in short supply. In minerals, the non-metallics, particularly diamonds, fertilizers and sulphuric acid basics, have been especially deficient. Other weaknesses include petroleum, zinc, tin, molybdenum and cobalt. In agricultural commodities, the supplies of fibers, rubber, leather, and protein sources have been conspicuously weak. As mentioned previously, timber production is also low. All of these shortages have been intensified by the decline of trade with the west, the need for supplying the satellites, and the disproportionately great demands of armaments.

SOVIET AND SATELLITE ECONOMIC PLANS: At the present time, the position of the Soviet Union is anomalous—that of a planned economy without a highly publicized plan of national economic development. The Fifth Five-Year Plan, which was to

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begin in 1951, has been either delayed or completely abrogated. Instead the main Soviet effort is ostensibly to be devoted, for the next five to six years, to the accomplishment of a series of grandiose water-development projects.

These plans may be divided into three groups: the Volga-Don Basin projects, the South Ukrainian projects and the Turkmen Canal scheme. The first of these is an old plan, started in the mid-1930's and originally scheduled for completion in 1947. Two parts of the Volga plan have already been completed, the Ivan'kovo-Uglich and the Rybinsk dam systems on the Upper Volga which have created a large reservoir above Rybinsk and have a capacity of 460,000 kw. if all the planned dynamos have been installed. Two other dams, near Gor'kii on the Volga, and Molotov on the Kama, started in 1933 and due to be completed in 1938-39, must yet be finished; they are to have installed capacities of 400,000 and 500,000 kw., respectively. All of these dams except the one at Molotov are wide but low structures, raising the natural water levels only by 36 to 49 feet; the Molotov dam is to be higher, with a head of 115 feet.

Lower on the Volga, two new dams are to be built at Kuibyshev and Stalingrad. They are to be largely of earthen construction, some two miles long, and 66 to 85 feet high, exclusive of parapets. Electrical power capacities of 2.0 and 1.7 million kilowatts, respectively, are to be installed; half the power generated to be transmitted to Moscow. The two reservoirs, each in excess of 16 million acre-feet capacity or equal jointly to that of Hoover Dam by itself, are to irrigate an overall total of some 10 million acres. To aid this purpose, two principal canals, one 60 miles south to the Sarpa lakes and the other 200 miles east to the Kamysh-Samar lakes, are to be dug as outlets for the Stalingrad reservoir.

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West of Stalingrad, work on the Volga-Don canals is in progress. This canal, 62 miles long, must lift the waters of the Volga some 250 feet; those of the Don, 125 feet. To accomplish this, 13 locks will be needed. Below the canal, at Tsymlyansk, the Soviets are constructing a low but exceedingly long retaining structure consisting of a 500-yard wide dam and two earthen dikes totalling 13,000 yards. The structure is to raise the water level of the Don by 86 feet, creating a reservoir of some 10 million acre-feet capacity, which is to regulate the flow of water to Rostov, and to permit the irrigation of 1,850,000 acres, facilitated by canals aggregating 350 miles in length. The power to be installed at Tsymlyansk is to total 160,000 kw.

The South Ukrainian projects comprise essentially the construction of the following: a dam on the lower Dnyepyr at Kakhovka, with a reservoir of nearly 11.5 million acre-feet capacity; another dam, on the Molochnaya River to the southeast, and a diversionary canal from the old Dnyepyrstroi reservoir to the Molochnaya River, carrying the flood-waters of the Dnyepyr hitherto spilled and thus filling the Molochnaya basin to a capacity of 5 million acre-feet. From these basic structures a series of irrigation canals totalling 560 miles in length will be needed to distribute water throughout the Southern Ukraine and Crimea. New irrigated land is to aggregate 3.7 million acres; power capacity at Kakhovka, 250,000 kw.

The Turkmen project envisages the construction of a dam diverting much of the waters of the Amu Darya from the river's delta and the Aral Sea southwestward, via canals and old streambeds, to the Caspian. The main purposes of this project are alleged to be the irrigation of 3.2 million acres, and the provision of industrial water supply to Krasnovodak and other mining centers.

