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Political Consequences of the development of Russia's Inland Waterways

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**POLITICAL CONSEQUENCES OF THE DEVELOPMENT
OF RUSSIA'S INLAND WATERWAYS**

by

Count L. Bower

B.S., University of Wyoming, 1950

**A THESIS SUBMITTED TO THE
GRADUATE DIVISION OF OMAHA UNIVERSITY
IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR A MASTER'S DEGREE IN
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1954

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CHAPTER I

THE PROBLEM AND ITS SCOPE

Introduction

"As long as capitalism and socialism remain, we cannot live in peace. In the end one or the other will triumph--a funeral requiem will be sung either over the Soviet Republic or over the world capitalism."¹

Thus the philosophy of Lenin reflects that of Marx and Engels, who some seventy years earlier had described an "inevitable" struggle between the communistic and capitalistic ideology as follows:

"The essential condition for the existence, and for the sway of the bourgeois class, is the formation and augmentation of capital; the condition for capital is wage-labor. Wage-labor rests exclusively on competition between the laborers. The advance of industry, whose involuntary promoter is the bourgeoisie, replaces the isolation of the laborers, due to competition, by their revolutionary combination, due to association. The development of Modern Industry, therefore, cuts from under its feet the very foundation on which the bourgeoisie produces and appropriates products. What the bourgeoisie therefore produces, above all, are its own grave diggers. Its fall and the victory of the proletariat are equally inevitable. . .

"The immediate aim of the Communists is the same as that of all the other proletarian parties; formation into a class, overthrow of the bourgeois supremacy, conquest of political power by the proletariat."²

-
1. Lenin, Collected Works, Vol. XVII, p. 398.
 2. Karl Marx, Friedrich Engels, Communist Manifesto, as quoted in the source book, Introduction to Contemporary Civilization in the West, p. 426.

The foundation for present Russian industrial development was laid in the period 1925 to 1933. Russians, with the aid of American technicians built factories in accordance with American standards. They installed American equipment and machinery in these factories. At the same time they constructed huge dams and power plants. Russia was then a market for American products and certainly offered no competition to United States industry. This was so, even though it was recognized that within the great Russian land mass lay huge reserves of resources. Few recognized then that these factors could, if developed, enable Russia to build an industrial empire capable of challenging the United States. Attributes of location, area, population and natural resources which enabled the United States to become the world's foremost industrial power were possessed also by Russia.

In World War II Russia's ability to mass produce weapons, equal to and in some instances superior to ours, came as a surprise. Gradually we are becoming aware of Russia's phenomenal growth.

Continued progress may well enable Russia eventually to match the United States industrial might and technological knowledge. Its industrial potential, coupled with the driving power of the Marxist-Lenin ideology, are of immediate concern to the Western allies. The degree to which Soviet leaders adhere to this ideology

undoubtedly must be considered in all speculation concerning the probability of World War III. Certainly ideological differences existing between the United States and Russia are a serious matter in an age of atomic bombs and inter-continental bombers.

The warning of Rudyard Kipling seems appropriate:

But (pray, and I put back the bandage) this is
 the time to fear,
 When he stands up like a tired man, tottering
 near and near;
 When he stands up as pleading, in wavering, man-
 brute guise,
 When he veils the hate and cunning of his little,
 swinish eyes;
 When he shows as seeking quarter, with paws like
 hands in prayer,
 That is the time of peril--the time of the Truce
 of the Bear!

Eyeless, noseless, and lipless, asking a dole at
 the door,
 Matun, the old blind beggar, he tells it o'er
 and o'er;
 Fumbling and feeling the rifles, warming his
 hands at the flame,
 Hearing our careless white men talk of the morrow's
 game;

Over and over the story, ending as he began:
 There is no truce, with Adamzad, the Bear that
 looks like a Man!¹

Need For This Study

An analysis of United States and Russian power in international politics both present and future depends upon a knowledge of their industrial and agricultural productivity as well as a knowledge of their relative

1. Rudyard Kipling, "The Truce of the Bear," Verse, p. 718.

4

military strength. The Soviets presently are endeavoring to increase their agricultural and industrial output to equal in terms of power that of the west. The Soviet government has initiated an extensive program to develop its inland waterways. It is the author's desire to determine the contribution these hydro developments will make in building Russian economic and political strength.

The Problem

This study is made to determine if Russia through development of inland waterways can improve her position in the bi-polar power struggle. To achieve this objective the author poses five questions:

- (1) How have inland waterways conditioned patterns of thinking in Russian society?
- (2) Are these patterns of thought discernible in present hydro plans?
- (3) What are Russia's present hydro plans and how do the Soviets propose to utilize these projects to improve their economy?
- (4) What political consequences evolve from the economic advances in agriculture and industry achieved through hydro development projects?
- (5) What domestic problems condition the development of Soviet hydro programs?

Delimitations

The thesis is entitled "Political Consequences of the Development of Russia's Inland Waterways." By "Political Consequence" the author means: Any factor which would tend to alter or improve Russia's bargaining role in the world power struggle.

The investigation is confined to known published information. Russian disseminated information is used. An attempt has been made to separate factual information from sheer propaganda.

Main consideration is given to the Soviet's plans for internal waterways development. Coastal systems are mentioned only where they seem pertinent to a consideration of the problems of internal waterway development.

Many hydro projects of lesser importance have recently been completed or are in process of construction. These include those located on the northern draining rivers of the Himalayan Mountains, such as the Kura in Azerbaijanian, the Vakhsh in Tajikistan and Syr Darya in the Ferghanna valley of Uzbek.¹ Such lesser projects have had little effect on the total economy of the Soviet Union and can best be classified as local in nature. Consequently, they will be omitted from this study.

The projects involving canals adjacent to the Leningrad region linking the Baltic and White Seas as

1. Nikolai Mikhailov, Across the Map of the USSR, pp. 169, et. seq.

well as power stations at Uglich, Ivankove and Scherbakov of the Rybinsk Reservoir system represent momentous hydro development advances. Nevertheless their influence on Russian economic and technological growth has been pretty well established.¹ For this reason mention is given them only in terms of their part in the overall program.

History notes that both the Poles and Russians have had ambitious schemes for reclaiming the vast Prippet marshes.² It is unforeseeable that plans for this region will have any significant geo-political implications relative to the power struggles existing between the Soviet Union and the United States in the near future. Consequently they are not covered in this paper.

Special emphasis is accorded, however, to the newer plans calculated to have a profound effect upon Russian industrial and agricultural productivity if and when completed.³ These newer internal hydro programs possess great potentialities within the economic framework of Soviet Socialism and therefore will have a tremendous impact on the future power status existing between the United States and Russia. It is for this reason the author deems it advisable to confine the study to the area as defined.

-
1. Anatole Mazour, Russia Past and Present, pp. 524-529.
 2. Witness the Royal Canal connecting the Bug and Prippet Rivers linking Russia and Poland. Reclamation schemes have harbored ideas for draining marsh land which would eventually be used for agriculture and obtaining of World Political Geography, pp. 237-242. Pearcy, et al.,
 3. Infra, p. 26. (List of projects.)
 3. Infra, p. 26. (List of projects.)

Previous Research

To the best of the author's knowledge no published material deals with Russia's hydro plans compositely. Isolated articles have been found dealing with individual hydro plans. Mention is given to these in appropriate footnotes. Occasionally Pravda, Izvestia and the New Times publish information on the progress of individual hydro schemes. Of course, such information states the Soviet viewpoint.

Recently visitors to Russia have been afforded a first hand view of some of these projects.¹

A review of doctoral dissertations reveals no previous study specifically concerned with new hydro development plans.²

Methods

Information used in this thesis was obtained through a study of material procured from libraries.

Russian imposed censorship and propaganda obviously does not always contribute to impeccable facts suitable

1. Dr. Manton, "Vast Projects Reclaim Desert in Soviet Russia," Science News Letter, Vol. 62 (Nov. 19, 1952), p. 312.

2. Richard S. Suter, "The Administration of the Electric Power Industry in the Soviet Union, 1932-1948," A related dissertation presently in process of completion at Columbia University.

Alexander Erlich, "The Soviet Industrialization Controversy," a related dissertation completed at The New School.

As listed in "Index of Doctoral Dissertations," American Political Science Review, Vol. XLVII (Sept. 1953).

for the premises out of which to derive scientific conclusions. Information obtained from several sources, however, does provide a means for deductive inference. Therefore, considerable basis of factual knowledge exists when evaluated in terms of the circumstances under which it was obtained.

CHAPTER II

CONTEMPORARY MOODS AS PRODUCTS OF THE PAST

Patterns of Colonization and Exploration

The Don

The Cossack wanders from thy shores,
But never finds a wave so fair;
Thy summer lapse, thy winter roar,
Still greet him in remotest air;
And death is sweet if he may lie,¹
With cross above, thy waters by.

It is no accident that so many folk songs endearingly refer to the quiet Don, and the Mother Volga, or the enchanting Dnieper. The rivers ran through their lives as much as through their land.

Throughout the history of Russia, whether of the eastern or the western part, rivers constituted the chief highways and the land between them the invaluable portages. The Dnieper, the Don and the Volga had also certain tactical value for the Slav defenders of the land against Asiatic invaders, while the deep forests and marshes gave origin to the famous guerrilla fighters. It was along the water highways that historic commercial, political, and cultural centers arose. Thus, Kiev is closely linked with the Dnieper; the Volga system is bound up with Moscow; the Volkhov-Neva system is associated with two great cities, one, the present ghost city of Novgorod the Great,

1. Edna Dean Proctor, "The Don," Anthology of Poetry, P. 316.

the other, the cold marble city, brain child of Peter I, St. Petersburg, known today as Leningrad.¹

During the 11th and 12th centuries rivers enabled goods to be exchanged which in turn created what was for its period of history a well-developed public economy. Furs served often as the monetary unit. It established a system of private property and capitalism at a time when the normal basis of capitalism, the private possession of land, was practically unknown.²

Along with the part Russian rivers have played with respect to trade their roles as avenues for movement of different racial groups have contributed to various ethnic problems, as evidenced by the situation in the Balkans. Irrendentism among the Slavs and its inherent problems in the Balkans is partially attributable to the Ukranian River network linked via the Black Sea to the Danube and its tributaries, for this was one of the avenues of Slavic migration. Intermingling of ethnic groups coupled with the influence of the Ottoman Turks resulted in a heterogeneous mass of humanity here, with its attendant social and ideology differences often leading to conflict.³

Rivers have played an equally important role in exploration as well as contributing to colonization and trade. Historically, we are aware that at one time

1. V. O. Kluchevsky, History of the Russian State, p. 27, et. seq.

2. Theodore Shabad, Geography of the USSR, pp. 106, et. seq.

3. Loc. cit.

Russia's quest for furs and gold lured her trappers across Siberia into Alaska and down into North America as far as northern California.¹ Of no little importance to this movement was the use of the rivers in Siberia.

Siberian rivers form an excellent network of communication as do those of Russia proper. True, the South to North flow of the Ob, Yenisei and Lena Rivers would appear to contribute little towards west to east exploration and development, but this was not so. Tributaries of the main trunk systems do flow to considerable degree east and west so that they in turn led from one trunk into another as progress was made to the east.

Of significance in the pattern of Russian expansion to the east is the thwarting of Russian penetration to the southeast and the vectoring of it to the northeast. This is partially attributable to the direction of river flow and due also to resistance of hostile tribes in the region of Afghanistan, Iran and Sinkiang.² Some historians theorize that had Russia been more successful, the status of India and Manchuria would have been quite different.³ The extent the rivers of Siberia contributed to this change of direction of Russian expansion is open to speculation, but there is no denying its influence and the consequences of the alternative exploration, had it been achieved.

