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PROVISIONAL INTELLIGENCE REPORT

PATTERN OF COAL TRAFFIC IN THE USSR
IN 1953



CIA/RR PR-152
31 December 1956

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

DOCUMENT NO. 1
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CLASS. CHANGED TO: TS S (C)
NEXT REVIEW DATE: 1989

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PATTERN OF COAL TRAFFIC IN THE USSR IN 1953

CIA/RR PR-152

(ORR Project 43.673)

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FOREWORD

Coal, measured both in tons-originated and in ton-kilometers, is the largest single item handled by Soviet transport. Information on the flow pattern for coal and its demands on transport is of major use in calculating the consumption of coal by industry and by region and in estimating which sources of supply are likely to receive priority in development; in estimating the economic cost of separation between coalfields and consumers; and in assessing the weaknesses, both economic and military, that are revealed thereby.

The USSR has not announced comprehensive data on the movement of major commodities between specific locations on its transportation system since 1934. Consequently, the only means presently available for obtaining information on the traffic pattern of major commodities is through study of data on the geographic locations of production and the major locations of consumption, supplemented by analysis of scattered references in Soviet literature to the transport of major commodities between specific points.

The estimates contained in this report were derived by this method and must be regarded as preliminary. It is not possible to present definitive data on the destination and routing of all Soviet coal movements. However, the accompanying tables and the flow chart, Figure 1,* provide a reasonably accurate estimate of the magnitude of coal traffic for 1953, both by volume of flow and by direction. The traffic movements calculated from regional demand and supply agree well with spot reports by Western observers on coal traffic levels on particular routes, and they yield figures for traffic volume which agree well with the announced total for the USSR.

* Following p. 2.

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PATTERN OF COAL TRAFFIC IN THE USSR IN 1953*

Summary and Conclusions

Transportation services carried approximately 319 million metric tons** of hard and brown coal in the USSR during 1953, excluding duplication because of double-counting of traffic. Nearly all the traffic from mine to point of consumption was moved either entirely or for part of the distance by railroad. The amount of coal hauled by water transport in that year was almost insignificant and amounted to about 2 percent of the tonnage. Motor transport was used almost exclusively for local distribution purposes.

More than 95 percent of the 320 million tons of coal produced during 1953 originated as traffic on the Soviet transportation system. Coal traffic in statistical total exceeded production by a considerable amount; however, it is estimated to have been more than 350 million tons for all transport media combined. The excess consisted of imports from Poland and Communist China plus double-hauling and double-counting of tonnage associated with distribution and redistribution and with traffic interchanges between rail and water transport. The total consumption of coal in the USSR in 1953 was 327 million tons.

About 27 percent of all coal consumed in 1953 was used by the transportation system. The railroads accounted for almost all of this amount -- more than 26 percent of the total consumed -- and were the largest single consumer of coal in the USSR. Coal was the largest single item of traffic handled by the railroads, representing about 30 percent of the tonnage of freight originated and 28 percent of the ton-kilometers performed. About 7.5 percent of all coal mined in the USSR was used in transporting the remaining coal to market. For very long hauls, 1 ton of coal was burned in the locomotive firebox to carry 2 tons to industrial users.

* The estimates and conclusions contained in this report represent the best judgment of ORR as of 15 August 1956.

** Tonnages are given in metric tons throughout this report.

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About 60 percent of the coal sent by rail in 1953 moved in through trains from one origin to one destination, at close to passenger-train speeds, and most of the coal trains were heavier in weight than the average mixed freight train.

Major points of origin and destination and the traffic flows are shown in Figures 1 and 2.* If traffic double-counting and rail-water interchange traffic are excluded, about 93 million tons of coal were moved by rail between regions** in 1953, and about 226 million tons were moved in intraregional hauls, most of it for fairly short distances. Of the 93 million tons of interregional rail traffic, about 33 percent (31 million tons) was hauled for extremely long distances (more than 1,800 kilometers [$\sqrt{\text{km}}$]) -- that is, about 26 percent (approximately 25 million tons) between 1,800 and 2,600 km and almost 7 percent (6 million tons) more than 2,600 km.

With the exception of about 6 million tons from the Pechora fields, almost all coal in long-haul traffic originated in the Kuzbas and Karaganda areas and terminated in the Urals or areas to the west of the Urals. Of the 62 million tons of interregional traffic moving less than 1,800 km, about half was Donbas coal moving to Region VII (Central) and to the Volga and the Caucasus, one-eighth was Karaganda coal for the Urals, and one-eighth was Polish coal for the western USSR.

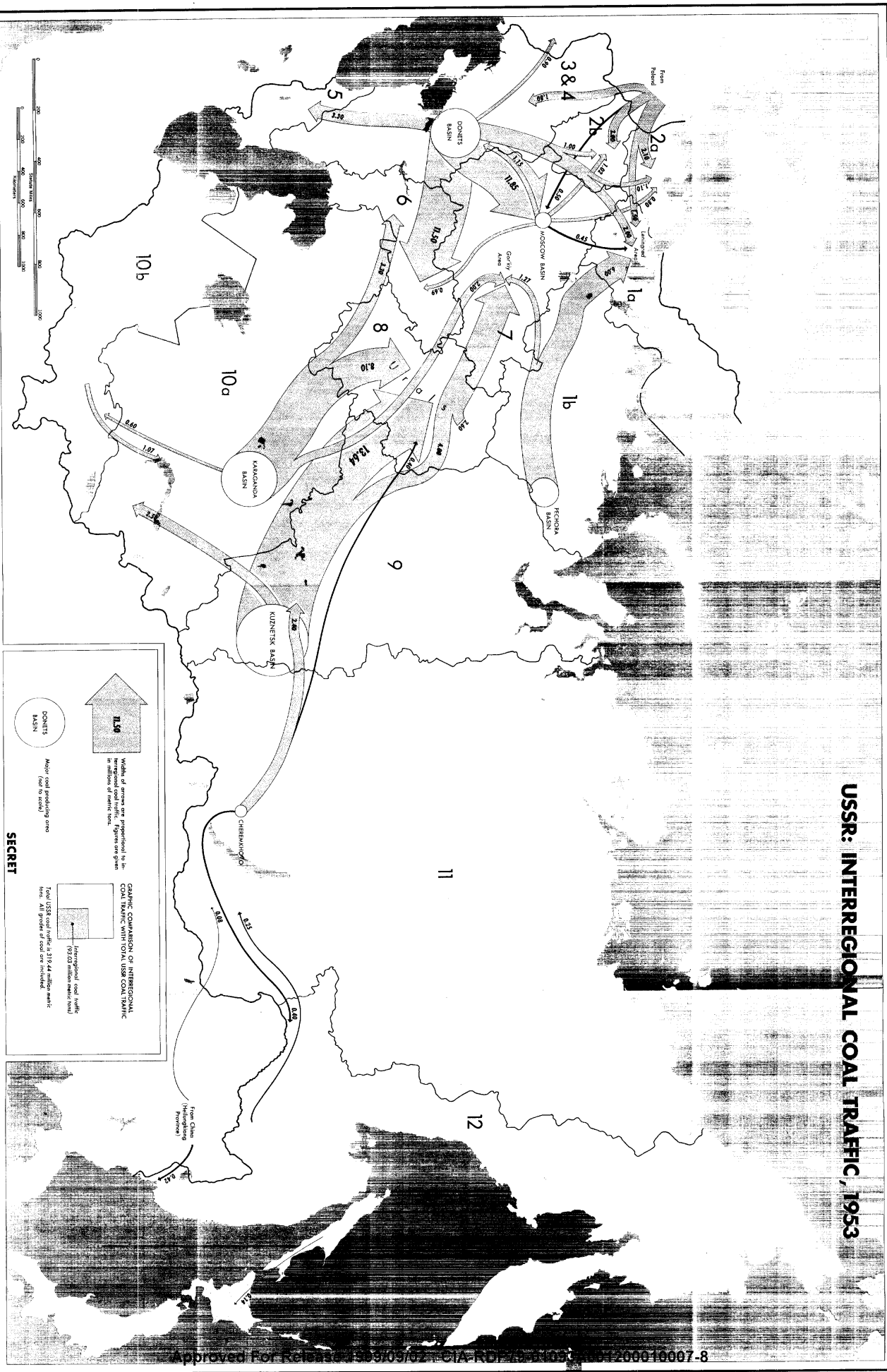
These major long-haul traffic flows were caused principally by the imbalance between production and consumption of coal in the various regions of the USSR. Half of the production of coal in 1953 is estimated to have been west of the Urals, with the Ukraine producing about 35 percent, the Moscow basin more than 11 percent, and the Pechora field about 4 percent. The consumption of coal west of the Urals, however, was about 58 percent of the total, so that large tonnages had to be shipped in from Poland, Karaganda, and the Kuzbas, in hauls of great length.

Within European USSR, about 32 million tons of coal moved in long hauls from the Donbas (which produced a surplus above the needs of the Ukraine) to the Moscow area, the Volga, and the Caucasus, but more than

* Following p. 2.

** The term region in this report refers to the economic regions defined and numbered on CIA Map 13702 (4-55), USSR: Administrative Divisions and Economic Regions, January 1955.

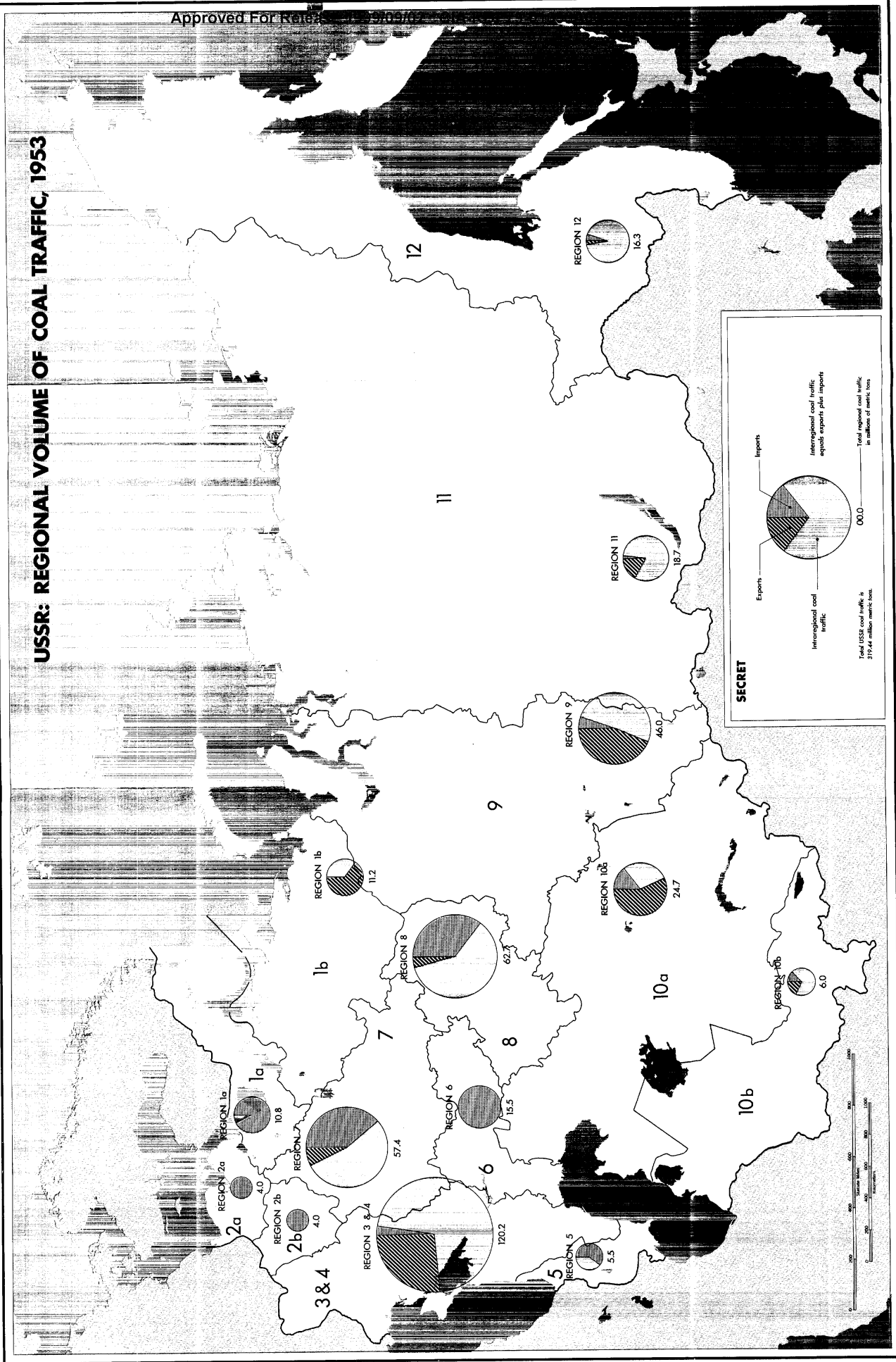
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USSR: INTERREGIONAL COAL TRAFFIC, 1953

