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# SIBERIA AND EASTERN RUSSIA

PART 4

WESTERN SIBERIA AND  
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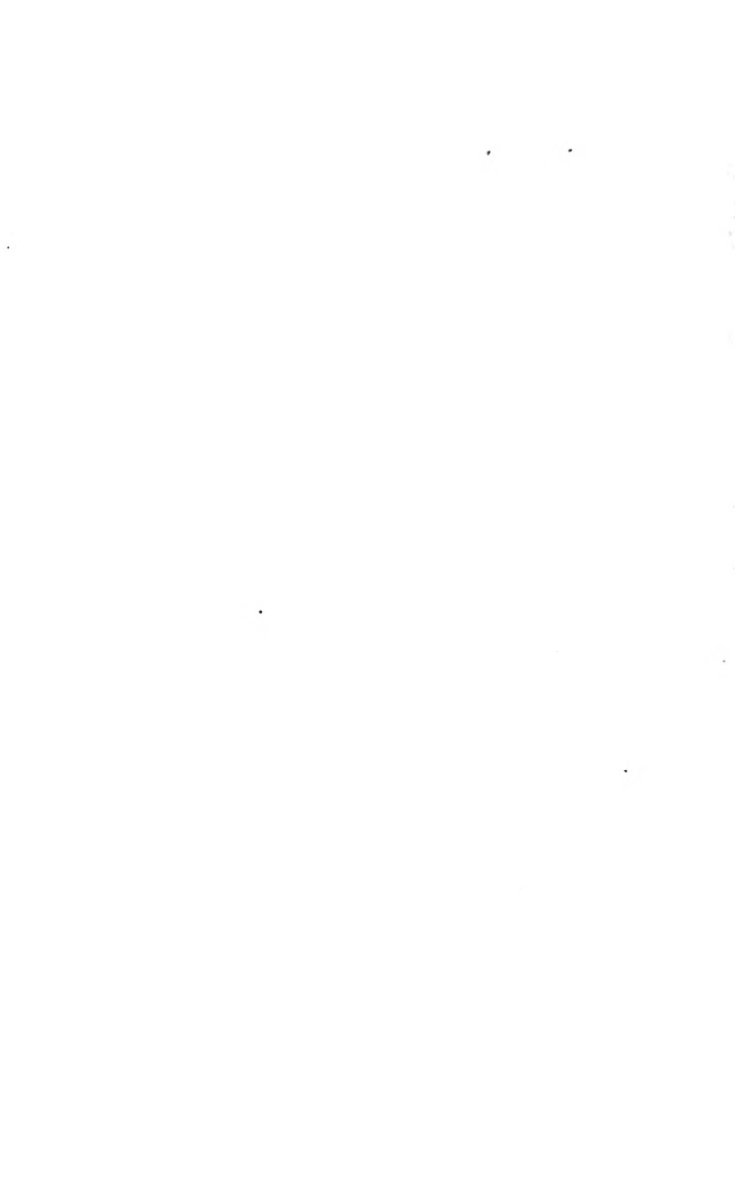
Russian letters.	English equivalents used in this volume.	Russian letters.	English equivalents used in this volume.
1. А а	A a.	19. С с	S s.
2. Б б	B b.	-20. Т т	T t.
3. В в	V v.	21. У у	U u.
4. Г г	G g.	22. Ф ф	Ph ph, F f.
5. Д д	D d.	23. Х х	Kh kh.
6. Е е	E e, Ye, ye.	24. Ц ц	Ts ts.
7. Ж ж	Zh zh.	25. Ч ч	Ch ch.
8. З з	Z z.	26. Ш ш	Sh sh.
9. И и	I i.	27. Щ щ	hch shch.
10. І і	I i.	28. Ъ ъ	(hard sign).
11. Ё ё	I i.	29. Ы ы	Y y.
12. К к	K k.	30. Ь ь	(soft sign).
13. Л л	L l.	31. Ъ ъ	Ye ye.
14. М м	M m.	32. Э э	E e.
15. Н н	N n.	33. Ю ю	Yu yu.
16. О о	O o.	34. Я я	Ya ya.
17. П п	P p.	35. Ё ё	Th th, F f.
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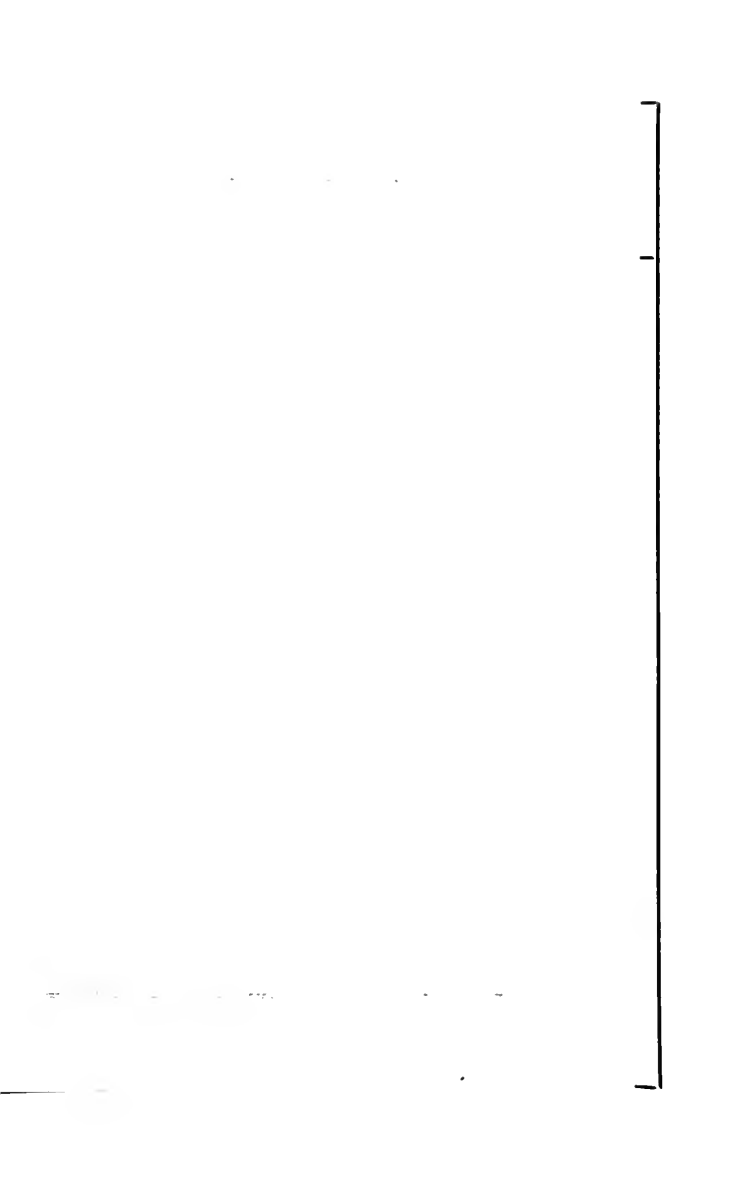


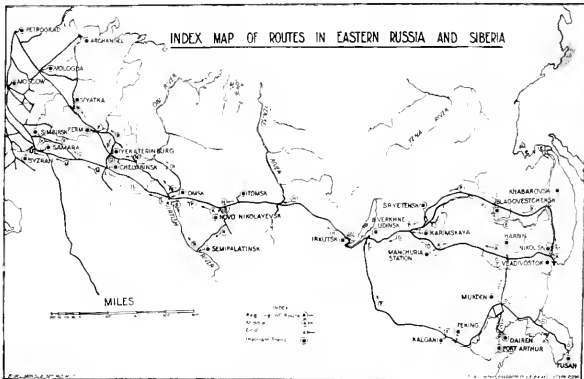












Map of Routes in Eastern Russia and Siberia

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# SIBERIA AND EASTERN RUSSIA

PART IV

## WESTERN SIBERIA AND EASTERN RUSSIA

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MILITARY MONOGRAPH SUBSECTION M. I. 2  
MILITARY INTELLIGENCE DIVISION  
GENERAL STAFF

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THIS REPORT CONTAINS INFORMATION ON THIS SUBJECT  
OBTAINED BY THE GENERAL STAFF TO OCTOBER 1, 1918



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1918

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Officers should remember that seemingly small bits of information may be of great value. For example, the length of a bridge, the number of houses in a village, the name of a good guide are each worth noting and transmitting to Washington.

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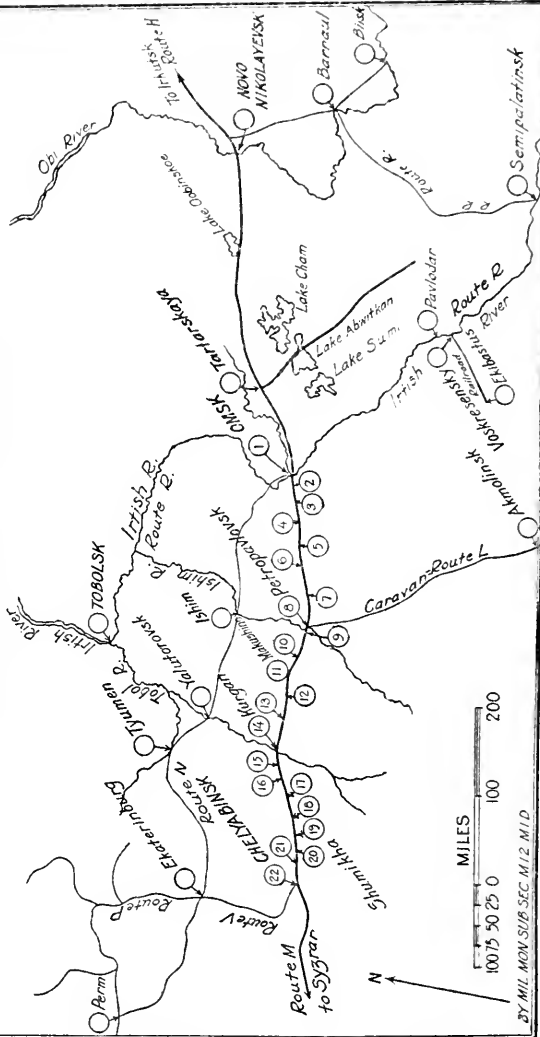
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# ROUTE L

## RAILROAD - OMSK TO CHELYABINSK



Index map of Route L.

## ROUTE L.

### OMSK TO CHELYABINSK.

(495 miles=746 versts.)

#### LIST OF STATIONS.

INDEX.—Numbers at left serve as a key to map which follows. Numbers at right show versts from Novo-Nikolayevsk. \* indicates railroad restaurant. Jct. indicates railroad junction. Important towns are in **heavy type**.

1. Omsk.....*	587	ОМСКЪ.
Post.....		ПОСТЪ.
2. Kulomzinò Jct.....	591	КУЛОМЗИНО.
Siding.....		РАЗЪБЪДЪ.
Luzino.....		ЛУЗИНО раз.
Àlonski.....		АЛОНСКІЙ раз.
3. Mariánovka.....	633	МАРІАШОВКА.
Tatyánovskí.....		ТАТЬЯНОВСКІЙ раз.
Pikétnoye.....		ПИКЕТНОЕ раз.
Pomurino.....		ПОМУРИНО раз.
4. Moskálenki.....	675	МОСКАЛЕНКИ.
Kuyanbàr.....		КУЯНВАРЪ раз.
Gòrkoye.....		ГОРЬКОЕ раз.
Ozerokamyslovskí.....		ОЗЕРОКАМЫСЛОВСКІЙ раз.

5. Isil-Kul.....*	716	ИСИЛЬ-КУЛЬ.
Siding.....		РАЗЪБЗДЪ.
Yümino.....		ЮНИНО раз.
Kara-Güga.....		КАРА-ГУГА раз.
Zarösloye.....		ЗАРОСЛОЕ раз.
6. Buläyevö.....	765	БУЛАЕВО.
Siding.....		РАЗЪБЗДЪ.
Gänkino.....		ГАНЬКИНО раз.
Yarmÿ.....		ЯРМЫ раз.
7. Toküshi.....	810	ТОКУШИ.
Siding.....		РАЗЪБЗДЪ.
Asänovo.....		АСАНОВО раз.
Siding.....		РАЗЪБЗДЪ.
8. Petropävlövsck.....*	842	ПЕТРОПАВЛОВСКЪ.
Siding.....		РАЗЪБЗДЪ.
Zatön.....		ЗАТОНЪ раз.
Kondratövsck.....		КОНДРАТОВКА раз.
Siding.....		РАЗЪБЗДЪ.
9. Mamlyütka.....	884	МАМЛЮТКА.
Orlyonok.....		ОРЛЕНОКЪ раз.
Gorbunövo.....		ГОРБУНОВО раз.
Söchino.....		СОЧИНО раз.

10. Pyetukhovo.....	926	ПЬТУХОВО.
Varakosovo.....		ВАРАКОСОВО раз.
Pyankovo.....		ПЬЯНКОВО раз.
Krÿsya.....		КРЬСЬЯ раз.
11. Makùshino.....*	970	МАКУШИНО.
Siding.....		РАЗЪБЗДЪ.
Konovàlovo.....		КОНОВАЛОВО раз.
Baksàry.....		БАКСАРЫ раз.
Siding.....		РАЗЪБЗДЪ.
12. Lebyazhjà.....	1, 014	ЛЕВЯЖЬЯ.
Kràvtsevo.....		КРАВЦЕВО раз.
Yurakhly.....		ЮРАХЛЫ раз.
Siding.....		РАЗЪБЗДЪ.
Vargashi.....	1, 056	ВАРГАШИ.
Siding.....		РАЗЪБЗДЪ.
Utyàk.....		УТЯКЪ.
Kamchikha.....		КАМЧИХА раз.
14. Kurgàn.....*	1, 092	КУРГАНЪ.
Siding.....		РАЗЪБЗДЪ.
Vvedenskoye.....		ВВЕДЕНСКОЕ.
Siding.....		РАЗЪБЗДЪ.
Logovùshka.....		ЛОГОВУШКА.
15. Zyrànka.....	1, 127	ЗЫРЯНКА.
Siding.....		РАЗЪБЗДЪ.

16. Yurgamysh.....	I, 145	ЮРГАМЫШЬ.
Siding.....		РАЗЪБЪЗДЪ.
Slâdkoye.....		СЛАДКОЕ раз.
17. Mÿshkino.....	I, 177	МЫШКИНО.
Varyushkino.....		ВАРЮШКИНО раз.
Butÿrskoye.....		БУТЪРСКОЕ раз.
Khokhlÿ.....		ХОХЛЫ раз.
18. Shumikha.....	* 1, 216	ШУМИХА.
Siding.....		РАЗЪБЪЗДЪ.
Chistoye.....		ЧИСТОЕ раз.
Siding.....		РАЗЪБЪЗДЪ.
19. Chumlyak.....	1, 250	ЧУМЛЯКЪ.
Alakul.....		АЛАКУЛЬ раз.
Pivkino.....		ПІВКИНО раз.
20. Kayasàn.....	1, 281	КАЯСАПЪ.
21. Chernyâvskaya.....	1, 292	ЧЕРНЯВСКАЯ.
Vanyushi.....		ВАНЮШИ раз.
Kòzyrevo.....		КОЗЫРЕВО раз.
Siding.....		РАЗЪБЪЗДЪ.
Churilovo.....		ЧУРИЛОВО раз.
Siding.....		РАЗЪБЪЗДЪ.
22. Chelyâbinsk (Jct.).....	* 1, 333	ЧЕЛЯВИНСКЪ.

## ROUTE L.

### TRANS-SIBERIAN RAILROAD—OMSK TO CHELYABINSK.

(495 miles, 746 versts.)

#### GENERAL DESCRIPTION.

##### GENERAL CONDITION.

Route L is part of the branch of the Trans-Siberian Railway which runs to Moscow. The region through which it passes is one of the great granaries and grazing fields of Siberia. It is also as densely populated as any other part. At the western end it enters the mineral region of the Urals.

Numerous caravan routes from the south join the railroad, especially at Petropavlovsk and Kurgan. In ordinary times herds of cattle, sheep, and horses are thus brought to market from the dry Kirghiz Steppes. In 1909 there were no less than 9,500,000 head of mixed stock in western Siberia, the greater part of which were accessible along this route. Before the war, the meat-packing industry was developing along modern lines under British control, with Kurgan as the chief center. A refrigerator railway service especially for meat and butter was in operation between western Siberia and Petrograd and other Baltic ports. During the war the packing plants were operated chiefly for the supply of the Russian Army. It would seem to be an easy matter, therefore, to revive the meat packing and butter business to meet the needs of a new army.

The reader who would get a good idea of general conditions in western Siberia is advised to read the account of Route W, page 133 ff, including the "General Description" and the "Detailed Description" as far as Akmolinsk.

##### CHARACTER OF THE COUNTRY.

The route crosses a typical section of the Siberian plain. Only river valleys and clumps of woods interrupt the level character of the region. Open prairie is common. This constitutes

excellent wheat and grazing lands. The soil is so deep and fine that wheel transportation after rains is greatly hindered.

### IMPORTANT CITIES.

**Omsk** is one of the most important cities in Siberia. Since it has a great barrack capacity and is a busy market for supplies of all kinds, it is fitted to serve as an important base. It is the junction of the railroads to Moscow and Petrograd and is the center of navigation on the Irtysh River.

**Petropavlovsk** is at the head of navigation on the Ishim River and is a point upon which many caravan routes converge from the Kirghiz Steppes at the south. This city and Kurgan are the most important cattle markets in Siberia.

**Kurgan** is at the head of navigation on the Tobol River and a great meat-packing city.

**Chelyabinsk** lies at the junction point of the Trans-Siberian Railway with one railroad to Yekaterinburg (Route P) on the north and another to Kustani at the southeast. Express trains from the Far East often proceed by route P to Petrograd.

### DETAILED DESCRIPTION.

<i>Distance</i>	<i>Distance</i>	
<i>from</i>	<i>from</i>	
<i>Vladi-</i>	<i>Novo-Niko-</i>	
<i>vostok.</i>	<i>layevsk.</i>	
3,542 M	587 V	<b>Omsk.</b> From the Omsk station the route descends into the valley of the Irtysh. One and a half miles beyond the station the Irtysh River is crossed on a high, steel bridge 2,100 feet long. It consists of six spans of 350 feet each. The embankment on the east is 68 feet high, on the west 45. The piers are laid on caissons. The abutments and piers are made of granite brought from Chelyabinsk. The girders are of open-hearth steel. The breadth of the river bed is about 2,450 feet. Dams projecting into the river have been constructed to regulate the current.
	388 M	



Just beyond the bridge is a siding, called Post, from which a branch railway runs one-third of a mile down the Irtysh to a sawmill and tie-preserving plant, both of which supply their products to the railway. Two flour mills stand near by.

For most of the distance between Omsk and Petropavlovsk, the next important station, the railroad follows a valley cut by a river whose course is now marked by a series of muddy, salty lakes known as the Kamyshlov Lakes. The valley slowly drains toward the Irtysh, but only near that river is the drainage evident enough to be called a stream. It is known as the Kamyshlovskaya River. During the summer the lakes are nearly dry, and their bitterness is increased. Then they become covered with weeds, which, as they rot, produce a repulsive odor and an unhealthy condition. This valley of lakes contains a series of Cossack settlements and is ordinarily occupied by Siberian Cossack troops called "the bitter line." The valley is followed by a post road.

- |         |                |  |
|---------|----------------|--|
| 3,545 M | 591 V<br>392 M | <b>Kulomzino.</b> At this station the Trans-Siberian Railway for Petrograd diverges from the Trans-Siberian Railway for Moscow by striking to the northwest. Route L continues westward.   |
| 3,571 M | 633 V<br>420 M | <b>Marianovka.</b> Small station. Cossack settlement of Burganski 3 miles at the northwest. Five versts beyond the station the railroad crosses a highway. One branch goes to the south, the other runs westward roughly parallel with the railroad. Three |

- sidings before the next station. At the third siding or platform stop, Pokrovski, the route crosses a north-south road. From Pokrovski a road follows the railroad to a point beyond the next station.
- 3,600 M      675 M    **Moskalenki.** The village from which the station is named is several miles to the south. The level country is covered with numerous birch trees. For the next hundred miles the country is dotted with salt lakes, some of which are good-sized. Three sidings intervene before the next station is reached.
- 3,628 M      716 V    **Isil-Kul.** The surrounding country is level yet well drained. Copses of birches abound. The water supply is from Lake Isil-Kul,  $1\frac{1}{2}$  miles from the station. In winter the lake often freezes to the bottom. Twenty farming settlements are tributary to the station, with a population of about 10,000. A north-south road is crossed at the station. The route proceeds to the west. Roads are crossed at about versts 732 and 749. Lakes are particularly numerous. Four sidings or platform stops intervene.
- 3,660 M      765 V    **Bulayevo.** Village of same name near station. Water supply is from swamps and wells near station. The route winds to left and right to avoid lakes and swamps. The wagon road to Petropavlovsk closely follows the railroad to the next station. Three sidings intervene. Two roads come in from the south.

