GEOGRAPHY OF THE USSR 1937

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MR. LOUDEN: We shall now continue our discussion dealing with the geography of the USSR. In discussing economic potential, the writers on the subject and the literature which they produce in their attempts to summarize the problem usually rely upon three factors. One is the machine--the industrial facilities for production; the second is the manpower; and the third is the natural resources. To discuss that phase of the USSR we have a speaker this morning, Mr. Edward Ames, who has had some experience in the USSR in the Department of State. He was formerly a professor at Amherst and is now with the Federal Reserve Board.

I take great pleasure in inviting Mr. Ames to the platform.

MR. AMES: Gentlemen, obviously we have an impossible subject to deal with in anything short of several months, but I will try to hit what seems to me to be some of the high spots in two subjects. One is that of the Soviet Union's natural resources; and, second, Soviet industrial and economic geography, which is to say, the practical application of geography in a modern society.

The first question, that of land resources, has been discussed in the preceding talk. A large part of the Soviet Union is flat, except on its southern borders. The Ural Mountains would hardly be considered mountains by an inhabitant of the Rockies. One is apt to get the impression that because the Soviet Union is so flat, it therefore must all be good agricultural land, but we must eliminate large portions of the Soviet Union as food-producing areas.

The Soviet Union is located very far north. Moscow doesn't seem very far north on a map of the USSR but it is actually on a latitude which in this hemisphere is halfway up Hudson Bay.

As a result, of course, most of the area north of Moscow is really not much use agriculturally. In the extreme North there is an area called tundra which is mostly marshy or permafrost land. Nothing much will grow there except short, stunted bushes of one kind or another. To the south of the tundra, of course, is a tremendous forest area. In certain parts of the country, notably the European North, the timber industry is relatively well developed but much timber land is still inaccessible. As you know, the Russian timber industries have played an important part in the world lumber market. At the present time they do not, simply because their limited output is reserved for their own domestic consumption.

It is only south of Moscow that extensive farming begins (except in the Baltic area). As one moves farther south, the areas under forest gradually diminish, until the famous steppe area is reached. Here, the land in many cases is extremely good. Having eliminated for agricultural purposes a very large part of the land simply because it is covered by forest and obviously requires forest clearing on a continental scale, something which has never been really tried in this country, one must next consider the climate, which by and large is not merely cold but also dry.

Now, there would seem to be three main influences affecting the Soviet climate. The first is the influence of the Gulf Stream, the tail end of which affects the Baltic Sea area and the western portion of the country. As you know, the rainfall throughout western Europe is associated largely with the Gulf Stream. The variations in the climatic conditions associated with it play a part in affecting the harvests of western Europe. They do also in other sections of Europe.

The second factor is the northeast Siberian cold center, a high-pressure area, which affects the winter climate of the Soviet Union. The summer climate primarily originates in the Gobi Desert. A storm moving in this direction across country as a cold mass originating in northeast Siberia comes into contact with the Gulf Stream.

Now, the result of this is that, although in a large part of the area from the southern Ukraine, running east across the Volga into Kazakstan the soil there is quite good for farming, comparable in many cases with our own plains, the area with sufficient rainfall varies from year to year; the drier the year, the farther west the drought area will extend. So in an extremely bad year drought will extend as far west as Rumania, whereas in better years the dry area will come only as far as the Aral Sea. Thus a very large portion of the land which could be used for Russian agriculture is subject to drought. In general there are very few areas in the Soviet Union where the rainfall comes even close to what it is, for example, in western Europe.

So that when one is talking in terms of the climatological conditions, and also soil and land conditions, the actual area which could be used for farming in the Soviet Union under ideal conditions is of the order of magnitude of that in the United States. Now, obviously, one can expand the farming area and contract it by artificial means, but there is definitely a difficulty in expanding it beyond a certain point, owing to these conditions.