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USSR: REGIONAL VOLUME OF COAL TRAFFIC, 1953



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60 percent of the Donbas coal was consumed close to the mines, so that the estimated average length of haul of Donbas coal in 1953 was only 450 km. The declining average length of haul of Donbas coal is the result of a more rapid increase in the consumption of coal in the Ukraine and in Region VII than in the coal production of the Donbas. The Donbas has had to abandon the supplying of some peripheral areas and has reduced its percentage of participation elsewhere, although it is still the principal supplier of coking coal in the USSR and furnishes about 30 percent of the coal used on the railroads.

Production in both the Moscow basin and the Pechora field is increasing rapidly but in 1953 did not keep pace with demand. Moscow basin coal (all low-quality lignite) generally is used locally for power, transport, and heating, but the much higher quality Pechora coal is consumed almost entirely at great distances from the mines, with an average length of haul of about 1,600 km. About 50 percent of the output goes to the Leningrad area, and Pechora is scheduled to supply the steelworks being built nearby.

The Urals produced 13 percent of the coal output of the USSR in 1953 but consumed 19 percent of the supply. Local coal is mainly of grades unsuitable for coking. Large quantities of coking coal were therefore shipped in from the Kuzbas and Karaganda, which also supplied important amounts of power coal for the rapidly expanding Urals industries. Coal imports to the Urals are still increasing, and the steel industry is entirely dependent upon external coal.

The Kuzbas produced 14 percent of the coal output of the USSR in 1953, and Karaganda produced 6 percent. Nearly half the Kuzbas coal was shipped to the Urals or beyond, and about two-thirds of the Karaganda coal went to the same destinations. The average length of haul from both these fields was approximately 1,300 km.

Miscellaneous smaller coalfields, mainly in Siberia, produced about 17 percent of the 1953 output, with consumption largely confined to nearby areas. Rail transport, power, and manufacturing industries were the main consumers of this output as well as of the imports from Communist China.

In spite of the extremely long rail hauls associated with some of the coal traffic, the bulk of the movement is intraregional and has relatively short hauls compared with other traffic in the USSR. As a result, the average length of haul for all coal traffic in

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1953, which is estimated at about 660 km, is considerably less than the average length of haul of 752 km for freight traffic of all types in that year. Soviet literature frequently mentions the economic waste involved in long-haul traffic, and the average length of haul is far higher than in the US. But even though the USSR desires to reduce or eliminate the long-haul traffic which appears uneconomical from the transport point of view, it nevertheless will have great difficulty in doing so. The planning effort that is required throughout industry in order to reduce the long hauls in coal traffic is prodigious, and there are substantial economic costs that will have to be incurred through increasing the production of coal in one area as opposed to another. Even after such expenditures have been made, there is considerable doubt that the proper mix in coal quality to satisfy all consumers can be provided through substantially shorter hauls in coal traffic.

It is estimated, therefore, that coal traffic in 1960 will remain almost as great a burden to Soviet transport as it was in 1953.

I. Means of Transport Used in the Distribution of Coal.

The total hard and brown coal traffic moved by rail, water, and motor carriers in the USSR during 1953 is estimated at about 350 million tons.* This figure includes about 10 percent double-counting because of the interchange of coal between one means of carriage and another and the reshipment of coal sent to stockpiles. Using procedures intended to eliminate double-counting, it is possible to account for the origin and destination of over 319 million tons of coal traffic by Soviet region and by country of origin and destination in foreign trade. The amount of coal originated within each

* The overwhelming proportion of this figure is rail movement. The rail total of 336 million tons is derived in Appendix A, Problem 1 (p. 17, below). The water total of 6 million tons is derived in Appendix A, Problem 6 (p. 37, below). The remainder of 8 million tons is a rough estimate of truck haulage from mines to consumers, based on incomplete data. No attempt has been made to estimate local distribution by road transport within cities from central stockpiles to local consumers.

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region is derived from the locations of coal mining basins and from data available on production. ^{1/}* The destination of coal is derived from the major centers of consumption within each region, as well as from the regions themselves, taking account of available data on coal requirements by major industries and on actual movements.

It is estimated that local and mine consumption of coal that required no rail or water transport amounted to only about 11.5 million tons in 1953, and that over 95 percent of the total coal output appeared in rail and water transport statistics, plus all the coal imported. Water transport is estimated to have handled only about 6 million tons, and most of this was joint rail and water movement. So large was the 1953 rail traffic in coal that between 20 and 25 percent of total daily carloadings in the USSR were coal, ^{2/} and -- because of the heavy loading of cars in transporting this commodity -- 30 percent of total tons-originated by the rail lines was coal. ^{3/} This traffic produced 28 percent of the total rail ton-kilometers. ^{4/} Trucks carried only a small proportion of the total ton-kilometers of coal hauled in the USSR in 1953.

II. Volume and Pattern of Coal Traffic.

A. Over-All Flow of Traffic.

The estimated regional flow of coal traffic by rail in the USSR in 1953 is shown in Table 1.** These estimates eliminate duplication because of double-hauling in shipments to and from stockpiles and because of traffic interchange between rail, highway, and water transport. Traffic originating as Soviet coal production or as imports from abroad and terminating as Soviet consumption or as exports abroad amounted to over 319 million tons. As shown in Figures 3 and 4,*** approximately 52 percent of all coal traffic originated in the area west of the Urals, and the remaining 48 percent in the Urals and regions to the east. Nearly 58 percent of the total traffic terminated west of the Urals. The imbalance between supply and demand in European USSR necessitated coal shipments from Kazakhstan and West Siberia at great economic cost. However, the larger part of total traffic -- approximately 70 percent, or 226 million tons --

* For serially numbered source references, see Appendix B.

** Table 1 follows on p. 6.

*** Following p. 6.

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Table 1

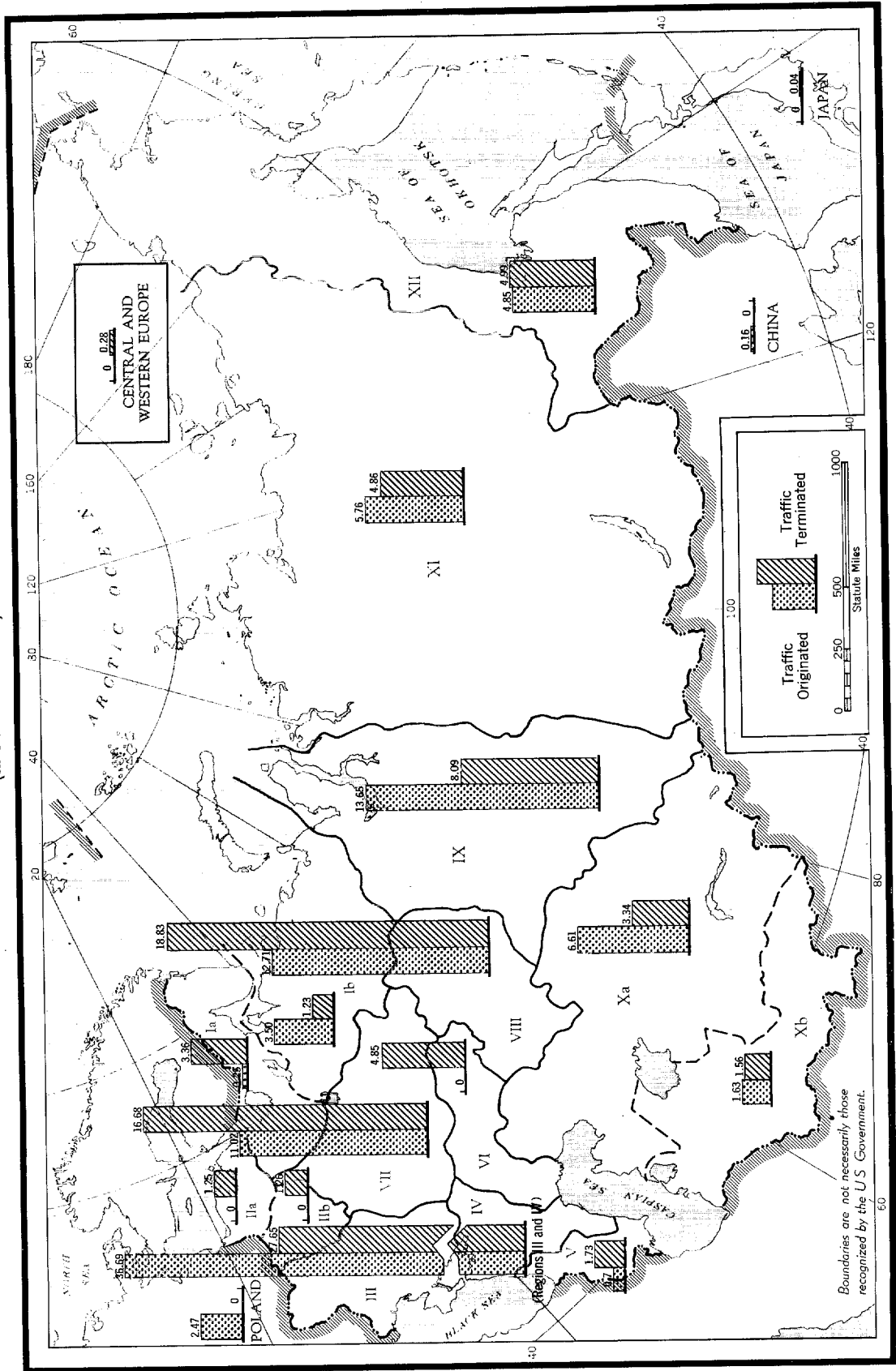
Estimated Regional Flow of Coal Traffic by Rail in the USSR
1953

Economic Region or Country	Traffic Originated		Traffic Terminated		Exports a/		Imports a/		Intraregional	
	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total
Ia (Northwest)	0.8	0.2	10.8	3.4	0		10.0	10.7	0.8	0.4
Ib (North)	11.2	3.5	3.9	1.2	7.3	7.8	0		3.9	1.7
IIa (Baltic)	0	0	4.0	1.2	0		4.0	4.3	0	0
IIb (Belorussia)	0	0	4.0	1.3	0		4.0	4.3	0	0
III (South)										
IV (Southeast)	117.2	36.7	88.3	27.6	31.8	34.4	3.0	3.2	85.4	37.7
V (Transcaucasus)	2.2	0.7	5.5	1.7	0		3.3	3.6	2.2	1.0
VI (Volga)	0		15.5	4.8	0		15.5	16.6	0	0
VII (Central)	35.2	11.0	53.3	16.7	4.1	4.4	22.2	23.9	31.1	13.7
VIII (Urals)	40.6	12.7	60.2	18.9	2.6	2.8	22.1	23.8	38.0	16.8
IX (West Siberia)	43.6	13.7	25.8	8.1	20.1	21.6	2.4	2.6	23.4	10.4
Xa (Kazakhstan)	21.1	6.6	10.7	3.3	14.0	15.0	3.6	3.8	7.1	3.1
Xb (Central Asia)	5.2	1.6	5.0	1.6	1.1	1.2	0.8	0.9	4.2	1.8
XI (East Siberia)	18.4	5.8	15.5	4.9	3.2	3.4	0.3	0.3	15.2	6.7
XII (Far East)	15.5	4.8	15.9	5.0	0.4	0.4	0.8	0.9	15.1	6.7
Poland	7.9	2.5	0		7.9	8.5	0		0	
China	0.5	0.2	0		0.5	0.5	0		0	
Japan			0.1				0.1	0.1		
Central and Western Europe			0.9	0.3			0.9	1.0		
Total	319.4	100.0	319.4	100.0	93.0	100.0	93.0	100.0	226.4	100.0

a. Coal moving between regions and in foreign trade.