At about verst 798 the highway to Petropavlovsk crosses the railroad and a road comes in from the south.

3,690 M      810 V    Tokushi. Settlement of same name near  
 537 M      the station. A near-by lake furnishes a  
 good water supply. Swamps, lakes, and  
 birch woods are scattered between the cul-  
 tivated tracts. In this vicinity the rail-  
 way reaches its highest point between the  
 Irtysh and Ishim Rivers. The line pro-  
 ceeds stright away across flat land to  
 Petropavlovsk. Three sidings intervene.

3,711 M    842 V    Petropavlovsk. (Altitude 445 feet. Popu-  
 558 M      lation 43,000.) Situated about 2 miles  
 northeast of the station on the right bank  
 of the Ishim. The city has a medical station,  
 with a small hospital. The city is built on  
 level ground, except for a slight depression  
 on the south, which was once the bed of  
 the Ishim River. There are numerous groves  
 of large timber in the outskirts. In the  
 business section the buildings are partly of  
 stone and brick and are close together.  
 Otherwise the houses are mostly made of  
 wood, with iron roofs, and have open spaces  
 about them, at least on one side. The city  
 is lighted from an electric power plant, which  
 also operates an ice plant. There is no  
 sewerage system, each house having a cess-  
 pool. Drinking water is obtained from wells  
 and hauled to the houses in wagons. (See  
 fig. 1.)

*Population.*—Unlike the other cities of  
 western Siberia, Petropavlovsk remains Asi-  
 atic and is strongly Mohammedan. One-  
 third of the people are of that religion.  
 They include Tartars, Bukharans, Sarts from  
 Tashkent, and some Kirghiz. The other  
 two-thirds are Russians.

*Transportation.*—The city lies on the Trans-Siberian Railway, where routes from the Kirghiz Steppes (Route W) most readily converge. The main highway from these grazing lands is followed by a telegraph line, and is much used both by drivers of herds of cattle on their way to market and by travelers. Besides this main southern highway, several roads and trails converge upon Petropavlovsk from the north, east, and west. At high water the Ishim furnishes water navigation northward to the Irtysh and Obi. (See fig. 1.)

*Trade.*—As might be expected from the large number of routes from the south and the Mohammedan character of the city, Petropavlovsk carries on important trade with the dry grazing lands of the Kirghiz Steppes. At two small places, called Kuyandi (near Kakardinsk) and At Bazar (Horse Bazar), two or three hundred miles south of Petropavlovsk, great gatherings are held each year by horse and cattle trading Kirghiz and other wanderers of the steppes. (See Route W, p. 133.) Many horses are brought from these places to Petropavlovsk. Although the war at first drew heavily upon the reserve supply of all except white horses, the region has now had a few years to recuperate, so that there should be large numbers still to be had.

It is reported that before the war from 250,000 to 400,000 head of cattle were annually assembled at Petropavlovsk, chiefly from the steppes between the railroad and Turkestan. They were then sent westward on the hoof or slaughtered and shipped in refriger-

ator cars, principally to Moscow and Petrograd. For a time the war naturally speeded up the city's trade in cattle. Now that the Russian revolution has cut the trade to practically nothing for nearly two years, the cattle regions should have a renewed supply.

Besides animals and animal products, such as butter, hides, and wool, the city exports hay, wheat, oats, and copper.

*Manufacturing.*—The other industries depend upon the cattle trade. Slaughtering is the chief of these. Close to the railroad and not far from the city the Union Cold Storage Co. has a new meat-packing plant. Tanneries, tallow works, wool washeries, and gut factories are all important. No less than 50 plants in town use animal products. Most of these, however, are small, but there is one large steam flour mill.

*Barracks.*—In August, 1916, about 10,000 soldiers were quartered in Petropavlovsk during their period of training. They were housed in various buildings, including dwelling houses and some barracks one-fourth mile southeast of the city. The barracks are said to consist of a building about 50 by 250 feet in size.

From Petropavlovsk the railroad descends the right bank of the Ishim and crosses the river on a steel bridge of four spans, two of 350 feet and two of 70 feet. Three piers are laid on caissons. The abutments have concrete foundations. The route then ascends the left bank of the Ishim. At about verst 856 the road from Petropavlovsk to the south and west is crossed. At about verst 867 the

boundary is crossed separating the Akmo-linsk territory from the Petropavlovsk district.

Four sidings intervene before the next station is reached.

- |         |                |   |
|---------|----------------|---|
| 3,739 M | 884 V<br>586 M | <b>Mamlyutka.</b> (Population 400.) The village is close to the station. Drinking water is bad. There are 10 settlements within 5 miles of the station. The freight exports amount to 1,300 tons of grain per year. The line bends gradually toward the north-west and passes over flat country that is at times swampy. Three sidings.   |
| 3,667 M | 926 V<br>614 M | <b>Pyetukhovo.</b> Pyetukhovo village is 4 miles from station. The household water comes from a neighboring lake and is bad in winter. About 8,000 people use the station. Nine thousand tons of grain are exported annually. Several butter factories near by have an annual output of 90 tons. A medical station is available. The railroad passes through a slightly higher and drier region. Three sidings.                             |
| 3,796 M | 970 V<br>643 M | <b>Makushino.</b> Railroad restaurant, midway from Petropavlovsk to Kurgan. The village lies three-fourths mile from the station. (Population 1,300.) The water supply is from the shallow Lake Makushino. In winter when it freezes to the bottom, melted ice is the sole source of supply. About 20,000 people are tributary to the station and export a surplus of 10,000 tons of grain. Four sidings between this and the next station. |
| 3,825 M | 1,014 V        | <b>Lebyazya.</b> Lebyazya village 4 miles from station. (Population 1,700.) Water supply poor, due to shallowness of wells.   |

There are 3,800 people tributary to the station. Export grain amounts to 9,000 tons annually, and export butter to 360 tons. Three sidings between this and the next station. At about verst 1050 the line reaches its highest point on the watershed between the Ishim and Tobol Rivers.

3,853 M 1,056 V **Vargashi.** Vargashi village 3 miles from the station. Young birch trees are numerous. Surrounding country is level and well drained. Grain export is about 200 tons annually. The route very gradually descends to the west. At about verst 1066 the Utyak River is crossed on a 70-foot bridge. At about verst 1086 the Tobol River is crossed on a steel bridge of six spans; four of 350 feet each and two of 70 feet. A roadway is carried on its lower chords. The height of the embankment is 30 feet on the west and 3,200 on the east. The five piers are laid on caissons, while the abutments of the retaining wall are supported on piles. Bridge girders are semiparabolic. Fig. 2.

3,871 M 1,092 V **Kurgan.** Altitude, 260 feet. Population, 25,000. Railroad restaurant. The town of Kurgan lies 1 mile south of the station on the right bank of the Tobol River, on a level, grassy tract. It has many substantial buildings, a public library, and a botanical garden, but is otherwise a typical Siberian city. (See fig. 3.) Fig. 4.

*Strategic importance.*—1. Located at the head of steam navigation on the Tobol River.

2. A junction point of roads from the grazing regions on the south, from Ishim

on the east, from Shadrinsk, Yalutorovsk, and Tyumen at the north, and from Cheliabinsk at the west. A railroad is projected to Shadrinsk.

*Military facilities — Barracks.* — Two large flour mills and some warehouses belonging to the Union Cold Storage Co. would be available for quartering soldiers.

*Camp sites.*—A possible site is on the lands belonging to Smolin Bros.

*Repairs.*—The railroad shops.

*Transport.*—A few horses might be available.

*Acroplanes landing place.*—The fair grounds.

*Hospitals.*—Fairly good.

*Food.*—The vicinity of Kurgan is a good dairy region. Owing to the large pasture lands, as well as the grain-growing tracts, there would be no question of supplies. The Ural region draws its supplies chiefly from this section (which extends as far east as Novo-Nikolayevsk). In Kurgan, as well as in Petropavlovsk, the facilities for obtaining pork and mutton are especially good. The Union Cold Storage Co. has a large canning establishment there, which supplied the Russian Army with "bully beef."

*Fuel.*—Cordwood. Some coal from Urals.

*Health.*—Good quality of water from Ishim River, which is carried to the houses in barrels. No sewerage system. Health conditions good.

*Trade.*—Kurgan contains representatives of several English firms. It sends west-



ward great quantities of butter. Other exports are grain, meat, tallow, hides, game, and fish. Many cattle are purchased through Petropavlovsk.

Navigation on the Tobol is in small vessels because of the shallowness, and is carried on with some difficulty because of the sinuous channel.

From Kurgan the route crosses the road from the south, rises out of the valley of the Tobol, passes a pond on the right, and runs due west across the flat land. Between Kurgan and the next station there are four sidings whose respective locations are approximately at versts 1097, 1103, 1109, and 1118. The line passes from the Province of Tobolsk into that of Orenburg just before the next station is reached.

- 3,900 M 1,127 V Zyryanka. (Population, 200.) Located in the center of a farming region which raises rye, wheat, oats, peas, hemp seed, flaxseed, and sugar beets. In the vicinity of the station there are six settlements with a combined population of about 4,000. The annual export of farm products is about 5,000 tons. There is a beet-sugar factory in the neighborhood. Near by there is a forest of Norwegian pines and birches which has long been drawn upon for railway fuel and ties. Sidings at about verst 1134. At about verst 1137 the line passes from the Province of Tobolsk into that of Orenburg.
- 3,912 M 1,145 V Yurgamysh. Settlement round station with about 400 population. A road with far-reaching connections runs through the town
- 747 M
- 759 M

from north to south. It is estimated that 7,000 people live within a radius of 5 miles from the station. The community supports several steam grain mills and butter establishments. Thirty thousand tons of grain are annually forwarded from this station to European markets.

The route continues through a dry, level country with scattered birch copses. Siding at about verst 1160, and another verst 1172.

3,933 M 1,177 V **Myshkino.** (Population, 1,000.) Much of the surrounding country is cultivated, and the yield is heavy. The station is reported to send away 50,000 tons of grain annually. There are several steam flour mills in the vicinity. Stockyards at this point collect cattle from the surrounding region and ship them westward. Three sidings intervene before the next station.

780 M

3,959 M 1,216 V **Shumikha.** (Altitude, 580 feet; population, 800.) Railroad restaurant. Artesian wells are the source of the water supply. The water is slightly brownish and contains lime. About 40,000 people north and south of the railroad use the station for freight shipments. No less than 40,000 tons of grain are shipped westward annually. This section is one of the richest farming regions in Siberia. Rye, wheat, oats, and peas are the favorite crops.

806 M

Railroad runs through ravines of the Tukan and crosses the River Kamenka by a 105-foot bridge. Three sidings are passed and a road crossed.

- 3,982 M 1,250 V **Chumlyak.** (Altitude, 560 feet.) Village of  
829 M same name 8 miles from station. Popu-  
lation, 2,000. Station has important grain  
shipments. Two sidings are passed be-  
fore the next station. The line runs  
through a region generally wooded and at  
times swampy.
- 4,002 M 1,281 V **Kayasan.** Small station. Beyond it the  
849 M Chumlyak River is crossed by a 70-foot  
bridge.
- 4,009 M 1,292 V **Chernyavskaya.** Located in a flat, swampy  
857 M district covered with young birch. A farm-  
ing tract, with 5,000 inhabitants, lies  
tributary to this station. The water is  
especially unhealthful in this vicinity.  
Shallow lakes are common. The line now  
departs from its former straight-away  
course as the region is less flat. Five sid-  
ings or platform stops are passed before  
Chelyabinsk is reached.
- 4,037 M 1,333 V **Chelyabinsk.** (Altitude, 760 feet; popula-  
884 M tion, 70,000.) Unfortified. The city is 2½  
miles from the station on the Miass River.  
Near the station are large wooden barracks  
(capacity 40,000 to 50,000 men), built for  
use during the Russo-Japanese War, 1904-5.  
(See fig. 5.)

*Character.*—Although Chelyabinsk is the largest and richest city in the Province of Orenburg, the city is not progressive in its appearance. The streets are unusually broad and straight, but as only a few of the main streets are paved, the side streets are bog holes in the rainy season and dusty in the dry season. Wooden sidewalks. The streets are dirty, the houses ill kept, and the hotels poor.

*Military importance.*—The military value of Chelyabinsk lies in the transportation routes which converge upon the city and in the mineral deposits of the vicinity. Besides the direct railroad between Moscow and Omsk (Routes L and M) there is another to Petrograd via Yekaterinburg, and still another to Kustanai and Troitsk at the south-east. There are also roads from the north, east, and west.

The mineral deposits include important iron and gold mines in the Urals at the west, reached by Route M and described in connection with that route in this handbook, and a coal mine 10 miles distant from the city. The only means available for transporting the coal are wagons, but a railway line is under construction. The coal lies in solid beds near the surface of the ground, so that it is mined by the open-pit method. Shafts, however, will probably be built as the works develop. The output resembles cannel coal, but it has a lower ignition point than that variety. It is of poor quality and is not suitable for locomotives.

*Military facilities.*—Besides the barracks mentioned above there is a good camp site on high ground between the railroad station and the town. The suitability of this site depends on the fact that the city aqueduct passes close by. Recent reports, however, indicate that at the present time the city water system is not in working order. For transport no motor trucks or gasoline launches are available nor are there any gasoline supplies on hand. During the revolutionary period great numbers of transport

animals were killed for food. Besides the large railway shops there is a repair shop for agricultural machinery. As the country is flat, many good sites for aeroplane landings may be found. Hospital facilities are good.

*Communications.*—Besides the railway communications mentioned above, water transportation is available. The River Miass can be navigated by shallow draft barges. The country roads in this region are fairly good even for automobiles. A good motor road connects the city with Orenburg. The Government telegraph and telephone systems are good.

*Inhabitants.*—Kirghiz of Tartar origin with some Great Russians. The intelligent classes are friendly and the others, though poor as laborers, are tractable.

*Food.*—Being close to the agricultural regions in the neighborhood of Kurgan, food is cheaper and better than at Yekaterinburg.

*Fuel.*—Cordwood is used for fuel, but the supply is limited and it is therefore very expensive. The new coal field recently discovered lying just east of the city will relieve the situation. In the past coal was procured from the Orenburg mines.

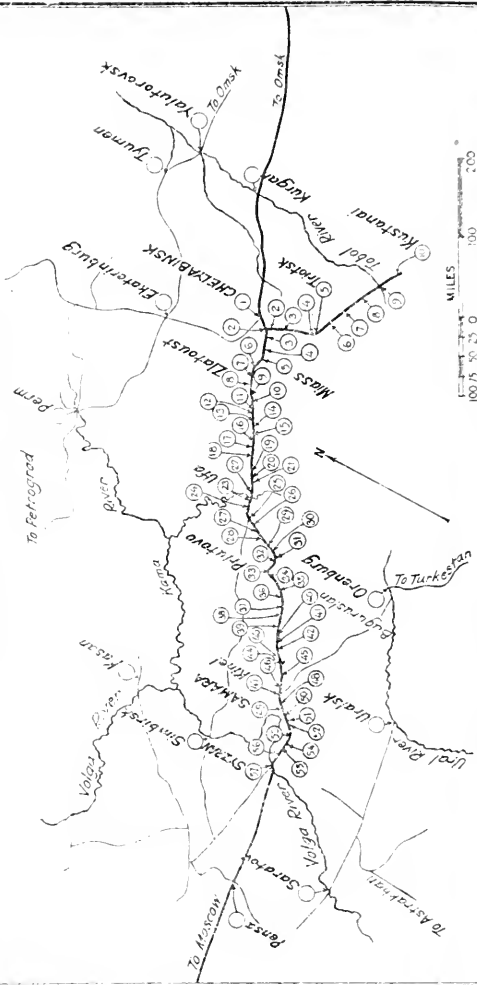
*Health.*—Since the water system installed four years ago is not now in working order, water of poor quality is procured directly from the river. There is no sewerage system. Sewage is carried out of the city and dumped into pits. Consequently health conditions are very poor.

*Industries and trade.*—Farming and flour milling are the chief industries. Their raw materials, hides, and grain are contributed by the important farming region which surrounds the city. A grain elevator near the station has a capacity of 9,000 tons. Chelyabinsk returns to the farms agricultural implements. For storing these it has large warehouses. Two of these are American owned and ordinarily hold products from the International Harvester Co. and the Moline Plow Co. About 80,000 head of cattle pass through the stockyards annually. About 600,000 tons of farm products are ordinarily sent westward each year.



ROUTE M

RAILROAD—CHELYABINSK TO SYZRAN



P. MILL ADVISOR-SEC. MIL. MID

Index map of Route M.



# ROUTE M.

## CHELYABINSK TO SYZRAN.

(709 miles=1,070 versts.)

### LIST OF STATIONS.

INDEX.—Numbers at left serve as a key to map which follows. \* Indicates railroad restaurant. Jct. indicates railroad junction. Important towns are shown in heavy type.

(Numbers at right show versts from Chelyabinsk.)

1. Chelyabinsk (Jct.).....*	0	ЧЕЛЯВИНСКЪ.
Shersht.....		ШЕРШНИ раз.
Smolino.....		СМОЛИНО раз.
2. Polelayevo (Jct.).....	24	ПОЛЕТАЕВО.
Birgida.....		БИРГИЛЬДА раз.
Toktybai.....		ТОКТЫБАЙ раз.
3. Bishkil.....	48	БИШКИЛЬ.
Shakmatovo.....		ШАХМАТОВО раз.
4. Chebarkul.....	68	ЧЕВАРКУЛЬ.
Kisegach.....		КИСЕГАЧЪ раз.
5. Miass.....*	90	МІАССЪ.
Turgoyak.....		ТУРГОЯКЪ раз.
6. Syrostan.....	111	СЫРОСТАЙЪ.
Khrebet.....		ХРЕБЕТЪ раз.
7. Urzhumka.....	132	УРЖУМКА.
Taganai.....		ТАГАНАЙ.

8. Zlatoŭst.....	* 150	ЗЛАТОУСТЪ.
Zavòdskaya.....		ЗАВОДСКАЯ пл.
Ai.....		Ай раз.
Kusn'skaya.....		КУСНИСКАЯ пл.
9. Tundùsh.....	179	ТУНДУШЪ.
Salgàn.....		САЛГАНЪ раз.
10. Berdyàush (Jet.).....	199	БЕРДЯУШЪ.
Yedinovyër.....		ЕДИНОВЬРЪ раз.
11. Suleyà.....	221	СУЛЕЯ.
Kukshik.....		КУКШИКЪ раз.
12. Mursalimkino.....	245	МУРСАЛИМКИНО.
Tyubyalys.....		ТЮБЯЛЫСЪ раз.
13. Vyàzovaya (Jet.).....	* 266	ВЯЗОВАЯ.
Munka.....		МИНКА раз.
Post Zavod.....		ПОСТЪ ЗАВОДЪ.
14. Ust-Katàv.....	284	УСТЪ-КАТАВЪ.
Yakhino.....		ЯХИНО раз.
15. Kropachèvo.....	299	КРОПАЧЕВО.
Yeràl.....		ЕРАЛЬ раз.
16. Shm'skaya.....	321	ШМСКАЯ.
Biànka.....		БЯНКА раз.
17. Minyàr.....	331	МИНЬЯРЪ.
Gremùchi Klyuch.....		ГРЕМУЧИИ КЛЮЧЪ раз.
18. Asha-Balàshèvsкая.....	* 353	АША-БАЛАШЕВСКАЯ.
Kazayàk.....		КАЗАЯКЪ раз.