1. Anatole G. Mazour, Russia Past and Present, pp. 114-150.
 2. Walter Kirchner, An Outline History of Russia, p. 48.
 3. G. Etzel Percy, et. al., World Political Geography, pp. 61-95.

Where the Cossack pushed eastward in Russia, the frontiersman did the same, westward, in America. Settlement and exploitation followed each advancement until eventually the ocean was reached. Settlers used rivers as avenues for communication and transportation. Their valleys attracted the first settlers and there agriculture began. Wars were fought over their control and the establishment of metropolitan and manufacturing areas were later determined by river locations, with respect to natural resources.

The history of the United States and the history of Russia has shown some similarity relative to river usage and the part they have had in the nations' development. A comparison of these similarities and departures is beyond the scope of this paper; however, several special implications are introduced because of their timeliness.

G. Etzel Percy reasons that Russia's past emphasis on water transportation contributed materially to the present high status Russia has achieved in aviation.¹ The automobile never played the part in Russia it has in the United States, and Russian roads are poorly developed.

Prior to the last war the Russian government recognized the need for faster transportation to supplement that of the railroad. It encouraged the formation of youthful aviation clubs and built airports. Where the

1. G. Etzel Percy, et al., World Political Geography, pp. 65-95.

average American owns a car and utilizes it for his primary means of transportation, the average Russian uses either the railroad or the airplane. Militarily this has given Russia a great reservoir of enthusiastic young flyers from which to draw.¹

Turkey's role as capitalistic sponsored guardian of the Black Sea entrance has been materially weakened by Russia's control in the Balkans and Great Britain relinquishing authority in the Eastern Mediterranean. Nevertheless, Russian plans for developing the Ukrainian rivers which flow into the Black Sea and her intervention in Danubian commerce must assuredly maintain the importance of the Black Sea itself if not the outlet.²

The British influence stood as a strong deterring element wherever Russia moved to gain access to warm water ports and world trade. Turkey exists today as an independent country through this counter pressure of Great Britain, as possibly does Greece, Iran, Iraq, Afghanistan and Baluchistan.³

Changing Patterns of River Usage

The foregoing has exemplified the important part internal waterways have had towards influencing past

1. In the United States, a selling job must be done to obtain applicants for flight training. In terms of the growing importance of the air age and air power this could become a serious problem.
2. Infra, p. 39. (Danube Project).
3. G. Etzel Pearcey, et al., World Political Geography, p. 86.

development. Today the rivers of both the United States and Russia are playing an equally important part, but in a different manner.¹

We have seen that for centuries the Russians have looked to the rivers for sustenance, trade, communication, transportation, colonization and adventure. As such the rivers have left their mark on Russian civilization. This may in effect explain Russia's early enthusiasm and excessive fascination for hydro electric projects. Two ideas seemed to dominate and condition their hydro programs at this time. Lenin's plans for "electrifying all of Russia" plus the heritage of "looking to the rivers as panaceas" stimulated the construction of great hydro electric plants during the period 1925-1935.³

During this period such construction seemed to become an obsession. American engineers were lured to Russia by offers of fabulous sums of money. Strangely enough, at this time, the Soviets failed to recognize the potentialities of hydro projects in areas other than electrification. Certainly no consideration was given to agriculture in these projects. Today recognition of the sorry plight of Russia's agriculture has altered it's hydro plans. Once again they are looking to the rivers. Not only have the

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1. In the United States the Tennessee Valley Authority (TVA), encompassing five states, the proposed Missouri Valley Authority, Ohio Valley Authority, St. Lawrence Waterways, and so on, attest to the changing role of rivers on the economic life of the nation.
 2. Charles C. Rohlfing, et al., Business and Government, pp. 269-284.
 3. Anatole G. Masour, Russia Past and Present, pp. 189-213.

Soviets undertaken an increased number of hydro projects but without fail all include provisions for aiding agriculture. Now these projects are becoming multiple purpose. Canals and pumping stations and other devices for irrigating are becoming an important part of the programs in an effort to bolster agriculture.

Without water power, atomic and hydrogen development, aluminum and chemical works would not be possible. These projects point to the changing but important use of the rivers in Russia as well as the United States.

Rivers could contribute materially toward a means to solve the differences existing between communism and capitalism. Russia has great industrial plans linked to her river projects and with industrial development comes a better way of life. This means farm implements, household goods, television, faster and better communication and transportation, all of which are akin to "capitalistic" improvements. It can be hoped that with them will come understanding and a desire for world trade as well as technological advancement.¹

Whether or not his lofty desire will materialize or remain as nebulous as the communistic "utopia" is

1. In the United States a task force of the new Hoover Commission will examine and make recommendations relative to federal activities in the water resources, development of power, navigation, flood-control, reclamation and domestic water usage. Although economy motivates the investigation it points up growing recognition of the fact that industrial and agricultural production is becoming more and more dependent upon the foundation of water development. From Omaha World Herald, Oct. 19, 1953, p. 5.

conjectural. Regardless, the hard cold facts indicate that Soviet plans for her waterways could be the means to erase the technological superiority presently enjoyed by the Western world over Russia.

CHAPTER III

UTILIZATION AND PHYSICAL CHARACTERISTICS OF WATERWAYS

Transportation and Commerce

Bulky freight for distant destination, a common feature of Soviet domestic commerce, generally is shipped by water routes. The principal goods which fall within this category are lumber products, petroleum, building materials (cement, stone and so forth), grain, salt, and coal. The total length of the waterways has been calculated at about 250,000 miles, of which only one-fourth was navigable. In 1950 the total length of navigable waterways was increased to 71,000 miles. Among the rivers which have been opened to navigation in recent years are the northern Siberian rivers.¹

An unusual activity found on the European and Asiatic river systems are the traveling experimental farm barges. Soil is fertilized and seeded aboard these barges early in the spring. They then proceed down stream stopping over at agricultural communities. Here the farmers come aboard and are given practical demonstrations and lectures on the latest government methods. Upon departing they are presented with free packets of seeds.²

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1. Theodore Shabad, Geography of the USSR, p. 189, et. seq.
 2. loc. cit.

The greatest development of the waterways has taken place in the European Russia. The most important streams of this section of the country rise in the Central Russian upland and flow toward the Baltic, the Black, and the Caspian seas. The upper course of the Northern Dvina and Neva systems also lies in close proximity to the Volga basin. These geographical factors and the low watershed elevation has made it into a unified water network. The principal canals involved in this scheme are the Marinsk system, which connects Leningrad and the Volga at Scherbakov and are undergoing reconstruction.¹ (See map--p. 25.)

The Volga River and its affluents carry nearly one-half of all the freight carried on the waterways of Russia.² The Volga is the largest river of the European Russia and flows through a densely populated, highly developed economic region, having a population of about 50,000,000, one-third of the total population of the European Russia.

Important in the Volga system is the Caspian Sea. It is the largest inland sea of the world with an area of 163,825 square miles. The basin of the Caspian has undergone several transformation in recent geological periods; it was once joined to the Black Sea in the west

1. Harry Schwartz, Russia's Soviet Economy, pp. 5-6.
2. Anatole Mazour, Russia Past and Present, pp. 210-212.

and the Aral Sea in the east. At another stage its area was reduced to that of its present section south of the latitude of Baku.

During the past one hundred years the level of the sea has been oscillating within the range of about four feet. In recent years, however, a steady fall has been noted, its present surface being ninety-two feet below sea level.¹

A number of circumstances, including the especially low salinity in the northern portion of the sea, its shallowness, and the abundance of micro-organisms, discharged by the Volga, and ensuing plankton formation, have turned that section of the Caspian into the richest fishing grounds of Russia. Here the Sturgeon and the Caspian Seal abound.²

The Caspian Sea provides an outlet toward central Asia and Iran. The chief freight items are lumber (downstream) and grain, fish, salt, and oil (upstream). The opening of the Don-Volga Canal in 1952 gives an outlet by way of the Black and Caspian Seas to the Atlantic Ocean. (See map--p. 25.)

The rivers of Siberia differ from those of the European Russia chiefly in their greater length and volume. Trade on the northern flowing Siberian rivers is relatively

1. A fact that Soviet engineers hope to correct.

Infra, p.

2. Nicholas Mikhailov, Soviet Russia, the Land and Its People, p. 110.

unimportant. Soviet strategic developments near their outlets in the Arctic warrants, however, a brief geographical description of their little recognized characteristics. The Ob, the Yenisey, the Lena, and the Amur are among the longest streams of the world and drain some of the most extensive basins. The Ob-Irtysch system being 3,200 miles long, is generally considered to rank fourth, after the Mississippi-Missouri, the Nile, and the Amazon.

The Siberian rivers rise in high mountain ranges and carry a large volume of water supplied by the melting snow and ice. The Ob and the Yenisey Rivers attain a width of about two or three miles in the middle course and of fifteen or twenty-five miles in their lower reaches, where the depth is fifty to sixty-five feet.¹ The Lena River already has a width of nearly twenty miles in the area of Yakutsk (middle course) and its major affluents, the Alden and the Vilyuy, exceed many of the large European rivers in length.²

Because of the severity of the climate, the Siberian rivers are frozen for a period of five months in the southwest and for more than nine months in the northeast. Tremendous floods occur in the spring, when the upper course is freed of ice, before the thaw sets in in the lower reaches.³

1. Hans W. Weigert, et al., New Compass of the World, p. 93 et. seq.

2. loc. cit.

3. loc. cit.

The Amur River, which unlike all the north-flowing tributaries of the Arctic Ocean, flows into the Pacific Basin. The heavy summer rains inherent in the prevailing monsoon climate create a high water stage in July and August, rather than in the spring. It remains ice-free as long as seven months of the year.¹

Although Russia is the most continental Great Power of the world, both ocean and coastal shipping are of considerable importance and of course is linked to the internal waterway system. An understanding of the situation regarding external or coastal waterways affords a basis for understanding some of the problems inherent to the internal waterway system since one links to the other.

Distribution of the foreign trade was true chiefly prior to the second World War, when the chief customers of Russia, Great Britain, the United States and France, were overseas countries. Since the war, however, a larger proportion of the foreign trade proceeds by railroad to the countries of eastern Europe. Local coastwise shipping has been developed to a large extent on the Black Sea and especially on the Caspian, where the shipping of petroleum from Baku to Astrakhan is one of the chief features of Russia's maritime commerce. Coastwise navigation can also be expected to assume greater importance

1. Hans W. Weigert, et al., New Compass of the World, p. 95 et. seq.

on the Baltic Sea in view of the great expansion of the Russian coast during the second World War.¹

The Black Sea handles more than fifty percent of all overseas exports. Its importance is due chiefly to the ice-free ports, the proximity of the rich grain areas of the Ukraine and the Northern Caucasus, of the Donbas industrial area and the Caucasus oil exports.²

Navigation on the Caspian Sea is limited by its inland location and by the shallowness of its northern section. The shipping of petroleum to Baku is the principal activity.³

The Arctic Ocean is rapidly gaining in importance in view of the development of the Northern Sea Route and Great Circle routes in an air age. This maritime link, which is the outcome of a practical realization of the long sought Northeast Passage, began to be developed as a normal transportation route in the middle 1930's. In order to derive the greatest benefit possible from the brief navigation period, the Soviets constructed special ships able to withstand the pressure of ice floes, charted the yearly movement of ice in the seas of the Arctic Ocean, established such vital navigation aids as light-houses, meteorological and oceanological observation posts,

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1. Theodore Shabad, Geography of the USSR, p. 88.
 2. G. Etzel Percy, et al., World Political Geography, pp. 84-86.
 3. Nicholas Mikhailov, Soviet Russia, the Land and Its People, pp. 137-147.

and secured the assistance of ice-breakers "borrowed" from the United States.¹

During the current Five-year plan the final stages of normal development of this Arctic route are scheduled to be achieved. Unique methods of supplying their new air bases at the mouths of the Ob, Yenisey and Lena Rivers have been developed by the Russians. During the winter, chains of giant sleds pulled by specially constructed ice tractors use the frozen rivers as their highways to supply these sites.²

The Soviet Pacific ports on the sea of Japan are handicapped by their remoteness from the chief economic centers of the country and, except for Vladivostok, by paralyzing ice conditions. Their position has been considerably enhanced since the end of World War II, when Russia acquired the former Japanese section of Sakhalin and the Kurile Islands. Russia thus obtained direct access to the open Pacific. The concession of the joint Sino-Soviet naval base at Port Arthur also added to the importance of the Soviet Pacific coast.³

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1. Nikolai Mikhailov, Across the Map of the USSR, pp. 37-47.
 2. George B. Cressey, Basis of Soviet Strength, pp. 216-220.
 3. The Soviet's control over the Kuriles in the Pacific poises a threat against the entire orient and specifically against Japan, for here the Russians have given great emphasis to submarines. Although lacking in large surface units such as battleships and carriers the new snorkel submarines give her considerable strength on the seas. Submarines tend to minimize the "enemy's" air superiority, (noteworthy in an air age); further, their very existence ties up great numbers of surface ships.