If we consider not just the land resources but the mineral resources, we find again a spotty picture. Part of the trouble in what I am about to say arises as a result of statistical difficulties. If we look at the American mineral resources, we find that American mineral resources are apt to be systematically underestimated. Businessmen in this country who own mineral resources attempt to minimize the amount which they have

because they are in some degree taxed on them and because a certain cautiousness is considered respectable. The Soviet geologist, on the other hand, derives his reputation in considerable part from how much he can locate, and therefore there is a systematic tendency, I think, to overestimate Soviet natural resources. So when I talk about natural resources, you have to realize that there are not very many very satisfactory figures, and I think there are certain inherent elements of bias in the picture.

A rule of thumb, which is the only one I have heard which is at all satisfactory, is one suggested by an American geologist: The Russians greatly overestimate what they have discovered, but there is so much territory as yet unexplored that when this is taken into account, perhaps Soviet figures are not really so bad after all. The resources that they don't know about perhaps compensate for their overestimation of what they do know about.

Now, if you consider, for example, coal, there are several principal groups of coal deposits. The largest one is in west Siberia, the so-called Kuznetsk Basin which is the largest deposit now under commercial operation. Although there are certain other deposits located farther to the East which are reportedly even larger, to date it has not been practical to develop them on a large scale.

The traditional center of the Russian coal industry is located in the Donets Basin, which is the traditional center of the coal industry. The resources there are very considerable in absolute amount; and since the center of population has always been in this general area these resources were discovered and developed first. The resources in western Siberia did not really become extensively exploited until the late 1920's.

A third important producing area is in the Urals. There are many coal-producing areas in the Urals and southwest of the Urals in Kazakstan, and there are several other producing areas.

Russian heavy industry does not have that fortunate combination of coal and iron ore located near together such as, for instance, exists in western Europe, where the iron resources of Lorraine are not far from the Ruhr coal resources. Soviet iron ore resources are not particularly well closely located to coal; this fact presents quite definite problems in industrial development.

Fortunately for the Russians, the large Krivoi-Rog iron deposit is situated at a distance of only a couple of hundred miles from the Donets Basin. Russian development there at the end of the nineteenth century set the pattern which has been followed since: a railroad connecting an iron ore deposit with a coal deposit; steel plants at each end of the line; freight cars carry coal in one direction and iron ore on the return trip; there is no movement of empty cars; and, consequently, transportation costs can be reduced.

There has been an attempt by Soviet industry to develop a similar pattern for coal ore transport in the Asiatic section of the USSR. In the southern Urals, at Magnitogorsk, there are large deposits of good-grade iron ore, but the coal produced in the neighborhood is inferior and cannot be used for coking purposes. Most of it is subbituminous coal. On the other hand, at the Siberian end, good coking coal is found, but iron reserves were inferior. Consequently, the First Five-Year Plan envisaged the construction of steel plants at either end of the line, with coal moving by rail from western Siberia to the Urals and iron ore moving from the Urals to western Siberia. The distance between those points is 2,200 kilometers, or about 1,400 miles.

The basis of Soviet eastern industrial development in the thirties lay precisely in this shuttling of coal and iron ores, together with the development of machinery industries to make use of the steel produced.

The Russians claim to have coal resources amounting to about half those of the United States. This figure may be somewhat low, for it relates to 1938, since which time some fairly important discoveries of coal in the northern Urals, and some in the extreme North, in the so-called Pechora Basin have been made. A railroad was completed in 1942 connecting the Pechora field with Leningrad. The 1950 plan for coal production in Pechora was 7.7 million metric tons. I have no information as to the extent to which the plan may have been realized, but the 8 million-ton figure gives you an idea of the magnitude of the attempt to develop this basin, which, incidentally, is under the jurisdiction of the Ministry of Internal Affairs, that is, it employs convict labor.

The Russians claim two and a half times as large iron ore resources as the United States. I think that we would have to use a good deal of caution in accepting these figures, because the Russians in their estimates have obviously included all the low-grade iron ore that they could find, whereas the United States tendency is to include only those ores which are at the present time commercially usable. If we eliminate the lower-grade ores from the Russian picture, the Russian iron ore resources are quite a bit less than those of the United States.