19. Ulu-Telyäk.....	374	УЛУ-ТЕЛҮЯКЪ.
Urmän.....		УРМАНЪ РАЗ.
Kudÿevka.....		КУДЪЕВКА РАЗ.
20. Tavtinänovo.....	399	ТАВТИМАШОВО.
Chuvashi.....		ЧУВАШИ РАЗ.
21. Iglino.....	417	ИГЛИНО.
22. Shakshà.....	430	ШАКША.
23. Chernikova.....	438	ЧЕРНИКОВКА.
Voronki.....		ВОРОНИКИ РАЗ.
24. Ufà.....*	450	УФА.
Dëma.....		ДЕМА РАЗ.
Avdon.....		АВДОНЪ РАЗ.
25. Yunätovo.....	472	ЮМАТОВО.
Äkino.....		АКШИНО РАЗ.
Tukràn.....		ТУКРАНЪ РАЗ.
26. Chishimÿ (det.).....	494	ЧИШИМЬ.
Küchüm.....		КУЧУМЪ РАЗ.
Udryäk.....		УДРЯКЪ РАЗ.
27. Shingäk-Kül.....	518	ШИНГАКЪ КУЛЬ.
Kazangül.....		КАЗАНГУЛЬ РАЗ.
28. Pavlekänovo.....	540	ПАВЛЕКАШОВО.
Tyudyän.....		ТЮДЫНЪ РАЗ.
29. Räyevka.....*	558	РАЕВКА.
Slak.....		СЛАКЪ РАЗ.

30. Shafrànovo.....	578	ШАФРАНОВО.
Aldàrovo.....		АЛДАРОВО раз.
31. Aksònovo.....	593	АКСЕНОВО.
32. Glukhovskaya.....	613	ГЛУХОВСКАЯ.
Maksyútovo.....		МАКСЮТОВО раз.
33. Aksàkovo (Jct.).....	630	АКСАКОВО.
Ryabàsh.....		РЯБАШЪ раз.
34. Priyútovo.....	649	ПРЮТОВО.
35. Taldý-Bulàk.....	665	ТАЛДЫ-БУЛАКЪ.
36. Abdùlino.....*	684	АБДУЛИНО.
Yakùpovo.....		ЯКУПОВО раз.
Tiràs.....		ТИРАСЪ раз.
37. Sàrai-Gür.....	705	САРАЙ-ГҮРЪ.
38. Philippovka.....	723	ФИЛИППОВКА.
Kislà.....		КИСЛА раз.
39. Asekèyevò.....	742	АСЕКЬЕВО.
40. Zaglyàdino.....	751	ЗАГЛЯДИНО.
Kozlovka.....		КОЗЛОВКА раз.
Zavyàlovo.....		ЗАВЬЯЛОВО раз.
41. Bugurslàn.....	773	БУГУРУСЛАНЫ.
Savrùkha.....		САВРУХА раз.
42. Pokhvístuevo.....*	791	ПОХВИСТЬЕВО.
Muràvka.....		МУРАВКА раз.
Avèrkino.....		АВЕРКИНО раз.

43. Podbyëlskaya.....	814	ПОДБЬЕЛЬСКАЯ.
Tunguz.....		ТУНГУЗЪ РАЗ.
44. Tolkai.....	837	ТОЛКАЙ.
Altikhovka.....		АЛТУХОВКА РАЗ.
45. Mukhanovo.....	853	МУХАНОВО.
Kurtamak.....		КУРТАМАКЪ РАЗ.
46. Krotovka (Jet.).....	867	КРОТОВКА.
Georgiyevka.....		ГЕОРГИЕВКА РАЗ.
47. Turgenevka.....	889	ТУРГЕНЕВКА.
Yazevka.....		ЯЗЕВКА РАЗ.
48. Kinël (Jet.).....*	903	КИНЕЛЬ.
Prigorod Post.....		ПРИГОРОДЪ ПОСТЪ.
49. Smyshlyäevka.....	922	СМЫШЛЯЕВКА.
Zubchaninovka.....		ЗУБЧАНИНОВКА.
Bezimiänka.....		БЕЗЪИМЯНКА РАЗ.
50. Samära.....*	942	САМАРА.
51. Kryäzh.....	948	КРЯЖЪ.
52. Lipyägi.....	957	ЛИПЯГИ.
Zhiguli.....		ЖИГУЛИ РАЗ.
53. Tomýlovo.....	978	ТОМЫЛОВО.
Ivashenkovo.....	982	ИВАШЕНКОВО РАЗ.
Yeriki.....		ЕРИКИ РАЗ.
54. Bezenchük.....	1,002	БЕЗЕНЧУКЪ.
Maituga.....		МАЙТУГА РАЗ.
Bashkürs-koye.....		БАШКІРСКОЕ РАЗ.

55. Mýlnaya.....	1, 025	МЫЛЬНАЯ.
Samàra Lúka.....		САМАРА ЛУКА раз.
56. Obshàrovka.....	1, 041	ОБШАРОВКА.
Lyévaya Volga Post.....		ЛЪВАЯ ВОЛГА ПОСТЪ.
Právaya Volga.....		ПРАВАЯ ВОЛГА раз.
57. Batraki.....	1, 057	БАТРАКИ.
58. Syzrân (Jct.).....	* 1, 070	СЫЗРАНЬ.

## ROUTE M—BRANCH 1.

(Numbers at right show verstis from Poletayevo.)

1. Poletàyevo (Sam. Zlatoust. St.).....	0	ПОЛЕТАЕВО (Сам. Злат.).
2. Poletàyevo (Troitsk St.).....	3	ПОЛЕТАЕВО (Троицкъ).
3. Yemanzhelinskaya.....	29	ЕМАНЖЕЛИНСКАЯ.
4. Nizhne-uvélskaya.....	65	НИЖНЕУВЕЛЬСКАЯ.
5. Troitsk.....	103	ТРОИЦКЪ.
Zolotàya Sopka.....		ЗОЛОТАЯ СОПКА раз.
6. Koyerák.....	121	КОЕРАКЪ.
7. Toguzák.....	159	ТОГУЗАКЪ.
8. Jar Kùl.....	196	ДЖАРЪ КУЛЬ.
9. Ozyòrnaya.....	235	ОЗЕРНАЯ.
10. Kustanái.....	268	КУСТАНАЙ.

## ROUTE M—BRANCH 2.

(Numbers at right show versts from Krotovka.)

1. Kрoтoвka.....	0	КРОТОВКА.
2. Timashevo.....	7	ТИМАШЕВО.
Platforma 19th verst.....		ПЛАТФОРМА 19 вер.
Platforma 23 verst.....		ПЛАТФОРМА 23 вер.
3. Sarbài.....	30	САРБАЙ.
4. Kabanovka.....	48	КАБАНОВКА.
Kopytovka.....		КОПЫТОВКА раз.
Syèrniya Vody.....		СЪРНИЯ ВОДЫ раз.
5. Surgût.....		СУРГУТЬ.

## ROUTE M.

### RAILROAD—CHELYABINSK TO SYZRAN.

#### GENERAL DESCRIPTION.

##### MILITARY VALUE.

The railroad from Chelyabinsk to Syzran is of military importance for the following reasons: First, it constitutes a section of the most direct route from Siberia to Moscow. Second, it passes through a section of the Urals particularly rich in iron and copper deposits. Moreover, the deposits are extensively worked and the metals manufactured into finished products within the region traversed by this route. Third, this route is one of two which must be used as supply lines if a battle front is maintained along the Volga or farther west. Fourth, the region traversed by the route ordinarily has a great surplus of food products, especially cereals and animals. The surplus of cereals usually exported varies from 7 to 21 bushels per inhabitant. Fifth, this is the shortest railway route from Siberia to Turkestan.

**STRATEGIC CENTERS.** In order from east to west.

**Chelyabinsk.** (Population, 70,000.) Treated in Route L.

**Zlatoust.** (Population, 34,000.) The value of Zlatoust as a strategic center lies in the highly productive iron mines of the neighborhood, and the iron manufacturing upon which the town thrives. The most important manufacturing from the military viewpoint is carried on in the Government arsenal, where side arms, bayonets, guns, rifles, machine guns, and other weapons are made.

**Ufa.** (Population, 106,000.) The strategic importance of Ufa arises from its location at the junction of three railways and four important roads. One railway comes from the east, another from the west, and the third from the southwest. Of the four roads, one comes from the east, paralleling the Trans-Siberian Railway and meets the one from the southwest, which also parallels that railroad. These two constitute the Great Trans-



Siberian Highway. The other two come from the north and south from important towns. Ufa also has large iron and copper works.

**Samara.** (Population, 144,000.) Samara is the largest center on this route and the most important strategically. Five first-class lines of transportation converge upon the city; a direct railroad from Moscow, another from Vladivostok, and a third from Turkestan. The fourth first-class route is up the navigable Volga, and the fifth is down the Volga. Samara is considered the best port on that river. Another phase of the military importance of the city is the many military conveniences it possesses. A large force may be accommodated with detraining and entraining conveniences, barracks, drill grounds, hospitals, etc.

**Syzran.** (Population, 48,000.) Like Samara, Syzran enjoys navigation on the Volga, but it lacks a good site for a port. Besides the railway from the east, it has two railways from Moscow. As the keeper of the Alexander Bridge across the Volga, Syzran is of high military importance.

### TERRAIN.

One-fifth of the route is through a rugged section of the Ural Mountains. Along this section many of the slopes are steep and the valleys narrow. A few heights, such as Urenga (a ridge near Zlatoust), reach beyond the tree line, but in general the mountains and their foothills are naturally well wooded.

The other four-fifths of the route, including a short section between Chelyabinsk and the Urals, are made up of a plain, below which rivers have cut deep valleys. From the bottom of one of the deep valleys the terrain above may seem almost mountainous, so long are the slopes and so rugged does the region appear. But when viewed from the summit of one of the flat-topped hills, it is apparent that the flat tops of the hills all lie in the same plane. The hilltops are a thousand feet above sea level near the Urals, whereas they are only a few hundred near Samara. (Photos Nos. 6 and 7.)

**SOIL AND AGRICULTURE.**

A thick layer of black earth covers most of the region traversed by this route; hence with favoring climatic conditions farming succeeds as a rule. Occasionally, however, adverse climatic conditions bring failure of crops and famine. At such times thousands die from the hunger typhus and other thousands have to migrate in search of work along the Volga.

The leading crops are rye, wheat, oats, barley, millet, buckwheat, and potatoes. Melons and sunflower are also extensively cultivated. Live-stock raising comes in for much attention. The exported farm products are chiefly the cereals.

**MINES.**

The fifth of the route that traverses the Ural Mountains taps many iron and copper mines. Near Miass gold is also found. This may be considered one of the most active mining sections of Russia.

**MANUFACTURING.**

Manufacturing centers in dairies, creameries, flour mills, and meat-packing plants, found throughout the entire route, even in the mountains, and in metal industries, which are scattered near the mines in the Urals and among the western foothills. The products range from pig iron and steel plate to hardware, munitions of war, and bridges. Manufacture of machinery is not attempted. (Photo No. 8.)

**INHABITANTS.**

Nearly 80 per cent of the people are Great and Little Russians, and nearly 10 per cent of the remainder are Germans. Many of these are thoroughly Russianized, however, since their ancestors came to Russia about 1762.

**STATISTICS.**

In reading the accounts of manufacturing towns in the following pages, it must be remembered that the statistics are misleading. For example, if a given factory is said to employ 2,000 men, it means that this is the total number of entries in the company's books. The same name may appear half a dozen

times if a man works a few weeks and then quits, only to come back again. Moreover, the men who are reported as employed in a factory may actually be at work miles away cutting wood on the mountains, digging ore in the mine, or driving a sledge to carry the ore scores of miles from mine to factory. It must also be remembered that the methods employed in all processes from the mine to the finished product are usually primitive, so that the product per man is very low.

### DETAILED DESCRIPTION.

<i>Miles from Vladivostok.</i>	<i>Distance from Chelyabinsk.</i>
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4,042	0 Chelyabinsk. (See Route L.)
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From Chelyabinsk, Route M runs southwest near the edge of the Miass Valley. The line soon ascends to the gold mines of Krasheninnikov. A small branch of the Miass, the Birgilda, is spanned by a 70-foot bridge.

24 V	16 M	16 M Poletayevo. A branch railroad (M 1) runs south.
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#### ROUTE M, BRANCH 1.

### POLETAYEVO TO KUSTANAI.

*From Pole-  
tayevo.*

**Poletayevo I** (Samara-Zlatoust Station). From the Samara-Zlatoust station the route runs to the southern part of the town.

M	V	
2	3	<b>Poletayevo II</b> (Troitsk station). The line continues due south across an upland surface.
19	29	<b>Yemanzhelinskaya.</b> Near the head of a valley tributary to the Uvelka Valley. The route proceeds down the valley passing the large Lake Sarikul on the east.

- 43      65 **Nizhne-Uvelskaya.** Railroad restaurant. On the left slope of the Uvelka Valley. A road and telegraph line come in from the northwest. The railroad passes down the valley of the Uvelka following the left slope.
- 68      103 **Troitsk.** Population, 25,000. Railroad restaurant. Situated in the valley where the Uvelka River empties into the Ui River. The city has grown rapidly in recent years. Besides the usual government buildings, it has 10 churches of the Greek religion and 6 Mohammedan mosques. There are also a high school for girls and boys and several substantial business houses. Military barracks and a hospital are located on the outskirts.

A fair held from July to October has a normal turnover of 4,000,000 rubles. European articles, such as metallic products, paper, sugar, and woolen goods, are exchanged for products of the Steppes, such as raw wool, felt, furs, hides, horses, sheep, and fruits from irrigated lands. During the fair the town is able to supply a large volume of these goods. There is a small volume of trade in food products for the Ural gold mines at the west.

About 40 industrial establishments employ 1,500 men and women.

Tanning, the making of leather goods, and iron-working are the chief industrial activities.

Troitsk is an important transportation center. A road and telegraph line come in from Verkhne-Uralsk at the west. Another road goes eastward down the Uvelka Valley. A third comes in from the north. Still another follows the railroad to Troitsk and beyond to Kustanai.

It is reported that a railroad projected from Troitsk through Varshavskaya to Orenburg, 315

miles to the southwest, has been built at least in part by war prisoners.

**Verkhne-Uralsk.** Population, 15,000. An important town about 190 versts (126 miles) west of Troitsk. The capital of the province of the same name, on the left bank of the Ural River. It has no railroad connection.

The town has a rapidly growing trade with the Kirghiz in cattle, sheep, and animal products, which are forwarded to European Russia. Fairs are held July 29 and August 29 (old style), or August 11 and September 11 (new style).

On leaving Troitsk, Route M 1 crosses the Ui River to the right and follows it to the southeast. The line gradually climbs out of the valley and strikes a dry and sparsely populated upland dotted with shallow lakes and ponds. Cattle raising is almost the exclusive occupation from this section to the end of the railroad.

- 80 121 **Koyerak.** Small station on the upland surface. The route continues southeast. At about verst 156 it descends the left slope of a valley tributary to the Ui River.
- 105 159 **Toguzak.** A village in the bottom of the valley. The river is crossed and the line ascends from the valley to the upland. The route strikes northeast across a dry, grassy plain, which is very sparsely populated. Trees are entirely lacking.
- 130 196 **Jar Kul.** A collecting point for export cattle.
- 156 235 **Ozyörnaya.** A convenient place for assembling cattle for the railroad. At about verst 266 descent begins into the valley of the Tobol.
- 177 268 **Kustanai.** (Population, 14,000, 3,000 of which are Kirghiz.) The railroad terminal in the valley of the Tobol. A road runs north down the Tobol valley. The town has important trade with the

Kirghiz in cattle, sheep, and potatoes. There are tanneries and tallow works. Fairs are held at which cattle are sold. The town has a cathedral and a number of schools. The adjoining steppe is fertile.

## CONTINUATION OF ROUTE M.

- From Chelyabinsk.* From Poletayevo Route M diverges from the Miass Valley and runs due west. In this vicinity a broad upland tract is crossed where gold is mined from veins, while in the valleys gravel is washed for gold. A 140-foot bridge takes the railroad across the small Bishkil River.
- |    |    |   |
|----|----|---|
| M. | V. |   |
| 32 | 48 | <b>Bishkil.</b> The highway from Chelyabinsk strikes southwest from the village. The railroad ascends as it continues west. At about verst 63 it enters a branch valley of the Ubedka River.  |
| 45 | 68 | <b>Chebarkul.</b> The village is near the station on Chebarkul Lake. From Chebarkul the railroad follows the narrow and uneven isthmus between Lake Chebarkul and Lake Yelovy and then begins to climb the Ilmen ridge, which forms part of the foothills of the Ural Mountains proper. Beyond the height of land the road descends into the Miass Valley.  |
| 60 | 90 | <b>Miass.</b> (Altitude, 1,115 feet.) Railroad restaurant. A busy gold-mining center situated in the Miass Valley on Lake Ilmen. The highway from Chelyabinsk enters Miass from the south. The surrounding region is rugged and forested. A small force might effectively cut the route at this point. The Miass metal works, founded in 1777, stand 4 miles from the station in a deep valley inclosed by the Chashkov Mountains. Formerly the works smelted copper, but now |

they are operated by the gold-mining company. At the works there is a town with many shops, stores, and stone houses. There are also two libraries and a club. In ordinary times the workmen number about 3,000 and the population exceeds 14,000.

The Ilmen mines, which are near the station, are connected with the Miass works by a narrow-gauge line, amply provided with trucks and engines. The gold-bearing strata contain clayey sand with a mixture of pebbles and gravel. In them are found fragments of quartz, gneiss, and flinty slate. A ton of gravel yields from 9 to 21 grains of gold.

From Chelyabinsk to Miass the railroad is single tracked. At Miass, however, the track becomes double and so continues for 153 miles to Sinskaya. On leaving Miass the railroad crosses the Miass River on a 175-foot bridge and climbs into the Ural Mountains proper. The grades are heavy, and many windings and zigzags are made to keep them within normal limits. The watershed between the Miass and Atlian Rivers is soon crossed, and the line descends into the Atlian Valley. The Atlian River is spanned by a 105-foot bridge. Another watershed is then climbed and descent is made into the valley of the Little Syrostan. The line twice crosses the Little Syrostan River, effecting a circuit of 1½ miles. Then the climb continues in the most rugged part of the Urals crossed by this railroad.

74 111 **Syrostan.** Small station, surrounded by mountains. The village of the same name is located within one-half mile.

The railroad begins an ascent along the right bank of the Bolshaya (Great) Syrostan. The bare stone ridges, which constitute the summit of Alex-

under Cone, altitude 3,500 feet, soon come into view, and remain visible for some time. The River Bolshaya-Syrostan, a branch of the Miass, is crossed by a 126-foot bridge of three spans, one of 70 feet and two of 28 feet. Here the railroad begins its ascent to the main summit of the line by zigzags of about 3 miles in length. Beyond verst 131 the summit is reached. It is marked by a stone pyramid inscribed "Europe" on the west side and "Asia" on the east. Just beyond is Urzhumka.

88 132 **Urzhumka.** (Altitude 1,859 feet.) The station stands in a place remote from all habitation in a rocky recess of the Ural Mountains. The route then swings down into the Pesma Valley and crosses the river of that name on a 161-foot bridge of three spans, one 105 feet long and two 28 feet long. (Photo No. 10.) Beyond, the route again rises over ridge after ridge.

100 150 **Zlatoust.** (Altitude of station 1,495, of town 1,925 feet; population 34,000.) (Photo No. 9.) Railroad restaurant. The town is 3 miles to the southwest, situated in the valley of the Ai, which is here dammed so as to form a considerable lake. The town spreads from the Ai Valley into the valleys of Gramotukha, Tesma, Kamenka, Chuvashka, and Tatarka. It is dominated by Kosotur, an imposing hill, and Urenga, the northern end of a long ridge by that name. A road runs west and southwest to the Satka Iron Works (photo No. 8), thence to a railway station called Suleya.

*Manufactures.*—Because of the proximity of iron mines, Zlatoust has long been important in iron manufactures. In the large Government arsenal located here alloy steel is made into side arms, bayonets, guns, rifles, and machine



guns, and chrome and nickel steel are made into shells of all descriptions. Detonators and shrapnel are reported to have been made to the quantity of about 50,000 per month. In ordinary times the Zlatoust Works produce pig iron, open-hearth steel, railroad equipment, hardware, knives, and forks. Other industries are soap works, textile mills, and bakeries. For fuel the town uses crude oil from Baku or Tashkent and coke from the Donetz Basin.