CHAPTER IV

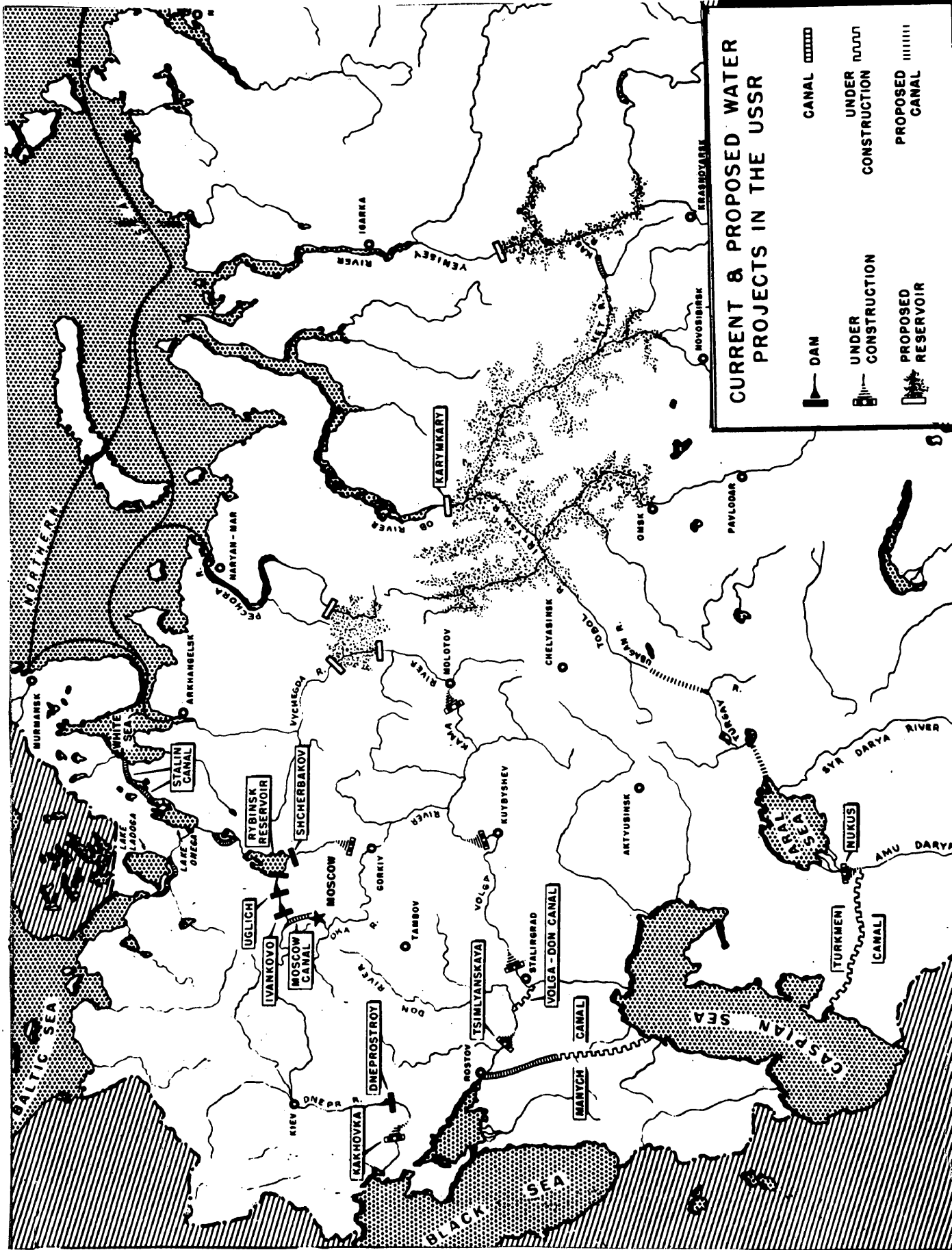
HYDRO PLANS

Methods alone do not account for the poor production on the potentially high productive "black earth" region of Russia. Lack of precipitation is a contributory factor for much of it receives less than fifteen inches rainfall per year and very little has as much as twenty inches. Comparatively speaking, this is considerably less than the "breadbasket" of the United States with thirty to forty inches, while the average in the eastern and southern states exceeds even this amount.¹

Prior to the last war the Russian's gave little thought to irrigation. They were fascinated by large hydro-electric projects only. The Dneprostroy Dam and the Moscow and Stalin Canals were given tremendous pre-war publicity, but were designed for improving navigation, river transportation and power, but not for irrigation.² (See Map I--page 26.)

In an analysis of the hydro projects reference is made to them by area progressing from east to west. All will increase the agricultural as well as the industrial strength of the Soviets, which in days to come

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1. Anatole Mazour, Russia Past and Present, p. 519.
 2. G. Etzel Percy, et al., World Political Geography, pp. 65-82.



CURRENT & PROPOSED WATER PROJECTS IN THE USSR

	DAM
	UNDER CONSTRUCTION CANAL
	PROPOSED CANAL
	UNDER CONSTRUCTION RESERVOIR
	PROPOSED RESERVOIR

will have increasing significance in altering the power-political struggle existing between the Western Powers and the Soviet Union.

These main projects will be examined in order as follows:

- (a) Kara Kum Desert (Turkman Canal)
- (b) Stalingrad-Kuibyshev System (Volga Transformation)
- (c) Volga-Don System
- (d) Lower Dneiper and Crimean Development
- (e) Danube-Oder River Linkage
- (f) Central Asian System (This being considered last since little has been done on it other than surveying.)

For reasons set forth in the delimitations no attention is given to projects already completed such as the Stalin Canal connecting the White Sea to the Baltic by way of Lake Ladoga, the Rybinsk Reservoir with its series of dams, and the Moscow Canal.¹ The effect of these projects will not measurably alter the future industrial potentialities of the Russians and their completion has been carefully weighed in comparing the United States and Russian potentialities. Not so widely appreciated are the implications of the newer Russian projects.

1. Supra, pp. 5-6.

In addition of poising the problems the completion of these projects will have on international relationships and world peace, sociological patterns could well arise in the colonization of these newly reclaimed areas foreign to present communistic ideologies. Examination of the method of colonization planned by the Soviets for at least one of these projects reveals that successful settlement probably can be achieved.¹ However, this forced colonization may subsequently contribute to a revolutionary spirit which has arisen so frequently to plague Russian leaders in the past.

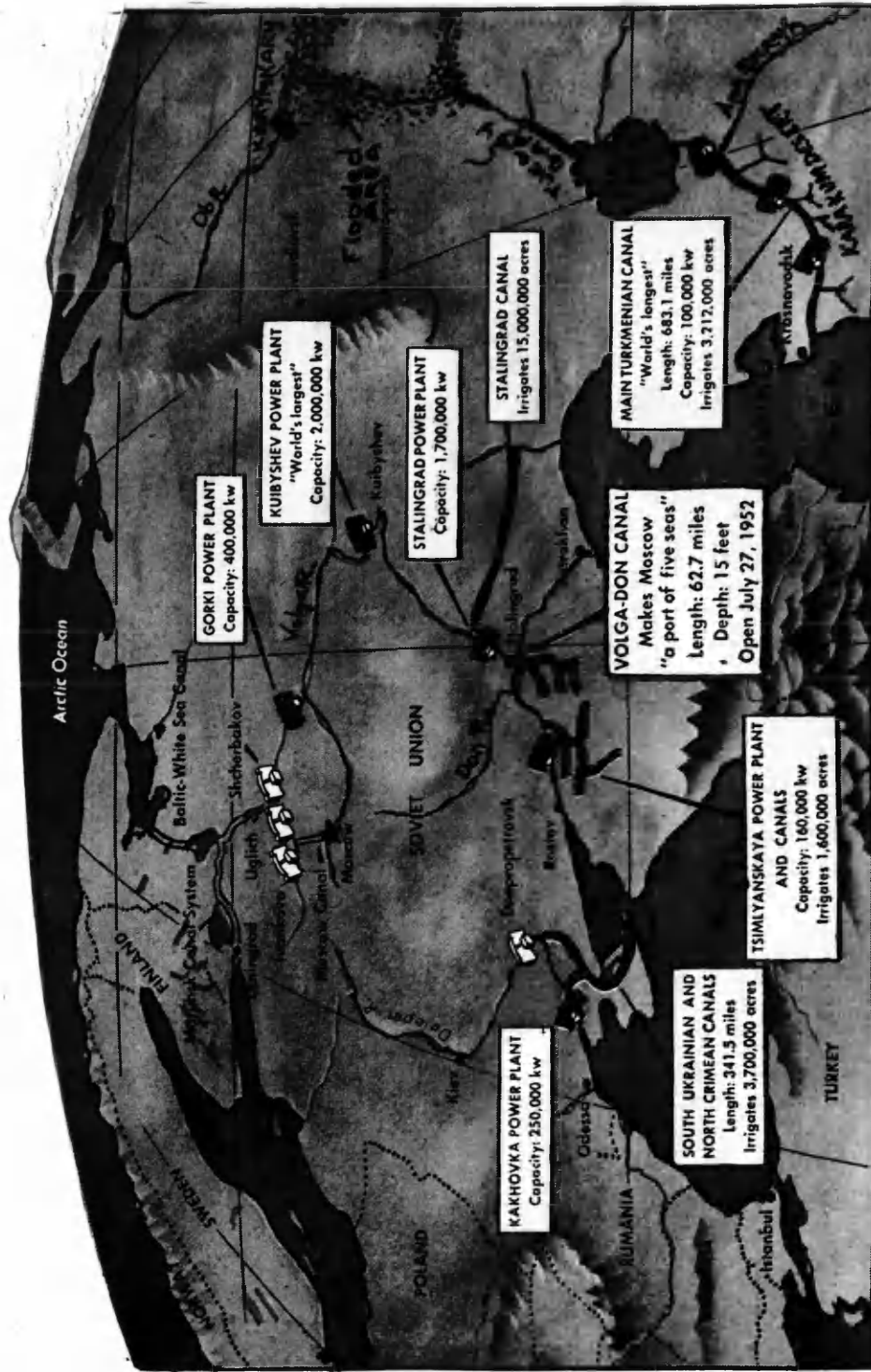
Kara Kum Desert Project

The Black Sands desert area between the Caspian Sea and south of the Aral Sea is to be altered materially. The Soviet's big undertaking here will eventually make this hot, arid and relatively uninhabited region blossom with humanity and all forms of agricultural produce.²

Five definite sub-projects make up the total plan for the Kara Kum desert project. A 650 or 683.1 mile canal (total length not definitely ascertained) will divert most of the water of the Amu Darya (Mad River) towards the Caspian Sea to irrigate the Kara Kum desert.