FIGURE 2

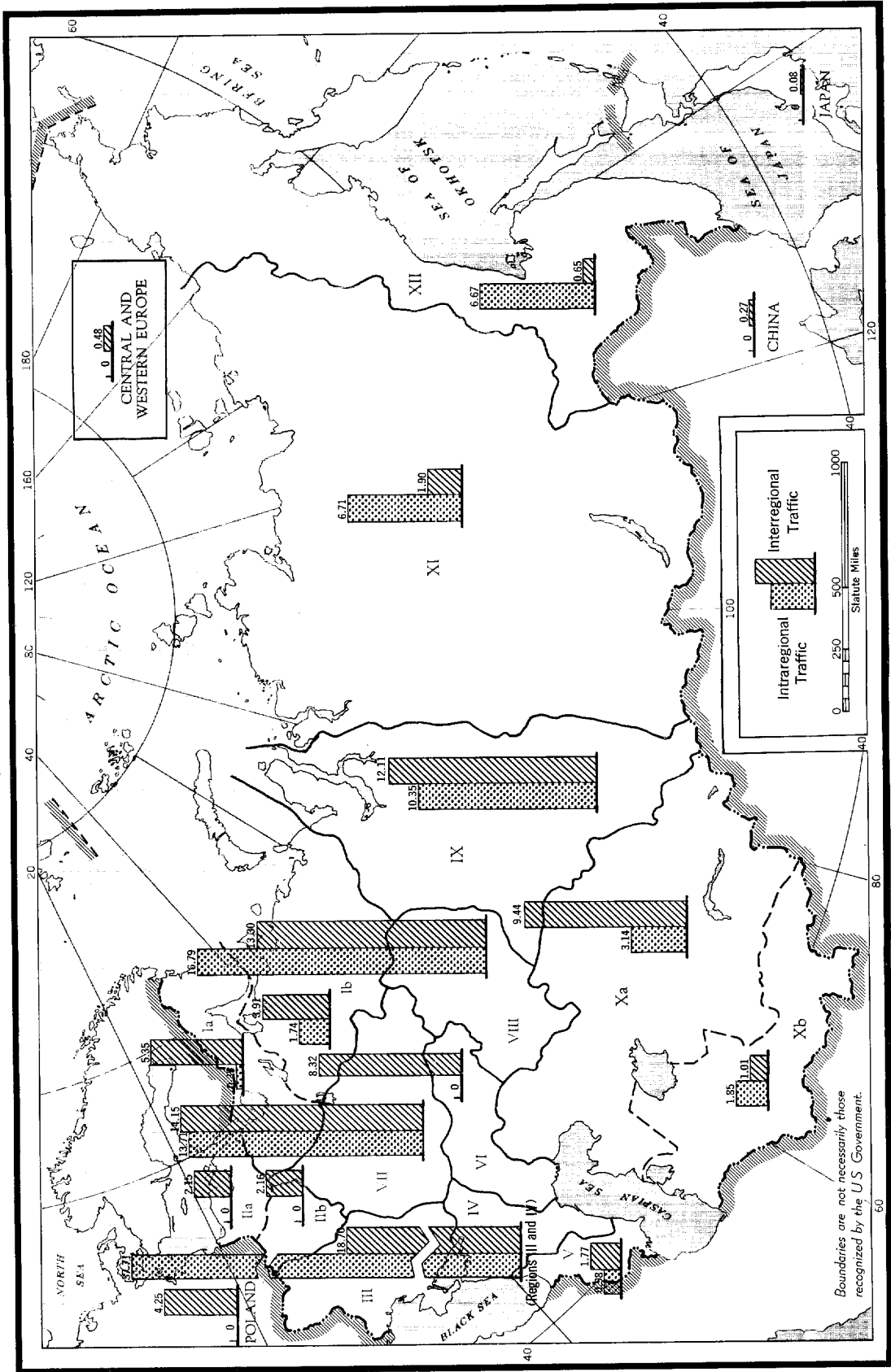
SECRET USSR REGIONAL DISTRIBUTION OF ORIGINATED AND TERMINATED COAL TRAFFIC, 1953 (In Percent of Total)



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FIGURE 3

SECRET USSR REGIONAL DISTRIBUTION OF INTRAREGIONAL AND INTERREGIONAL COAL TRAFFIC, 1953 (In Percent of Total)



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was intraregional traffic which originated and terminated within a single region of the USSR. Thirty percent, or 93 million tons, moved between the regions and in foreign trade.

Most of the 226 million tons of intraregional traffic during 1953 moved for relatively short distances from the mines to nearby industrial establishments and population centers. As shown in Figure 2,* intraregional traffic was heavier in the part of the country west of the Urals. Nearly 55 percent of the total originated and terminated here; the remaining 45 percent represented intraregional traffic in the Urals and the regions to the south and east.

The origin and termination of interregional coal traffic by rail in the USSR are shown in Table 2.** These data when compared with the computed distances for selected coal traffic by rail in the USSR shown in Table 3*** and with source data on the movement of coal traffic indicate the vast distances that some of the interregional coal traffic must move. About one-third (31 million tons) of the 93 million tons of interregional coal traffic was hauled over 1,800 km -- that is, about 26 percent (approximately 25 million tons) was hauled between 1,800 and 2,600 km, and almost 7 percent (6 million tons) was hauled over 2,600 km.

These major long-haul traffic flows result principally from the imbalance between production and consumption of coal in the various regions and to a lesser extent from the need to provide coal of appropriate quality to the various parts of the country. With the exception of about 6 million tons originated in the Pechora fields of Region Ib (North) and destined to Region Ia (Northwest) and Region VII (Central), almost all coal in long-haul traffic originated in the Kuzbas in Region IX (West Siberia) and the Karaganda area in Region Xa (Kazakhstan) and terminated in Region VIII (Urals) or in the areas to the west of the Urals. Of the 62 million tons of interregional traffic which move for less than 1,800 km, about half was Donbas coal from Region III (South) and Region IV (Southeast) moving to Region VII or Region VI (Volga), one-eighth was Karaganda coal for the Urals, one-eighth was Polish coal for the western USSR, and the remainder consisted of widely scattered minor shipments.

* Following p. 2, above.
** Table 2 follows on p. 8.
*** Table 3 follows on p. 9.

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Table 2
Origin and Termination of Interregional Coal Traffic by Rail in the USSR a/
1953

Economic Region or Country of Destination	Economic Region or Country of Origin												Million Metric Tons				
	Ia	Ib	IIa	IIb	III and IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII	Poland	Communist China	Total Receipts
Ia (Northwest)	6.00				2.00		0.45								1.50		9.95
Ib (North)					1.10		0.80								2.10		4.00
IIa (Baltic)					1.00		1.02								2.00		4.02
IIb (Belorussia)							1.15								1.80		2.95
III (South)																	3.30
IV (Southeast)																	15.49
V (Transcaucasus)																	22.22
VI (Volga)							0.69	2.60		4.00	3.30				0.50		22.14
VII (Central)		1.27								13.64	2.00						2.40
VIII (Urals)											8.10		0.40				3.57
IX (West Siberia)												1.07					0.80
Xa (Kazakhstan)													0.40				0.33
Xb (Central Asia)																	0.82
XI (East Siberia)																	0.14
XII (Far East)																	0.90
Japan																	
Central and Western Europe																	
Total shipments	7.27				31.85		4.11	2.60	20.14	14.00	1.07	3.26	0.32	7.90	0.50	23.03	

a. See Appendix A, Methodology.

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Table 3

Distances of Selected Coal Traffic by Rail in the USSR a/
1953

From		To		Distance (Kilometers)
Economic Region	Coal Basin	Economic Region	City	
Ib (North)	Pechora	Ia (Northwest)	Kotlas	1,100
Ib (North)	Pechora	VII (Central)	Kirov	1,479
Ib (North)	Pechora	VII (Central)	Gor'kiy	1,936
Ib (North)	Pechora	Ia (Northwest)	Leningrad	2,288
Ib (North)	Pechora	Ia (Northwest)	Vologda	1,738
III (South)	Donbas	III (South)	Dnepropetrovsk	315
III (South)	Donbas	Ia (Northwest)	Leningrad	1,633
IV (Southeast)	Donbas	VII (Central)	Gor'kiy	1,385
IV (Southeast)	Donbas	VI (Volga)	Kazan'	1,629
III (South)	Donbas	VII (Central)	Moscow	1,034
III (South)	Donbas	III (South)	Kiev	695
VIII (Urals)	Urals	VIII (Urals)	Molotov	244
VIII (Urals)	Urals	VII (Central)	Moscow	1,672
VIII (Urals)	Urals	VIII (Urals)	Magnitogorsk	1,153
VIII (Urals)	Urals	VIII (Urals)	Sverdlovsk	436
VII (Central)	Moscow	VII (Central)	Moscow	236
VII (Central)	Moscow	VII (Central)	Gor'kiy	661

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Table 3

Distances of Selected Coal Traffic by Rail in the USSR
1953
(Continued)

From			To			Distance (Kilometers)
Economic Region	Coal Basin	City	Economic Region	City		
IX (West Siberia)	Kuzbas	Prokop'yevsk	VIII (Urals)	Sverdlovsk	1,956	
IX (West Siberia)	Kuzbas	Prokop'yevsk	VIII (Urals)	Magnitogorsk	2,248	
IX (West Siberia)	Kuzbas	Stalinsk	VIII (Urals)	Sverdlovsk	1,973	
IX (West Siberia)	Kuzbas	Stalinsk	VIII (Urals)	Magnitogorsk	2,289	
IX (West Siberia)	Kuzbas	Stalinsk	VI (Volga)	Kuybyshev	2,878	
IX (West Siberia)	Kuzbas	Stalinsk	VII (Central)	Moscow	3,792	
IX (West Siberia)	Kuzbas	Stalinsk	VI (Volga)	Kazan'	2,838	
IX (West Siberia)	Kuzbas	Stalinsk	VII (Central)	Gor'kiy	3,281	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VIII (Urals)	Magnitogorsk	1,200	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VIII (Urals)	Chelyabinsk	1,311	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VIII (Urals)	Sverdlovsk	1,360	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VI (Volga)	Kuybyshev	2,315	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VI (Volga)	Kazan'	2,224	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VII (Central)	Gor'kiy	2,732	
X (Kazakhstan and Central Asia)	Karaganda	Karaganda	VII (Central)	Moscow	3,211	
VIII (Urals)	Siberia	Cheremkhovo	XI (East Siberia)	Chita	1,182	
VIII (Urals)	Siberia	Cheremkhovo	XII (Far East)	Skovorodino	2,290	

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B. Intraregional Traffic.*

Of the 226 million tons of coal in intraregional hauls during 1953, Regions III (South) (the Ukraine and Moldavia) and IV (Southeast) -- which for convenience in presentation are regarded as one unit -- had more than 85 million tons, or about 38 percent of the total. Regions VIII (Urals), with 38 million tons, and VII (Central), with 31 million tons, had about 17 and 14 percent, respectively, of the total. Region IX (West Siberia), with over 23 million tons (10 percent), and Regions XI (East Siberia) and XII (Far East), with about 15 million tons each (7 percent), also have large intraregional coal shipments. Three of the remaining 5 of the 15 regions -- Regions IIa (Baltic), IIb (Belorussia), and VI (Volga) -- have no appreciable intraregional traffic in coal and are dependent on shipments from other regions. Regions Ia (Northwest) and V (Transcaucasus) have some coal production and accordingly some intraregional traffic but are primarily dependent on coal shipments arriving from other regions.