The metal products have lately had the following destinations: pig iron to Nizhni-Novgorod; side arms to Moscow and Petrograd; shells to Moscow, Kazan, and Perm, to be loaded; railway equipment to Chelyabinsk.

The average yearly output of the Zlatoust Works from 1914 to 1917 was about 50,000 tons of rolled steel, 15,000 tons of cast steel, 10,000 tons of tool steel.

*Hospitals.*—Some of the Government iron works have hospitals of their own. The town supports a small hospital and dispensary.

The route from Zlatoust follows down the valley of the Ai. Cuttings in the valley side often reveal chalk. Fir and pine trees predominate in the forests which clothe the hills.

At about verst 160 is a platform stop named Kusinsk, used chiefly for freight. The town of this name is located about 9 miles away down the valley of the Ai. Its population is about 7,000. Government iron works and foundries are located here. The works are supplied with ore from the Akhtensk mine, situated about 10 miles beyond. The ore is about 73 per cent oxide of iron or about 50 per cent metal. The output of the works is especially for the navy and Government artillery works at vari-

ous centers. Wood and charcoal are employed as fuels.

The route continues down the valley of the Ai, being perched in the main high upon the valley slope. The valley makes a great sweep to the northwest and north, while the railroad continues to bear west. At about verst 176 the Ai River is crossed by a 210-foot bridge, and a steep climb is made out of the valley.

119 179 **Tundush.** The route now passes through a less rugged region and approaches the Suleya ridge.

132 199 **Berdyash.** From this station a broad-gauge branch railroad winds southward, parallel with the Suleya ridge, to the important Satka Iron Works, at Satka (population, 12,000), and thence southwest to the famous Bakal mine (49 versts, or 33 miles). The Satka Iron & Steel Works employ 5,000 operatives. The works consist of several blast furnaces, rolling mills, steel mills, and foundry and machine shops. The pig-iron production is 50,000 tons annually. Shells of all descriptions are made, as well as guns, gun carriages, and large forgings. These munitions are supplied ordinarily to the navy and artillery departments. Wood and charcoal from the neighboring forests are used as fuel in the iron works. The iron ore is brought from Bakal by railroad.

The Bakal mine on the Bulandikha Mountains is in one of the most extensive iron deposits in Russia. The analysis of the ore shows 81.44 per cent oxide of iron, 57.36 per cent metallic iron, 6.78 per cent silica, and 5.46 per cent aluminum. The mine supplies ore not only to Satka but to Sinskaya, Zlatoust, and other centers.

It is reported that prisoners of war have built another railroad from Berdyash northward through Zlokazovo and Grobovo to Kuzino, a

newly erected station on Route N, between Yekaterinburg and Kourovka.

From Berdyaush Route M 1 crosses the Satka River on a 700-foot bridge (spans of 418, 210, and 42 feet), and makes a great sweep to the north to avoid the northern end of the Suleya ridge. The line then continues southwest parallel with the ridge. The country to the west opens up broadly.

- 147      221 **Suleya.** From here a road runs 12½ miles across the Suleya ridge to the Satka Iron Works, thence to the northeast to Zlatoust. Another road with a telephone line runs to the northwest with far-reaching connections. Within 3 miles of the station is a quarry which turns out slate shingles for roofing buildings. The route still continues to the southwest in nearly a straight line, parallel with the Suleya ridge. The Ishelga River is crossed by a 70-foot bridge. Before the next station is reached two more rivers, the Uluir and Sikiarz, are crossed by 70-foot bridges.
- 162      215 **Mursalimkino.** Small station. Broad views are obtained at the west. The line continues to the southwest, with forested mountains on the left and far-stretching fields and meadows on the right. The level land on the right is occasionally cut by deep ravines and valleys.
- 176      266 **Vyazovaya.** (Altitude, 1,060 feet.) Important station. Inclosed by hills clad with evergreen forests. The scenery is parklike. The Yurezhan River, with its steep slopes and islands, is close by.

From Vyazovaya a branch railroad goes due south up the Yurezhan River on its left bank to (11 versts, 8 miles) *Yurezhanski*. Here are located the Yurezhan Iron & Steel Works. They consist of 6 blast furnaces and large steel mills.

## CHELYABINSK TO SYZRAN.

They roll commercial sizes of structural steel as well as steel rails, fastenings, and bridge steel. The annual output is about 50,000 tons. As last reported, the iron ore was brought in carts from the Bakal mine, 24 miles away. It is probable that now it is received by railway.

From Yurezanski the branch line curves to the southwest out of the Yurezan Valley (32 versts, 22 miles) to *Zaprudorka*. The route climbs over the watershed separating the two rivers and descends into the Katav Valley (35 versts, 24 miles) *Katar-Ivanovski*. This is another iron and steel town. The works consist of 7 blast furnaces, rolling mills, Bessemer converters, machine shops, forge, and sawmill. There is also an electrical plant. Large warehouses and sheds for the storage of metal and iron products have been built near the station. The ore comes from the Bakal mines. Before the war 40,000 tons of rails were annually produced, but they were of low grade. During the war the works manufactured ammunition of great variety, but especially shells from 3 inches to 6 inches.

About 77 miles south of Katav-Ivanovski is Tirland, with more steel and iron works. Their output is about 18,000 tons of pig iron and steel. Thirteen miles beyond Tirland is located the town of Byeloryetsk, with still more iron and steel works. They have a capacity of about 9,000 tons of cast iron annually. The products of both Tirland and Byeloryetsk are forwarded to Katav to be sent away by rail.

From Vyazovaya, the main line, Route M, runs to the north and northwest following down the Yurezan Valley on the right slope. The slope is so steep that bare rocks are numerous. Occasionally they rise almost perpendicularly.

188      284    **Ust-Katav.** Amidst cliffs and rocky slopes. Iron works are situated about 3 miles from the station near the junction of the Yurezan and Katav Rivers. They manufacture steel of all commercial sizes and are especially equipped to furnish railroad supplies.

The railroad soon descends into the Yurezan Valley and crosses the river by a bridge with 3 spans of 70, 322, and 70 feet, respectively. Height above low-water mark is 84 feet. A long climb is made toward the plateau surface.

198      299    **Kropachevo.** (Altitude, 1,200 feet.) Small station at the crest of the upland between the Yurezan and Sima Rivers. The Nicholas Iron Works are located about 16 miles from the station. The iron ore is obtained from the Bakal mine, reached by Route M 3. It is reported that during the war the Nicholas Works at one time employed as many as 6,000 persons. The railroad runs west and descends into the Sima Valley.

213      321    **Simskaya.** (Altitude, 625 feet.) Small station, deep in the valley. The town of Simskaya is about 4 miles up the Sima Valley and is connected with the railroad by a street railway line. It contains the Sima Iron Works, which has several blast furnaces and a Bessemer converter. Iron ore is derived from the Bakal mine via Route M 4. It is reported that a maximum of 8,000 men were employed here during the war. Sima has a good-sized hospital. The town is surrounded by tree-clad mountains. There is much limestone in the mountains, and natural caves are common.

The route to this point from Miass is a double-track railway. It continues as a single-track line and follows the Sima Valley westward for

the next 37 miles or beyond the Ulu-Teliak station. Before the next station is reached the railroad crosses the Sima River four times on bridges whose respective lengths are 245, 175, 175, and 280 feet. The first bridge has 3 spans, 35, 175, and 35 feet.

- 221 334 **Minyar.** (Altitude, 520 feet.) The Minyar Steel Works are located  $1\frac{1}{2}$  miles from the station. The reported war output was about 15,000 tons of cast iron and 4,000 tons of steel annually with a maximum working force of 10,000. Their specialty is sheet work and steel plates of all descriptions.

The route curves gradually to the southwest and runs between two mountain ridges, the Vorovei on the right and the Anjigordak on the left. At about verst 349 the railway track is built into the side of a perpendicular limestone rock, the Kazaramen, whose base is washed by the waters of the Sima.

Before the next station is reached exit is made from the Ural Mountains. Beyond this point there is much ruggedness, but it is caused by valleys cut by rivers below the upland surface rather than by hills and ridges rising above the upland surface.

- 234 353 **Asha-Balashkevskaya.** (Altitude, 435 feet.) Railroad restaurant. Close to the station is a steel plant with a large blast furnace. The route continues to the southwest, crossing the river Asha on a 105-foot bridge.
- 248 374 **Ulu-Telyak.** Small station. The line now crosses the streams Telyak and Ulu on 70-foot bridges and climbs out of the Sima Valley. It soon reaches the highest point between the Sima Valley and the Ufa Valley.

- 265 399 **Tavtimanovo.** High on the watershed between the two valleys. The route gradually descends toward the Ufa Valley as it swings from the northwest to the southwest.
- 277 417 **Iglino.** Small station on the left slope of the Ufa Valley. Well-forested section. Two stream saw-mills are located near the station. The line now curves to the west.
- 285 430 **Shaksha.** Near the bottom of the Ufa Valley. The river Tauzh is crossed by a 70-foot bridge. The left bank of the Ufa is followed.
- 290 438 **Chernikovka.** Nearby is a great tallow factory with an annual capacity of 6,000 tons. The railway soon crosses the Ufa River on a 1,500-foot steel bridge (photo No. 10) and ascends the right slope of the Ufa Valley to the town of Ufa.
- 298 450 **Ufa.** Railroad restaurant. (Altitude, 310 feet.) (Population, 106,000.) Located on the right bank of the river Byelaya near its junction with the Ufa. The station lies on the Byelaya, 1½ miles to the north of the town. Ufa is the capital of a province. The better part of the town contains two cathedrals and a few churches; the remainder is a scattered aggregation of small wooden houses. In the middle of the town is a large square and a little to the south are recreation grounds. Both are suitable for camp sites.

*Transportation.*—Besides the main railroad (Route M), Ufa has a newly built railway direct to Simbirsk, on the Volga River (Route X). This railway leaves Route M at Chishmy, the second station west of Ufa, on the main line. Steamers ply from Ufa down the Byelaya, thence down the Kama to Kazan in 2½ days. On the average, the river is open for navigation by the 11th of April and freezes over by the 4th of November.

In summer the river is sometimes so low that steamers can not proceed above Birsk, about 50 miles downstream from Ufa in a straight line, but nearly twice as far by the river. Above Ufa the river is navigable at high water to the Byeloryetsk Works. A roadway runs north to the important town of Birsk and another goes south to Sterlitamak. Telephone lines follow each road.

*Industries.*—There are several private mining enterprises in the vicinity whose products are manufactured in the city. There are 15 copper factories and 13 iron and steel mills, which employ together several thousand men. There are also many small factories making wax candles, candies, rope, and wooden products. Large gasoline reservoirs near the station might well serve military purposes.

Leaving Ufa the route almost immediately crosses the Byelaya on a 2,100-foot bridge, having 6 spans of 350 feet each. (Photo No. 11) The arches are semiparabolic and the track is on the lower chord. The piers and abutments are laid on caissons lowered to the depth of 57 feet below the ordinary water level. The railroad proceeds straight across the flood plain of the Byelaya.

313      472 **Yumatovo.** At the mouth of the Dema Valley. For the next 58 miles, or until Rayevka station is reached, the railroad follows up the Dema Valley. The valley and the upland support occasional farming settlements. The forests are of young growth. The steep slopes of the Dema Valley consist of friable schistose sandstone containing copper ores. Remains of mines are occasionally seen along the valley. Mines in operation are rarely seen. Much of the surrounding country is of limestone, and, as is usual in such regions, caves and depressions called "funnels" are



common. These are places where percolating water has dissolved the limestone, forming caves, the surface of which has fallen in so as to form a hollow.

The route crosses the Uza and the Kolomysh, branches of the Dema, on 140-foot bridges.

- 328 494 **Chishmy.** From Chishmy a newly built railway (Route X) runs due west to Simbirsk. Route M continues to the southwest. The River Dalyshly, a branch of the Dema, is crossed on a 70-foot bridge.
- 343 518 **Shingak-Kul.** Small station. Continuing, the line crosses the River Urdiak, a branch of the Dema, on a bridge of 175 feet. At a siding or platform stop called Karakalinsk copper ores are successfully taken from the friable schistose sandstone of the Dema Valley.
- 358 540 **Davlekanovo.** The station is near Itkulovo, a small Bashkir settlement. Trade is confined to the winter season, when travel is easy over the snow and ice. Not far from the station are a number of farming estates of considerable size. A station grain elevator has a capacity of 540 tons. Proceeding, the route crosses the River Tiulen, a branch of the Dema, on a 140-foot bridge.
- 370 558 **Rayevka.** (Altitude, 380 feet.) Railroad restaurant. A wide view of the Dema Valley is obtained at the east. The route soon leaves the Dema Valley by curving to the west. The River Kyly is crossed by a 175-foot bridge.
- 383 578 **Shafranovo.** The line winds considerably across several valleys, which are tributary to the Dema.
- 393 593 **Aksenovo.** The route climbs to the west and north.
- 406 613 **Glukhovskaya.** (Altitude, 1,235 feet.) An upland station. Here the line reaches the watershed between the Byelaya and Kama River systems.

The route descends as it swings around a semi-circle.

- 418      630 **Aksakovo.** On the edge of the upland. A branch railroad runs 13 versts (9 miles) to the north to Belebei, a district town, with a population of 5,000. It is on the left bank of the Belebeika River. The surrounding region is extensively cultivated. Much grain is exported from Aksakovo. Rye flour also is sent away in considerable quantities. It is milled by small water wheels of primitive construction.

The route descends to the southwest through rough country.

- 430      649 **Priyutovo.** Small station. The surrounding region contains many small farms.

- 441      665 **Taldy-Bulak.** In the valley of the River Ik. The valley is well cultivated. The River Ik is crossed by a 105-foot steel bridge and passes from the Ufa district to that of Samara.

- 454      684 **Abdulino.** (Altitude 530 feet; population 2,000.) Railroad restaurant. Water power is here available and is used by flour mills. Four of these, not far from the station, have a reported output of 20,000 tons of flour yearly. They belong, respectively to merchants named Markov, Sviridov, Rogov, and Zhidkov. A steam flour mill produces about 22 tons of flour per day. A grain elevator near the station has a capacity of 550 tons.

The surrounding country is highly productive, especially of cereals. About 70 per cent of the grain fields are planted with rye, which is the chief crop. Buckwheat comes next. A good harvest yields no less than 13,000 tons of buckwheat in the region tributary to Abdulino. A road goes north down the Ik Valley. Another goes south.

The route climbs out of the Ik Valley and continues to the southwest.

- 467 705 **Sarai-Gir.** (Altitude 825 feet.) Here the watershed is crossed between the Kama and the Volga. A north-south road passes through the town. The route descends as it proceeds to the west.
- 479 723 **Philippovka.** A small station. Descent continues.
- 492 742 **Asekeyevo.** Small station. Railroad follows down the valley slope of the Kisla and crosses the river on a 210-foot steel bridge.
- 498 751 **Zaglyadino.** In the Kisla Valley a road comes in from the southeast. The route now turns to the northwest and follows down the Kisla on its left slope.
- 513 773 **Buguruslan.** The town of Buguruslan lies 2 miles north of the station. (Population 21,500.) It is a district town of the Province of Samara. Buguruslan stands on a bench above the River Kinel, with long slopes rising steeply to the upland surface on the west, north, and east. The Tarkhanka joins the Kinel at this point. The town trades extensively in grain and flour, especially rye. As much as 54,000 tons of rye flour is milled annually by water power in a plant belonging to Mr. Shuvalov. The town ships annually 8,200 tons of buckwheat meal. A large grain elevator serves both town and station.
- One road runs due south about 100 versts to the important town of Buzuluk, another goes northeast and north about 100 versts to Buturuslan, another important town on the Ufa-Simbirsk Railroad. A third road runs to the northwest. The railroad continues down the Kinel Valley due west.
- 524 791 **Pokhvistnevo.** (Altitude 220 feet.) Railroad restaurant. Just beyond a north-south road is crossed. The line curves to the southwest.

- 540 814 **Podbeylskaya.** Small station. The region is well cultivated. The route soon crosses the River Malaya-Kinel, a branch of the Kinel, by a 210-foot bridge.
- 555 837 **Tolkai.** The important town of Kinel is near by. It is the center of the local trade in grain, especially rye. The route proceeds southwestward.
- 566 853 **Mukhanovo.** Small station on left slope of Kinel Valley. The route soon crosses the River Kur-tamak, a small branch of the Kinel, by a 70-foot bridge.
- 575 867 **Krotovka.** Junction of a narrow-gauge branch railway (Route M. 8) that runs to the north.

*Distance  
from  
Krotovka.*

#### ROUTE M, BRANCH 2.

**Krotovka.** The railroad strikes due north and soon crosses the Kinel River on a long bridge. The route then follows up a branch valley of the Kinel.

- |    |    |  |
|----|----|--|
| M  | V  |  |
| 5  | 7  | <b>Timashevo.</b> At this point is located the Timashevo Sugar Refinery. It produces both granulated and leaf sugar to the extent of 11,000 tons annually. Gasoline from Samara is used as the source of power in the refinery. The route soon climbs from the left to the right slope of the branch valley. |
| 20 | 30 | <b>Sarbai.</b> High up on the valley slope. The route soon reaches the upland surface.   |
| 32 | 48 | <b>Kabanovka.</b> An upland town. About the highest point on the route. After crossing the upland, the route begins the descent along the valley of the Surgut, a northward flowing stream.  |
| 54 | 81 | <b>Surgut.</b> Beyond this terminal station across the River Sok lies the town of Sergiyevsk. It is famed  |

for its mineral springs. The waters are 67° F. and contain a large percentage of sulphurated hydrogen. The medicinal effects are supposed to be excellent. Many people come here for treatment, and during the season, from May 10 to August 25, several doctors are in attendance.

## CONTINUATION OF ROUTE M.

*From Cheli-  
abinsk.*

From Krotovka the route continues westward along the floor of the Kinel Valley. The Kutuluk, a branch of the Kinel, is crossed on a 175-foot bridge.

- 589 889 **Turgenevka.** Small station.  
601  
600 906 **Kinel.** Railroad restaurant. From this station a railroad (Route T) runs southeast to Turkestan. The route now crosses to the right bank of the river by a 420-foot bridge. It then ascends a hilly section to the siding Padvoka, the highest point, and descends to the valley floor again, crossing a small stream by a 70-foot bridge.
- 611 922 **Smyshlyayevka.** Small suburban station. A road and telephone line run to the north. The route strikes southwest toward Samara.
- 625 942 **Samara.** (Altitude 185 feet; population, 144,000.) (Photo. No. 12.)

*Situation.*—Capital of the Province of Samara. Situated at the junction of the Volga and Samara Rivers, at the southeastern curve of the great "Bow of Samara," which the Volga makes in a long sweep to the east, south, and west. Within the bow as well as at the north and northeast of the city the land is generally rugged. The valley floor of the Volga here narrows to a few miles, while both up and down stream the width is measured by tens of miles.

## CHELYABINSK TO SYZRAN.

*Strategic value.*—The city is of high strategic importance: (1) It lies near the junction of the Siberian and Turkestan Railways, as well as on a direct line to Moscow. (2) These routes are met at Samara by the great north and south water highway, the River Volga. (3) The port here is the best one on the river. (4) The city lies at the point where the Volga Valley contracts to its smallest dimensions, and thus the city is surrounded by hills instead of being in a flat plain, as are most Russian cities. Since the five lines of transportation diverging from Samara—three by rail and two by water—are all of first-class importance, the control of the city is of vital necessity to any military expedition in this region. In order to hold the city the entire "Bow of Samara" would have to be held strongly, else the city would be put in serious hazard, as the height of land in the eastern part of the bow could dominate the city with heavy artillery. Moreover, if the neck of the bow is held, Syzran would be within the line. This would be desirable, since Syzran constitutes the western bridgehead of Samara. Elsewhere the open Volga makes an effective military barrier, since the river is nearly a mile wide.