It is in petroleum that the Russians really make their largest claim. As you probably know, the center of the Russian oil industry has been historically at Baku. There is a set of oil-bearing formations which extend throughout the Caspian Sea Basin, southward into Iran, to the East, across the Caspian Sea into Soviet central Asia. The only area traditionally which has been of much economic importance has been Baku, with two small fields located at Grozny and Maikop in the north Caucasus, one at Krasnovodsk, one in Dagetasn, one in Guriev.

Until the late 1930's the bulk of the Soviet oil resources was believed to be located in the Caspian area. The available geological data relate primarily to that area. However, there was extensive

exploratory geologic work, under the leadership of the Soviet geologist named Gubkin, who died about 1940, who predicted that very extensive oil deposits should be found in the area of Kuibyshev, on the Volga running northeast through Bashkirlya to the western Urals. Although in his lifetime major discoveries were not actually made in this area, many important discoveries have since been made. Therefore the petroleum resources position of the Soviet Union would seem to have been considerably improved in the past 10 years in terms of known resources.

The Russians claimed, as of 1938, to have resources of 4.6 billion metric tons, as compared with 1.8 billion metric tons in the United States. Obviously, since that time we have enlarged our proved resources to about 2.5 billion, which is still very much less than the Russians claimed in 1938. On the other hand, the Russian claims as of 1938 were probably very much exaggerated. They would be less exaggerated applied to the resources now known.

Our discussion has so far been largely in terms of natural resources, and largely about resources in the area west of Krasnoyarsk. The area east of Krasnoyarsk is relatively undeveloped, and some of it is virtually unexplored. The density of population in Europe tends to decline steadily east of Germany. In the western portions of the USSR before the war, the density of population was approximately equal to that of Poland. The farther one moves east, the less dense the population until the Urals are reached. East of the Urals, the inhabited areas form a triangle, the point of which is in the Novosibirsk area. East of this point, only areas along the Trans-Siberian railroad are populated. Although there are several industrial towns along the line, the only inhabited places not on the line are mining and lumbering camps, many of which are operated by convict labor.

Historically, as Mr. Herman mentioned, the original industrial centers of the country were Leningrad, Moscow, and the Donets Basin. The Leningrad development was primarily because it was a seaport. Before the revolution, for example, it received its coal and a large part of its iron from abroad. It had machinery plants, which used to fabricate these things, but it received a great deal of its raw materials from abroad.

The Moscow industrial region--the area roughly between Moscow and Gorki--was developed industrially largely, it would seem, for historical and political reasons, Moscow being the center of government. The textile industry of Russia is traditionally located in the Moscow area even though Soviet cotton, of course, is grown in central Asia, and even though before the Revolution cotton imports entered the country from the Baltic. The Soviet Government is making an effort to move the textile industry into the cotton producing areas; this movement has not been completed by any means.

Everyone has heard, of course, of the so-called eastward movement of Russian industry and of the evacuation of the industrial plants from the German-occupied areas to the East in 1941. We all know in a general sort of way that the Soviet Government put a great deal of effort, or at least a tremendous amount of talk, into the moving of industry from its traditional centers in European Russia into the Urals during the thirties. There is a tendency in this country to assume that most Soviet industry has been moved to the Urals. We must be a little careful about such generalizations. The percentages of growth in the eastern areas have been very much greater than in the older areas, but the base on which these percentage of growth figures are calculated was very much smaller in the eastern areas than in the older areas. Figures which came to my hand--these were prepared by Professor Hunter of Haverford College--indicate that in 1949 about 12.5 percent of Soviet rail loadings were in the Urals. That indicates, obviously, that the Urals are an important part of the Soviet system, but it also indicates that the Urals do not account for half or even a quarter of total Soviet economic activity.

In 1949 rail loadings in Siberia as a whole amounted to 13 percent of the total. This means that perhaps a quarter of the Soviet rail loadings are in the area including the Urals and points east. Of this quarter, half are in the Urals and most of the rest in the west Siberian industrial area around there.