C. Interregional Traffic.*

All of the regions of the USSR** both exported and imported coal to and from other regions or in foreign trade, with the exception of Regions Ia (Northwest), Ib (North), IIa (Baltic), IIb (Belorussia), V (Transcaucasus), and VI (Volga). Region VII (Central) and Region VIII (Urals) are large importers of coal, with about 22 million tons each. Region VI and Region Ia are also important importers of coal, with about 15.5 and 10 million tons, respectively. The other regions import small amounts ranging from 4 million to a few hundred thousand tons.

Regions III (South) and IV (Southeast) are the principal regional exporters of coal, with a combined total of about 32 million tons, followed by Region IX (West Siberia) with approximately 20 million and Region Xa (Kazakhstan) with 14 million tons. Region Ib exports about 7 million tons, and the 5 other exporting regions ship small amounts ranging from 4 million to a few hundred thousand tons.

* See Table 1, p. 6, above. See also Figure 4, following p. 6, above.
** Data on coal traffic, by region, are presented in Tables 1 and 2, pp. 6 and 8, respectively, above. See also Figure 2, following p. 2, above.

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Foreign trade in coal during 1953 amounted to slightly less than 10 million tons, which for the purpose of traffic analysis is included in the 93 million tons of interregional hauls. Imports from Poland and Communist China were 8.4 million tons, and exports to Japan and to Central and Western Europe were 1.04 million tons.

III. Significance of Coal Traffic.

The USSR depends on coal for an estimated 65 percent of its energy 6/ and is expanding coal production at such a rate as to make it certain that coal will be the main supplier of energy for some time to come. 7/ The country has very large coal resources, but except in the Donbas the better quality deposits and the largest supplies are generally distant from the main centers of population and industry. This situation, plus the need to blend different types of coal for most efficient consumption, has made it necessary to move large tonnages of coal for long average distances. Because of the poor geographic location of waterways in relation to needed coal movements and because of shipment delays caused by ice or low water, about 95 percent of the coal movement (as measured in ton-kilometers) is by rail. Waterways and trucks divide the remainder, but the latter, in practice, still are confined to short hauls from mines. Local cartage (distribution from railheads to local consumers) is not considered in this report.

Soviet coal traffic is dominated by the fact that most industry and most coal consumption are concentrated in the sector stretching from Leningrad southeast to Moscow and then east through the Volga basin to the central and southern Urals, but most coal production is well outside this major industrial zone. 8/ Furthermore, the coal produced in the Moscow basin and the Urals is of low quality, not suitable for metallurgical coke and generally of low calorific value. 9/

This situation causes certain major long-distance movements, as follows: (1) from the Donbas north and northeast to Region VII (Central) and Region VI (Volga); (2) from the Kuzbas west to the Urals, with large and increasing tonnages going even farther west to Moscow and vicinity; (3) from Karaganda northwest to the Urals, the Volga, and Region VII; and (4) from Pechora southwest to Leningrad and the northern industrial centers. 10/ Donbas production has been inadequate in recent years to meet the needs of the Ukraine and simultaneously to furnish all the coal required in

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neighboring regions. 11/* Long-haul shipments therefore have had to be increased from the Kuzbas, Karaganda, and Pechora. These shipments, although still relatively small in total tonnage compared with that of all the coal shipped, are quite important in ton-kilometers and impose an appreciable burden on the rail system. They cause the average length of rail haul for coal (686 km in 1955) 12/ to be greater in the USSR than in any other country and about 40 percent above the apparent US average. This has been a matter for much concern in Soviet administrative circles and has caused drastic steps to be taken in the effort to increase coal output in the Ukraine.

The importance of reducing the average length of haul for coal, or of finding substitutes for it, is shown by the fact that in 1953 coal made up 30 percent of the tons-originated on Soviet rail lines and 28 percent of the total ton-kilometers of haul performed. Coal was much the largest item handled. The relative share of coal in total rail traffic was about the same in 1954 and 1955 as in 1953. 13/ In spite of efforts which are being made to reduce the transport burden by increasing production in the coalfields of European USSR, by shifting railroads from coal-burning locomotives to diesel and electric traction, by using more oil and gas, and by developing hydroelectric power, it seems likely that in 1960, coal still will be about as great a proportional burden to the rail lines as it was in 1953. Judging from recent performance and Soviet announcements of plans for 1960, 14/ it is believed that the actual volume of coal traffic by rail will increase about 80 percent in tons and 70 to 75 percent in ton-kilometers by 1960 above that in 1953. The rail movement of coal should at least keep pace with the scheduled increase for all rail traffic combined.

The USSR has planned a reduction in the average length of haul for coal to 635 km in 1960, 15/ but the figure may be slightly optimistic and may have been issued to spur Soviet planners and managers to greater efforts. Because of the failure of similar long-range traffic plans in the past, it is believed that a figure of about 650 km for 1960 is more likely. Some of the considerations behind this assessment follow.

* See pp. 34 and 36, below.

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First, the expansion of coal production in fields near consumers is counterbalanced by other factors which tend to keep hauls long. It appears certain that total coal production in European USSR will expand in 1953-60, but Donbas production probably will not expand at as fast a rate. The Donbas has, in general, smaller seams, more difficult mining conditions, and higher costs than are found in the Kuzbas and Kazakhstan fields, and expansion per unit of output should be less costly in these other coalfields than in Donbas. Moscow basin lignite output may increase at a rate slightly greater than the national average, but any shortening of the average length of haul brought about by its use would be counterbalanced by the increased length of haul caused by a larger differential demand for the much better quality Pechora output, which will be needed in quantity by the new Cherepovets Steel Works. Similarly, increases in local coal output in the Urals can be expected to be counterbalanced by increased local demand, so that Urals industry must still import coal from the Kuzbas and Kazakhstan. A slight reduction in average length of haul is to be expected, however, from rail construction now taking place. This will reduce distances from the Kuzbas to the Urals by 5 to 10 percent.

Second, although the plan to shift rail traction from the 1955 figure of about 14 percent of traffic handled by diesel and electric locomotives 16/ to a 1960 goal of about 45 percent 17/ is likely to be carried out and would be very important in freeing more power coal for industry, it should have little effect on the average length of haul. The railroads used in 1953 an estimated 26 percent of all coal produced, 18/* and by 1960 this should be reduced to about 19 percent. But coal not used by the railroads is merely diverted to other purposes -- it is still shipped -- and the only distance saving likely is the difference between the average length of haul for coal now used on particular locomotive runs and the average length of haul for such released coal sent to industrial consumers. Kuzbas coal now being diverted from use on the Omsk Railroad probably will go a much greater distance to industrial consumers in the Urals, and Donbas coal to be released may also have a greater length of haul. Karaganda coal so diverted may move a shorter average distance. The net result in average distance moved and in rail ton-kilometers probably is a standoff. The shift away from steam locomotives is exceedingly important from the point of view of industrial development, however, because the saving of coal is almost equal to the average annual increase in coal output. That is, shifting the Soviet railroads to 45-percent diesel and electric traction could step up the

* See p. 34, below.

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tempo of Soviet industrial development by nearly 1 year. This is probably an important reason for the dieselization and electrification program.

Third, the development of oil and gas production and the increase in power output from hydroelectric stations do not appreciably affect the average length of haul for coal, although they are of great significance for industrial development. The demand for coal now exceeds the supply and should continue to do so for some years; so a shift locally to oil or another energy source merely means the diversion of coal to another customer. An eventual reduction in average haul is to be expected, however, from the development of power-line grids, which utilize coal burned at the mines as a source of power.

Fourth, 20 percent of the cost of coal to the Soviet consumer at present is made up of freight charges. ^{19/} Because coal is often carried at charges below the cost of hauling, ^{20/} transport is an even more important factor than coal in Soviet economic planning. This may help explain the effort to build up industry near the coalfields of Siberia and Kazakhstan. ^{21/} It is only in this way that the average length of haul for coal can be brought down eventually to near the level of the US, in which the average annual length of coal haul is 490 km compared with 686 km (1955) in the USSR.*

Regardless of efforts to cut down the average length of haul of coal, the USSR still faces the almost insurmountable problem of supplying the right grade of coal where needed. It is at this point that the Soviet transport system is likely to be continually vulnerable for the foreseeable future. For instance, the metallurgical works in the Urals require millions of tons of coke. Almost all is made from coal brought in from the Kuzbas or Karaganda, because local coal is not of suitable quality. Movement depends entirely on continued operation of two railroads. Similarly, the new Cherepovets Steel Works near Leningrad will be dependent on long-distance movement of Pechora coal for its coke. Because the

* The US is more an oil-using than a coal-using nation and moves oil mainly by pipeline or tanker rather than by rail. The ton-kilometer cost for pipeline or tanker movement is much lower than for rail carriage.

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local coal supply of Moscow is inadequate in quantity and poor in quality, it must be supplemented by millions of tons brought in from the Kuzbas to the east, from the Donbas to the south, from Poland to the west, and from Pechora to the northeast. The movements involve tremendous distances of coal haul and cause great economic loss. The major receipt, from the Donbas, moves 1,100 km; and the second largest, from the Kuzbas, moves about 3,800 km. This is as though Washington, D.C., got much of its coal from Central Florida and from beyond the Rocky Mountains, with some coming from mines on Hudson Bay.

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APPENDIX A

METHODOLOGY

Problem 1: Estimating Total Coal Traffic by Rail.

Total coal traffic by rail in the USSR during 1953 is estimated at about 336 million tons, including some double-counting of tonnage handled twice by the rail lines between the mines and the consumer. There was an average length of haul of slightly more than 662 km and an estimated coal traffic of 222.6 billion ton-kilometers.

No absolute figures for coal traffic by rail during 1953 have been announced by the USSR. Coal traffic statistics for this year, therefore, must be estimated on the basis of Soviet statements and their relationship to known data.

In April and May 1954, Kaganovich, the member of the Politburo in general charge of transport, made two major speeches dealing with 1953 rail traffic and with plans for future transport development. 22/ These speeches give data that are helpful in studying the movement of coal and are consistent with other sources (see Problem 2*). Kaganovich stated that in 1953, coal made up 30 percent of all rail loadings and 28 percent of all rail traffic. Both figures appear in the same statement, indicating that rail loadings and rail traffic apparently are not the same. The average length of haul for coal in the USSR is known to be about 8 to 10 percent less than the average for all commodities. 23/ The larger percentage, therefore, should be tons-originated, and the 28 percent should be the proportion that ton-kilometers of coal traffic bear to total ton-kilometers for all rail traffic for 1953. Neither can be carloadings, because coal is stated elsewhere to comprise "more than one-fifth" of all railroad carloadings. 24/

Applying 28 percent to the total Soviet rail traffic figure of about 795 billion tariff ton-kilometers for 1953 25/ gives a coal traffic estimate of 222.6 billion tariff ton-kilometers. If this figure is divided by 662 km, the average length of haul for coal in 1952 26/ (which is estimated on the basis of Soviet statements to have remained about the same in 1953), a total is obtained of 336 million tons of coal originated on the railroads in 1953.