1. Infra, p. 30.

2. H. Friesch, "Hydro-technical Schemes for the Soviet Union," Contemporary Review, Vol. 179 (Feb. 11, 1951), p. 107.



How Russia plans to increase its power and land resources with new dams and canals

(See Map II--page 28.) The results not only will make the desert fertile, but by means of forestation actually ameliorate the climate.¹

Work is progressing on the canal, according to published information. This ambitious plan calls for reclaiming twenty million acres of desert of which three million acres is to be irrigated for crops and the remainder for pasture-land. Hybrid grasses have been developed that presumably will thrive in the Kara Kum region.²

The enormity of the Kara Kum project coupled with the complications of Russian long range plans to divert water from the Arctic flowing rivers back through the Aral Sea and then by way of the Turkman Canal to the Caspian Sea would require huge numbers of laborers.³ In addition to huge numbers of World War II prisoners, great numbers of political undesirables are always becoming available for such "transformation" projects.

Recently some of the German war prisoners have been released. Interrogation at Camp Friedland, Germany adds authenticity to previously suspected slave labor usage in all of the Soviets' hydro-development programs.

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1. Nikolai Mikhailov, Across the Map of Russia, p. 243.
 2. Information as given to Dr. Manton on a conducted tour of this area tends to verify information previously published in Pravda and Izvestia. As quoted in Science News Letter, (Nov. 15, 1952) Vol. 62, p. 312.
 3. The fabulous plan for damming the Ob River and canal construction via the Turgay Gap to bring water into the diminishing Aral Sea is given on page 45.

On the Don-Volga project alone some 60,000 slaves were forced to work up to fifteen hours daily in order to meet the scheduled completion date.¹ The interviewed former prisoner stated:

Many of us have been working on the Volga-Don Canal in the last years. It has been built by 60,000 slave workers of all nationalities. The largest groups were Ukrainians and Georgians. But there were also Russians, Rumanians, Spaniards from the Civil War, Italians, Uzbeks and Poles from the Polish underground army of World War II. And, of course, German war prisoners.²

Following completion of the Kara Kum and Turkman Canal the Soviets plan to use this same vast pool of manpower for colonization in the Kara Kum desert.³ The colonization plan will require yearly leveling and reclaiming of the feeder ditches coming off of the main Turkman Canal which, at first, might appear to be a flaw in the engineering, but this is not so. The Soviets recognize that to maintain colonization and production a dependency must be inaugurated. Annual dredging and cleaning of the canals and main ditches is in accordance with a plan to divorce the "colonists" from the soil and make him dependent on the state. Mechanized equipment would be needed to rid the ditches and canals of accumulated sand, vegetation and debris.

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1. Infra, p. 35.
 2. "Ten Years in a Slave-Labor Camp," U.S. News and World Report, Oct. 30, 1953, pp. 35-37.
 3. H. Friesch, "Hydro-technical Schemes for the Soviet Union," Contemporary Review, Vol. 179 (Feb. 11, 1951), p. 312.

This vital equipment is the property of the state; hence, the peasants will have to look to the state for their very existence. Undoubtedly, the idea was borrowed from the Machine-Tractor Stations (MTS) which has done wonders to bring the reluctant peasant farmers into the collective system.¹

The Russians hope to set up a kind of "traveling salesman marriage" in so far as farm workers are to be employed in the Kara Kum region. That is to say, migratory farm workers are to be produced through supra-collectivism and use of electrical farm machinery. The peasant who has learned to depend on the state for his machinery must in turn depend on the state for his power. The use of electrical farm machinery is foreign to American thinking, but the Russians are presently experimenting with such equipment on at least several of their Sovkhozos (experimental farms).

An even more radical employment of electric power is that found in the eastern Taiga where according to Mikhailov in his book, Across the Map of the USSR:

The timber industry of the Far East is growing with rapidity; this is a region which in our country is called the "Stalin new construction site." One of the new towns in this region is even called "Sesozavodsk" which means "Lumberville."

Not only has the distribution of the timber industry changed, so also has its technology.

1. H. Friesch, "Hydro-technical Schemes for the Soviet Union," Contemporary Review, Vol. 179 (Feb. 11, 1951), p. 312.

Electric cables from mobile power stations wind like snakes around tree stumps. Electric saws have come to the forests.¹

One can well imagine the effect such widespread electrification would have on the oil industry.

Stalingrad-Kuibyshev Dams

A chain of new hydro plants are scheduled for completion in a year or so to supplement those already completed on the Volga system. When the turbines at Stalingrad and Kuibyshev (see Map I, p. 29) start operating the Soviet power will be increased by 25%. This will represent approximately 100-billion KWH annually compared to approximately 300-billion for the United States today.²

One of the greatest of all Soviet water schemes has been the "Greater Volga" plan which envisages the transformation of the Volga and its tributaries, the Oka and Kama into a continuous chain of artificial lakes in the form of a stairway. According to the Soviets this will give the following results:

(a) An annual output of electric power exceeding that of all of France.

(b) 1800 miles of deep water for transportation and commerce.

(c) Irrigation of 35,000,000 acres or an area larger than the state of Ohio.³

1. Nikolai Mikhailov, Across the Map of the USSR, p. 153.
 2. "Power for Peace," Business Week, (Nov. 11, 1950), p. 136.
 3. Mikhailov, op. cit., pp. 125-129.

At Shcherbakov the huge Sheksna Dam holding back the Rybinsk Reservoir (see Map I, p. 25) and the three upper Volga dams were completed before the war. At each of these sites power stations and locks were constructed; however, there was no need for irrigation in this area. Postwar releases in Pravda claim that work has been started on a fourth Volga dam just above Gorkiy and on the Kama near Molotov. In 1948 the Soviets announced their "Great Stalin plan for the Transformation of Nature" for improving agriculture yields through drought control and soil conservation, to include:

- (a) Development of wide wooded "shelter belts."
- (b) Intensive use of scientific methods in agriculture.
- (c) Construction of ponds, reservoirs and hold-back dams on the headwaters which would ultimately raise the water table.

Releases presently appearing in Russian news sources indicate that these projects are well under way and will require a fifteen-year period for completion. Apparently the Soviets intend consolidating the "Greater Volga Plan" with the new "Transformation."¹

Considerable speculation is presently going on as to the military implications as to how and where the power will be used that comes from the Kuibyshev and

1. Nikolai Mikhailov, Across the Map of the USSR, pp. 283-285.

Stalingrad dams. It is a well known propaganda move that the Soviets generally accuse their enemies of some despicable act to camouflage their own intent for such employment. And so it may be with respect to these dams, for Izvestia has strongly ballyhooed these projects as "designed for peace" while America's hydroelectric plants on the Tennessee and Columbia Rivers are working for war (i.e., developing Atomic and Hydrogen power).¹

The Council of Ministers of Russia decreed that 10-billion KWH yearly from the Stalingrad and Kuibyshev power plants, when completed, must be reserved for transmission to a single point 500 and 650 miles from these dams. Further, Izvestia states the power is needed for "industrial purposes;" and herein lies the speculation.² United States military authorities believe, and with considerable validity, that the 10-billion KWH power may be transmitted to a spot high in the Ural Mountains, nearby which are important uranium deposits.³ Also, Magnitogorsk, a main arsenal of the Red Army, is located here, which according to the Soviets made every other shell that was fired at the Germans in World War II.⁴ Russia's atomic and hydrogen development may be tied in with the completion of the Stalingrad and Kuibyshev dams.

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1. "Power for Peace," Business Week, Nov. 11, 1950, p. 136.
 2. loc. cit.
 3. Massachusetts Institute of Technology Maps, dated 1952.
 4. Nikolai Mikhailov, Across the Map of USSR, p. 146.

These two dams each of which contain navigation locks, hydroelectric installations and a system of irrigation canals, presumably will raise the water level eighty-two feet and form a lake five hundred miles long. If the power output of two million KWH is attained here it will be the largest generating plant in the world, double that of the Hoover Dam.¹

Volga-Don Canal and Related Projects

Moving west let us examine the implications and possibilities existing for the Volga-Don Canal. Although opened in July, 1952, it is not entirely completed to date. Some references term this the Lenin Canal and the Russians delight in describing it as the "Russian Panama Canal." Like most Soviet published articles on Russian projects, undue emphasis is made to their contribution to the "cause of peace" and so it is in the New Times publication which states:

"The completion of the Volga-Don navigation canal, giant hydro-engineering project of our time, is regarded by the Soviet people and rightly, as a triumph of their constructive endeavors and as another important contribution to the cause of peace."²

According to the Soviets, this project is a hydro-engineering feat unparalleled in the capitalistic world.³ In addition to sixty-three miles of navigation canal

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1. Harry Schwartz, Russia's Soviet Economy, p. 219-223.
 2. "Volga-Don Canal," New Times, Moscow, July 16, 1952, (Printed in English and seven other languages).
 3. Ibid.

with its locks and pumping stations, dams, dykes, spillways, bridges and wharves, the project includes the Tsimlyanskaya hydro-electric station and attending reservoir, plus three special irrigating canals of approximately twenty miles, sixty miles, and eighty miles length respectively.

Again quoting New Times:

"A distinguishing feature of Soviet hydro-engineering projects is that they are comprehensive schemes for solving several economic problems simultaneously. This applies in full measure to the Volga-Don project. Its completion, as the Soviet Government's decision announcing its opening points out, 'Links up the White, Baltic, and Caspian Seas with the Azov and Black Seas into a single transport system along which it will be possible, beginning with 1952, to carry large quantities of coal, cement, oil and grain.'"¹

This engineering feat is specifically designed to improve agricultural conditions in the eastern Ukraine. An analysis of the scheme is not without some problems not fully exploited in Russian publications.

The Volga-Don Canal is not an all weather waterway, being frozen for much of the winter, as is the Volga above the canal. Despite Russian claims it will probably be uneconomical to try to move by water large quantities of fertilizer from the Kola peninsula in the Arctic down to the Don farming region. Frozen rivers and frozen tundra limit this activity to but a few short months a year. Besides, the Russians have emphasized that priority has been given to destroyer and

1. Loc. cit.

submarine movements within the waterways.¹ Consequently the strategic movement of warships may relegate the possibility of heavy peaceful barges blocking the waterways to a secondary consideration.