On the other hand, the Ukraine, which is the traditional center of Russian heavy industry, accounted for about 28 percent of freight loadings in 1949 according to Professor Hunter. That represents quite a considerable decline in importance from 1940, when 34 percent of all loadings were in the South. We can say that certainly the Soviet Government since the war has permitted industry in the German-occupied portions of the country to regain prewar output levels, but so far has not encouraged any great development above the prewar level. On the other hand, there has been quite extensive industrial development in the Urals and in west Siberia. I think that there will be an increasing trend toward settlement in this particular area.

If we look at the whole pattern of Soviet eastward movement, we could say that it is taking place in a series of steps, the first step having been in the late thirties with the development of the Urals as an outpost of Soviet industry. Under postwar conditions the Urals are quite an important center of Soviet industry, though they are not so important as the older areas. Now the west Siberian area is being developed more extensively than it was before the war, and has become in its turn the eastern outpost of Soviet industry.

I think that however hard we may look, we will not find very much industry east of Krasnoyarsk. In eastern Siberia and the Far East where industrial development takes place it is primarily of local importance,

designed to make these regions self-sufficient rather than to be major sources of industrial supplies for the country as a whole.

Having given a very sketchy summary of the economic geography of the Soviet Union, I would rather answer your questions than continue. I think that will give us all much more of an opportunity to find out what it is you really want to know.

QUESTION: You mentioned the variation in climatic conditions from year to year and the recurring droughts. We have had indications from speakers and from our reading that there is a progressive drying up going on east of the Urals. Also something I read yesterday indicates that the level of the Caspian Sea is going down from year to year. Would you care to discuss the effect of that on the economy?

MR. AMES: A Russian geographer named Berg has written about the Caspian Sea area in some detail. It seems that it is not enough to say that the Caspian Sea is declining, because the level of the Caspian Sea is subject to cycles.

If you fly over Baku, according to Berg, you can see under the water the ruins of a castle that was built in the thirteenth century on what must have been then dry land. The castle is actually coming to the surface again. In a couple of hundred years the Caspian Sea will be back to the level where it was in the thirteenth century. Berg has established a correlation of some sort--he has worked in that area for quite a long time--between snowfall in the Arctic area and the height of the Caspian Sea. He maintains, on the basis of very fragmentary data stretching back a thousand years, that there have been quite definite cycles in Arctic snowfall, associated with which are cycles of the Caspian Sea.

It is important to consider the practical implications of fluctuations in the height of the Caspian Sea on the agriculture in the Volga grain-surplus area. A large hydroelectric plant is under construction at Kuibyshev and another at Stalingrad. A large power plant was to have been built at Kuibyshev in the late 1930's; at that time, it was suggested that irrigation of farm land (which is a part of the project) would worsen, rather than improve the farm situation in this area by reducing the water flow into the Caspian and hence increase the speed at which the Caspian is falling. Since the end of the war there has been no discussion of this problem.

At one time in the past the Aral Sea did have an outlet into the Caspian Sea. There is an attempt being made now to catch more water in the Caspian Sea from the central Asian rivers by re-establishing that outlet from the Aral into the Caspian. This is the so-called Turkmen canal project.

The problem of the level of the Caspian Sea does seem to have considerable practical importance in the agriculture of this whole southern European area.

QUESTION: How about the area east of the Urals?

MR. AMES: I haven't run into anything that would indicate that this area east of the Ural Mountains is drying up as is the southern portion here, which we might call the Caspian Basin. But you may be quite right.

QUESTION: Last fall I ran some plots on the production of Russia as compared with the United States in iron, coal, petroleum, and the electrical industry. They showed that Russia and the United States had been running pretty much at a parallel rate since 1860, but that it is behind us by approximately 25 years. Would you care to comment on that?

MR. AMES: Obviously, it is very important to know whether the Russians are going to catch up with us. The Russians claim that they can maintain their industrial expansion indefinitely. In this country a decade ago there was a tendency to assume that we would reach some kind of plateau in our industrial expansion, and that although we might increase the output somewhat, it would probably not continue indefinitely. The experience of the war, of course, has tended to change everybody's mind about that; and there is a tendency now in this country to assume that we can go on expanding indefinitely.