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The evaluation of all of these projects is extremely difficult, since very few technical or economic data regarding them are available. Nevertheless, I would like to summarize a number of my impressions:

1. Although these projects involve very large undertakings in moving earth and laying concrete, none of them are inherently impossible from the standpoint of present-day technology. However, the degree to which these projects appear to be serious plans rather than fanciful schemes differs greatly. Technically, the most dubious appear to be the Turkmen project, the Stalingrad-Kamysh-Samar lakes canal, the Tsymlyansk dam, and the Volga-Moscow transmission lines. It should be noted the Amu Darya is still a completely unregulated river, with tremendous variations in discharge, carrying an extremely heavy load of silt. The effectiveness of a dam just above the delta is thus very doubtful. In addition, the complete absence of industrial facilities in, or even transportation to, this region would make necessary a very large scale of preliminary investment. In regard to the Stalingrad canal, I will simply state that not even the route has yet been determined. The Tsymlyansk dam, while technically not difficult to build, will face very difficult maintenance and seepage problems, since it is being constructed on deep, unconsolidated sands. Finally, the planned transmission lines from Kuibyshev and Stalingrad to Moscow would strain Soviet technology to the utmost.

2. At the same time, it is essential to note that all of these projects can be phased, and that alternative plans are fully possible for the later phases. In general, the first effects of dam construction would be to facilitate local water supplies and navigation; the power facilities can be built up very gradually, since the small drop characterizing all the sites involves numerous small generators rather than a few giants. Furthermore, the power developed can

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be used locally, or transmitted for varying distances. In the Volga project, as laid out in 1937, barely 20% of the power from Kuibyshev was to be transmitted to Moscow. Instead, most to be used locally for power-intensive industry and irrigation, while the bulk of the remainder was to be transmitted to Kazan, Gor'kii and Ufa. The pre-war variant of the lower Volga project anticipated using nearly all the power for non-ferrous metals, fertilizer, synthetic rubber and other plants to be located near the dam site. The enormous power and water requirements for the manufacture of fissionable or fusionable atomic raw materials are well known; thus it is conceivable that the Volga projects might eventually augment Soviet atomic potential rather than furnishing power to Moscow.

3. The construction time for these projects, especially the irrigation schemes, is almost certain to be far greater than anticipated. Numerous bottlenecks for simultaneous progress on these various plans are evident, e. g., limited quantities of heavy earth-moving equipment, cement, and electrical-generating machinery. In consequence, the probable rate of investment is unlikely to exceed a moderate fraction of Russia's total investment capacity, leaving the bulk for a more general Fifth Five-Year Plan, intensified aid to the satellites, or a rapidly accelerating armaments program.

4. The economic effect of these programs, excluding the Turkman Canal as unlikely of accomplishment, may be the following. Extremely important gains in electrical power production, without corresponding pressures on coal mining or transportation, are probable. So too is the development of large water supplies on the Volga and in the Southern Ukraine for industrial and urban use. Substantial accessions to Soviet air and atomic power would be plausible by-products.

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From the standpoint of navigation, both gains and losses may be foreseen. A deep-water channel from Tsymlyansk to Moscow and to Molotov in the Urals would be of great advantage to the Soviet Union, providing significant relief to the railroads which link the great central Russian, Ukrainian and Urals' industrial complexes. On the other hand, the loss of at least 16% of the Volga discharge because of water diversions and increased evaporation from reservoirs would accelerate the already-rapid drying up of the Caspian Sea. The northern shore would recede possibly 40 miles in a couple of decades; Kara Bugaz Gulf, already a separate lake, would disappear. Maintenance of transportation on the lower Volga and in the Caspian would be both difficult and costly. The effects on the important Caspian Sea fisheries would be disastrous. Much of the same can be said for the prospects of the Don below Tsymlyansk, which faces loss of some 40% of its discharge.

5. The projects envisage irrigating some 15.5 million acres of land. They do not emphasize, however, that nearly a million acres of cultivated land have already been flooded in the creation of the Rybinsk reservoir, and that the new reservoirs would flood an additional four million acres. Thus the net gain in cultivated land would ultimately total barely 3% of the acreage sown in 1950; the net gain in agricultural production, not more than 6 or 7%. Clearly, these plans provide no long-range solution to Russia's agricultural problem. The purported amelioration of climatic conditions through these projects is, of course, nonsense.