The Volga-Don Canal will relieve Russia's overtaxed railroads in the southern industrial areas. Coal from the Donets basin north of the Black Sea will be used by cities such as Gorki on the middle Volga. In return scarce timber needed in the Donets will be brought down from the Northern Volga Taiga region.²

The possibility of oil being shipped by way of the Caspian Sea through the canal to the Rostov area cannot be discounted. Present difficulties in Iran might well amplify the importance of this route if Russia gained access to Iranian oil fields. The Bandar Shah railroad links the heart of the Iranian oil field to the Caspian Sea. Geo-politically this is not without some significance. Most of the oil for the Rostov area now comes from the Batum area thence via large ocean type tankers across the Black Sea to the Rostov region.³

Comparatively, the Volga-Don Canal can handle ten million tons of freight per year as against one hundred million tons through the Sault St. Marie locks if operated under similar weather conditions. Such comparison is

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1. "New Threat--The Soviet Navy," U.S. News and World Report, April 10, 1953, p. 16.
 2. "Remaking Nature for the Glory of the Great Stalin," News-Week, Vol. 40 (August 11, 1952), p. 44.
 3. Anatole Mazour, Russia Past and Present, p. 499.

of little value though for it considers iron ore tonnage as against that of timber, fertilizer, and machinery which will constitute the chief volume of traffic of the Volga-Don Canal.¹

Most of the energy from the Tsimlyanskaya will be used to pump water from the Don River into the canal. It will then flow via the Volga to the Caspian Sea. Therefore, the Volga-Don Canal along with the Manyeh and Turkmen Canals, presently under construction, eventually will solve the problem pertaining to the drying up of the Caspian Sea, or so it is planned.²

Lower Dneiper and Crimean Developmental Plans

Although the Ukraina was once termed the granary of Russia, expansion of agriculture elsewhere has decreased its proportionate place. Wholesale slaughtering of livestock in the 30's, forced collectivization and unusually light precipitation (eighteen to twenty inches per year) have tended to depreciate the role it formerly enjoyed as one of Russia's most productive agricultural areas. The rapid introduction of tractors was recently made by the Soviets to forestall this trend in the potentially rich lands of the lower Dneiper River.³

1. "Russian Panama Canal?" U.S. News and World Report, Vol. 32 (Feb. 22, 1952), p. 38.

2. Ibid.

3. George Cressey, Basis of Soviet Strength, p. 150.

In line with increased emphasis on agriculture, a power plant is being constructed on the Dneiper at Kakhovka, having an output of 250,000 KWH. It will generate approximately the same amount of power as the American engineered plant at Dnepropetrovsk, which prior to World War II was Europe's largest. Linked to these two dams will be the South Ukrainian and North Crimean Canals with a total length of 341.5 miles. (See Map II, p. 28.) The Soviets estimate that some 3,700,000 acres alone can be irrigated from these canals, increasing the productivity of agriculture within the area served. Soviet engineers anticipate no lowering of the Dneiper River by this project.¹

Hence, removal of iron ore from the rich Krivoi Rog area will not be endangered. Iron ore from this region now goes, via rail and water, to the Donets area. By 1955 Russia plans to transport iron ore from this region by way of the Danube to Central Europe.² The Crimean canals will operate primarily to bolster agriculture and its effect on industrial production will be secondary.

Russia's "Schuman Plan" and the Danube

Students of international organizations herald the merging of Europe's steel and coal resources under

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1. "Remaking Nature for the Glory of the Great Stalin," News-Week, Vol. 40 (Aug. 11, 1952), p. 44.
 2. Infra, p. 40. (The Danube-Oder River linkage.)

the Schuman Plan a step forward in dissolving nationalistic trade restrictions and unifying western Europe. Russia has a similar plan with the Danube River playing a key part in the meshing of Polish-East German and Czechoslovakian heavy industries. By 1955 the Russians hope to have interlocked and developed the resources of these countries to rival that of the Ruhr.¹

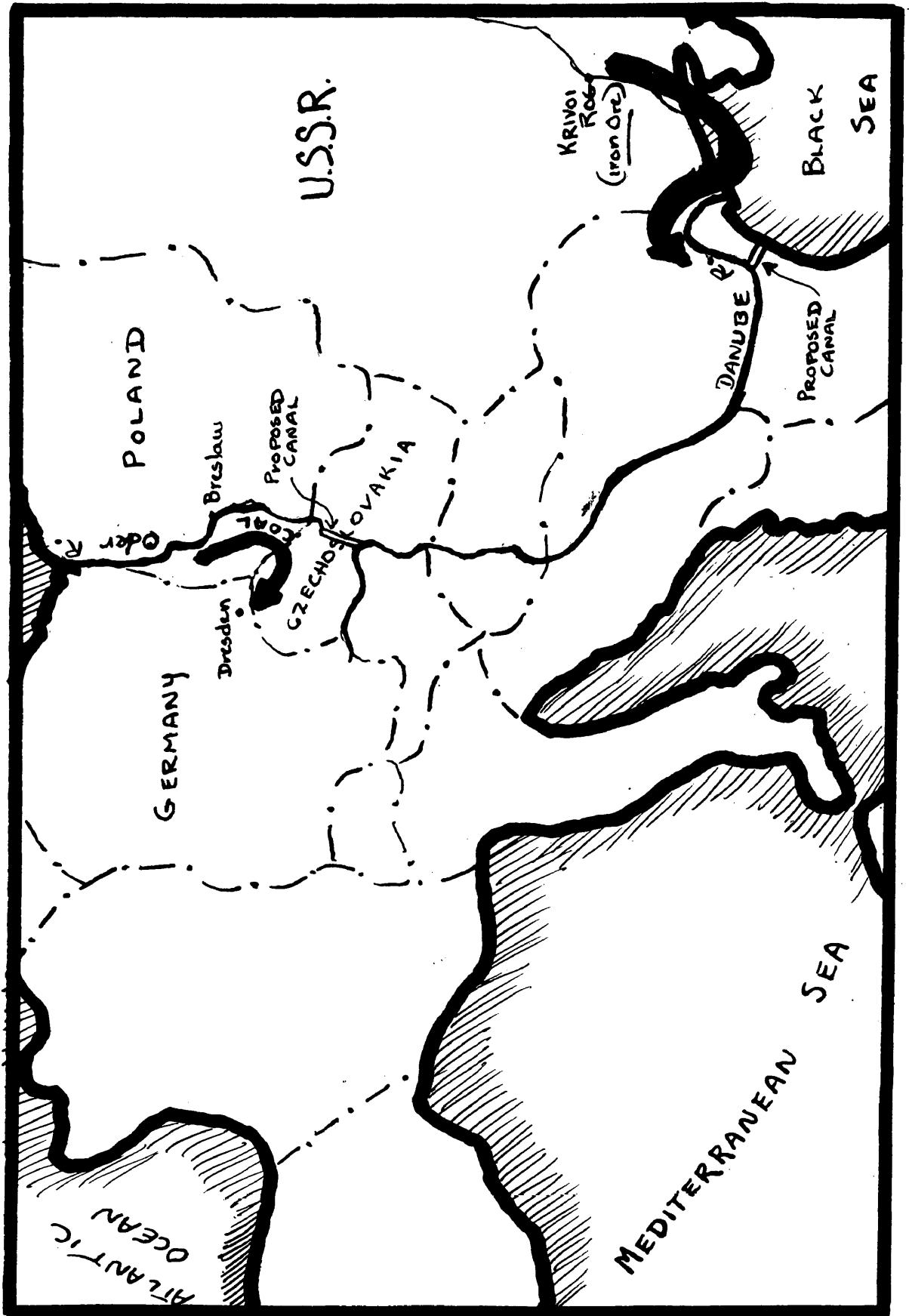
The plan will bring about a merging of Polish coal, Ukrainian iron ore with German and Czechoslovakian technological skill and facilities. A triangle of heavy industry is to be established using Silesia, Moravia and Saxony as the points.² Ample labor can be obtained in this region from the fifty-six million population. (See Map III, p. 41.) Here coal reserves exceed two hundred twenty billion tons. Allied to the scheme are provisions to double the coal production of the Communists, from thirty to sixty million tons, by 1955.³

The iron ore will be provided by Russia from the Krivoi Rog in the Ukraine requiring a seven hundred mile water haul by way of the Black Sea, via the Dneiper River, thence up the Danube River. Czechoslovakia and Poland are jointly constructing a canal to connect the Oder River to the Danube through the Moravian gate of the Carpathian mountains. The completion of this canal will join the

1. "Soviet War Potential is Rising," U.S. News and World Report, Vol. 29 (July 14, 1950), p. 20.

2. loc. cit.

3. loc. cit.



RUSSIA'S "SCHUMAN PLAN"

USING THE DANUBE AND ODER RIVERS

Silisian, Moravian, Saxony areas to provide merging of resources and facilities. This then is to be the "Russian Schuman Plan" whereby, according to Pravda, Soviet iron ore will be "married to Polish coal by Czechoslovakian and German ministers" through the medium of the Danube River.¹

The plan is well underway and undoubtedly will do much to develop economic dependency of Central Europe to Russia proper. Recent announcements of Malenkov's intention to shift production from capital goods could give increased meaning to the deceptive part this Russian Schuman plan may play in the Soviet's future economy.²

There is good reason to believe that Russia will push the plan to completion but some inconsistencies fog the issue. First the question arises as to the defense of the area in event of a war, but obviously the question is no different for the Russians than the problem western Europe would be faced with in such a crisis. Secondly, the postponement of the fifty mile Dobruja plain canal in Rumania which was started in 1950. Since this canal, linking the Danube River to the Black Sea, was to cut off one hundred seventy miles of river travel it is inconsistent to postpone its construction, realizing the important part the Danube is scheduled to play in the "Russian Schuman Plan."³

1. Loc. cit.

2. "Russia, the Man in Charge," Time, August 17, 1953, p. 19.

3. "Unfinished Canal," Time, August 24, 1953, p. 19.

When questioned about the canal's progress, the Rumanian Foreign Minister notified western newsmen that: "The material and moral forces of the people should be concentrated in those works that will most rapidly raise their living standards. The continuance of work on the canal is not essential."¹ So work on this canal has been stopped with less than six miles of its fifty completed. But that is not the complete story for on May 28th, Radio Belgrade announced that work has temporarily stopped on the Danube-Black Sea Canal because of lack of equipment. Prisoners working there have been transferred to other locations. In addition to more fully explain the stoppage, attention is focused on the use of prisoners for such construction.²

1. Current Political Moves Affecting Danube Trade. In May, 1953, Russia announced the Danube River would be opened, a move calculated to bring world trade to the satellite countries.³ This in turn would afford capital which Russia could obtain by means of control over the satellite countries. Politically the move may be of some importance in patching up Russian and Yugoslavian disagreements.⁴ However, Russia has more to gain

1. Loc. cit.

2. "Shift in Labor Camps," News From Behind the Iron Curtain, Vol. 1, No. 7, July 1952, p. 44.

3. "Opening the Danube," Time, May 25, 1953, p. 29.

4. Loc. cit.

economically than politically; courting western trade is becoming a necessity. True, great markets exist at home for consumer sales as well as the whole Asian market but time is needed to develop these fields.

Trade on the Danube has been free only from 1929 to 1939 under the provisions of the Versailles treaty. During the middle ages Austrian robber barons stretched huge chains across the Danube. Hitler, and then later Stalin, in effect restored the chains.¹

The new treaty will open the Danube to nations other than the Communists. The first agreement permits Austrian and Hungarian boats to trade with Germany. The second agreement deals with, and includes, a joint commission made up of Russia, Austria, Hungary, Rumania, and Yugoslavia.² In no sense will the joint commission ever be a Rhine River commission. Russian control of the Danube mocks the "free trade" clause of the treaty and relegates the commission's authority to little more than that of a puppet. It is doubtful that world trade will be enticed up the Danube River but the treaty could well create a greater dependency of the central European countries upon Russia.

2. Russian plans for the Danube in Agriculture and Hydro-electric Development. In addition to Russian

1. "The Beautiful Blue," Commonweal, Aug. 1952, p. 404.

2. loc. cit.

plans for the Danube as an avenue for trade and the merging of resources, they have other schemes involving the reclaiming of agricultural lands and the utilizing of water for hydro-power.