*Military conveniences.*—As headquarters of the Twenty-fourth Army Corps, Samara has in ordinary times many military conveniences, such as barracks, "sklads" (storehouses), hospitals, and drill grounds. As no repairs have been made on the barracks since the war began, they are now so dilapidated that they can not be used. The theaters and factories, however, are available. The Zemstvo Hospital, in the northern quarter of the town, contains 250 beds. There

is also a railway hospital and a bacteriological station. Several "kumyss" establishments partake of the nature of hospitals. There are sanitarium, where the sour milk of the Asiatic Steppes is used as a restorative, together with baths and other devices. A large one, Postnikov's, lies in a park on the high bank of the Volga, two-thirds of a mile from the river. It consists of isolated cottages.

The city contains a large factory, where cartridges were made during the war.

The railway yards and sidings, about a mile east of the city, are extensive enough to speedily entrain a large body of troops. In April, 1918, there were in these yards, but not on cars, seven 8-inch howitzers, eight 60-pound fieldpieces, nine Russian field pieces, and two caterpillar tractors. Many of the guns were new, and the mountings, especially of the howitzers, were of the best. They bore the name of the Midvale Steel Co., of Pennsylvania.

*Climate.*—Although the average yearly temperature at Samara (Lat. 53° 11' N.) is only 39.2° F., the July average rises to 70.4° and the January average falls to 9.3°. Moreover, the maximum summer temperatures while they are at their worst are depressingly hot. The winter brings severe frosts with many snowstorms. The accumulation of snow, however, is not heavy. The Volga north of Samara freezes in mid-November, but through communication with Petrograd by river and canal usually closes late in October and does not open until May. The Volga near Samara is free from ice, as a rule, from April 16 to December 13.

*Transportation.*—Besides the three railways already mentioned, Samara is served by roads

both to the north and south. Within the city goods and passengers are transported by horses, electric cars, and automobiles. From the Volga side the streets rise steeply to the center of the city. The streets are well paved with granite blocks. The grain supply is brought into the city from the outlying districts on sledges or low carts, according to the season. Often camels as well as horses are used for transportation. The country roads are so impassable in the spring that the city people are often without bread for weeks at a time.

The mouth of the Samara River forms a deep and broad bay, which with the port on the Volga can accommodate 50 vessels. Samara has the most convenient wharves of the Volga towns. Passengers and light cargoes are taken from the Volga side of the town, while grain and other heavy cargoes are loaded on the Samara River side. A municipal grain elevator, capacity about 5,400 tons, facilitates the loading.

*Manufactures and trade.*—Samara is surrounded by an important grain-raising and grazing region. Hence the city's chief trade is in cereals, flour, and hides, and the leading industries are flour milling and tanning. The flour mills in the town and its vicinity have a total capacity of about 180,000 tons annually. The surplus grain of the region, especially to the east, is collected at Samara and sent to Petrograd, mainly by river and canal. Other industries are iron foundries, soap and candle factories, and wagon works. Three great fairs are held every year.

From the Samara Station the railroad curves to the south, descends to the floor of the Samara River Valley, and crosses the river by a steel



bridge, 840 feet long. (Photo No. 13.) It then curves to the west.

- 629 948 **Kryazh.** An industrial suburb of Samara. A large flour mill, owned by Mr. Shikhobalov, has a capacity of 18,000 tons annually. Near by are stockyards and slaughterhouses, which ordinarily handle 200,000 head of cattle, sheep, and hogs per year. These are chiefly brought on the railroad from Turkestan. Much grain and other farm products are exported from Kryazh. The route runs west roughly parallel with the Volga.
- 635 957 **Lipyagi.** Small station in a fertile farming region. Near by is the village of Voskresenskoye, with a population of 2,000. The route strikes to the southwest.
- 648 978 **Tomylovo.** (Population, 2,000.) Good agricultural district in the Volga Valley. The route crosses the Mochu River on a 280-foot bridge and curves to the west.
- 664 1,002 **Bezenchuk.** The annual exports of farm products from this station amount to 5,000 tons. The large Bashkirova flour mill, with a capacity of 54 tons per day, lies near the station. The Government maintains an agricultural experiment station and farm, which is equipped with large buildings, repair shops, and loading platforms for heavy tractors, etc. The loading platform is the only one where cranes are found between Samara and the Volga River. Beyond Bezenchuk the railroad crosses a small river and continues westward.
- 680 1,025 **Myl'naya.** Fertile farming country in the Volga Valley. The line bends to the northwest as it passes over flat country. One of the largest shell-loading and chemical works in Russia was established here by the Government in 1915. The works covered hundreds of acres on both sides

of the railroad. In 1917 they were so far completed that they were provided with waterworks, paved streets, and many substantial brick buildings, as well as with large reservoirs for oil and chemicals.

- 690 1,041 **Obsharovka.** Not far from the station is the town of Novy-Kostychi, with a population of 5,000. Many flour mills have a combined annual capacity of 18,000 tons. The route continues across the flood plain of the Volga and soon reaches the imposing Alexander Bridge over the Volga. (Photo No. 14.) This steel bridge is 4,710 feet long and consists of 13 spans. The supporting pillars are high enough to allow the passage of large steamers on the Volga. The bridge was injured by the Bolsheviki in the fall of 1918, but appears to have been soon repaired.
- 701 1,057 **Batraki.** (Altitude, 130 feet; population, 2,500.) On the right bank of the Volga. Batraki is a river port of some importance. Nearly 200,000 tons of gasoline and kerosene are handled yearly. These are stored in large reservoirs near the station. Several flour mills have a combined capacity of 50 tons daily. Batraki is important because it immediately controls the great Alexander Bridge. East of the river the bridge is approached across a low, level plain about 75 feet above the main level of the river. The river banks are steep, but are cut here and there by ravines, which break the continuity of the plain. Batraki lies on a narrow terrace west of the river. This terrace is about the same height as the plain on the east side; it varies in width from a few hundred feet to one-half mile. At Batraki it is about one-fourth of a mile. Back of the terrace there is a grassy bluff about 50 feet high, and at the top of this

lies the great plain of the Volga Valley. In the town of Batraki the railroad swings through an angle of  $45^{\circ}$  or more and runs along the west bank of the Volga.

Like all the towns along the Volga, Batraki has no real wharves, but has several large landings. Passengers are usually landed on small floating docks. Freight, however, is simply carried by hand from the deck of the steamer to the land across long gangplanks. Neither here nor elsewhere along the river is freight handled by docks or cranes.

709 1.070 Syzran. (Population 46,000.) (Photos Nos. 15 and 16.) The chief town in a district of the Province of Simbirsk. The center of the town lies one-half mile south of the station.

Syzran lies on two small rivers, the Syzran-Voloshka and the Kryumza. The ravine of the latter divides the town into two parts.

*Manufacturing.*—No fewer than 5,000 operatives are employed in cotton mills. Tanneries and leather factories are also important. There are several flour mills within the city. The large villages of the surrounding region engage in a variety of petty domestic manufactures, the aggregate of which is important.

*Transportation.*—From Syzran two railroads continue west and northwest to Moscow, one by way of Pensa, the other farther north. Syzran also enjoys transportation on the Volga. The landing place for steamers is usually at the island of Rakov,  $3\frac{1}{2}$  miles from the town. The town may be regarded as one of the strategic points on the Volga, since it would need to be held if Batraki and the Alexander Bridge are to be protected.

## ROUTE N.

### OMSK TO VYATKA.

(1,091 miles=1,646 versts.)

#### LIST OF STATIONS.

INDEX.—Numbers at left serve as a key to map which follows. Numbers at right show versts from Omsk. \* indicates railroad restaurant. Jct. indicates railroad junction. Important towns are shown in **heavy type**.

1. Omsk.....	*	0	ОМСКЪ.
Post.....			ПОСТЪ.
2. Kulomzinò (Jct.).....		5	КУЛОМЪИНО.
Siding 55.....			РАЗЪВЪДЪ 55.
3. Lyùbinskaya.....		50	ЛЮБИЦСКАЯ.
Siding 52.....			РАЗ. 52.
4. Dragùnskaya.....		93	ДРАГУЦСКАЯ.
Siding 49.....			РАЗ. 49.
5. Nazyvàyevskaya.....		* 140	НАЗЫВАЕВСКАЯ.
Siding 46.....			РАЗ. 46.
6. Mangùt.....		182	МАНГУТЪ.
Siding 43.....			РАЗ. 43.
7. Maslyànskaya.....		222	МАСЛЯНСКАЯ.
Siding 40.....			РАЗ. 40.
Siding 39.....			РАЗ. 39.

8. Ishim.....	* 266	ИШИМЪ.
Siding 37.....		РАЗ. 37.
9. Karasûlskaya.....	305	КАРАСУЛЬСКАЯ.
Siding 34.....		РАЗ. 34.
10. Golyshmanovo.....	339	ГОЛЫШМАНОВО.
Siding 31.....		РАЗ. 31.
11. Omutn'skaya.....	381	ОМУТИНСКАЯ.
12. Vagài.....	* 402	БАГАЙ.
Siding 27.....		РАЗ. 27.
13. Zavodo-ùkovskaya.....	446	ЗАВОДОУКОВСКАЯ.
14. Yalûtorovsk.....	* 468	ЯЛУТОРОВСКЪ.
Siding 23.....		РАЗ. 23.
15. Bogandinskaya.....	502	БОГАЦДИНСКАЯ.
Siding 20.....		РАЗ. 20.
16. Tyumèn.....	* 537	ТЮМЕНЬ.
Siding 18.....		РАЗ. 18.
17. Podyòm.....	557	ПОДЪЕМЪ.
Siding 17.....		РАЗ. 17.
18. Karmàk.....	576	КАРМАКЪ.
Siding 16.....		РАЗ. 16.
19. Tugul'ym.....	594	ТУГУЛЫМЪ.
Siding 15.....		РАЗ. 15.
20. Yushalà.....	610	ЮШАЛА.
Siding 14.....		РАЗ. 14.
Siding 13.....		РАЗ. 13.

1. Poklëvskaya.....	* 641	ПОКЛЕВСКАЯ.
Siding 12.....		РАЗ. 12.
Siding 11.....		РАЗ. 11.
22. Oshchëpkovo.....	670	ОЩЕПКОВО.
Siding 10.....		РАЗ. 10.
23. Aksariĭka.....	690	АКСАРИХА.
Siding 9.....		РАЗ. 9.
24. Kamyshlõv.....	* 708	КАМЫШЛОВЪ.
Siding 8.....		РАЗ. 8.
Siding 7.....		РАЗ. 7.
25. Pysbmïnskaya.....	729	ПЫШМИНСКАЯ.
Siding 6.....		РАЗ. 6.
26. Bogdanovich (Jct.).....	748	БОГДАНОВИЧЪ.
Siding 5.....		РАЗ. 5.
27. Gryaznõvskaya.....	767	ГРЯЗНОВСКАЯ.
Siding 4.....		РАЗ. 4.
Siding 3.....		РАЗ. 3.
28. Bazhenovo.....	789	БАЖЕНОВО.
Siding 2.....		РАЗ. 2.
29. Kosulino.....	809	КОСУЛИНО.
Siding 1.....		РАЗ. 1.
30. Istok.....	827	ИСТОКЪ.
31. Yekaterinbùrg II.....	837	ЕКАТЕРИНБУРГЪ II.
32. Yekaterinbùrg I (Jct.).....	* 811	ЕКАТЕРИНБУРГЪ I.
Siding 73.....		ЧАЗ. 73.

33. Khrustálnaya.....	26	ХРУСТАЛЫНАЯ.
34. Revdà.....	40	РЕВДА.
35. Bilimbài.....	54	БИЛИБАЙ.
36. Kòurovka.....	* 71	КОУРОВКА.
Siding 68.....		РАЗ. 68.
Siding 67.....		РАЗ. 67.
37. Sabik.....	99	САБИКЪ.
Siding 66.....		РАЗ. 66.
38. Sargà.....	119	САРГА.
39. Shalyà.....	* 136	ШАЛЯ.
40. Vogülka.....	152	ВОГУЛКА.
Siding 62.....		РАЗ. 62.
41. Shamarÿ.....	171	ШАМАРЫ.
Siding 61.....		РАЗ. 61.
42. Kordón.....	* 196	КОРДОНИ.
Siding 59.....		РАЗ. 59.
43. Tulumbàsy.....	214	ТУЛУМБАСЫ.
44. Shùmukovo.....	229	ШУМКОВО.
45. Kishèrt.....	242	КИШЕРТЬ.
Siding 56.....		РАЗ. 56.
46. Kungür.....	* 261	КУНГУРЪ.
47. Yergàch.....	283	ЕРГАЧЪ.
Siding 54.....		РАЗ. 54.
48. Kùkshàn.....	306	КУКУШТАНЪ.

49. Mulyanka.....	326	МУЛЯШКА.
Siding 51.....	362	РАЗ. 51.
Perm II.....*		ПЕРМЬ II.
50. Perm I (Jct.).....*	355	ПЕРМЬ I.
Siding 37.....		РАЗ. 37.
Kuryà.....		КУРЬЯ.
Siding 36.....	391	РАЗ. 36.
51. Shabunichi.....		ШАБУНИЧИ.
Chaikovskaya.....		ЧАЙКОВСКАЯ.
Siding 34.....		РАЗ. 34.
52. Grigoryevskaya.....	416	ГРИГОРЬЕВСКАЯ.
Mokino 33.....		МОКИНО раз 33.
Siding 32.....		РАЗ. 32.
53. Mendelejevo.....	443	МЕНДЕЛЪЕВО.
Siding 31.....		РАЗ. 31.
Siding 30.....		РАЗ. 30.
Siding 29.....		РАЗ. 29.
54. Vereshchagino.....*	468	ВЕРЕЩАГИНО.
Siding 28.....		РАЗ. 28.
55. Borodulino.....	489	БОРОДУЛИНО.
56. Kuznà.....	513	КУЗЬМА.
Siding 25.....		РАЗ. 25.
57. Kez.....	533	КЕЗЪ.
Siding 24.....		РАЗ. 24.
Siding 23.....		РАЗ. 23.



58. Chèptsa.....	553	ЧЕПЦА.
Shur.....		ШУРЪ раз. 21.
59. Balezinò.....	583	БАЛЕЗИНО.
Karavài.....		КАРАВАЙ раз. 19.
60. Glàzov.....*	610	ГЛАЗОВЪ.
Siding 17.....		РАЗ. 17.
Zhàba.....		ЖАБА раз. 16.
61. Yar.....	645	ЯРЪ.
Sàda.....		САДА раз. 13.
62. Fàlenki.....	677	ФАЛЕНКИ.
Chernoùs.....		ЧЕРНОУСЪ раз. 10.
63. Zùyevka.....*	706	ЗУЕВКА.
Rèkhino.....		РЕХИНО раз. 7.
64. Ardashì.....		АРДАШИ.
Siding 5.....	736	РАЗ. 5.
65. Pròsnitsa.....	760	ПРОСНИЦА.
Siding 2.....		РАЗ. 2.
66. Polòi.....	785	ПОЛОЙ.
Siding 1.....		РАЗ. 1.
67. Vyâtka.....*	805	ВЯТКА.

## ROUTE N—BRANCH 1.

1. Bogdanovich (Jct.).....*	0	БОГДАНОВИЧЪ.
2. Sinarskaya.....	38	СИНАРСКАЯ.
3. Kolchedan.....	58	КОЛЧЕДАНЪ.
4. Chuga.....	74	ЧУГА.
5. Katisk.....	85	КАТАЙСКЪ.
6. Dalmatov.....	105	ДАЛМАТОВЪ.
7. Leshchevo Zamaraevo.....	127	ЛЕЩЕВО ЗАМАРАЕВО.
8. Shadrinsk.....*	149	ШАДРИНСКЪ.

## ROUTE N—BRANCH 2.

(The numbers to the right indicate versis from Yekaterinburg, roughly estimated.)

1. Yekaterinburg I.....*	0	ЕКАТЕРИНБУРГЪ I.
2. Monètnaya.....	28	МОНЕТНАЯ.
3. Rudyanskaya.....	45	РУДЯНСКАЯ.
4. Ryozh.....	65	РЕЖЪ.
5. Yegorshino.....	93	ЕГОРШИНО.
6. Boyarskaya.....	117	БОЯРСКАЯ.
7. Khudyakovo.....	142	ХУДЯКОВО.
8. Irbit.....*	170	ИРБИТЪ.

## ROUTE N.

### RAILROAD—OMSK TO VYATKA.

#### GENERAL DESCRIPTION.

##### MILITARY IMPORTANCE.

The railroad from Omsk to Vyatka is important for four chief reasons of a military character: First, by this route forces from Vladivostok would naturally effect a junction with the allied forces from Archangel and Murmansk. Second, the route is the easiest outlet for the platinum-producing regions of the Central Urals. One railway runs from Yekaterinburg into the mining region and another from Perm. The control of the platinum output of the Central Urals is a valuable military prize, since over 90 per cent of the world's supply comes from here and since platinum is essential in war manufactures. Third, the mining regions tapped by this route also turn out a great supply of iron. It is reported that during the war the Ural iron mines were so speeded up that about 45 per cent of Russia's supply was from that region. Fourth, the route is part of the only railway that leads directly from Siberia to Petrograd, the most important center in Russia.

##### STRATEGIC CENTERS.

**Omsk.**—(Population, 136,000.) (See Route M.)

**Yekaterinburg.**—(Population, 70,000.) The junction of four railways—the Perm line on the west, the Omsk line on the east, the Chelyabinsk line on the south, and the mining railway to the Central Urals on the north. The city is also strategically located at the entrance to an easy pass over the Ural Mountains.

**Perm.**—(Population, 105,000.) On the Trans-Siberian Railway to Petrograd at its junction with the western railway outlet of the Central Ural mining district. The center of river navigation in four directions.

**Vyatka.**—(Population, 60,000.) On the Trans-Siberian Railway at a point where that route is joined by a river-railway route from Archangel. Since Vyatka is also on the navigable

Vyatka River which flows southward, it has easy communication in four directions.

Each of the following secondary strategic centers, **Ishim**, **Yalutorovsk**, and **Tyumen**, lies on the railway where it is crossed by a northward-flowing navigable river.

#### **RELIEF.**

The first third of the route—from Omsk to Tyumen—traverses a flat region varied only by slight swellings above the general level and by shallow valleys cut by the rivers below the general level. The second third, from Tyumen to Perm, is rough. From the low eastern foothills of the Ural Mountains it rises into the mountains proper and then descends to an upland which is thoroughly cut up by river valleys. The last third, from Perm to Vyatka, traverses a typical portion of the great Russian plain.

#### **FORESTS.**

Throughout the route trees are to be seen, but they vary greatly in size and numbers. In the first third the trees are small and generally scattered in grovelike clumps. Timber is plentiful here for fuel and light construction. In the second third the forest as a rule is dense, especially in the Ural Mountains, and can supply heavy timber for extensive engineering work. The last third of the route resembles the first in having birches and small pines chiefly, but here they occupy nearly all of the country except where it has been cleared for cultivation.

#### **SOIL AND AGRICULTURE.**

All along the route the fertile soil permits excellent crops to be raised wherever the forest is cleared. East of the mountains the soil is black and well drained for the most part. In the second third of the route a thick sheet of rich humus covers the valleys, the uplands, and even the lower slope of the mountains. In the last third much of the soil is light and made up of a sandy, red clay, but even in this crops do well. Trench digging is easy throughout the route, except on the steeper slopes in the Urals where granite is found.

Farming villages are scattered fairly regularly all along the route and within sight for several miles on both sides, but as a rule the cultivated sections are merely interruptions in the continuity of the forests. The ordinary village is made up of a group of one-story, dark-looking houses with thatched roofs. A green-domed church is generally the most conspicuous object, as it reaches high above all else.

Agricultural education is higher in this section of Russia than in almost any other. This perhaps accounts for the large surplus of agricultural products that is shipped, both by water and by rail, chiefly to Petrograd. Rye, wheat, oats, barley, potatoes, buckwheat, and hemp are raised. Cattle breeding is well developed all along the route, but especially east of the Urals. Butter and cheese are the chief export products. It is obvious, therefore, that this region should be able indefinitely to provision many thousand troops, providing the peasants continue their normal work on the farms.

#### **MINES.**

This route is the southern and western railway exit of the Central Urals, which contain mines of platinum, iron, copper, gold, coal, and salt, besides many precious or semiprecious stones. Iron is the most important for local consumption, but platinum is chief from the world's viewpoint.