The essential difficulty, when we try to project rates of expansion into the future, is that in the United States there is no way of forcing anybody to expand any plants; expansion occurs when business sees a profitable opportunity. In the Soviet Union these things can be done quite simply by decree. The government decides to build a plant and it is built. Consequently, it is very much easier to say that they are probably going to keep on building more plants in the Soviet Union and carry on their expansion in the future than it is in the United States. In one case we know that the Government intends to maintain capital expansion; in the other we must guess what business expectations will be. It is very difficult to say that this is what steel producers will think 10 years from now when the steel industry thinks today that it already has capacity in excess of normal market demands.

COMMENT: If the Russian expansion does not level off, if the Russiar continue their rate of growth at what it has been over the last three years, it does look as if they might catch up in 25 or 30 years to us in all the basic commodities.

MR. AMES: Stalin says he wants to achieve by 1960 a steel production of 60 million metric tons, a coal production of 500 million metric tons, an oil production of 60 million metric tons, and so forth. Those

figures are roughly the same as the level of output that the United States had in 1939. If the Russians' plan is achieved and no more, then obviously it means that they are 20 years behind us in their entire industrial field, or something of that sort, rather than 25 years.

Whether the Soviet Union will achieve this aim is another question. In general over the past they have shown an ability, if not to raise the standard of living, at least to increase their heavy industry output to the levels they plan for. By concentrating on particular products they seem to have been able by and large to reach something like the goal that they have contemplated.

QUESTION: There was an article in "Colliers" some time ago by a former Russian geologist saying that there had been extensive discoveries of petroleum on the coast of the Arctic Ocean in the Soviet Union, and that they were being developed by the Soviet Union, not for purposes of bringing that perroleum south into the industrial area, but for the purpose of having it available for transpolar aerial operations. Have you any information on that?

MR. AMES: I haven't any information on that. Of course, the Japs did use the Sakhalin Islands for oil, and the Russians are now using Sakhalin for oil. There is some oil being produced there. I think as far inland as Khabarousk there is some crude oil production.

There does not seem to be much indication that oil produced in the Far East is moving into Siberia. The 1946-1950 Five-Year Plan indicated that by 1950, the construction of a synthetic oil plant in east Siberia was contemplated. That obviously means they had been getting oil from remote areas over here west or east and that it was indicated that they ought to supply this area with synthetic oil. Since synthetic oil is more expensive than the natural product, presumably what they intend to do in the Far East is to use this for military needs.

There are, of course, oil deposits in the Pechora area. I do not know their extent or their degree of development. Obviously, oil produced in this area would be available for an air force based in the Arctic. However, we can assume on the basis of over-all Soviet fuel policy, that a large part of any oil produced goes to the armed forces.

QUESTION: You haven't said anything about bauxite. Would you mind telling us what sources the Russians have and giving us any information you have in regard to the manufacture of aluminum in Russia?

MR. AMES: The manufacture of aluminum, I think, was in the neighborhood of 100,000 tons immediately after the war. One aluminum plant and one aluminum rolling mill as of 1940 were in the area occupied by the Germans. A new plant was just coming into production in the Urals. That didn't reach large-scale production until late 1941 or 1942. The capacity of that plant is about 60,000 tons, I believe.

There is a plant in western Siberia, the location of which I am not exactly sure; it uses local bauxite. So that at the present time the Russians seem to have three major aluminum plants each with a capacity of 60,000 tons. One is located in the Ukraine; one, in the Urals; and one, in western Siberia. All of them are getting resources fairly conveniently at hand. Soviet aluminum output is obviously much less than American output. The Soviets don't have anywhere near so large aluminum production as we do. In the recent war Soviet aircraft output consisted mainly of fighter planes; the USSR didn't have the same demand for aluminum as we did, because the Soviets' airplanes were smaller and could be made of plywood, like the Canadian Mosquito bomber. A very considerable proportion of the Soviet production of airplanes was made of plywood during the war. In the future, as they go into the building of larger planes, the demand for aluminum will increase more than in proportion.

QUESTION: Can you tell us about some of the major weaknesses of the Soviet Union which will require them to look to their satellites or to world trade to make up?