During the period from 1948 to 1953 some 130,000 acres of land were reclaimed for crops. The reclamation included draining of marshes and other malarial breeding sites in addition to flood control and irrigation.¹

Observation of what has transpired is not impressive but information appearing in news from satellite countries marks this as the first step in the "advantages of association with the Soviets." More impressive are the ultimate plans scheduled for completion by 1960, which will result in 1,350,000 acres being reclaimed, most of which is near the mouth of the Danube.²

Just north of the region mentioned lies the valley of the Bistritza, which is an important tributary of the Danube. It is here at Bicas that the Lenin hydroelectric station is being constructed. The project is scheduled for completion by 1957 and according to the Soviets "will transform this backward area into an industrial empire."³

The undertaking includes dams to back up what will be Rumania's largest reservoir and power plants capable

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1. "Flood Control, Irrigation Increases Available Farmland," Rumanian News, No. 241 (July 1, 1953), Washington, D.C., p.3.
 2. Loc. cit.
 3. "The V. I. Lenin Hydroelectric Station," Rumanian News, No. 239, June 17, 1953, p. 2.

of generating 200,000 KWH. Linked to the system will be canals which, again quoting the Rumanian News: "will enable agriculture to thrive and compliment industry."¹ Power alone from the project, it is hoped, will be sufficient to provide for the needs of all of Moldavia. Available information indicates that the Bicas project is approximately one-third completed.²

Central Asian System

The main complication to most of Russian hydro projects is the receding Caspian Sea, the level of which has been dropping since 1931 and is presently ninety-two feet below sea level. Since the Caspian Sea is fed primarily by the Volga, the addition of reservoirs with attending evaporation plus diverted water for new irrigation schemes probably will not materially improve this situation. The problem is the same with the Aral Sea where the level has also been dropping and the new Turkmen Canal system will draw heavily from the Amu Darya, one of its only two feeders.

The solution to this dilemma has been planned by Engineer M. Davydov. It consists primarily of the creation of a huge reservoir which would be by far the largest in the world.⁴ By damming the Ob River and later the Yenisy

1. loc. cit.

2. loc. cit.

3. Rand McNally Cosmopolitan Atlas, 1953.

4. "Vast Projects Reclaim Desert in Soviet Russia," Science News Letter, Vol. 62 (Nov. 15, 1952), p. 312.

River and the construction of a canal to the Aral Sea and from here by way of the Turkmen Canal to the Caspian Sea, both levels would be raised. Such an undertaking would not only afford water for irrigation of millions of acres but the reservoir being so large would materially alter the climate of south-central Siberia. This aberration, in terms of the Soviets, would be completely favorable.

From an engineering standpoint this plan is valid because a natural watershed extends eastward at about sixty-two to sixty-four degrees north from the Urals through most of Siberia, cut only by the main channels of the Ob and the Yenisy Rivers. Engineer Davydov proposes to construct a huge dam across the Ob River somewhere between the towns of Karymkarya and Bolshoy Atlym, creating a large inland sea.

The water would be brought from this reservoir southward by means of the Tobol and Ubagan Rivers and thence to the Caspian lowlands by way of the "Turgay Gate." Five hundred to six hundred miles would have to be cut through the Turgay watershed to form a canal linking the Turgay River to the Tobol and Ubagan Rivers. At the highest point of the watershed the canal surface would have to be about two hundred feet below the surface of the land.¹

1. loc. cit.

Enormous as this undertaking would be, its eventual completion is regarded as more than possible. Necessity requires that the Soviets take some immediate action to alleviate the water problem. Further the past success and progress obtained by five-year plans emphasizes the possibilities for success in this venture.¹

The totalitarian nature of the Soviet state simplifies what would be serious problems in another country, such as the dispossession and resettlement of the present inhabitants of the proposed reservoir areas. This relocation of peoples such as that proposed for the Missouri River and Ohio River as well as the St. Lawrence presents one of the major sociological problems involving any consideration of similar projects in this country.

Regard for human rights is a significant difference between our philosophy and that of the Russian's in the development of these projects. Another questionable asset is the availability of an unlimited number of slave laborers at the disposal of the Russians. Considerable concern has been displayed by the Germans, Poles, and Japanese authorities over the "disappearances" of large numbers of known war captives. Most of these are presently finding "employment" on the new transformation projects, as was verified with respect to the Danube-Black Sea Canal and the Kara Kum Desert.²

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1. Harry Schwartz, Russia's Soviet Economy, pp. 219-223.
 2. "Ten Years in a Slave-Labor Camp," U.S. News and World Report, Oct. 30, 1953, p. 35.

Such an undertaking would have a tremendous impact on the over all economy enabling the establishment of a gigantic industrial empire as well as a tremendous boost to agriculture presently lacking water.

CHAPTER V

IMPACT OF HYDRO DEVELOPMENT ON INDUSTRY AND AGRICULTURE

Introduction

An examination of dams, canals, power plants and attending facilities "per se" pertaining to Russian hydro programs is of little significance unless one recognizes the effect these projects will have on agriculture and industry. The strength of a nation rests equally with its productive capabilities as it does with its population assets and military power for the latter is determined by the former. Production capacities of a nation's agriculture and industry are important "bargaining elements" and to considerable extent determine a nation's status in power politics. Most assuredly Russian plans for hydro-development will have a profound effect upon her industrial and agricultural capacity.

Hence, any comparison of present and future strength of the United States and Russia should take cognizance of such hydro schemes. Certainly an understanding of the gigantic strides being made by the Soviets should be assayed and balanced in the molding of our future political policies. It is for this reason that attention is now directed towards Soviet industrial and agricultural problems.

Industry and Hydro Development

Previous chapters have shown industrial advances to be closely associated with the development and use of waterways. This development has been directed not only to increase future industrial production but is being engineered to bolster agriculture. The role of Russian rivers will become increasingly important as production rises in these two fields. Russia's ability to surpass the United States production hinges to a considerable extent upon the success of her hydro plans.¹

Subsequent to World War II and in the post war era up until Stalin's death in 1953 Soviet industrial production was earmarked almost entirely for military needs, unless the situation in the United States where the "butter or guns" and the number of "new cars or tanks" philosophy was and is a point of disagreement. The Soviet standard of living in 1953 was essentially the same as that in 1928. In 1928 the Soviets produced four million tons of steel; in 1952 they produced 38.6 million tons. The 34.6 million ton difference has been surplus so far as maintaining the internal Russian economy is concerned.²

The same situation is generally true for petroleum, aluminum and other industrial products, practically all of which has been reserved for the military. Thus a

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1. Statement by Harry Schwartz, as tape recorded from speech made at World Affairs Institute, University of Omaha, 1951.
 2. "Russian Industry," Business Week, Oct. 18, 1952, p. 164.

comparison of American and Russian production figures is meaningless as an index of Russia's war effectiveness.¹

During World War II the Soviets fought the Germans with a total steel availability, including what we "lend-leased" to them in raw steel and manufactured steel goods, of less than ten million tons. With this amount they maintained and kept in the field fifteen million men. They now have forty-two million ton capacity.² Similarly, they fought the last war with far less than their present petroleum production.

After the war Ex-Premier Stalin, through Pravda, released wartime production figures which military leaders consider quite reliable. They show Russia produced more tanks and half as many planes per year as we did, further she produced far more rifles, machine guns and ammunition. So with a production of ten million tons of steel her production was militarily comparable to ours in terms of land and air power--the difference being naval, for Russia produced no heavy naval vessels or liberty ships which we required to supply our allies and maintain logistics support.³

As late as 1953 some six hundred seventy United States lend leased ships were still in the hands of

1. Loc. cit.

2. Rand McNally Cosmopolitan Atlas, 1953.

3. Abram Bergson, "Postwar Economic Reconstruction in the USSR," Annals of the American Academy of Political and Social Science, Vol. 263 (May, 1949), pp. 55-65.

the Soviets. So logistically the situation would have been altered had the United States failed to furnish these ships.¹

An analysis of this totalitarian economy reveals seeming advantages over that of capitalism but it is not without grave pitfalls too. Presently three major obstacles loom in the path of Russia's economic growth. They are:

- (a) The problems attending lack of capital. This presently is contributing to Russia's effort to gain world trade and credit.
- (b) Internal dissatisfaction necessitating a shift from capital goods to consumer goods production.
- (c) Possibility of overly ambitious hydro schemes causing industrial and agricultural curtailment.

1. The Problem of Lack of Capital in Industry. Russia's industrial growth has undergone three phases:²

- (a) 1917-1928, that period, following the revolution, of no appreciable growth.
- (b) 1928-1948, inculcation of Stalin's industrial buildup under five-year plans which in twenty years put Russia in second place as an industrial nation.
- (c) 1948 on, hydro development and satellite trade integration which Russia hopes will enable her

1. United Press Release, Washington D.C., as quoted by Omaha World Herald, Sept. 13, 1953.

2. Anatole G. Mazour, Russia Past and Present, pp. 189-214.

to surpass the industrial production of Western Europe and ultimately that of the United States. Within this is a plan to displace American and Western European industries in Asian markets.

That the Russians have made tremendous industrial advances is obvious. Political and economic alterations have certainly contributed to the increase but more closely linked with the tremendous strides has been the development of waterways. Completion of the Rybinsk reservoir with its attending power plants, the Dneprostrov Dam, Stalin and Moscow Canals exemplify this surge in industrial production linked to hydro developments. With the completion of dams comes more power so vital to all heavy industry and new canals strategically link and coordinate industrial effort that otherwise would be isolated. And so, as the waterways develop the output of Soviet industries progress.

A year by year comparison of basic industry reveals a steady increase in production as shown in Table I, p. 55.¹ However, these figures apply only to basic production in Russia proper and do not include her satellites. Although a phenomenal growth is readily discernible it does not reveal Russia's true industrial strength compared to the United States. American steel capacity is almost three times that of Russia. For total industrial capacity the ratio is at least four

1. Abram Bergson, *op. cit.*, pp. 55-65.

TABLE I

RUSSIAN OUTPUT OF BASIC INDUSTRIES¹

ITEM	YEAR						
	1940	1945	1946	1947	1948	1950	1952 ²
<u>Coal</u>							
(mil. tons)	166	113	124	139	159	250	330
<u>Petroleum</u>							
(mil. tons)	31.0	19.4	21.7	25.9	29.2	35.4	43
<u>Electric Power</u>							
(bil. KWH)	48.3	43.2	47.5	54.6	63.4	82.0	117
<u>Steel</u>							
(mil. tons)	18.3	11.2	12.2	13.3	17.0	25.4	38.6

1. Abram Bergson, "Postwar Economic Reconstruction in the USSR," Annals of the American Academy of Political and Social Science, Vol. 263 (May 1949), p. 56.
2. "Why Russia is Caught in an Economical Trap", Business Week, (Dec. 20, 1952), pp. 104-105, i.e., Source of data for 1952.

to one in favor of the United States. However, one should be cautious in translating these ratios because their potentialities vary between totalitarian and democratic societies.

The manpower for Russia's growing industrial strength can be adequately procured from a population now well over two hundred five million people. The population is increasing at the rate of two and eight-tenths million per year which is as fast as that of the United States according to most recent census figures.

The North Atlantic Treaty Organization, Benelux and Schuman Plans operate to unify militarily and industrially those countries of Europe presumably allied to the cause of the United States. So to understand industrial strength existing between United States and her allies and Russia with her satellites one must examine the over all production of these two protagonists. In 1952 Russia produced 90% as much steel as Great Britain, France and west Germany combined, 70% as much coal and 70% as much electrical power. Table II, p. 57,¹ shows the output of basic industries for 1952 for the United States, Western Europe and the Soviet Bloc. It reveals that the Soviet Bloc is already starting to challenge Western Europe for Supremacy. By 1955

1. "Russian Industry," Business Week, Oct. 18, 1952, p. 164.