* P. 18, below.

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This figure if taken at face value definitely indicates some double-counting of coal traffic because it is about 6 percent in excess of calculated mine shipments plus imports (see Tables 1 and 2*). Some double-counting certainly takes place, for it is known that at times coal is hauled from a mine to a storage area and later picked up again for dispatch to a consumer. Railroad statistics would count this as two separate originations. Rail-water-rail movements would also result in the same coal being counted twice in rail totals. Such traffic is found on the Black Sea as well as on the Amur and Volga Rivers. 27/

The 336-million-ton figure and the 662-km average length of haul for 1953 are both uncertain; however, the former probably is slightly too high and the latter slightly too low. To satisfy the requirement that coal be 28 percent of total 1953 ton-kilometers and 30 percent of tons-originated, with the 662-km length of haul, it must be assumed that both percentages given by Kaganovich are rounded and that the 28 percent is actually a little high and the 30 percent a little low -- or, alternatively, that the average length of haul in 1953 increased somewhat over 1952. At this time it cannot be determined where the possible error lies, or its magnitude, and the figures will therefore be used as derived.

Problem 2: Estimating Interregional and Intraregional Coal Traffic.

Interregional coal traffic is estimated at 93 million tons and intraregional coal traffic at 226 million tons, after eliminating double-counting resulting from distribution and redistribution and from traffic interchanges between rail, highway, and water transport. The basis for the estimates of the total interregional flow, the flow between regions and foreign countries, and the intraregional flow included in Tables 1 and 2 is given below.

a. Long-Haul Traffic.

The statistically derived figures of 336 million tons-originated and 222.6 billion ton-kilometers may be used to determine the absolute volume of certain major coal movements (see Table 2). Kaganovich stated that 7.1 percent of the rail movement of coal was more than 2,600 km and that 30 percent was more than 1,800 km. 28/ These percentages cannot have been given in terms of total tons moved, because

* Pp. 6 and 8, respectively, above.

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this would imply that about 25 million tons were hauled more than 2,600 km, and 101 million tons were hauled more than 1,800 km. As will be shown below, the only coal moving in major quantity for more than 2,600 km is a part of the Kuzbas and Karaganda coal, and these fields also supply the great bulk of the coal moving from 1,800 to 2,600 km. To deal with the latter first, the 101 million tons are nearly twice the total 1953 output for the Kuzbas and Karaganda, and a 25-million-ton movement of more than 2,600 km does not agree with Kaganovich's complaint that unnecessary and long-distance hauls of coal amounted to 13 million tons. ^{29/} The percentages must therefore apply to ton-kilometers of coal traffic rather than to tons.

Multiplication of the 222.6 billion ton-kilometers derived (the total Soviet rail traffic in coal) by 7.1 percent then yields 15.8 billion ton-kilometers of coal movement in excess of 2,600 km for 1953, and multiplication by 30 percent and subtraction from the product of the total moved over 2,600 km yields 51 billion ton-kilometers as the coal traffic moving between 1,800 and 2,600 km. Firm estimates of tonnage movements may be calculated from these figures.

Table 3* showing distances for movements from various coal sources to typical known destinations outside the local fields, indicates that for normal movements only Kuzbas and Karaganda coal goes to destinations more than 2,600 km distant. Kuzbas coal to any destination west of the Urals falls into the "more than 2,600-km" category, but Karaganda coal falls into this category only for destinations beyond Region VI (Volga). Some Karaganda coal for the nearer parts of Region VII (Central) may move slightly less than 2,600 km.

Using an arbitrary figure of 2,700 km as the average distance for coal moving in long-haul traffic and dividing 15.8 billion ton-kilometers by this figure gives a total of about 5.9 million tons of coal in such traffic. Similarly, using 2,200 km, the midpoint of the 1,800-to-2,600-km range, as divisor and 51 billion ton-kilometers as dividend, a total of about 23.2 million tons moving in medium-long hauls is derived. A slightly lower average distance of 2,100 km would give a total of 24.3 million tons for such traffic. These figures seem reasonable maximum and minimum limits.

* P. 9, above.

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As stated, the 5.9 million tons are probably nearly all Kuzbas and Karaganda coal, but the medium long-haul traffic can also embrace Pechora coal and a small amount from Cheremkhovo and a few minor fields. From statements concerning the distribution of Pechora coal 30/* as applied to 1953 production data, about 6 million tons of Pechora coal can be safely allocated to medium long-haul traffic (largely to the Leningrad area). Cheremkhovo and other minor coals moving in medium-long hauls east on the Trans-Siberian Railroad are rather definitely known to amount to no more than 700,000 tons. 31/* It follows that at least 16.5 million tons of Kuzbas and neighboring coals or of Karaganda coal moved in medium long-haul traffic in 1953, with the possibility that the tonnage may have been as high as 17.6 million tons if the average length of haul was 2,100 rather than 2,200 km.

This was allocated between the Kuzbas, neighboring minor fields, and Karaganda on the basis of 1952 traffic data 32** and particularly of a statement that about one-third of the Karaganda coal was used in the Karaganda area in 1952.*** (For 1951-52 traffic, see Problem 5.****) Considering the appreciable increase in Karaganda coal output in 1953, without a proportionate increase in local demand, it might be proper to estimate local use as 31 percent of the 1953 Karaganda production total. This would give about 14 million tons transported out of the producing region, with nearly all of it moving to the Urals and beyond. But more than half of this amount probably would stop in the Urals and be hauled less than 1,800 km, since half of Karaganda production in 1952 was consumed in the Urals. 33/ This would imply that about 9 million tons were shipped to Urals consumers that year. In view of the larger supplies of Kuzbas coal available for 1953 and the greater demand for coal in Regions VI (Volga) and VII (Central), the coal export of Karaganda to the Urals was probably cut to 8.1 million tons.

The amount of coal sent to Regions VI and VII from Karaganda probably was increased substantially in 1953, for reasons of economy in transport. The actual 1953 movement cannot be derived by analogy from available data for previous years, but nevertheless can be approximated

* See p. 36, below.

** See pp. 34-35, below.

*** Possibly 1951, but believed to be 1952 because of the ratio mentioned of 1940 to "present" output.

**** See p. 34, below.

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by indirect methods. Table 4* shows the estimated shipments of coal by rail to selected cities in the USSR in 1953. The distances in this table indicate that Karaganda coal has a decisive advantage in length of haul for almost all parts of Region VI and a lesser one for Region VII and for the northern part of Region VIII (Urals). The distance advantage reaches a maximum for the southern part of Region VIII. It seems likely, therefore, that with a demand for coal greater than the supply, and with a known shortage of coal cars, the routing of coal would have been arranged to give minimum average lengths of haul, to the degree that requirements for special-quality coal would allow.

Under such conditions, nearly all coal from the eastern regions needed for Region VI would be expected to come from Karaganda, as well as fuel coal for the southern Urals. Fuel coal from the Kuzbas would go to the northern Urals and Region VII, with only such Karaganda coal to these two areas as could be spared. In support of this contention there is the condition that not more than 5.9 million tons of Kuzbas and Karaganda coal can have moved more than 2,600 km and that only 16.5 million to 17 million tons probably can have moved from 1,800 to 2,600 km. The allocation of 4 million tons of Kuzbas coal and 2 million tons of Karaganda coal to Region VII satisfies the requirement for 5.9 million tons moving over 2,600 km because a small part of the Karaganda total to Region VII will move less than this distance. Allocations of 14.04 million tons of Kuzbas coal and other Siberian coal to Region VIII, plus 3.3 million tons of Karaganda coal to Region VI, with the estimated 100,000 tons of Karaganda coal to Region VII that was moved less than 2,600 km gives a total of 17.44 million tons that would move between 1,800 and 2,600 km. Small amounts hauled excessive distances on the Turk-Sib line would bring the total for the USSR to about 17.5 million tons. The tonnages satisfy calculated Kuzbas and Karaganda shipment surpluses, if allowances are made for Karaganda shipments to the South Urals; a small amount to Region Xb (Central Asia); and minor Kuzbas deliveries to Region Xa (Kazakhstan), which are known to have taken place. Such an allocation satisfies both computed shipments from the coalfields and the conditions posed by the Kaganovich statements regarding percentages sent from the various fields for distances of 1,800 to 2,600 km and for more than 2,600 km.

Furthermore, shipments of 6 million tons of Kuzbas and Karaganda coal to Region VII and 3.3 million tons to Region VI total 9.3 million tons, which can be compared with the Kaganovich statement about these

* Table 4 follows on p. 22.

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Table 4

Estimated Shipments of Coal by Rail to Selected Cities in the USSR a/
1953

<u>Economic Region</u>	<u>City</u>	<u>Receipts</u> <u>(Million Metric Tons)</u>
Ia (Northwest)	Leningrad	6.5
III (South)	Zaporozh'ye	3.5
	Dneprodzerzhinsk	3.8
	Zhdanov	3.6
	Krivoy Rog	3.0
	Khar'kov	3.0
	Rostov	3.0
	Girlovka	2.5
	Stalino	3.0
	Makeyevka	3.0
	Voroshilovsk	2.8
	Kadiyevka	2.5
	Yenakiyevo	2.5
	Dnepropetrovsk	2.0
	Kiev	1.8
	Odessa	1.5
	Zuyevka	1.3
Voroshilovgrad	1.0	
Uspenka	1.0	
Roya	1.0	
VI (Volga)	Stalingrad	2.0
	Kuybyshev	1.0
	Saratov	1.0
	Kazan'	1.5
VII (Central)	Moscow	20.0
	Gor'kiy	3.5
	Stalinogorsk	3.0

a. See Problem 8, p. 39, below.

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Table 4

Estimated Shipments of Coal by Rail to Selected Cities in the USSR
1953
(Continued)

<u>Economic Region</u>	<u>City</u>	<u>Receipts (Million Metric Tons)</u>
VII (Central) (Continued)	Aleksin	1.5
	Kashira	1.8
	Ivanovo	1.0
VIII (Urals)	Magnitogorsk	8.0
	Chelyabinsk (and vicinity)	7.0
	Nizhniy Tagil (and vicinity)	5.5
	Sverdlovsk	3.0
	Krasnogorskiy	2.5
	Nizhnyaya Tura	2.5
	Molotov	1.5
	Gubakha	1.5
	Orsk	1.0
IX (West Siberia)	Stalinsk	6.2
	Kemerovo	4.8
	Prokop'yevsk	1.1
	Osinniki	1.0
	Novosibirsk	3.5
	Omsk	2.0
	Barnaul	1.5
	Tomsk	1.25
XI (East Siberia)	Krasnoyarsk	3.0
	Irkutsk	2.6
	Chita	1.5
	Petrovsk-Zabaykal'skiy	1.3
XII (Far East)	Komsomol'sk	2.5
	Khabarovsk	2.0
	Vladivostok	2.8

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two coals being transported "in quantities up to 10 million tons, as far as Moscow, where it was never transported in the past." ^{34/} Kaganovich does not mean that the total went to Moscow but that some got that far. He does not use the words "to Moscow," but "as far as Moscow." The burden of his complaint is that Kuzbas and Karaganda coals are being moved into regions that are nearer the Donbas and Moscow coalfields, because nearer fields are not producing enough coal to meet the demand. If his argument is taken literally and lines of equidistance from Karaganda and Donbas are drawn, it is apparent that part of the western Urals also falls in the Donbas sphere. Kaganovich, therefore, may have been counting in his "up to 10 million" total the Karaganda coal delivered to the Ufa region, which is administratively in the Urals though physically west of them. This would make his statement and this computation agree almost exactly.