MR. AMES: You can tell them to some extent in terms of what the Soviets are attempting to purchase outside the bloc at the present time. That, of course, is in the papers: tin, wool, rubber, and cotton in particular--these are all apparently deficit materials in the Soviet bloc.

We don't know enough about the Soviet Union to know the extent to which its present imports are for current consumption and the extent to which such imports are for stockpiling.

In terms of specific materials, most of you know, I presume, that the Russians are importing tungsten from China. Again it may be supposed that they are stockpiling it. But it is very hard to speak with any confidence in these things.

Now, of course, by and large the Soviet Union was self-sufficient in the late thirties--almost completely self-sufficient. At the present time the Soviets have a good many more connections with the outside world than they did in the thirties, largely through the satellite countries. The extent to which those are a matter of convenience rather than necessity is uncertain. Take rubber, for instance, I am told that you only need to have around 2 percent of natural rubber to make a tire that will at least hold up a truck. It is quite likely that they can obtain from their own synthetic rubber industry enough to enable them to get along with almost no natural rubber imports. During the recent war, however, the USSR continued to import rubber from Japan. It has never actually been in the position of having to depend completely upon its own natural rubber resources.

QUESTION: You have discussed the petroleum situation in Russia and you mentioned the Soviets' plans for new plants. How about their refining capacity?

MR. AMES: The refining capacity has certainly been a problem. During the early part of the war, the Russians had a great deal of trouble with petroleum due both to the fact that output was small and to the fact that in 1943 the Soviet fighter planes had been unable to catch up with the German fighter planes, not because they had any lower theoretical supply, but because they were operating on lower-octane gasoline. This situation arose because at that time they were unable apparently to make 100-octane gasoline. We supplied them with a couple of such plants during the war. I presume now they are perfectly well able to make 100-octane gasoline--whether in sufficient quantities or not is another question. I think in general the whole Soviet attitude toward petroleum is that it is an extremely scarce commodity and can be used only for things of the highest military priority. There is an attempt all along the line to substitute lower-grade fuels for higher-grade fuels. Despite output increases, petroleum still continues to be in short supply. In a number of satellite countries in the past couple of months, gas rationing has been introduced, or the existing rations have been cut, or gasoline prices have been raised; all these symptoms would indicate a continuing petroleum shortage.

QUESTION: Do you have any information as to whether the Russians are still operating the Spitzbergen coal deposits?

MR. AMES: As late as 1948 they were known to be operating them. But since 1948 I don't know. One of the reasons, incidentally, for developing the Pechora Basin was to eliminate the need for using the Spitzbergen coal. The latest figures I have on the Spitzbergen output are quite old--1937. At that time it amounted to something like a half million tons, which is obviously less than they are attempting to get at Pechora.

QUESTION: To what extent do you consider that Siberia has been explored for mineral resources? We have seen some of the old figures, but presumably there are a great many more sources that exist.

MR. AMES: It is hard to estimate to what extent Siberia has been explored. I haven't really studied the history of the geological expeditions. There have been, of course, over the past 20 years very extensive studies and actual expeditions that have gone in various directions to explore their resources. But, after all, one of the problems in that is that there isn't very much point in exploring for resources if they are located too far from civilization. There has been, I think, a tendency to explore the regions which were reasonably accessible. Since, of course, at the present time very large parts of the country are not believed

reasonably accessible, I would suppose that there are quite considerable areas which have not been explored at all adequately.

QUESTION: Do you know if they have found any uranium deposits, and can you tell us what has been going on?

MR. AMES: No. I don't know anything above the level of scuttlebutt. Scuttlebutt says there is uranium to be found in the Tian Shan Mountains and on the Mongolian frontier.

They have been exploring east Siberia particularly for the so-called rare metals--tungsten and the alloy metals in general. I know there are many mines in production in that area for the minor metals. As to whether there is any uranium there I don't know. But since the Russians are working so hard to get uranium out of Germany, Czechoslovakia, and Bulgaria, it may be that they haven't so much of their own as they would like us to assume.

COLONEL RINDLAUB: Mr. Ames, on behalf of the Commandant, the faculty, and the students, I thank you for having given us freely of your time today in helping us out on this subject.

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