Let us now consider briefly the satellite plans for economic development. For Poland, Czechoslovakia and presumably, Eastern Germany, there is envisaged a 70% increase in mineral production within five years. Fuel output is to rise by about a third; cement, to nearly double. Pig iron, copper and zinc production

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are supposed to be more than tripled. In manufacturing, the planned increases range from 40% for shoes, to 70 to 95% for locomotives, radios, textiles, motor vehicles and electrical-power output. Three new industrial centers are to arise, near Cracow, in the Warsaw area, and in the vicinity of Frankfort on the Oder. Generally speaking, the plans anticipate a rate of growth in industry comparable to that achieved by the Soviet Union during the First Five-Year Plan. However, conditions in Poland, Czechoslovakia and Eastern Germany today are far less favorable for rapid industrialization than were those in the USSR in 1928. Their populations are already 55% to 75% urban; their agricultural practices are relatively advanced. Furthermore, they must import a great part of their raw materials. All cotton, much timber, two-thirds of the iron ore, all steel-alloying metals, many non-ferrous metals, and such basics as sulphur minerals and phosphate rock must come either from the Soviet Union or the west. In addition, these countries carry armaments loads comparable to that of the USSR in 1939, rather than in 1928. Only substantial Soviet aid can avert the failure of these plans.

The plans for Hungary, Rumania and Bulgaria are even more ambitious, calling for a 175% increase in mineral production within five years, and for the creation of many completely new industries, ranging from fertilizers to bicycles. Here again, Soviet aid would be indispensable for success.

POTENTIALITIES AND ALTERNATIVES: Let us summarize the data presented thus far. First, the Soviet Union, by the end of 1950, achieved an industrial output 40-50% above its pre-war peak, and a quarter as great as the American in 1948-50. In agriculture, it essentially regained the pre-war level, roughly 60% the current American output. Second, the Soviet economy today faces serious problems deriving from the impacts of an armaments

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race with the West; of shortages in productive capacity; of obsolescence and inadequate diversification in many technological areas; of low man-power productivity; and of numerous raw-material shortages. Third, the absence of a Fifth Five-Year Plan currently leaves the bulk of Soviet investment capacity without known commitments. The water-development projects now under way are certain to be completed at a slower speed than planned. They are likely to be most valuable in augmenting Soviet electrical-power production and industrial water supplies, and in improving transportation within the Volga River basin north of the Caspian Sea. Sharp increases in Soviet air and atomic energy capabilities may be results. Finally, the Eastern European satellites have been committed to industrialization programs substantially beyond their capabilities without substantial Soviet aid.

In conclusion, I would like to indicate the longer-term economic potentialities and alternatives of action which appear to be open to the Soviet sphere today. It is my belief that the USSR has the manpower and investment capacity at present to be able to double its industrial output within ten years. Such an increase, however, could be achieved only by continuing austerity, limiting armaments, and avoiding exports of capital. By such means, Russia could largely solve her food problems, through increased irrigation and, above all, systematic land improvement in the old Central Russian and Ukrainian agricultural areas. Considerable expansion in mineral output could be achieved, especially in Kazakhstan and Central Siberia. New industrial centers in these areas, and in the underdeveloped regions of Central Russia could, in conjunction with a moderate length of new railroads, greatly reduce the nation's weaknesses in transportation. The potential rate of economic growth by the satellite areas would, under such circumstances, be rather slower than the Soviet.

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The second alternative would be accelerated economic growth in the satellite areas, including Manchuria, achieved by large capital flows from the USSR, and hence slower Soviet development. Such a program would gain more output with less investment and would create strong outposts, east and west, for defense or offense. Potential Titoism and the vulnerability of immensely long communication lines would, however, be paramount problems.

The final alternative would be a virtual cessation of economic expansion in favor of an all-out armaments effort soon followed by attempted seizure of Western Europe's industrial potential.

Which alternative or combination of alternatives the Soviet Union may have chosen is an unanswered question of decisive significance.

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