TABLE II
OUTPUT OF BASIC INDUSTRIES--1952¹

	United States	Western Europe	Soviet-Bloc*
<u>Steel</u>			
(mil. tons)	93 **	66	51.2
<u>Coal</u>			
(mil. tons)	540	520	473.9
<u>Oil</u>			
(mil. bbls.)	2,250	-	435.0
<u>Electric Power</u>			
(bil. KWH)	395	265	187.3

* Not including Red China

** Steel Strike limited -- normally would be 108 mil. tons.

¹. "Russian Industry," Business Week, Oct. 18, 1952, p. 164.

the Soviet Bloc plans to surpass the production of Western Europe. Completion of hydro plans on the Volga River and lower Ukraine, providing increased consumer production does not prohibit it, will enable Russia and her satellites to achieve this goal.

Industrial development in the United States is governed by consumer demand as modified by government projects and mobilization. Russia's industrial investment is a planned military operation. Industry was superimposed on an agricultural economy and has been given priority over agriculture. As a result industry has in the past prospered to the disadvantage of agriculture.¹

The understanding of Russia's basic motives governing all her activities is recognition of the concentration of investment which assures maintenance of power at the top of the political structure and survival of the Soviet Union based on superior military strength.

From the beginning of the industrialization drive, Russian leaders have been faced with a problem of obtaining the capital to build heavy industry. This has never been a problem in the United States. British and European capital came willingly to build American factories, mills and railroads. Later on the United States economy became productive enough to increase not only the standard of

1. G. Etzel Percy, et al., World Political Geography, pp. 72-81.

living and consumption but large private savings that could be invested. And so profit operated to attract investors to furnish capital for expansion.

In Russia lack of capital and low wages fostered by communistic ideology--"From each according to his ability and to each according to his needs."¹ prevented the population from becoming the owners of heavy industry. Consequently the period from 1928 to 1933 found Russia exporting grain in the midst of famine at home, depleting her forests and reserves of manganese and chrome in order to obtain capital for procuring heavy machinery. Collectivization of agriculture forcibly extracted food from the farmer to be given to the industrial workers. Such a relationship can be likened to the old feudal town fattening off the surrounding villages, for most assuredly, that was exactly what was happening to Russian industry at the expense of agriculture.

Russia's industrial empire has continued to grow in spite of lack of capital. Substitutes have been initiated tending to minimize the deficiency. Until the rise of Malenkov's authority, consumer production was curtailed. Those commodities, including housing, clothing, furniture and electrical appliances, were sacrificed at the expense of the military and industrial needs,

1. Karl Marx, Communist Manifesto, as quoted in the source book, Introduction to Contemporary Civilization in West, Vol. II, Columbia University Press, New York, 1947, p. 415.

including great hydro projects. Further, the use of slave labor requires no capital for wages, a factor contributing little to the morale of the masses.

Russia's latest trade overtures are designed not only to drive a wedge into western friendship alliances but also to provide sorely needed capital.

2. The Problem of Internal Dissatisfaction. Probably the pulse of public dissatisfaction is best acknowledged in the changing economic patterns. Long has the average Russian been maligned with lack of and inferior consumer products. Food, clothing, housing and luxury items including soap, cosmetics and electrical appliances are of extremely poor quality if available at all. Since World War II the Russian populace has been promised a higher living standard. This has not been forthcoming.¹

In August, 1953, public acknowledgement of the dissatisfaction was voiced by Premier Malenkov in a tone of appeasement. He promised a drastic upsurge in the production of consumer goods to be made available to the population: cars, refrigerators, radio and TV sets, better homes and clothing. His condemnation of the quality of consumer goods previously produced as compared to western goods, seemed to acknowledge public recognition of the difference. This is to be changed and starting the

1. "Russia, the Man in Charge," Time, Aug. 17, 1953, p. 19.

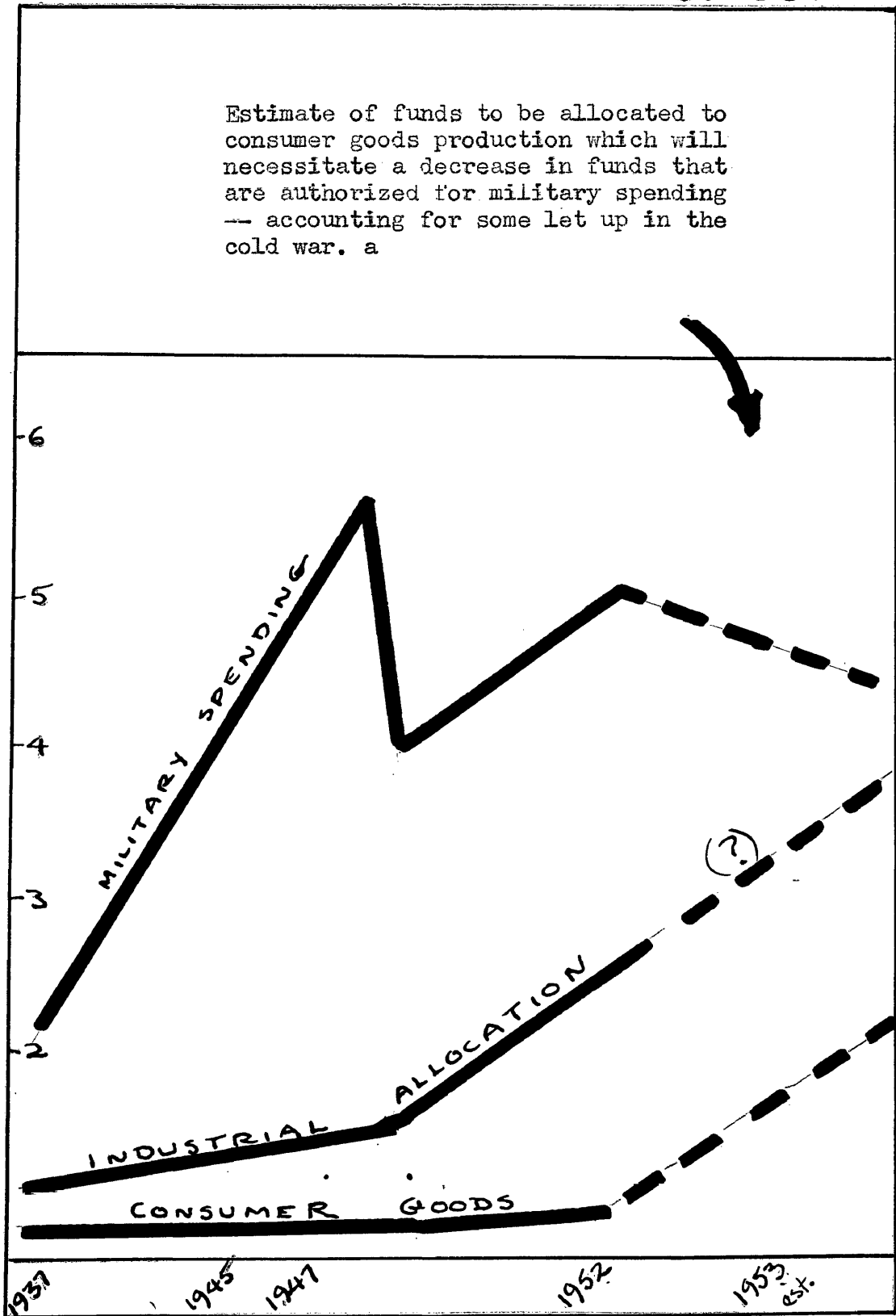
latter part of 1953 a much greater portion of the national budget will be allocated to consumer goods.¹

It is questionable whether Malenkov can afford to weaken the Red army appreciably or postpone hydro developments to increase consumer production. The let-up in the cold war is a reflection of the forced changes in Russian economy. Russian leaders are recognizing the growing dissatisfaction; hence the promises of more of the commodities needed to raise living standards. Graph I on page 62 reveals that the preponderance of the total budget is used for military and industrial spending.² Monies allocated for consumer goods have been far too little to pacify the population. Decreased military strength and pacificism gestures indicate that the Russians might attempt to appease the consumer cries at the expense of the military.

In order to increase consumer goods though, light industries would have to be promoted to include all types of factories for manufacturing these commodities. There is no indication that this is being done. Although state owned factories exist to manufacture military clothing and equipment, there are few factories in Russia producing acceptable items, in quantity, including civilian clothing, automobiles, television, plumbing supplies, cosmetics, radio sets, electric washing machines and recreational

1. Loc. cit.
2. Loc. cit.

ALLOCATION OF THE RUSSIAN BUDGET



a. "Russia, The Man in Charge," Time, (Aug. 17, 1953), p. 19.

equipment. One must not forget that the soldiers of the Red army along with great numbers of administrative personnel serving in Europe have been exposed to the niceties of a "decadent capitalistic society." Upon returning home they have informed their friends of the advantages of better clothing, radios, and electrical appliances enjoyed by the average capitalistic follower. And so the feeling of discontent spreads and pressure grows for these luxury items necessitating a shift to more consumer production.

Herein lies the key to success or failure of Russia's greatest hydro plans. For if a larger percent of the national budget must go for consumer goods then some of the more ambitious water development plans may have to be abandoned or postponed. In either case Russian leaders are caught on the horns of a dilemma.

Agriculture and Hydro Plans

Until recently agriculture was the stepchild of Russia. Industry was paramount and agriculture was merely to supplement industrial advances.¹ As a result agriculture has suffered, which accounts for postwar emphasis upon development of irrigation projects. An examination of the plight of agriculture tends to cultivate an appreciation for Russian reclamation plans to

1. G. Etzel Percy, et al., World Political Geography, pp. 71-74.

include the vast areas of the Kara Kum desert and the steppes of Central Asia.

The farmer of Russia, like his American counterpart, has an heritage of resistance to interference and is a disciple of laissez faire control. Collectivization was achieved only through strong "persuasion."¹

Definite progressive steps can be traced to force the farmer into a pattern of collectivization. Each step tended to force the reluctant peasant further under the authority of the state. They are:²

(a) 1929-32, collective farms and machine tractor stations.

(b) 1949, forest belts started.

(c) 1950, integration of collective farms.

(d) 1950, irrigation laws.

(e) 1950 on, new irrigation and hydro projects for reclaiming and reclinatizing great areas.

1. Reasons for Production Lag. The first five-year plans fell far short of compensating for the five million farm animals destroyed when the peasants resisted collectivization. Conseription of farm workers into the military has depleted the ranks of agricultural labor. Further incroads were made into farm manpower through priority given the industrial worker and impetus given

1. Anatole G. Mazour, Russia Past and Present, p. 453.
 2. "Remaking Nature for the Glory of the Great Stalin," Newsweek, Vol. 40 (Aug. 11, 1952), p. 44.