Additional cross-check is also possible. One-fourth of the Kizel coal from the Urals moves west to Region VII, and Kaganovich complained that this traffic should not exist. Adding, therefore, 2.6 million tons of Kizel coal to the minimum 9.3 million tons of Kuzbas and Karaganda coal movement complained of as going beyond the Urals, and estimating from consumption data and a Kaganovich statement about the cost in rubles of crosshauling coal on the Turk-Sib Railroad ^{35/} that the crosshauling of Central Asian, Kuzbas, and Karaganda coal may amount to 500,000 to 1 million tons, a total of "unnecessary and long-distance conveyance of coal" is derived of 12.4 million to more than 12.9 million tons. This compares well with Kaganovich's statement that, for the whole USSR, such movements amount to "over 13 million tons."

A satisfactory verification of the above calculations has been obtained from a recent speech of Bulganin, ^{36/} who states that "the lagging behind of coal extraction in the European part of the USSR as compared with coal consumption in this part of the country leads to the necessity of carrying coal over enormous distances." Bulganin continues, "thus in 1954 over 11 million tons of Kuznetsk and Karaganda coal were transported to areas west of the Urals." In view of the increased coal consumption in 1954, this compares well with a computed movement of Kuzbas and Karaganda coal to the same area of a little less than 10 million tons for 1953.

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b. Short-Haul Traffic.

The broad outline of Kuzbas, Karaganda, and Pechora long-haul coal movements having been determined, there remains the allocation of the residual short-haul and medium-haul coal movements to local industry. This amounts to approximately 282 million tons. The general pattern of this movement may be found in Tables 1 and 2.*

For Kuzbas coal a somewhat more detailed regional allocation based on commodity analysis gives an estimated 7 million tons of coal used in the coalfield itself for coke; 9 million tons used there for electric power, coal production, railroads, and the like; and 11 million tons used outside the actual coalfield but still within Region IX (West Siberia) for railroad consumption or for power and industry in various cities. The largest centers of coal use in the field are Stalinsk, which is estimated to consume about 6.2 million tons; Kemerovo, about 4.8 million tons; Prokop'yevsk, 1.1 million tons; and Osinniki, 1 million tons. Novosibirsk is the largest consumer in Region IX outside the coalfield and is estimated to receive about 3.5 million tons. The estimated consumption for other cities is as follows: Omsk, 2 million tons; Barnaul, 1.5 million tons; and Tomsk, 1.25 million tons. The above figures include movement and consumption of both local coal and that imported from Region XI (East Siberia) and are approximations made after considering the size and nature of local industries, size of power plants, population, and the like, plus the statements from Soviet technical articles given in Problem 5.** The calculations used in making these and the following estimates are shown in Problem 8.***

Karaganda coal has no major centers of local consumption. There is relatively minor use in the Karaganda field for coal. Mining and industry there are estimated to use 1.5 million tons; some is used at the important Balkhash copper center and some at the small steel center of Temir-Tau.**** Most Karaganda coal consumed locally goes to the railroads for moving other coal long distances to market, although important tonnages began to move to consumers in south Kazakstan over the new Mointy-Chu Railroad late in 1953.

* Pp. 6 and 8, respectively, above.

** P. 34, below.

*** P. 39, below.

**** This plant is slated for major expansion in the next few years.

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For the remaining sources of coal, only a general pattern of movement can be given, based on data in this appendix and in Table 5,* which shows the estimated consumption of coal in the USSR, by region and by type of use, in 1953. The movement of coal to Urals consumers is estimated to be approximately 61.5 million tons. Of this, Magnitogorsk may receive up to 8 million tons; Chelyabinsk, about 4.5 million tons; another 2.5 million tons in plants of the surrounding area; Nizhniy Tagil and its vicinity, about 5.5 million tons; Sverdlovsk, 3 million tons; Krasnogorsk, 2.5 million tons; Nizhnyaya Tura, 2.5 million tons; Molotov, 1.5 million tons; Gubakha, 1.5 million tons; and Orsk, 1 million tons. A number of lesser consuming centers exist.

In Region VII (Central), Moscow may receive 20 million tons (mainly lignite); Gor'kiy, 3.5 million tons; Stalinogorsk, 3 million tons; Aleksin, 1.5 million tons; Kashira, 1.8 million tons; and Ivanovo, 1 million tons. Leningrad is the only major center of coal consumption in Region Ia (Northwest) and is tentatively estimated to require 6.5 million tons.

In the central and lower Volga area, Stalingrad is estimated to receive about 2 million tons; Kuybyshev, 1 million tons; Saratov, 1 million tons; and Kazan', 1.5 million tons. About 45 percent of the coal brought in seems to go to rail use, rather than to local cities for industry.

Important centers of coal consumption abound in the Donets area, but there are none that are conspicuously larger than others. There are probably 13 cities that receive more than 2 million tons of coal, and not one of these is estimated to use as much as 4 million tons. Coal traffic to major centers, based mainly on use in coke plants and steelworks, is estimated to have been as follows: Zaporozh'ye, 3.5 million tons; Dneprodzerzhinsk, 3.8 million tons; Rostov, 3 million tons; Gorlovka, 2.5 million tons; Stalino, 3 million tons; Makeyevka, 3 million tons; Voroshilovsk, 2.8 million tons; Kadiyevka, 2.5 million tons; Yenakiyev, 2.5 million tons; and Dnepropetrovsk, 2 million tons.

Other Region III (South, or Ukraine) centers of coal consumption of major importance are as follows: Kiev, 1.8 million tons; Odessa, 1.5 million tons; Zuyevka, 1.3 million tons; Voroshilovgrad, 1 million tons; Uspenka, 1 million tons; and Roya, 1 million tons.

* Table 5 follows on p. 27.

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Table 5
Estimated Consumption of Coal in the USSR, by Region and by Type of Use
1953

Economic Region	1951 Population (Millions)	1951 Labor Force in Industry (Millions)	Used at Mines in Coal Production	Used in Metallurgy		Used for Cement, Brick, and Tile	Used for Electric Power a/ b/	Used in Public Buildings, Factories, and General Industry b/		Used in Transport		Total Consumption
				For Heat	For Coke and Power			Railroads	Other Shipping	For Household Use		
Ia (Northwest)	8.1	1.10		0.30	0.50	0.80	1.25	3.80	2.50	0.50	1.10	10.75
Ib (North)	3.1	0.10	0.30		0.10	0.13	0.20	0.40	2.50	0.30	0.30	4.23
IIa (Baltic)	6.8	0.32			0.10	0.40	0.30	1.30	1.00	0.20	0.70	4.00
IIb (Belorussia)	7.7	0.29				0.57	0.35	1.30	1.10		0.70	4.02
III (South)	45.9	2.90	2.00	29.30	7.50	3.21	7.50	11.75	16.50	0.20	4.00	81.96
IV (Southeast)	9.6	0.47	0.40		0.50	0.89	1.20	1.75	2.80	0.10	1.10	8.74
V (Transcaucasus)	8.1	0.31	0.19	0.20	0.50	0.80	1.16	1.75	0.40		0.70	5.70
VI (Volga)	11.1	0.56			0.80	0.99	3.60	1.90	7.00	0.10	1.10	15.49
VII (Central)	16.7	4.30	1.40	0.40	1.30	3.77	11.00	18.20	13.00	0.10	5.49	54.66
VIII (Urals)	13.8	1.60	1.40	14.80	7.30	1.29	16.95	9.20	8.70	0.10	1.90	61.54
IX (West Siberia)	11.0	0.80	1.30	7.00	1.60	0.73	2.60	2.70	9.80	0.10	1.30	27.13
Xa (Kazakhstan)	6.8	0.30	0.80		1.10	0.37	2.50	1.00	4.90		0.80	11.47
Xb (Central Asia)	10.4	0.35	0.15		0.20	0.58	1.73	0.50	1.20		0.60	5.13
XI (East Siberia)	5.9	0.35	0.50		0.80	0.58	1.60	4.05	8.00	0.10	1.00	16.03
XII (Far East)	4.5	0.19	0.50	0.20	0.80	0.89	3.00	2.99	6.00	0.50	1.55	16.43
Total	203.8	13.90	8.94	52.20	22.45	16.22	54.94	62.59	85.40	2.20	22.34	327.28

a. This is the estimated amount of coal used by powerplants of the Ministry of Electric Power Stations, making allowance for possible use of peat, wood, and petroleum in particular areas. Much electricity is made in plants belonging to other ministries, and coal for such plants appears under the other headings.
 b. The figures here are a residual after subtracting calculated consumption under the other headings. Soviet sources state that 6 percent of the coal used goes to heavy industry and 6 percent to light industry. ^{3/} Factories therefore might require about 40 million tons, leaving about 22 million tons for heating public buildings and stores, for agriculture, for military and naval use, for atomic energy, for increase of stockpiles, for storage and transit losses, and so on.

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In central Siberia and Region XII (Far East) the major consuming centers are as follows: Krasnoyarsk, 3 million tons; Irkutsk, 2.6 million tons; Chita, 1.5 million tons; Petrovsk-Zabaykal'skiy, 1.3 million tons; Komsomol'sk, 2.5 million tons; Khabarovsk, 2 million tons; and Vladivostok, 2.8 million tons.

The above figures in most cases represent rough estimates of coal shipments for local consumption, and the accuracy of the figures for cities is considerably lower than that for regions. Movements to local centers, however, are believed to be of about the right order of magnitude.

Problem 3: Estimating the Production of Coal.

The production of coal in the USSR for 1953 is estimated to be 320 million tons. ^{38/} Table 6* shows the estimated production of coal in the USSR by region, by producing area, and by type. These figures were computed on the basis of data in Soviet announcements and in technical articles, the reported output of fields, and reported production and shipments. For most fields, data are believed accurate within a few percent, and the national total so derived agrees with a Soviet statement of 1953 output. ^{39/}

In 1953 about 35 percent of the total production of coal in the USSR was from the Donbas in the Ukraine area, 14 percent from the Kuzbas in West Siberia, 13 percent from the Urals fields, 11 percent from the Moscow basin south of Moscow, 6 percent from Karaganda in Kazakhstan, and almost 4 percent from the Pechora area near the Arctic Coast. Most of the remainder was from numerous smaller fields in Siberia. There is little production in the west and northwest area of the USSR or in the Volga basin. By type of coal, about 30 percent of total output was lignite (brown coal) and the rest was bituminous or anthracite coal. Lignite comprised all the Moscow basin output and two-thirds of the Urals output.

Problem 4: Estimating the Consumption of Coal.

The estimated consumption of coal in the USSR in 1953 was about 327 million tons (see Table 5**). The excess of consumption over domestic supply was made good by imports from Poland and Communist***

* Table 6 follows on p. 29.

** P. 27, above.

*** Continued on p. 32.

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Table 6

Estimated Production of Coal in the USSR, by Producing Area and by Type a/*
1953

Economic Region	Producing Area	Hard Coal	Lignite	Thousand Metric Tons	
				Total by Field	Total by Region
Ia (Northwest)	Spitzbergen Leningrad	250	550	250 550	800
Ib (North)	Vorkuta Inta	10,100 1,400		10,100 1,400	11,500
III (South)	Donets	113,500 b/		113,500	
IV (Southeast)	Western Ukraine		5,750	5,750	
	Northern Caucasus	350		350	119,600
V (Transcaucasus)	Transcaucasus	2,300	125	2,425	2,425
VI (Volga)	Volga basin		25	25	25
VII (Central)	Moscow basin		36,600	36,600	36,600
VIII (Urals)	Kizel and Yegorshino	14,100		14,100	
	Karpinsk and Chelyabinsk		27,900	27,900	42,000
IX (West Siberia) *	Kuzbas	44,600		44,600	
	Novosibirsk		290	290	44,890

* Footnotes for Table 6 follow on p. 31.