#### **MANUFACTURING.**

The mines, farms, and forests determine the character of the manufacturing industries. Along the first and last thirds of the route flour mills and creameries are common. In the small towns and villages windmills generally furnish the power, but in the large centers steam plants are used. The close adjunct of the flour mill is the grain elevator. The large towns have grain elevators, but the small ones have storage sheds. In the larger cities warehouses contain in ordinary times a supply of farming machinery turned out by American firms, such as the International Harvester Co.

Along the second third of the route iron furnaces, copper foundries, sawmills, and machine shops are frequent.

Hence, at least the larger cities are equipped to make military repairs of various sorts. However, since local standards are not high, the more serious repairs should have the immediate supervision of American mechanics. An important gun factory on the outskirts of Perm is a possible source of new supplies as well as a repair depot.

### STATISTICS.

See note on this subject under Route M, page 36.

### DETAILED DESCRIPTION.

M.	V.	
0	0	<b>Omsk.</b> (See Station 155, Route K.) For the first 5 versts the route runs west along the Trans-Siberian Railway, crossing the Irtysh on the long bridge described fully in notes on Route M.
3	5	<b>Kulomzino.</b> At this station the route leaves the Moscow branch of the Trans-Siberian Railway and strikes to the northwest. It follows the valley of the Irtysh for 30 miles to Lyubinskaya. The land is extensively cultivated and the fields are well grazed by herds of cattle. An immense amount of hay is taken from the meadows. Unusually fine crops of oats are raised along this part of the route.
33	50	<b>Lyubinskaya.</b> At Lyubinskaya the railroad comes out of the valley of the Irtysh and rises to the level of the general plain. Here a north and south highway is crossed. This highway connects at the north with the main road from Omsk to Tyumen. The railroad connects the two centers by a shorter line. The route then strikes across the plain for a distance of 233 versts before descending into the next important valley.

*Verst 67.*—Birch trees are of good size. Some of the trunks might be used for engineering work. The land is high and well drained, with more extensive cultivation, especially wheat, barley, and

oats. Soil is dark brown and about 16 inches deep.

In the vicinity of verst 82 the land is more open and freer from bushes. Barley, oats, and wheat are commonly raised along here, and herds of cattle are to be seen in the fields.

62 93 **Dragunskaya.** Three lakes are passed at the north just before this town is reached. Large patches of prairie all along the route, with a dense growth of grass. Wherever the land is cultivated, good crops are raised, especially of rye. Bushy stretches are common.

93 140 **Nazyvayevskaya.** Railroad restaurant. Cattle raising and butter district. At this point engines and crews are ordinarily changed. Two lakes lie near the town. A typical portion of the monotonous plain is crossed, diversified only by clumps of bushes. The route bends more to the northwest.

121 182 **Mangut.** Situated on the shores of a lake of the same name. A long undiversified stretch is traversed. Much of this region is open prairie, with occasional large patches of white birch.

In the vicinity of verst 193 the country is very flat and quite free from trees. There is no cultivation, but the land supports a heavy growth of grass. Soil is only 6 to 8 inches deep, with a gray clay subsoil. In some places the soil looks very dry and alkaline.

147 222 **Maslyanskaya.** A town on the edge of the valley of the Ishim, a branch of the Irtysh. The railway now runs due west roughly parallel to the Ishim Valley. Cattle breeding is an important occupation throughout the valley. There is practically no cultivation.

At about 250 versts the route dips into the valley, crosses the river, and on the opposite bank reaches the town of Ishim. The bridge across the Ishim is 900 feet long and has four spans.

176 266 **Ishim.** Railroad restaurant. (Population, 10,000, one-fifth Tartars.) A typical Siberian city in a cattle-grazing country. Important as a meat-producing center. The river lies on three sides of the city. The river valley is 10 to 12 miles wide, with hay meadows occupying the river flats.

*Health.*—Good water from the River Ishim. No sewage system. Health conditions very good.

*Fuel.*—Cordwood. Coal from Omsk.

*Food.*—Since Ishim is in the midst of a dairy country and not far from grain-producing regions, food is normally abundant.

*Military facilities—Quartering troops.*—In addition to the usual barracks, a number of booths used at the annual fair are available as quarters. A camp site might be found close to the bridge across the River Ishim.

*Repair.*—There are no adequate railway shops or other conveniences for repairs.

*Transport.*—Horses and oxen may be had for transport, but there are no motor vehicles or gasoline.

*Industry and commerce.*—There are tanneries, soap and candle factories, and flour mills. The last use the power of windmills. In November and December fairs are held at which peasants exchange cattle, horses, and farm products for other necessities of life. About 4,000,000 rubles' worth of property changes hands in this way annually.

The Ishim River is navigable for small steamers as far as Ishim during the high water of May and June. At other times the shallows make it difficult to reach the city.

From Ishim a highway runs southward about 153 versts up the valley of the Ishim to Petropavlovsk, on the Moscow branch of the Trans-Siberian Railway. Another highway, in only fair condition,



goes southwest about 310 versts to Kurgan and other towns on the same railway. A large lake lies to the southwest of Ishim. From Ishim to the Ural Mountains the railroad roughly follows the Government highway.

In the vicinity of verst 273 is a large level prairie, with no trees in sight and little cultivation. Houses in the village are low and weather beaten, with heavily thatched hay roofs.

At verst 300 the soil is brown and good for grain. Much of the land is cultivated. The land continues flat with slight swellings. Because these swellings are better drained, they are more cultivated than the lower stretches.

202 305 **Karasulskaya.** Soon after passing Karasulskaya a broad marshy stretch is crossed. Brush and small white birch are abundant. Hay meadows prevail.

225 339 **Golyshmanovo.** Here higher, drier land with normal cultivation is reached. The town lies on the right bank of the Vagai River, which the route crosses directly. The railroad continues northwest in the midst of a broad agricultural region. This region is flanked on both the north and south by partially wooded swamps that cover great areas. Hay is the chief crop.

Such districts are common throughout the western part of the Siberian plain. They lie in the interstream spaces. The banks of the rivers and broad belts on either side are the higher, better-drained areas. These are therefore taken over for farming, and are the inhabited sections. They look like the Dakota prairies, about 25 per cent cultivated. The soil consists of 1 foot of dark loam, with grayish clay subsoil.

253 381 **Omutinskaya.** With a Cossack guardhouse. Along this stretch the route follows up a small western branch of the Vagai. The railroad towns are usu-

ally on the highway and also on a river. The towns from which the stations take their names are often out of sight of the railway line. Brush and poplar cover wide areas.

- 267 402 **Vagai.** Railroad restaurant. Vagai is also located on the Vagai River. The route then passes to the headwaters of another small stream. The land is flat as far as the eye can reach, with about one-fourth under cultivation. The other three-fourths are in pasture and hay. The only timber is fair-sized white birch.
- 298 446 **Zavodo-Ukovskaya.** The Tobol River is crossed by a bridge more than 1,000 feet long.
- 310 468 **Yalutorovsk.** (Population, 5,000. 5 per cent Tartars.) Railroad restaurant. Yalutorovsk is located at the junction of the Tobol and Iset Rivers on the north bank. The station ordinarily has a Cossack guard. River boats ply the Tobol from Kurgan on the south past Yalutorovsk to Tobolsk on the north, but are apt to be hindered by sand bars except in the late spring. Fairs are held in January, March, September, and December. A fair highway runs due west from Yalutorovsk and follows up the Iset River for over 200 miles to Ostrovskaya, whence a branch railway runs north about 28 miles to Bogdanovich, on the main railroad, Route N.
- Our route proceeds northwest from Yalutorovsk on a line roughly separating the swampy land at the northeast from the highly cultivated land at the southwest. A good highway runs in the same direction as the railroad and not far from it. The soil is occasionally sandy and in low ridges. The trees are small white birch and poplar.
- 333 502 **Bogandinskaya.** On the small river Pyshma. About 10 versts beyond the station a large lake is passed on the right. The country is very flat and bushy without much cultivation.

356 537 **Tyumen.** (Altitude 280 feet, population 50,000.)  
 Railroad restaurant. Tyumen is situated where the chief highway from Russia across the Urals touches the first navigable river of Siberia, the Tura. The town is well built and stands on both banks of the Tura, here spanned by a bridge. Tyumen is a district town of the government of Tobolsk. (Photo, No. 17. Photo, No. 18.)

*Military facilities.*—*Barracks.*—As this city was once the point of embarkation for all exiles and prisoners going east, all buildings used as prisons would be available for barracks. These would be in addition to the regular barracks.

*Camp sites.*—The best camp site would be on the left bank of the Tura River near which is an island, where Messrs. Ignatyev have a shipyard and shop. The race course on the outskirts of the town would be available for aeroplane landing.

*Transport.*—No automobiles and not many horses are available. Chief dependence is on the river.

*Repair facilities.*—Fairly modern equipment in the railroad shops.

*Hospital facilities* fair.

*Labor.*—Mostly Russians and friendly.

*The city.*—The streets are broad and straight. As in all Siberian cities, only the main streets are paved.

*Health.*—River water is supplied, but as it is muddy it must be filtered. There is no sewage system. The sewage is carried out of the city and dumped into pits. Notwithstanding these conditions, the general health is fairly good.

*Food.*—Since this is a dairy region, food supplies are fairly abundant.

*Fuel.*—Cordwood. This is cut above the city on the river and floated down on rafts. Poor coal may also be had from the Ural Mountains.

*Manufacturing.*—The people of Tyumen are well-known for their industrial skill. Local industries include four lumber mills, five shipbuilding yards handling annually about \$250,000 worth of river craft and barges, two flour mills (output 7,500 tons per year), bell factory, brewery, sheep-leather factory, cloth factory for soldiers' uniforms, fur factory, three machine shops handling chiefly agricultural machinery, potteries, soap factories, and match and veneer factories. A large shipyard, situated on the left bank of the river Tura and belonging to Trapeznikova, has stationary and marine boilers, a machine shop, foundry, blacksmith shop, and woodworking shop. A large flour mill 1 mile from the city has its own repair machine shop.

*Transportation.*—The banks of the river Tura have been strengthened so that railroad cars may be brought direct to the steamers to facilitate loading and unloading. Landing places belong to the Ship & Trading Co., Kurbatov & Ignatyev, and several others. Steamers go down the Tura for 273 miles (412 versts) to Tobolsk (population 21,400) and 755 miles (1,140 versts) up another branch of the Obi River to Omsk, and from Tobolsk, 1,197 miles (1,807 versts), up the Obi proper to Tomsk (pp. 91 and 92, Part III). A good highway follows down the Tura to Tobolsk. Another road follows up the Tura River.

From Tyumen the route strikes due west across the fertile plain amid wheat fields, pasture lands, and wooded tracts. It runs to the north of the Pishma River and roughly parallel to it.

369 557 **Podyom.**

382 576 **Karmak.** On a small stream. The route now passes through great wheat fields, which stretch away 4 or 5 miles on both sides of the track.

394 594 **Tugulym.** The level Siberian plain now begins to give way to hilly land, for here begins the Piedmont region of the Central Ural Mountains. The valleys become deeper and deeper and the flat upland tracts between the valleys become more and more narrow as the Urals are approached.

At about verst 608, there is a plant for treating railway ties. Light timber abounds.

404 610 **Yushala.** Near the boundary line that separates the province of Tobolsk and Perm. Beyond the station a sweeping view is obtained of the Pishma Valley at the south. This view continues for about 65 miles to Kamyshlov. Many good-sized villages are seen in the valley, which is about 4 miles wide. Valley at the south from 3 to 4 miles wide.

425 641 **Poklevskaya.** (Altitude, 225 feet.) Railroad restaurant. Country well cultivated for long distances on both sides.

444 670 **Oshchepkovo.**

458 690 **Aksarikha.**

469 708 **Kamyshlov.** (Altitude, 325 feet. Population, 9,900.) Railroad restaurant. Kamyshlov is a district town. Irbit (population, 8,600), lies about 74 miles to the north of Kamyshlov and is connected with it by diligence. (See Route N, Branch 2.)

Along this part of the route much of the land is under cultivation, especially at the north. Fine crops are the rule. Wheat and oats are the chief crops. Soil is very dark. At the south there are forests in patches.

483 729 **Pyshminskaya.** Soil very dark and rich. Country is well settled. Patches of white birch and poplars scattered among the fields.

About verst 741, it is reported, railway branches run both to the north and south to newly developed coal mines. Railways and mine owned by a private company.

- 496 748 **Bogdanovich.** (Altitude, 550 feet.) Railroad restaurant. The station exports 80,000 tons annually of various products. A branch railroad (Route N, Branch 1) runs south and southeast to Shadrinsk on the Iset River. Broad views are obtained of the country, which is nearly all under cultivation as far as the eye can reach. Oats are a favorite crop here.
- 509 767 **Gryaznovskaya.** The town lies on the highway well to the north of the station.
- 533 789 **Bazhenovo.** (Altitude, 785 feet.) The town is located on the Bolshoi Reft. Twenty-three miles to the north are emerald mines. Forests are scattered and trees small.
- 536 809 **Kosulino.** The route winds considerably to find the best grades. Soil is a brownish clay, with just a tinge of red.
- 548 827 **Istok.** In the bottom of a valley. Pine woods prevail here, with some trees as large as 10 inches in diameter.
- 555 837 **Yekaterinburg Station.** in the eastern end of the city.
- 558 841 **Yekaterinburg.** (Altitude, 870 feet; population, 75,000.) Railroad restaurant. The chief station is at the northern end of the city. (Photo. No. 20.)

*Location.*—Yekaterinburg, a district town in the Government of Perm, lies on both sides of the Iset River, a branch of the Obi at the eastern base of the Ural Mountains. (Photo No. 21 and Photo No. 22.)

*Details of city.*—The main streets, broad and straight, are cobbled and generally have sidewalks, but the clay side streets and country roads are very muddy after rain. There are no street cars, and passenger traffic depends on several hundred 4-wheeled cabs.

The houses in the center of town are brick or stone; those on the outskirts, log. Roofs are V-

shaped and covered with roofing iron or boards. Lighting is usually by electricity, but kerosene is used in the poorer houses. Wood is mainly used for fuel in heating the houses and cooking. Coal is abundant.

Large barracks are on the west side of the town.

*Importance.*—Yekaterinburg is the most important place in the Ural Mountains. This is due primarily to its location at the eastern entrance of a convenient pass over the Ural Mountains. Because of this location the main railroad from Petrograd to Vladivostok passes through this city. The importance of the city is further enhanced by the rich mineral deposits of the Central Urals. It is a trading center for many mining towns.

*Military facilities—Barracks.*—The number of men that can be quartered in barracks is not as great as at Chelyabinsk, although there are a large number of buildings in course of construction and some have been finished. Mention may be made of the Gostiny Dvor, a large concrete building holding 1,000 to 1,200 soldiers.

*Billets.*—A large number of private houses are available.

*Camp sites.*—Many good camp sites can be formed in the neighborhood of the town. Schertash in particular, a summer resort 3 miles away, on a lake with good drinking water, would furnish by far the best camp site.

*Repair.*—Since Yekaterinburg is a manufacturing city, good facilities exist for repairs. The Zavod and Verkhni-Isetski works are but two of many iron works with modern equipment. In addition, a large shop is operated by the railroad.

*Transport.*—Mechanical means of transport are very limited and transport animals are not available, as they have been used of late for food.

*Labor.*—Plenty of labor is available, chiefly peasants, who are for the most part Great Russians.

*Acroplane landing places.*—The large hippodrome, used for horse racing and other sports, would furnish a good site for aeroplane landings. This lies between the Verkhni-Issetski Iron Works and the town.

*Hospitals.*—Facilities very good. Three private hospitals, belonging to local physicians, may be noted. The eye hospital is of unusual excellence for Russia.

*Inhabitants.*—The intelligent classes would be friendly, but since this is a factory town it has been the center of Bolshevik activity.

*Health.*—The water supply is obtained from springs and wells on the outskirts of the town. There are neither wells nor cisterns attached to individual houses. The water is hard, but good. Since the pumping is insufficient, much water has to be carted into the city. There is no sewerage system. The health conditions are unusually good.

*Communications.*—A telephone system covers the town and outlying districts, with about 800 subscribers. Wooden poles are used to support the wires. Service fair. Regular Government telegraph service.

*Transportation.*—Besides the main east and west railroad, the city has two others. From Yekaterinburg a branch railroad runs north (see Route P) to many mining centers. These are, in turn, connected by rail with Perm via Bissersk. Another railroad runs south and skirts the eastern base of the Ural Mountains from Yekaterinburg to Chelyabinsk. (For details see Route M.) Here it connects with the main line from Omsk to Moscow. Some trains between Petrograd and Vladivostok use this Yekaterinburg-Chelyabinsk con-



nection. A Government highway also runs along the railroad. Another highway runs north from Yekaterinburg. The country roads are very good and motor transport could be used.

*Industries.*—There are three large flour mills, a foundry and machine shop, wire-rope works, match factory (output 60,000 boxes), a six-story steam mill almost in center of town near a pond, a cloth factory, and several oil manufactories. In Verkhni-Iset, less than a mile away, are works consisting of blast, refining, and puddling furnaces, rolling mills, and machine shops. These are on a lake 7 miles long by 2 miles wide. Output of works is about 6,300 tons of steel and 4,500 tons of commercial shaped steel. Roof iron is also supplied. One thousand five hundred men are employed. The Yates foundry and shops are near the railroad station.

*Strategic center.*—From a military point of view Yekaterinburg is a strategic point of the first rank. It guards a main railway route over the Urals and taps mineral regions which produce war necessities, especially platinum. The forces that hold the city and the surrounding heights are likely to dominate the four railroads and two highways that converge upon it. Moreover, the plains, both at the east and west of the Central Urals, are likely to be dominated for considerable distances by the possessors of this city. There is no center of greater strategic value between Omsk and Perm.

*Fortification.*—Although the city is unfortified in the ordinary sense, yet the large iron works with their great piles of ore, scrap iron, and pig iron were used as fortresses in the revolution, trenches having been dug at many places. Forces controlling these could dominate the town, and with the great sluices at the iron works could inundate it.

## ROUTE N, BRANCH 1.

### RAILROAD—BOGDANOVICH TO SHADRINSK.

#### GENERAL DESCRIPTION.

This branch railway runs to the agricultural and mining region south and southeast of Bogdanovich, passing through hilly country which slopes to the plains at the east.

The line runs southwest 38 versts (25 miles) to Sinarskaya, chiefly over upland, then turns sharply to the southeast and follows down the Iset Valley, a tributary of the Tura. It crosses the Iset or its tributaries at intervals, but never is far from the river.

A telegraph line and post road run parallel to the railroad. Occasionally they lie on the opposite side of the river from the railroad. The telegraph continues down the valley to Kremovskoye, about 20 versts beyond the terminal of the railway, and the post road follows the Iset to Yalutorovsk. Other post roads connect this line with stations on the Siberian railways.

#### DETAILED DESCRIPTION.

<i>Distance</i>		
<i>from</i>		
<i>Bogdanovich.</i>		
V.	M.	
0	0	<b>Bogdanovich.</b> From Bogdanovich the railway goes southwest, crosses a small valley, and runs along an upland surface called Barsuchya Steppe. It descends into the Iset Valley at the junction of the Kamenaya and Iset Rivers. The country is chiefly agricultural. About 20 per cent is forested, with birch and pine predominating.
25	38	<b>Sinarskaya.</b> On the north side of the River Iset. This station exports 80,000 tons of iron, steel, and agricultural products annually. The town has a population of 10,000. It has four churches.

several schools, a small hospital with 15 beds, and about 160 little domestic shops, whose output amounts to \$675,000 annually. Several flour mills are not far distant. District fairs are held here four times a year.

A few miles up the river are located the government iron and steel works of Kamennaya. Here, too, are machine and blacksmith shops, where some gun parts and shells are made. Near by are asbestos, gold, and tungsten mines and small deposits of hard coal. During the war some tungsten steel was made, but to what extent is not known.

Post roads run from Sinarskaya to Yekaterinburg and Bogdanovich. A third goes to the southeast, parallel with the railway. A railroad is under construction to the important mines of Sinarski, at the south.

The railway crosses the Iset River and continues southeast.