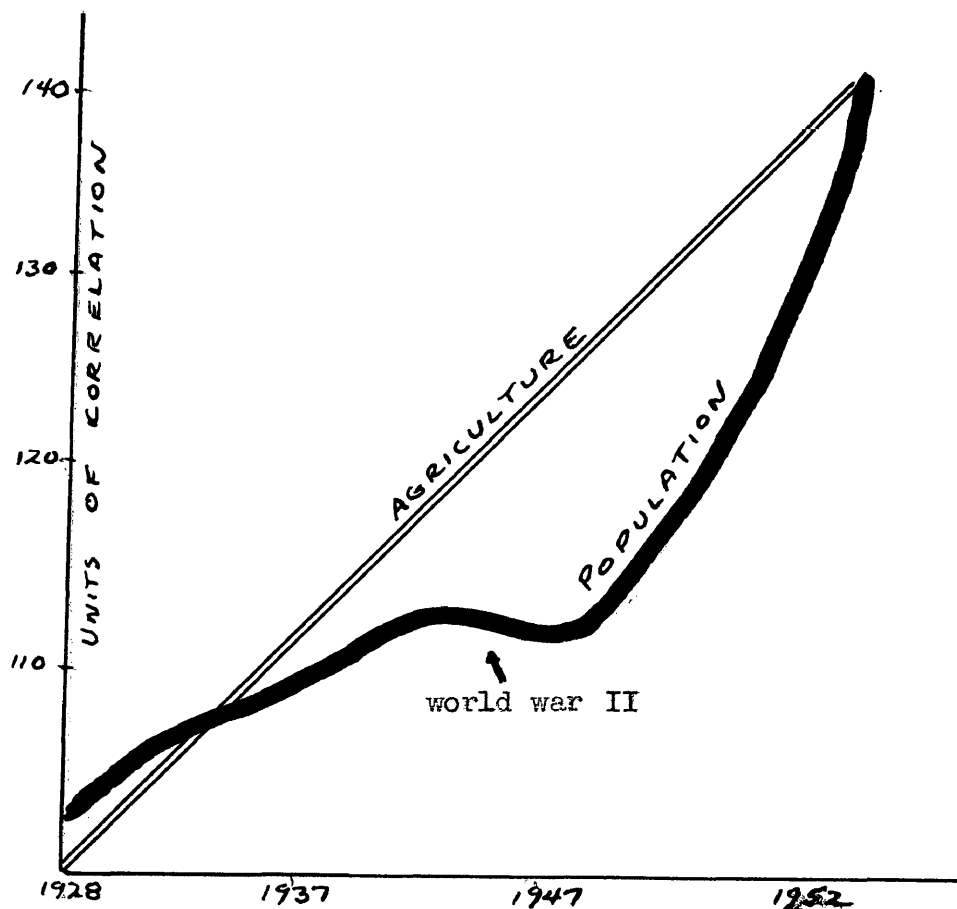
to this emigration by knowledge that he was on the receiving end of the food produced.

Aside from personnel depletion the agriculture program suffered by failure to invest sufficient capital to compensate for the loss in manpower. In any country production can be maintained or even increased with less farm workers, providing sufficient mechanical equipment is substituted. That is exactly what has happened in the United States during the last decade. Census figures show a steady migration away from the rural areas. Still farm production has risen because of the introduction of more modern methods and specifically an increase in farm machinery. In Russia, mechanical equipment has not been adequately provided to balance the loss of manpower in terms of overall population growth.¹ The last five-year plans fell far short of agriculture quotas; and returns barely kept up with the population rise, as is seen in Graph II, page 66

Another factor contributing to the present plight of agriculture is soil depletion. This is becoming a critical problem. The Chernozem or black earth region is recognized as being one of the world's most productive belts. However, any soil can be farmed out. Improper agriculture methods, coupled with a low annual rainfall, have caused production to decline.² The grain yield

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1. Nikolai Mikhailov, Across the Map of USSR, p. 193.
 2. Harry Schwartz, Russia's Soviet Economy, p. 173, et. seq.

AGRICULTURE PRODUCTION AS COMPARED
WITH RUSSIAN POPULATION RISE ^a



- a. Information taken from "Why Russia is caught in an Economical Trap," Business Week (Dec. 20, 1952), p. 100. Population information imposed thereon as published by Abram Bergson, "Postwar Economic Reconstruction and Development in the USSR," Annals of the American Academy of Political Science, Vol. 263 (May 1949).

per acre has decreased by 6% during the years 1949 to 1950 from that of the years 1925 to 1928. This fact alone acted as a stimulus in prompting an early opening of the Volga-Don Canal.¹

2. Hydro plans to Improve Agriculture Production. The Volga-Don Canal, so Soviet engineers surmized, would permit fertilizer to be brought by water from the Kola Peninsula region to the lower Ukraine and Crimean areas. Accomplishment of this, along with the completion of the Ukrainian canals, will restore the fertility and productivity of this region by 6% to 7% and also reclaim additional lands. So vital is the reclamation of Russian soils considered that such projects have been placed under the supervision of Russia's secret police, the MVD. This enables the State to keep an eye on the bulk of Russia's twenty million slave laborers assigned almost exclusively to hydro development projects.²

Then, to meet the long range industrial goals, agriculture must also be increased. To do this Russia plans more mechanization, a factor not complementing the program for increasing consumer goods production. Also more lands must be made to produce, which in turn amplifies the priority and importance of such projects as the

1. Supra, p. 35. (Volga-Don Canal.)

2. "Why Russia is Caught in an Economic Trap," Business Week, (Dec. 20, 1952), p. 100.

Kara Kum, Turkmanian and Ob. All in all it points to even more state control over agriculture. Soviet leaders plan to exercise the same type of administration over agriculture as now employed over industry.

The new hydro projects include plans for:

(1) Establishing super-collective farms in new areas and merging of smaller collective units in established regions. Redivision of lands and strategically located MTS (Machine Tractor Stations) will contribute to this unification creating a dependency to transform the peasant into an agriculture laborer.

(2) Discontinuance of all but state markets.

Presently a degree of independence is enjoyed by the peasant through a few free markets where excess produce can be peddled. This privilege will soon be denied him.¹

Whether the peasant will tolerate such practices remains to be seen but there is no doubt that if industry is to expand agriculture must do likewise.

1. "Russian Industry," Business Week, (Oct. 18, 1952), p. 170

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary

1. Examination of Russia's past history shows that waterways have conditioned Russian thinking in that they have played a significant part in formulating patterns of exploration, colonization and economic development. As such they were a means to the solution of many of her problems relative to growth. In this respect it is found that:

(a) Waterways determined the sites of settlements. Moscow, Kiev and Novgorod exemplify such settlements.

(b) Colonization and expansion followed the courses of rivers. Cossacks found the Ob, Yenisei and Lena and their tributaries excellent routes for their relentless drive to the East. Further the fact that many of Russia's great rivers flow to the north contributed to Russia's early interest in the Arctic. This has given the Soviets a jump on the United States in so far as developments in the Arctic Region are concerned. Which in turn is of vital concern in an air age where increased emphasis is being directed toward "Great Circle" route.

(c) Aside from a desire to gain access to warm water ports, Russia inadvertently moved toward the southwest because of the direction of flow of Ukranian rivers, and the vital use these rivers have had in the people's lives.

2. In her plans for hydro development now, as in the past, Russia looks to her rivers as a solution to her many problems. Lenin's early electrification scheme was to be solved by hydro projects. Today production deficiencies are to be corrected by vast hydro programs.

(a) Modern technological advances in the fields of physics and chemistry have changed the role of rivers and amplified their importance. This is manifested through a growing demand for more electrical power in Atomic development, additional water utilization in industry and control of water itself for irrigation. Regardless of the role, there is no denying the rivers today are as important to the Russian society as they were in the past.

3. Some of the more important projects calculated to enable Russia to meet the challenge of modern technology are:

(a) Kara Kum. Here the diverting of water from the Amu Darya River will enable the Soviets to reclaim twenty million acres of desert.

(b) Stalingrad Kuibyshev Dams and the Volga Transformation. During the next fifteen years the Soviets plan to complete a series of hydro engineering works on the Volga and its tributaries the Oka and Kama Rivers.

Turbines at Stalingrad and Kuibyshev will increase electric power by 25%. In addition to provisions for transportation and power, canals and reservoirs will provide for irrigation of 35,000,000 acres of land. If the power output contemplated of two million KWH is attained, the output will double that generated by the Hoover dam and will be the world's largest.

(c) Volga-Don Canal and Related Projects.

Here two projects are linked together. One is to aid agriculture in the eastern Ukraine, while the Volga-Don Canal proper culminates a Russian dream to connect these two great river systems. Thus, light naval units can now be moved from the Arctic to the Caspian or Black Seas. Also, the canal enables upper Volga cities such as Gorki to use coal from the Donets basin and in turn receive scarce fertilizer and timber from the northern Volga Taiga area.

(d) Lower Dneiper and Crimean Development Plans. This project has a dual function but electric power for industry is secondary to the primary consideration for increasing agriculture production. Two main canals of a total length of 341.5 miles are to irrigate 3,700,000 acres.

(e) Russia's "Schuman Plan" and the Danube. By 1955 the Russians hope to have interlocked and developed the heavy industry of Poland, East Germany and Czechoslovakia to rival that of the Ruhr. Iron ore from Krivoi Rog will go up the Danube to German and Czechoslovakian mills where it will be joined by coal from Poland's Silesia region. Coal will be moved through a canal, presently being constructed which will link the Oder to the Danube River.

Further Soviet plans for the region of the Danube include reclamation of marshlands, construction of power plants, and flood control. Ultimate plans, scheduled for completion by 1960, will result in the reclamation of 1,300,000 acres of land, while the hydro electric plant at Bicaş in Rumania will generate 200,000 KWH of electricity, a quantity sufficient to supply the industrial needs of all of Moldavia.

(f) Central Asian System. It consists primarily of the creation of a huge reservoir which would be the world's largest. By damming the Ob and later the Yenisey Rivers and constructing a great canal the Russians hope to prevent the Aral and Caspian Seas from further drying up; afford water for irrigating millions of acres and thus achieve a population shift; and amelioration of the climate of South Central Siberia.

4. The political consequences stemming from Russia's current hydro plans are:

(a) Industrial capabilities and agricultural production will be considerably increased. This will strengthen the internal economy which in turn could enable the Soviets to support a stronger military force, if necessary, and sustain their ability to wage an extended war. Thus the basic criteria for practicing power politics will be strengthened. The end products of Russia's hydro schemes then are aimed to afford her added strength, politically and economically, and thereby enable her to achieve a more favorable status in the bipolar power struggle.

(b) The meshing of the heavy industry of those European countries that are under Russian domination and binding of these industries to the Soviet economy. This is the situation relative to Western Germany, Poland, Czechoslovakia and Romania. Hydro projects involving the Danube, Oder and Bistritar rivers were engineered to achieve this end. The Soviets hope that by 1955 production under this plan will equal that of the Ruhr. If successful the Soviets will have to a degree effectively countered the advantages of the Schuman Plan.

5. Certain domestic problems exist that tend to condition the development of the Soviet's hydro program.

(a) Data gathered substantiates that the totalitarian nature of the Soviet state simplifies what would be serious problems relative to hydro developments in other countries. Dispossession and re-settlement of peoples from proposed reservoir sites is no problem to the Russians; nor does the obtaining of labor present difficulties, for apparently vast numbers of political and war prisoners are available at no cost.

(b) It appears that other problems related to Russia's waterway development are arising which may tend to offset or delay expected results. They are lack of capital, which has caused Russia to look to world trade indirectly through her satellites; and internal dissatisfaction, which has necessitated a shift in allocation of funds to provide for more consumer goods. Therefore to raise living standards, some of the more ambitious hydro schemes may have to be abandoned or delayed.

Conclusions

The nature of power politics makes military and economic strengths basic necessities for nations engaged in the present power struggle. In fact, they appear essential to survival. Communistic policies as conditioned by an ideology which holds to the "inevitable struggle against and victory over capitalism" places

the United States and her allies on the defensive in the current conflict.

Russia appears to be gambling on hydro developments to secure economic strength and as a consequence also to achieve political advantages in the bi-polar power struggle. Through gains in industrial and agricultural production the Soviets hope to close the gap on our industrial and technological lead. This may be realized at some future date.

Certainly an awareness of the situation should act as a manometer in determining our future political policies. If the Soviets should continue to dictate a policy of power politics (that is to say if communistic ideologies continue to prevail that prescribe to the ultimate defeat of capitalism) then the United States has no alternative but to support a strong military force indefinitely and to endeavor to maintain technological superiority.

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