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Table 6

Estimated Production of Coal in the USSR, by Producing Area and by Type a/
1953
(Continued)

<u>Economic Region</u>	<u>Producing Area</u>	<u>Hard Coal</u>	<u>Lignite</u>	<u>Thousand Metric Tons</u>	
				<u>Total by Field</u>	<u>Total by Region</u>
Xa (Kazakhstan)	Karaganda	15,400	4,800	20,200	21,900
	Lenger and other fields	125	1,575	1,700	
Xb (Central Asia)	Kirgiz SSR	855	1,325	2,180	5,360
	Uzbek SSR		2,400	2,400	
	Tadzhik SSR		725	725	
	Turkmen SSR		55	55	
XI (East Siberia)	Minusinsk	2,900		2,900	18,900
	Kansk		1,300	1,300	
	Cheremkhovo	9,250		9,250	
	Bukachacha	1,200		1,200	
	Chernovskiye Kopi		1,900	1,900	
	Other fields	1,090	1,260	2,350	
XII (Far East)	Raychikhinsk		5,500	5,500	2,565
	Suchan	1,300		1,300	
	Artem		2,565	2,565	

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Table 6

Estimated Production of Coal in the USSR, by Producing Area and by Type a/
1953
(Continued)

Economic Region	Producing Area	Hard Coal	Lignite	Thousand Metric Tons	
				Total by Field	Total by Region
XII (Far East) (Continued)	El'gen		1,450	1,450	
	Sakhalin	3,050		3,050	
	Other fields	885	1,250	2,135	16,000
Total USSR		<u>222,655</u>	<u>97,345</u>		<u>320,000</u>

a. 40/

b. The Donets coalfield cuts across the boundary between Regions III and IV. About 20 million tons of coal are produced in Region IV, the remainder in Region III.

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China, as in other postwar years. The Ukraine was the largest consumer, using nearly 82 million tons, closely followed by the Urals, using more than 61.5 million tons and by Region VII (Central), using more than 54.5 million tons. Region IX (West Siberia) used more than 27 million tons; Region XI (East Siberia), 16 million tons; and Region XII (Far East), about 16.5 million tons. Slightly below these came Region VI (Volga), using 15.5 million tons, and the remaining consumption was widely scattered.

Consumption by type of use was approximately as follows: coke, 52 million tons; metallurgical plants, 22.5 million tons; cement, brick, and tile, 16.2 million tons; electric power, 55 million tons; public buildings, factories, and general industry, 62.6 million tons; transport, 87.6 million tons; and household use, 22.3 million tons.

The figures in Table 5* showing the consumption of coal in 1953 come from varying sources and are of varying degrees of completeness and accuracy. The amount of coal used in transport was computed from traffic estimates and from Soviet official data on rail fuel use, and the figures are believed to be fairly accurate. The amount of coal used for cement, brick, and tile is believed to be reasonably accurate as to total but subject to possible minor revision as to allocation by region because data on the location and size of brick plants are incomplete. The amount of coal used for metallurgy is essentially that estimated to have been used by the steel industry. The figures are believed to be excellent as to coke and good as to fuel use. Rough estimates for the relatively small amounts of coal used by nonferrous metallurgy have been added to these totals, giving consideration to a report that 23 percent of the consumption of Soviet coal goes to metallurgy. ^{41/} The total allocation of coal for use at mines is an estimate made mainly on the basis of probable power requirements for coal production and is believed to be reasonable.

Coal for household use was estimated after examination of US consumption of coal for this use at about 7 percent of total consumption. The figure and its allocation by region (mainly according to population, but with consideration for local availability of fuelwood and peat, centralized city heating, local tightness of coal supply, and so on) can hardly be considered satisfactory, because it is not based on extensive research, but it is unlikely to be more than 50 percent too low or 10 percent too high. It is known that per capita use of coal for heating is low because families in the USSR have much smaller per

* P. 27, above.

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capita house space than those in the US. Because of the relatively small size of the item, even an error of 50 percent would have little effect on the regional pattern of coal flow.

Information on the location and size of the hundreds of small electric powerplants using coal in the USSR is very incomplete, as well as information on powerplants belonging to various industries in the USSR and not under the Ministry of Electric Power Stations. The consumption of coal by these and by plants fitted to burn several alternative fuels is also unknown. The totals given, both by region and in aggregate, are therefore only approximations of the amount consumed by the Ministry, and it seems certain that the actual consumption of coal in the generation of electric power is appreciably larger than shown.

Part of the coal shown as used for "public buildings, factories, and general industry" undoubtedly goes for generating electric power, and it may be desirable to consolidate this total with that for "electric power." This miscellaneous residual item is based mainly on the regional distribution of the labor force in industry, which is considered to correspond roughly to industrial output and to fuel demand. Modification was made for approximate regional proportions of heavy and light industry and also for use of peat, gas, and petroleum and for electric power from plants of the Ministry of Electric Power Stations.

This residual item, which includes a reported "6 percent of coal used in machine building and 6 percent used by light industry," 42/ or a total of almost 40 million tons, must also include allowance for any underestimates of coal for electric power. The residual also includes coal for heating public buildings and stores, for agriculture, for military and naval use, for atomic energy plants, and for increases in fuel stockpiles and losses in storage and transit.

Adjustment of the residual so that the total for Soviet consumption of coal equals the total for Soviet supply was made after subtotals by regions were roughly computed for the coal used in public buildings, factories, and general industry. The adjustment amounted to a reduction of only about 2 million tons and to a rearrangement of about the same magnitude to reflect smaller total consumption in the European USSR and larger consumption in Region XI (East Siberia) and Region XII (Far East) than had been estimated tentatively. This rearrangement rests on what seem to be firm data on total regional production and on

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imports and exports of coal. The actual allocation of coal by region, therefore, seems to be more accurate than the uncertainty of various single items indicates. The estimates in Table 5*, however, are preliminary and should be used only until more satisfactory data are assembled.

Problem 5: Comments on Source Material Dealing with Coal Traffic.

In any consideration of coal movements in the USSR during 1953, attention must be given to statements in three articles appearing in Ugol', the Soviet coal journal, in September 1954, 43/ about changes in the production and distribution of coal between 1940 and 1952, the proportions of coal going to various industries, and the coal supply for the Soviet railroads. Statements from these articles having a bearing on traffic flow are as follows:

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a. "Coal now from context, probably 1952 makes up 71 percent of the total fuel balance, and will be 72 percent in 1955." The context makes it clear that here the percentage is in standard fuel and not in actual tons. Standard fuel is an accounting concept used for equating various fuels according to their energy outputs. One ton of a good oil might, for example, be equal in energy output to one ton of standard fuel, but for a lignite, perhaps 3 tons weight might be no more than 1 ton when reckoned in terms of standard fuel. A table in Voprosy ekonomiki which deals with fuels in the USSR 44/ makes it clear that the Ugol' percentages exclude wood and hydroelectric power.

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b. "Of the present coal consumption, transportation takes 25-26 percent, metallurgy 23 percent, electric power 17 percent, machine building 6 percent, and light and food industry 6 percent." The distribution of the remaining 22 to 23 percent is not given, but a study of the transport and electric power items makes it fairly clear that the percentages given here are in terms of standard fuel and not actual tons used. The large production of lignite and other low-grade coal makes standard and actual fuel percentages quite different where an industry uses coal of a quality different from the national average.

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c. "The northern oblasts of RSFSR, the Ukrainian SSR, North Caucasus, Kazakhstan, West and East Siberia, which are responsible for 77 to 78 percent in standard fuel of coal output, consume only 51.5 percent of the total coal yield. The remaining regions produce

* P. 27, above.

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only 22-23 percent and consume about 48.5 percent." The enumerated regions include all the major coalfields except Moscow and the Urals, and the statement gives excellent clues as to consumption.

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d. "Donbas coal is now not shipped to the northern regions, and the total to the northwest (particularly Leningrad) is now one-third of prewar. There has been some curtailment to the Central Industrial Region on account of the development of Moscow Basin coal. The Volga now takes 15.5 percent of Donbas coal, and the north Caucasus also takes more than prewar. Less than 1 percent of Donbas coal goes to

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the Transcaucasus and Central Asia." The last statement, which is in direct conflict with actual statistics given by Kaganovich for 1952 shipments and with implications in the Kaganovich statements that 1953 movement to the Transcaucasus was also appreciable, makes it probable that 1951 statistics are being quoted. The discussion here and subsequently seems to be in terms of tons of actual coal.

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e. "Compared with prewar, delivery of Kuzbas coal to the Central Regions is now reduced to a small amount and that to the Volga to one-fourth the former level. Deliveries via the Turk-Sib Railroad to Kazakhstan and Uzbekistan have increased. Almost half Kuzbas coal is now, as in 1940, consumed in the basin. Delivery to the Urals has increased to 2.5 times the former level, bringing the proportion of the Urals in the consumption of Kuzbas coal from 28.7 percent prewar

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to 38.3 percent." Again, the traffic pattern is not that of 1953 but of an earlier year, probably 1952 but possibly 1951. A statement that "consumption of Kuzbas coal has almost doubled although its proportion of total USSR output is only a little over prewar" makes it likely that 1952 is the year in question. An earlier year would not have output and consumption "almost double" 1940.

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f. "Consumption of Karaganda coal is more than three times its prewar level. Deliveries to the Central Region have been curtailed. Those to the Volga are almost 5 times their former level and those to the Urals are 3 times that level. About one-third of Karaganda coal is consumed in Karaganda itself, one-half goes to the Urals and one-eighth to the Volga." Consumption in Karaganda should be understood as consumption in Region Xa (Kazakhstan), largely for rail fuel.

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g. "The consumption of Moscow Basin coal is 3.5 times the prewar level. The area of consumption is limited but expanding. Consumption of this coal in Moscow is more than 30 times the former level -- mainly in electric power and machine-building enterprises."

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h. "All Ural coal is used in the Urals, except one-fifth of Kizel coal, which goes to the Central oblasts."

i. "Khakasskaya coal [Minusinsk] is of minor importance. Three-fourths is now shipped west [even] as far as Sverdlovsk. There is a considerable increase (4 to 8 times) in transport to Kemerovskaya and Novosibirskaya Oblasts and to Altayskiy Kray."

j. "Cheremkhovo coal to the west amounts to 30 percent, with a considerable part shipped west of Krasnoyarsk. Absolute and relative consumption in Irkutsk Oblast has increased and transport to the east has diminished."

k. "Chernovsky and Bukachacha deposits deliver about three-fourths of all Transbaykal coal. Consumption is local except for some Bukachacha coal sent as far as Primorskiy Kray. Railroads are the principal users. One-half the Raychikhinskiy coal is used in Amurskaya Oblast and one-half in Khabarovskiy Kray. Three-fourths of Sakhalin coal is used on the island. Twenty to 30 percent of Suchan and Artem coal is shipped to Khabarovskiy Kray, mainly for railroads. Some 70 to 75 percent of Central Asian coal is used in Uzbek SSR and 10 to 12 percent in Tadzhik SSR."

l. "Pechora coal goes one-third to the northern oblasts, about 55 percent to the northwest (with half this to Leningrad) and 10 percent to the Kirov and Gor'kiy regions. Local use is small."

m. "Railroads are the largest consumers of coal and use 27 percent of the balance. In 1940 the Donbas, Kuzbas, Moscow, Karaganda, and Cheremkhovo fields supplied 82.2 percent of railroad coal. Now they supply 73.8 percent. The Donbas in 1940 supplied more than half the railroad coal and now supplies less than one-third, although the actual amount delivered is the same. The Kuzbas is in second place as a supplier of railroad fuel, and Moscow has taken third place. Railroad fuel is 25.2 percent of Donbas production, 26.4 percent for Kuzbas, 26.3 percent for Moscow, 32.4 percent for Pechora, 40.1 percent for Karaganda,"

n. "The railroads consumed in 1951 3.5 times as much lignite as in 1940. At the same time, consumption of all coals on the railroads rose only 55 percent, since bituminous coal consumption rose only 30 percent. The average distance of haul for railroad coal is 785 kilometers as against 662 kilometers for all coal hauled."