- 38 58 **Kolchedan.** The line continues southeast, close to the river.
- 49 74 **Chuga.** On the river at the junction with a small branch. The line turns to the east, keeping close to the river.
- 56 85 **Kataisk.** A post road runs south to Chelyabinsk. The line bends to the southeast, then east.
- 69 105 **Dalmatov.** (Population, 4,000.) On the River Iset at the junction of a small branch. The town lies on the opposite side of the river from the station. It has several churches, public schools, and a large monastery. Home industries have an annual output of \$50,000. District fairs are held twice a year. The town is the center of an agricultural region.

The railway continues down the valley, crosses the river, and follows the left valley slope.

- 84 127 **Leshevo-Zamarayevo.** The village lies south of the station.
- 99 149 **Shadrinsk.** Railroad restaurant. (Population, 12,000.) The town lies on the north bank of the River Iset. It has a large monastery and several churches and schools, including a high school for boys and girls. There are about 308 manufacturing establishments, including several flour mills, with an annual output valued at \$2,000,000. Most of the industries are of the domestic type, employing only the members of the family. Three times a year fairs are held. At such times local agricultural products, such as grains, butter, hemp, horses, and cattle, are exchanged for simple manufactured goods from western Europe. Salt is found near by. About 20 per cent of the surrounding region is forested.

Post roads run northwest to Kamyshlov, southeast to Yurgamysh, and northeast down the Iset to Yalutorovsk. The railroad is projected to Kurgan on Route L.

## ROUTE N, BRANCH 2.

### YEKATERINBURG TO IRBIT.

*Distance from  
Yekaterinburg  
(roughly  
estimated.)*

Miles. Versts.

- 0 0 **Yekaterinburg.** This line curves around the south end of a ridge and runs northeast. It crosses a small valley, rises to the upland, and crosses it.
- 19 28 **Monetnaya.** A station on the upland. The road continues northeast along the upland and descends into a small valley.
- 30 45 **Rudyanskaya.** A station in a small valley. The road follows the valley a short distance, then

rises out of the valley, crosses a divide, and descends into another small valley.

- 43 65 **Ryozh.** A station in a small valley. The road rises out of the valley, continues northeast over some hills, and descends into the Irbit Basin.
- 62 93 **Yegorshino.** On a small tributary of the Irbit River. Near by are iron mines. A north-and-south railway meets this line at Yegorshino (see Route P-1). The line turns almost to the east, leaves the valley, crosses some hills, and enters the Irbit Valley, but soon leaves it again.
- 78 117 **Boyarskaya.** On the upland. Nearby, to the south, are the Irbitski iron works. The line continues northeast along the upland.
- 94 142 **Khudyakovo.** The line drops down into the Irbit Valley, which it follows for a short distance, then continues northeast and avoids the great curve made by the river before it enters the Neiva.
- 113 170 **Irbit.** (Population, 21,000.) In the Perm Government, at the junction of the Irbit and Neiva Rivers. Irbit is famous for its annual fair, which is held from February 1 to March 1. This is a general market for goods from European Russia, the Caucasus, a part of Siberia, and the Steppe district. Buyers assemble from all over Russia, western Europe, China, and even the United States. Generally 57 per cent of the business is with European Russia and the Caucasus, 40 per cent with Siberia, and 3 per cent with the foreign countries. The annual trade has amounted to \$28,000,000 at its maximum, but the average is \$16,000,000.

Furs, which eventually enter the markets of London and Leipzig, are the most important articles of trade. Wool, cotton, flax, hemp, tea, leather, and hides enter into the trade, and manufactured goods in wool, metals, silk, homemade

(kustarni) leather goods, and felt are bought and sold.

A post road runs south from Irbit to Kamyshevo on the Siberian Railway, and another northwest to Verhoturye (Route U-2).

It is reported that the continuation of Route N, Branch 2, northeast to Turinsk, on the Tura River, has recently been completed.

#### CONTINUANCE OF ROUTE N.

From the northern station of Yekaterinburg the route first runs northwest about 10 versts (7 miles) along the eastern borders of a large lake. Along this stretch the track is used in common with the railroad north to the Central Urals. The grades are so heavy that two engines are required to pull the train. It often happens, however, that the casual traveler crosses the Urals in this section without realizing it. The "mountains" as seen from the train are less imposing than the Berkshire Hills of western Massachusetts. The approach from the east is much steeper than the descent toward the west. The forests of the Central Urals are chiefly evergreens, with a scattering of birches of fair size. The evergreens yield logs up to 15 and 20 inches in diameter. The larger lumber, however, has already been taken from the forests near the railway.

- 17 26 **Khrustalnaya.** In the vicinity of the watershed between the headwaters of the Ob flowing into the Arctic Ocean and those of the Volga flowing into the Caspian Sea.
- 27 40 **Revda.** The railroad winds into the Chusovaya Valley and finds this town on its slopes. The valley and its small swift river are crossed to the left bank. The line follows down the Chusovaya

- Valley for 25 versts (17 miles). The land is very fertile and well cultivated.
- 29 44 **Railroad Siding No. 70.** A branch railroad runs south for 6 versts up a mountain valley to Baranovskaya.
- 36 54 **Bilimbai.** In the Chusovaya Valley. The town of Bilimbai, of considerable size (Population 7,000), lies on the opposite side of the river. Near the station on the small River Bilimbaya are large steel and iron works. About 3 miles from the works, on the River Chusovaya is a wharf belonging to the works, from which more than 15,000 tons of steel are exported into the interior of Russia. In the vicinity of the station are large deposits of gold and iron ore. Near by is a hospital. Farther on, a highway from Bilimbai crosses the river and the railroad.
- 47 71 **Kourovka.** Railroad restaurant (population 4,500). On the high left slope of the Chusovaya Valley, close to the River Utk. The Utk Iron & Steel Works, near station on the Chusovaya River, export 15,000 tons of steel annually. Farther down on the Chusovaya River the Utk-Denidova Steel & Iron Works are situated in a village of 7,000 persons. Nearby is a wharf, also a small shipyard for building barges and tugs. Soon the railroad leaves the Chusovaya Valley, turns to the west and rises with heavy grades toward the Kirgishan Pass. On the other side of the pass a broad view of the country reveals a high plain into which an intricate river system has cut an equally intricate system of valleys, varying in depth according to the volume of water.
- 66 99 **Sabik.** The route descends gradually. An occasional broad view westward is obtained. The railroad keeps to the surface of the upland plain, and bends to the northwest to avoid valleys.

- 79 119 **Sarga.** Deep valleys extend from the town both to the northeast and south. Four miles south of the station is a town of 15,000 people, which is supported by important iron works. Large iron deposits with ore running from 45 to 55 per cent of iron lie near by.
- 90 136 **Shalya.** Railroad restaurant. Still another upland town. The valley of the Sylva lies to the north. The Sylva River rises in a lake at the northeast. About 3 miles from the station, on the bank of the Sylva River, are steel and iron works, which manufacture open-hearth steel and sheet steel. Soon after leaving Shalya the railway crosses a valley.
- 101 152 **Vogulka.** In the center of a large upland tract. From the margins of this tract the land slopes abruptly into valleys.
- 113 171 **Shamary.** This town is located at the junction of the valleys of the Sylva and the Volgulka. The railroad rises out of the valley by a curve and crosses another upland surface in about 20 versts. It then crosses a shallow valley to Kordon, on the opposite slope.
- 130 196 **Kordon.** Railroad restaurant. Still another upland surface is traversed and another shallow valley crossed.
- 142 214 **Tulumbasy.** In the center of a small upland tract. The line goes to the edge of the miniature plateau and gradually descends into the valley of the Sylva.
- 152 229 **Shumkovo.** The Sylva River is crossed and Kishert is reached down the valley.
- 160 242 **Kishert.** A valley town. Leaving Kishert the railroad crosses the Sylva on a 70-foot steel bridge and continues down the Sylva to Kungur.
- 172 261 **Kungur.** (Population 18,000.) Kungur lies in a fertile valley at the junction of the Iren with



the Sylva. It is the most important town between Yekaterinburg and Perm. Highways run from Kungur to the south, east, and west. Still another runs northwest to Perm parallel to the railroad. Unlike most important railroads in Russia the section from Yekaterinburg to Kungur is not followed by a highway.

In the spring and early summer Kungur has transportation by side-wheel steamers down the Sylva to Perm. The river curves so much that the distance by water is about twice as great as by rail. Exports by this waterway amount to 12,000 long tons annually.

In ordinary times Kungur manufactures leather, boots, gloves, overcoats, iron castings, and machinery. There are 33 tanneries, 3 soap factories, several flour mills, and 3 brickyards. Nearly 1,000 families are engaged in making shoes and gloves. There are usually stored in the city quantities of cereals, tallow, linseed, and tea.

From Kungur the railway strikes to the west, leaves the valley of the Sylva and follows up the valley of a small branch stream. As it proceeds it gradually bends to the northwest.

- 187    283 **Yergach.** A small town located between the railroad and the stream. Seven miles west are the hills called Ostraya, Belaya, and Sayle with copper deposits. At their foot is a copper smelting village of 4,000 people. The route gradually rises.
- 203    306 **Kukushtan.** This town is on the stream where it is crossed by the railroad. In the neighborhood is a large copper smelter. About 10 versts beyond the railroad reaches the level of the upland. About one-third of the region is forested.
- 216    326 **Muzyanka.** (Population 10,000.) A road runs to the southwest to a town 7 miles away, containing

important copper smelters. A shallow valley is crossed, a stretch of the upland is traversed, and Perm is reached.

235 355 **Perm.** (Altitude, 300 feet; population, 105,410.)

*Location and character.*—Perm, the capital of the Province of Perm, stands on the left bank of the navigable Kama. The town is mostly built of wood with broad streets and wide squares but **has a somewhat dilapidated aspect.** (Photo No. 23.)

*Chief buildings.*—The most important buildings in Perm are barracks, capable of holding 20,000 soldiers; an artillery school; the district and Perm government buildings; large fair buildings; several boys' and girls' high schools; the Perm district drug store and warehouse; and **the warehouse at the wharf on the River Kama.** (Photo No. 24.)

*Transportation.*—Besides being on the chief railroad from Petrograd to Siberia, Perm is the **western terminus** of a railway network of the mining towns of the central Urals (see route P), of which Yekaterinburg is the southern terminus. Moreover, Perm is the focus of four navigable waterways, southwestward down the Kama, **northward up the Kama**, eastward up the Chusovaya, and southeastward up the Sylva. During the ice-free seasons, especially in the spring when the rivers are deepest, these waterways are busy routes. They are used chiefly to convey heavy iron goods into Russia. During the summer regular steamboat communication is maintained with Kazan, 605 miles to the southwest.

Perm is also served by three Government highways. One runs north roughly parallel with the Kama. Another runs southwest to the important town of Okhansk, thence westward. Both of

these are followed by telephone lines. The third runs south with the railroad we have followed.

The city annually exports by rail 73,000 tons of goods and imports 54,000 tons. By the Kama River it imports 126,000 tons and exports 144,000 tons.

*Industries.*—Perm has such close touch with the iron, copper, and coal mines and forests of the central Urals that it has naturally become a manufacturing center for iron, copper, and wooden goods. The city has important sawmills, shipbuilding yards, machinery works, copper foundries, and chemical factories. Tanneries also are important, as well as soap and candle factories. A phosphorous plant, situated just outside the city on the bank of the River Danilikhy, is one of the largest in Russia. Before the war it sent goods even to Germany, Sweden, and England.

About 3 miles northeast from the city is situated Motovilikha, a large Government arsenal, employing about 15,000 men in 1916. Population of the town is over 30,000. Enlargement of the plant during the war, with the addition of equipment from the United States and England, has made it one of Russia's modern arsenals. Its buildings include a shell and shrapnel plant and a main machine shop equipped with large steam hammers with a capacity of 50 long tons. The output consisted of 3-inch field guns (about 32 or 34 batteries, 1917, per month), rifles (about 10,000 a month), machine guns (about 100 per month), 16-inch rifle cannon, shells from 3 to 6 inches, shrapnel, detonators (about 25,000 per month), hand grenades, and time fuses. The plant was also building ships, tugs, marine and stationary boilers, and steam engines. It was

being run by the Bolsheviks in the summer of 1918. About one-half mile from the arsenal on the River Kama are two islands. Just opposite, on the left bank of the River Kama, are the Nobel Oil Co.'s kerosene and gasoline reservoirs.

Near Perm is a copper smelting plant belonging to the Government and under the same management as the gun plant. Copper ore is brought to the smelter from five different copper mines, situated from 4 to 21 miles distant. Annual production of this plant is 90 tons. The copper smelted is the best from the Ural Mountains. It is used by Government mints.

*Strategic value.*—Perm possesses high strategic value. This results chiefly from the fact that the city is such a center of transportation. The forces holding it would be able to cut the chief railway from Petrograd and northern Russia to Siberia. Moreover, such forces would command the easiest exits of the mineral resources of the central Urals. Perm would make an excellent base for troops operating at the west. The richness of the regions to which it has easy access makes the city economically valuable.

#### CONTINUANCE OF THE ROUTE.

The route leaves the station in the western part of Perm and soon crosses the Kama on a bridge 970 yards long. The bridge affords a commanding view of town. From the height near the western bridgehead light artillery might readily sweep the whole city.

The railroad soon turns down the valley of the Kama and gradually rises to higher levels on the right slope. At about verst 370 the route bends to the northwest, leaves the Kama Valley, and

climbs to the upland surface. Several small branch valleys are crossed.

- 259 391 **Shabunichi.** A town on the upland surface with a wide outlook over the surrounding country. From this station 4,000 tons of steel products are shipped annually. In general, the land is fairly well cultivated with some patches of forest. The route crosses a number of branch valleys of the Kama.
- 276 416 **Grigoryovskaya.** A town near the edge of a broad upland tract. An iron plant near by exports 180 tons of goods annually. The route now makes a broad sweep to the north around the head of a branch valley. At about verst 429 a road is crossed.
- For 84 versts (56 miles) to Kuzma the railroad runs parallel with and 8 versts south of the Orba Valley.
- 294 443 **Mendeleyevo.** Between the head of two minor valleys. The village of Karagaiskoye lies 7 miles north of the station; population, 1,000. The route now strikes to the southwest.
- 310 468 **Vereschagino.** Railroad restaurant. Village of same name lies 1 mile north of station. In this region are fine forests of pine and birch. The station exports 4,000 tons of farm and forest products. A road runs to the north and to the south. The one to the south connects via Okhansk with Perm, a distance of about 110 miles. The town is at the center of a large upland tract. The route continues to the southwest.
- 324 489 **Borodulino.** Near the northern margin of a broad upland stretch. Nine thousand tons of farm products leave the station annually. Small birch and pine are abundant in clumps. The region is still fairly well cultivated.

- 340 513 **Kuzma.** On the boundary line between the Perm and Vyatka districts. The route follows along the edge of a minor valley, crosses an upland stretch, and descends into a minor valley to Kez.
- 353 533 **Kez.** Near the station is the village of Yuski. Population, 1,000. The railroad climbs out of the valley to the upland, across which it strikes due west for 13 versts. Thin forests of birch and pine prevail.
- At about verst 551 a road runs south. The route then descends into the Cheptsa Valley, the largest encountered since leaving the Kama. The river is crossed by a 105-foot steel bridge and the town of Cheptsa is reached on the opposite slope.
- 367 553 **Cheptsa.** The station exports 2,000 tons of farm and forest products. A glass factory is located nearby. Fine forests abound. The railroad now follows down the valley of the Cheptsa on the left slope. Broad views are obtained on the right.
- 387 583 **Balezino.** The station is on the left bank of the river. The town itself is 6 miles down the river on the right bank. Population, 1,200. The farm and forest products exported amount to 900 tons annually. At about verst 590 is the Kesmym, from which a road runs east to Balezino. The route now rises out of the valley, crosses several branch valleys, and returns to the main Cheptsa Valley at Glazov.
- 404 610 **Glazov.** (Population, 4,500.) Railroad restaurant. Located midway from Perm and Vyatka and the most important town between them. The town has a boys' and girls' high school. Glazov is at the head of navigation of the Cheptsa River. During the summer small boats ply between here and Vyatka. From Glazov a road runs north 42 miles, then westerly for 110 miles to Vyatka, connecting many towns en route.

District fairs are held from the 1st to the 6th of December. The station exports 13,000 tons of a variety of products by rail and 3,000 by the River Cheptsá.

About 40 miles north of the city are the Verkhne & Nizhne ZALOZNIISKI Iron & Steel Works, located near iron deposits.

From Glazov the railroad runs to the northwest and follows the Cheptsá Valley practically all the way to Vyatka. It is usually located well up on the left slope and often crosses stretches of the upland. The valley is from 3 to 4 miles broad and from 75 to 100 feet below the upland surface. Throughout this route from Glazov to Vyatka wooded land alternates with well-cultivated stretches in which villages are numerous. Women ordinarily do much of the farm work with primitive implements. Grain is generally harvested with a sickle, then gathered and bound by hand.

Many cattle are grazed in the wet meadows of the valley floors, and crops are commonly raised on the valley slopes. Grain, however, does best on the upland surface.

- 428      645 **Yar.** On a spur of the upland between the main valley and a branch. Nine hundred tons of farm products are exported. There are iron works not far away. The branch valley and several others are soon crossed.
- 449      677 **Falenki.** On the left valley slope. The route now bends to the west and traverses pine woods.
- 468      706 **Zuyevka.** Railroad restaurant. In a branch valley near its junction with the main valley. Seven miles from the station on the right bank of the River Kosy is the town of Kosa, where district fairs are held in March. The route now

passes through a well-settled and well-cultivated section. The soil is a light, sandy, red clay.

- 488 736 **Ardashi.** On an upland stretch. Four hundred tons of farm products are sent away yearly. The route gradually diverges from the Cheptsa Valley.
- 505 760 **Prosnitsa.** Near the head of a small branch valley. Five hundred tons of farm products are exported.
- 520 785 **Poloi.** In the midst of a well-settled farming country. Three hundred tons of products are exported. At about verst 791 a road comes in from the south and joins the highway, which continually follows our railway route. This road comes from Kazan, about 360 versts away. It would become of great importance if a battle line were established from Murmansk to Soroka and thence to Vyatka, Kazan, and the Volga.

From Poloi the route gradually curves to the right and swings through the Cheptsa Valley to the southern part of Vyatka. Throughout this last section of the route the town of Vyatka is visible from the train.

- 534 805 **Vyatka.** (Altitude, 440 feet; population, 60,000.) Capital of Vyatka Province. Situated on the left bank of the navigable Cheptsa.

*Details of city.*—The city is built upon the valley slope and reaches from the river bank to the edge of the upland surface. Most of the streets therefore are steep and badly gullied except where carefully paved. It is reported that 500 of the houses are of stone. The rest are of wood. The upland surface adjacent to the town is not built up except for the Government buildings. The upland is partially wooded. Much of the rest is in gardens and parks. The height to the north of the town would be a suitable location for light artillery to command the highways that



converge upon Vyatka as well as the city itself. It might serve as a camp site.

From Vyatka a railroad goes to the west to Vologda and Petrograd. Another runs northwest 238 miles (359 versts) to Kotlas on the Dvina River. Thence steamers ply northwest to Archangel and southwest to Vologda. In ordinary times a steamer leaves Vyatka twice daily during the open season for Kazan. Length of trip,  $2\frac{1}{2}$  days. Roads run parallel to each of the three railroads that serve Vyatka. Another runs to the northeast about 22 miles to Slobodskoye, thence east and south to Glazov.

There are tanneries, shoe factories, furniture factories, lumber yards, brickyards, and several small machine shops.

## ROUTE P.

# YEKATERINBURG TO PERM VIA NIZHNI-TAGIL.

(311 miles=469 versts.)

### LIST OF STATIONS.

INDEX.—Numbers at left serve as a key to map which follows. Numbers at right show vershs from Yekaterinburg. \* indicates a railroad restaurant. Jct. indicates a railroad junction. Important towns are shown in heavy type.