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Karaganda is supplying the railroads with a considerable amount of lignite, up to 30 percent in 1952. Thirty percent of the Karaganda coal used by the railroads is coking coal." The above two items are extracted from a discussion of railroad fuel supply. Note that 1951 and 1952 statistics are mentioned in the same paragraph, which raises doubt as to which year the unlabeled statistics represent. It is believed, however, that the average length of haul for coal was similar in 1951 to 1952, so that on this point the ambiguity does not matter.

Problem 6: Estimating the Volume of Waterborne Coal Traffic.

There are numerous waterborne coal movements in the USSR, amounting to almost 6 million tons, but the aggregate is only about 2 percent of total coal traffic by tonnage and is little more by ton-kilometers. The shipment of coal in the USSR, therefore, is handled almost exclusively by rail. The following isolated data on waterborne coal traffic would seem to bear out this conclusion.

In a speech in March 1954 to the sea and inland waterway workers, Kaganovich implied that coal movements in 1953 on the Volga were small compared with parallel rail hauls -- a situation similar to that existing in 1950 -- and mentioned that traffic on the Black Sea from the Donbas to the Caucasus area in 1952 amounted to only 787,000 tons compared with a rail movement of 2.65 million tons. 45/

It has been reported that about one-fourth of the coal produced in Sakhalin is consumed outside the island. 46/* This statement probably applies to 1952 traffic, but the percentage should be roughly similar for 1953. On this assumption, Sakhalin exports were about 750,000 tons. Subtracting small movements known to have been made to Japan gives a coastwise shipment of about 600,000 tons, with most of the total going to the Vladivostok area. Some coal probably was shipped to Kamchatka and some to the lower Amur, and minor amounts may have moved to Magadan.

An estimated 250,000 tons of coal mined in the Soviet concession in Spitzbergen is shipped to Murmansk.

* See p. 36, above.

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Coal is produced on the Lena River for local use and is moved to its destination by water, but the quantity is unlikely to exceed 200,000 tons. Minor coal movements take place on the Yenisey and Ob' Rivers, but the quantities involved are believed to be insignificant.

Some coal from Communist China is shipped down the Sungari River to destinations in the USSR. About 2.5 million tons of Polish coal is probably received through Baltic ports.

About 900,000 tons of Raychikhinsk coal is estimated to be shipped down the Amur by barge.

Steps are being taken to encourage the shipment of Donets coal to Volga destinations by barge through the Volga-Don Canal, but in 1953 and 1954 comparatively little waterborne traffic of this type was taking place.

Problem 7: Estimating the Proportion of the Production of Coal Moving by Rail and by Water.

A transport mission that visited the USSR in 1954 on behalf of India was told that between 90 and 95 percent of the Soviet production of coal moved on the railroads. ^{47/} The figure reported seems to omit foreign coal handled, and it covers rail movement as a percentage of production and not a percentage of the total shipped by rail, water, and truck combined. Some coal produced is used at the mines. Soviet transport studies give rail tons-originated as percentages of total coal production for several years. The information is somewhat dated, but for 1945 the figure was 91 percent. ^{48/} Foreign coal is not mentioned and is believed to be omitted from the figure.

B.P. Beshchev, the Minister of Transportation, USSR, stated in a speech before the XXth Party Congress that "in 1955 the average ash content of coal hauled increased by 2.4 percent over 1940, and that this increase in the ash content of coal made it necessary for the railroads to haul in 1955 an additional 10 million tons of rock." ^{49/} Interpreted on the basis of Soviet writings on economics which give somewhat similar comparisons, this statement means the following: In 1940, ash content was X percent of total coal weight, and in 1955 it was X plus 2.4 percent of total coal weight. Then, if 2.4 percent of total coal movement by rail is 10 million tons, the total movement is 417 million tons. Possible maximum and minimum figures resulting from rounding are 441 million tons and 393 million tons, respectively.

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Production, however, was 391 million tons. ^{50/} It is then clear that Beshchev is quoting originations of coal on the railroads, which include some double-counting, and that the railroads handled an overwhelming proportion of the total traffic, probably about 95 percent. This leaves very little to be divided between water and truck movements.

The computation tends to support an estimate that 9 to 10 percent of rail coal originations represent double-counting due to rail-water-rail hauls and movement of coal to and out of stockpiles. This is very nearly the same although slightly higher than the percentage calculated for 1953, and, if accepted, implies that rail transport handles about 95 percent of the coal moved. To assume that rail transport handles less of the total means that it must have a correspondingly larger percentage of double-hauling. This is unlikely, since double-hauling is discouraged.

Accepting 95 percent of coal movement (in ton-kilometers) as handled by rail, then water movement may be estimated by compiling fragmentary data on individual hauls. The average length of haul by ship seems to approximate the average length of haul by rail and indicates that water movement, in ton-kilometers, is normally 2 to 3 percent of the total. Trucks ^{51/} can then be credited with hauling the remainder.

Problem 8: Estimating Shipments of Coal to Selected Cities.

Table 4* gives estimated shipments of coal to selected cities in the USSR in 1953. The following discussion of the types of sources and methodology used in arriving at the estimate of coal shipments to Stalinsk is representative of sources and methodology used in making all the estimates in Table 4.

Stalinsk is in the Kuzbas in Region IX (West Siberia). It had an estimated population of 550,000 in 1950. The city is a major metallurgical center and is also important as a producer of cement, chemicals, machinery, and general manufactures. ^{52/} Coal is produced, but for quality reasons part of that mined is shipped elsewhere, and larger quantities of better grade coal are brought in from other districts for the local coke plant.

* P. 22, above.

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From data on coking capacity, coking coal output in the Kuzbas and the percentage coked locally, and calculations by metallurgical specialists as to coke requirements, a figure was derived of 3.21 million tons of coal consumed for making coke in 1953 in Stalinsk. The figure is believed to be firm. Data also indicate that the electric powerplant of the steel plant would require a further 305,000 tons of coal for electric power production, and about 400,000 tons additional would be needed for miscellaneous uses in the steel plant.

Based on the known capacity and operation of the Stalinsk electric powerplant, which is under the Ministry of Electric Power Stations, 655,000 tons of coal have been computed to be needed for this. The figure is believed to be firm.

Estimates for the coal used in making cement, brick, and refractory products amount to 300,000 tons, based on firm data for cement and rough approximations for smaller items.

Local mines are estimated to use 150,000 tons of coal, based on the general level of output.

Based on a roughly estimated 1953 population of 550,000 and on the status of the city as an important center of manufacturing, it is estimated that 730,000 tons of coal were used for factories, public buildings, stores, household use, and so on. The figure is only a general approximation but is unlikely to be more than 200,000 tons too high or too low.

Stalinsk is an important rail point, and it is estimated that railroads would have required about 450,000 tons of coal in the Stalinsk area in 1953. The figure is believed to be accurate within a range of plus or minus 30 percent.

The total of the above requirements is 6.2 million tons, which is the figure listed in this report.

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APPENDIX B

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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1. CIA. CIA/RR 28, Solid Fuels in the USSR, 29 Jan 54. S/US ONLY.
 2. Gudok, 8 Jul 54. U. Eval. RR 2.
 3. CIA. FDD Summary no 487, 14 Jun 55, Improving and Reorganizing Rail Traffic in the USSR, p. 5. OFF USE. Eval. RR 2. (speech of May 1954 by Kaganovich)
 4. Ibid.

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5. CIA. OCR/IR, USSR Locations, 3d ed, 1 Feb 56. OFF USE. Eval. RR 2.
6. Joint Committee on Slavic Studies. Current Digest of the Soviet Press, 23 May 56, p. 22. U. Eval. RR 2.

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7. Gudok, 5 Feb 56. U. Eval. RR 2.
8. CIA. CIA/RR 28 (1, above).
9. Ibid.
10. Ibid.
11. Ugol', no 9, Sep 54. U. Eval. RR 2.
12. CIA. FDD Summary no 566, 29 Jun 56, The National Economy of the USSR, p. 186. OFF USE. Eval. RR 2.
13. Ibid., p. 83, 84. OFF USE. Eval. RR 2. CIA. FDD Summary no 487 (3, above).
14. Gudok, 5 Feb 56. U. Eval. RR 2. Ibid., 20 Mar 56. U. Eval. RR 2.
15. Zheleznodorozhnyy transport, Apr 56, p. 36. U. Eval. RR 2.
16. Pravda, 25 Feb 56. U. Eval. RR 2.
17. Ibid.
18. Ugol', no 9, Sep 54. U. Eval. RR 2.
19. CIA. FDD Summary no 936, 23 May 56, Transportation and Communications, Electric Power and Construction in the USSR (No. 22), p. 12. OFF USE. Eval. RR 2.
20. Ibid.

FOIAb3b1

21. CIA. FDD U-205/49. U. Eval. RR 2.
22. CIA. FDD Summary no 487 (3, above), p. 1-25. U. Eval. RR 2.
23. CIA. FDD Summary no 372, 4 Feb 55, Data on USSR Extractive Industries (No. 3), p. 53. C. Eval. RR 2.
24. Gudok, 8 Jul 54. U. Eval. RR 2.
25. CIA. CIA/RR IM-404, Significance of Recent Announcements Concerning the Soviet Railroad Transportation System, 12 Nov 54. S.
26. CIA. FDD Summary no 372 (23, above).
27. CIA. FDD Summary no 487 (3, above). CIA. FDD Summary no 467, 27 Apr 55, Transportation and Communications in the USSR (No. 9). OFF USE. Eval. RR 2.
28. CIA. FDD Summary no 487 (3, above).

FOIAb3b1

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S-E-C-R-E-T

- FOIAb3b1 29. [REDACTED]
30. Ugol', no 9, Sep 54. U. Eval. RR 2.
31. Ibid.
32. Ibid.
33. Ibid.
34. CIA. FDD Summary no 487 (3, above), p. 1-25. U. Eval. RR 2.
35. Ibid.
36. CIA. FDD Summary no 732, 1 Dec 55, Transportation and Communications, Electric Power and Construction in the USSR (No. 16), p. 5-7. OFF USE. Eval. RR 2.
- Ekonomika transport, Moscow, 1955, p. 186. U. Eval. RR 2.
37. Ugol', no 9, Sep 54. U. Eval. RR 2.
38. CIA. CIA/RR 28 (1, above).
- FOIAb3b1 39. [REDACTED]
40. Ugol', no 9, Sep 54. U. Eval. RR 2.
41. Ibid.
42. Ibid.
43. Ibid.
44. Voprosy ekonomiki, Jan 56. U. Eval. RR 2.
45. CIA. FDD Summary no 390, 23 Feb 55, Transportation and Communications in the USSR (No. 7), p. 16. C. Eval. RR 2.
- Rechnoy transport, 1947, p. 15. U. Eval. RR 2.
- Izvestiya, no 213, 8 Sep 55, p. 2. U. Eval. RR 2.
46. Ugol', no 9, Sep 54. U. Eval. RR 2.
- 25X1A 47. Gudok, 12 Aug 52. U. Eval. RR 2.
- [REDACTED]
48. Kochetov, V.I. Zheleznodorozhnaya statistika (Railroad Statistics), Moscow, 1948. U. Eval. RR 2.
49. Pravda, 25 Feb 56, p. 8-9. U. Eval. RR 2. (B.P. Beshchev)
- 25X1A 50. UN, ECE. Quarterly Bulletin of Coal Statistics for Europe, Apr 56, p. 5. U. Eval. RR 2.
51. [REDACTED]
52. Geograficheskiy atlas SSSR (Geographical Atlas of the USSR), Moscow, 1954. U. Eval. RR 2.

S-E-C-R-E-T

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