1. Yekaterinbùrg.....	* 0	ЕКАТЕРИНБУРГЪ.
2. Isèt.....	21	ИСЕТЬ.
3. Tavatùì.....	39	ТАВАТУЙ.
Murzànka.....		МУРЗИНКА.
4. Verkh-Nèivinsk.....*	60	ВЕРХЪ-НЕЙВИНСКЪ.
5. Nèivo-Rudyànskaya (Jct.).....	68	НЕЙВО-РУДЯНСКАЯ.
6. Shuralìnski. ....*	77	ШУРАЛИНСКІЙ.
7. Nèvyànsk.....*	86	НЕВЬЯНСКЪ.
Chernovskòì.....		ЧЕРНОВСКОЙ РАЗ.
8. Anatòlskaya.....	108	АНАТОЛЬСКАЯ.
9. Shaitànka.....	122	ШАЙТАНКА.
10. Nizhni-Tagil (Jct.).....*	133	НИЖНИЙ ТАГИЛЬ.
S. Donàto.....		С-ДОНАТО РАЗ.
11. Làya.....	151	ЛАЯ.
12. Baranchùnskaya.....	168	БАРАНЧЕНСКАЯ.

13. Goroblagodàtskaya (Jet.).....	177	ГОРОБЛАГОДАТСКАЯ.
14. Aziàtskaya.....	192	АЗІАТСКАЯ.
15. Khrèbèt Ural'ski.....	206	ХРЕБЕТЪ УРАЛЬСКІЙ.
16. Evropèiskaya.....	220	ЕВРОПЕЙСКАЯ.
17. Ust Tiskos.....	230	УСТЬ ТИСКОСЪ.
Lòmovka.....		ЛОМОВКА.
18. Tùpłaya Gorà.....	243	ТЕПЛАЯ ГОРА.
19. Biser.....	257	БИСЕРЪ.
20. Vizhài.....	271	ВИЖАЙ.
21. Kòiva.....	284	КОЙВА.
22. Pàshiya.....	296	ПАШІЯ.
23. Bagùl.....	307	БАГУЛЬ.
24. Vsesvyàtskaya.....	320	ВСЕСВЯТСКАЯ.
25. Arkhìpovka.....	334	АРХИПОВКА.
26. Yermàk.....	342	ЕРМАКЪ.
27. Chusovskàya (Jet.).....	* 349	ЧУСОВСКАЯ.
28. Kàlino (Jet.).....	365	КАЛІНО.
Drovyanòi.....		ДРОВЯНОЙ РАЗ. 103.
29. Selyànka.....	382	СЕЛЯНКА.
30. Komarìkhinskaya.....	400	КОМАРИХИНСКАЯ.
31. Valèzhnaya.....	411	ВАЛЖЖНАЯ.
32. Sylva.....	* 425	СЫЛВА.
33. Lyàdy.....	435	ЛЯДЫ.
34. Lèvshino.....	453	ЛЕВШИНО.
35. Motovlìkha.....	465	МОТОВИЛИХА.

36. Perm I (Jct.).....	* 469	ПЕРМЬ I.
Perm II.....		ПЕРМЬ II.

## ROUTE P, BRANCH 1, NIZHNI-TAGIL TO ALAPÁYEVSK.

(Numbers at right show versts from Nizhni Tagil.)

1. Nizhni-Tagil (Jct.).....	* 0	НИЖНИЙ ТАГИЛЬ.
2. Sálka.....	27	САЛКА.
3. Vèrkhnaya-Saldà.....	44	ВЕРХНЯЯ САЛДА.
4. Nìzhnaya-Saldà.....	59	НИЖНЯЯ САЛДА.
5. Yasàshnaya.....	90	ЯСАШНАЯ.
6. Alapáyevsk.....	* 121	АЛАПАЕВСКЪ.

## ROUTE P, BRANCH 2, GOROBLAGODÁTSKAYA TO NADÉZHINSKI.

(Numbers at right show versts from Goroblagodatskaya.)

1. Goroblagodátskaya (Jct.).....	* 0	ГОРОБЛАГОДАТСКАЯ.
2. Kùshlva.....	6	КУШВА.
3. Blagodát (Jct.).....	9	БЛАГОДАТЬ раз.
4. Vèrkhnaya.....	14	ВЕРХНЯЯ.
5. Vÿya (Jct.).....	43	ВЫЯ.
6. Korèlino.....	71	КОРЕЛИНО.
7. Verkhotúrye.....	* 98	ВЕРХОТУРЬЕ.
8. Lyàlya.....	118	ЛЯЛЯ.
9. Lóbva.....	134	ЛОБВА.
10. Vagrànskaya.....	155	ВАГРАНСКАЯ.
11. Nadèzhinski (Jct.).....	* 182	НАДЕЖДИНСКІЙ 3.

## BRANCH LINE.

Shàkhta.....	ШАХТА.
Anerbàkovski Rudnik.....	АПЕРБАКОВСКІЙ РУДНИКЪ.
Làrinski Rudnik.....	ЛЪРИНСКІЙ РУДНИКЪ.
Shàkhta na Vagrànkyc.....	ШАХТА НА ВАГРАНКЪ.

## ROUTE P, BRANCH 3, CHUSOVSKAYA TO SOLEVARNI.

(Numbers at right show versts from Chusovskaya.)

1. Chusovskaya.....	* 0 ЧУСОВСКАЯ.
2. Utyòs.....	18 УТЕСЪ.
3. Baskaya.....	37 БАСКАЯ.
4. Úsva.....	55 УСЬВА.
5. Nàgornaya.....	65 НАГОРНАЯ.
6. Gubàkha.....	78 ГУБАХА.
7. Polovinka.....	91 ПОЛОВИНКА.
8. Kìzel.....	* 106 КИЗЕЛЬ.
9. Kòpi.....	127 КОПИ.
10. Vsevolodo-Vilva.....	143 ВСЕВОЛОДО-ВИЛЬВА.
11. Yàiva.....	158 ЯИВА.
12. Shishl.....	174 ШИШЛ.
13. Usòlskaya.....	* 193 УСОЛЬСКАЯ.
14. Solevárni.....	196 СОЛЕВАРНИ.

## GENERAL DESCRIPTION.

**MILITARY VALUE.**

In ordinary times this route is used principally as a mining railroad. The main line makes a great northward sweep from Yekaterinburg to Perm, while branches diverge to a large number of mines. The main line is of such quality that in spite of the grades and curves it could be used as a substitute for the Trans-Siberian line in case the latter were cut or congested between Yekaterinburg and Perm. In times of war, as in peace, however, the chief function of the route is to get out ores.

**TERRAIN.**

For the first quarter of the distance the railroad follows the valleys of the Neiva and Tagil, which are approached by a low ridge. The Neiva Valley is a rolling country, through which the river makes many turns among lakes and swamps. About half of the region is wooded, but cultivated areas are common. Both the Neiva and the Tagil Valleys are important mining regions.

After crossing the Tagil Valley the railroad climbs the eastern slope of the Urals. It makes many turns, with increasing grades, to the pass, which has an altitude of 1,545 feet at its highest point near Khrebet Uralski. This point is about halfway between Yekaterinburg and Perm. The mountains are not high, being merely good-sized hills.

Down the western slope, which forms the third quarter, the grades are steep and the country mountainous as far as the Chusovaya River. The last quarter almost parallels the Chusovaya to its junction with the Kama, about 10 miles from Perm. The country is gently rolling and partly timbered. The railroad cuts have abrupt, rocky slopes.

**RESOURCES AND INDUSTRIES.**

*Platinum.*—Ninety-five per cent of the world's supply of platinum comes from Russia. Although small quantities of this precious metal have been found in a number of places, the commercially important fields are limited to small areas on

both sides of the Ural Mountains in the region tapped by this railroad. Most of the platinum is found in the alluvial deposits of the river beds. The most important are the deposits along the Is River, on the west slope of the northern Urals, and along the Tura, on the east slope. These regions supply about 80 per cent of the total Ural output. Other deposits are found in connection with the gold mines in the Neviansky, Verkhni-Isetski, Belimbayevski, Alapayevski, Syssert Kyshtym, and Miass properties.

In 1912 the production of platinum was 300,000 ounces. Since then it has decreased so that in 1917 it probably did not amount to 50,000 ounces, in spite of the world's increasing demand. The reasons for the decrease in production are, first, the withdrawal of labor for military mobilization, and, second, labor demoralization since the overthrow of the Imperial Government of Russia. A little placer washing by hand has been carried on by the local inhabitants. In the summer of 1918 it was reported that the dredges were not working.

*Iron.*—Manganese, magnetite, and pyrite ores are mined at several points in this region. Hence smelters, steel mills, and machine shops are distributed along the railroad. Aside from Yekaterinburg, the most important centers for iron and steel products are Nevyansh, Nizhni-Tagil, Baranchinskaya, Pashiya, and Chusovskaya. Hundreds of thousands of tons of iron products are ordinarily manufactured in these regions each year, and these centers are well prepared to manufacture all sorts of munitions of war.

*Other ores.*—Copper, gold, coal, and salt are also found in this region. Tyoplaya Gora is the most important gold-producing region. Coal of comparatively poor quality is found on the west slope of the Urals and is reached by a branch railroad running north from Chusovskaya.

*Forests.*—The country along the railway was originally covered with scrubby trees, chiefly birch and pine. These have been the chief source of building material, fuel, and charcoal for the iron works. Thus the forests have been cut off and now coal is being introduced by rail to replace the wood and charcoal in heating and smelting.

*Soil and meadows.*—Many fields are cultivated, and natural meadows make cattle raising profitable. Most of the people, however, are engaged in mining and in related industries.

### DETAILED DESCRIPTION.

*Distance from  
Yekaterinburg.*  
Miles.    Versts.

- |    |    |  |
|----|----|--|
| 0  | 0  | <b>Yekaterinburg.</b> See station 31 of Route N. Route P starts from the north station of Yekaterinburg. In common with Route N, it uses the stretch of track which skirts the eastern shores of Lake Iset. Just beyond the lake the two routes separate. Route P continues to the northwest.  |
| 14 | 21 | <b>Iset.</b> Small station near Lake Iset. Railroad crosses small river by a steel bridge about 38 feet long soon after leaving the station. Near by is Byeloryechansk, a pyrite mine on Verkhni-Isetsk estate.  |
| 26 | 39 | <b>Tavatui.</b> Small station near south end of Lake Tavatui, which stretches about 12 miles (18 versts) to the north. The railroad now bends to the north on the west side of Lake Tavatui, which can be seen occasionally. Not far away are reddish hills from which iron ore has been taken.  |
| 40 | 60 | <b>Verkhne-Neivinsk.</b> (Altitude, 875 feet; population, 10,000.) Railroad restaurant. The station is near the north end of Lake Tavatui. The town is about a mile east on the river Neiva. A hill east of the town affords a very good camp site. A branch post road runs west to Shurala and thence to the village of Verkhni-Tagil, on the Tagil River. The post road is generally in fair condition. A gravel surface has made it better than the average. This road continues westward to Route N and is suitable for motor transport. Verkhne-Neivinsk has steel and iron works |



and a machine shop for making detonators for large shells. The fall of water created by a dam across the River Neiva is used to generate electric power for the iron works. Gold mines near the station.

The railroad bends to the northeast, crosses the river, turns to the north, and skirts the eastern shores of a large lake.

- 45 68 **Neivo-Rudyanskaya.** Near the northern end of the lake. The railroad runs north down the Neiva Valley. A swampy region is passed on the west.

The town lies west of the railroad across the Neiva (population over 3,000). It has an iron smelting plant, a sulphuric-acid factory, a machine shop, and a foundry. About 7,000 tons of iron products are exported.

A narrow-gauge (30 inches) railroad runs from Neivo-Rudyanskaya northward along Route P to Shuralinski, the next siding, No. 117 (51 miles, 77 versts). It there leaves the main line and runs 6 miles (9 versts) to Kalata. With the narrow-gauge line the main railroad crosses the Neiva and its swamps before reaching Shuralinski. Beyond the main line crosses the Shurala River.

- 57 86 **Nevyansk.** (Population, 25,000.) Railroad restaurant. The town is about a mile from the station. It has wide streets for fire protection, a few stone houses, but mostly log houses with wooden roofs. It has a hospital and a large schoolhouse. A dam converts the Neiva into a good-sized pond. The hill east of Nevyansk, and the south slope of the table, and between Nevyansk and Shurala, furnish good camp sites.

Water is obtained from shallow wells. Local supplies of grain, cattle, and sheep are small.

Pasturage is plentiful and good. Wood, of which there are large supplies in the vicinity, furnishes the chief fuel. Coal and petroleum products are lacking. Health is generally good, but in winter contagious diseases, such as scarlet fever, are prevalent.

Nevyansk has an old iron smelter, well-equipped machine shops for making fuses for large shells, and a foundry which before the war made a specialty of cast-iron pipe. Five thousand workmen are employed and over 36,000 tons of iron and steel products are exported annually.

About 2 miles north of Nevyansk the Byngovski Iron & Steel Works are located on the Neiva. Charcoal is used in the works, although during the war some Siberian coal was used. The neighboring village has a population of over 5,000.

Nevyansk is connected by a post road with the main highway or Verkhoturys-Yekaterinburg "Trakt." Another post road connects Nevyansk with the mining settlement at Kalata and the village of Verkhni-Tagil. This road is described below:

#### POST ROAD FROM NEVYANSK TO VERKHNI-TAGIL.

One mile: The road passes some reddish iron hills from which iron ore has been mined. It crosses the railroad and passes over a tableland with cultivated fields on the north and scrub-covered pastures on the south, and descends into the valley of the Shurala River. The river is small and never has much water. It is spanned by two wooden bridges, both in fair condition. The old dam is broken.

Three miles, Shurala: This village, on the river, was formerly the site of iron smelters. It has wooden houses with wooden roofs. A large two-story house, occupied by the manager, has the lower story of brick and the upper of logs.

The post road mentioned under Verkhne-Neivinsk comes in at this point. Continuation of main railway.

Four and one-half miles: A branch road turns north, swings around to Nevyansk station, and back to the post road again about 1 mile southwest of Nevyansk. It passes a cement plant on the river north of Shurala. This road is much used in winter.

Eight miles: Kalata-Kalatinsky works. Here are located a smelter and a machine shop for ordinary repairs, including a foundry. At Kalata is a pyrite mine on the Verkhni-Isetsk estate. In recent years (report 1912) there have been extracted about 100,000 tons of ore, containing about 25 per cent copper. This has been shipped and sold for its sulphur and copper contents. Magnetite also occurs here. The road climbs the ridge to the west, then descends sharply into the Tagil River Valley to Verkhni-Tagil.

Thirteen miles: Town of Verkhni-Tagil, with iron and steel works employing over 1,000 workmen. Iron ore (magnetite) is obtained from the Vysokoi Hill near by. The houses are mostly of logs, with wooden roofs. West of Verkhni-Tagil there are many wood roads, used chiefly in winter for hauling timber and charcoal.

From Nevyansk the railroad leaves the valley of the Neiva and swings close to the Urals. The east bank of the ridge is ascended and a low pass is crossed.

- 77 108 **Anatolskaya.** Small station in a wooded country on the west slope of the ridge. The valley of the Tagil lies at the west. The route proceeds north into the Tagil Valley and follows the right slope.
- 81 122 **Shaitanka.** (Population, 3,000.) There are iron and steel works about 3 miles from the station. The route continues north in the Tagil Valley.
- 88 133 **Nizhni-Tagil.** (Altitude, 730 feet; population, 35,000.) Railway restaurant. Nizhni-Tagil has important Government iron and steel works, with a modern plant equipped with new American machinery and tools. There are large administration buildings, houses for employees, and a modern hospital. More than 90,000 tons of iron and steel products are exported annually.

Mount Vysokaya, at the west, has large iron-ore deposits (65 to 70 per cent iron). The mines employ 1,200 workmen. Statistics show that 126,000 tons were mined in 1913. Of this amount 90,000 tons were used by the Nizhni-Tagil smelters.

Near Nizhni-Tagil are gold and platinum mines, the most important of which are Avrorinski, Pavlo-Anatolyevski, Sosifovski, and Pavlovski. About 1,500 men are engaged in these mines, using 160 horses. Up to 1913, 180 pounds of platinum were mined and 54,000 pounds of gold.

Nizhni-Tagil is the junction point of two branch railroads. One runs east 82 miles (121 versts), to the Alapayevsk Iron & Steel Works, and is described below as Route P-1. The other branch runs southwest 35 miles (53 versts), to the Visino-Utkinski mines, where iron and steel works are located.

This route is not described further in this handbook.

From Nizhni-Tagil the main line runs north for about 7 miles, then bends northwest, and crosses the River Tagil. It then climbs out of the valley to the northwest. A siding intervenes.

100 151 **Laya.** The station lies between the Teplaya Hill on the east and Sinaya Hill on the west. About half a mile north of the station are the Verkhne-Daiski and Nizhni-Daiski iron and steel works. They have two old blast furnaces and several open-hearth furnaces. From Laya the post road, which has been near the railroad, runs north and diverges from the railroad.

111 168 **Baranchinskaya.** (Population, 8,000.) About 2 miles west of the station, at the junction of Akhtaya and Baranchi Rivers, lies the Nizhni-Baranchinskaya iron and steel plant. It makes large shells, time fuses, and field guns for the Russian Navy. The plant is equipped with modern American tools and machinery. Manganese iron ore comes from the Blagodaty Hill, about 9 miles distant.

About 5 miles north are the Verkhni-Baranovskii iron and steel works, under the same management as the works referred to above. The village at the works has a population of 3,000. The railroad continues north.

117 177 **Goroblagodatskaya.** (Altitude, 760 feet.) Railway restaurant. Government iron works located here export over 45,000 tons of iron and steel products annually. About 3 miles north manganese iron ore is obtained from Mount Blagodat. A branch railroad runs 156.6 miles (236 versts) from here to Shakhta via Nadezhdinski Zavod. This railroad is described as Route P-2 in this handbook. The main line now curves to the northwest between hills and ascends toward the watersheds between Asia and Europe.

- 127 192 **Aziatskaya.** Last stop on Asiatic side of Urals. A forested country. The people make charcoal for steel works and carry on some farming. The ascent continues.
- 137 206 **Khrebet Uralski.** "Summit of the Urals." The railroad makes many turns through the hills and mountains from here westward. Before the next station is reached large foundries are passed.
- 149 220 **Evropeiskaya.** The mountains are low; the timber is small. The people make charcoal and work in various iron plants. The line descends westward. First stop on European side.
- 152 230 **Ust Tiskos.** Small station, overlooking the Koivy Valley. The people are engaged in making charcoal. The railroad crosses the River Koivy, descends into the Koivy Valley, crosses the river, and climbs out toward the northwest.
- 161 243 **Tyoplaya Gora.** On the western edge of the Koivy Valley. A marshy district extends to the west. About half a mile from the station are the Tep-layar Iron & Steel Works, which are supplied from the Voznesenskoi iron mines near by. Export from station, 7,200 tons annually. Within 4 miles north of the station, near the junction of the Polubenk and Koivy Rivers, is Krestovozd-vizhenskoe village. Near this village gold and platinum are found. In 1914 the output of gold was 540 pounds, of platinum 36 pounds. Since 1880 statistics show that 2,160 pounds of platinum were mined here. A large part of the platinum was found near the River Is, in which region 1,500 workmen were employed in 1914.
- The line next climbs out of the Koivy Valley and strikes westward.
- 170 257 **Biser.** (Altitude, 1,510 feet; population, 4,000.) Railroad restaurant. At the southern end of a ridge. On the River Biser, 8 miles south of the

station are the Biser iron and steel works. The annual output is over 18,000 tons of iron and steel products. Iron ore comes from eight mines near by, the most important of which are the Kurvinsk, Voronzhesk, and Petrovsk. For the next 57 miles (85 versts), or until Yermak is reached, the route runs southwest over an upland surface between the Vizhai Valley on the north and the Koivy Valley on the south.

- 179 271 **Vizhai.** In a forested country. Charcoal making is the chief occupation.
- 189 284 **Koiva.** The forests and charcoal making continue.
- 196 296 **Pashiya.** Railroad restaurant. Forested region. About 6 miles north are the Arkhangelo-Pashiski Iron Works. The village near by has 6,000 people. Eight miles south of the station are the Kuse-Alexandroviski Iron Works, in a village of 3,500 people. Pashiya exports more than 36,000 tons of iron and steel products annually. From this station to Yermak the railroad swings around the heads of several valleys, tributaries of the Koivy Valley.
- 204 307 **Bagul.**
- 212 320 **Vsesvyatskaya.** Near the head of a valley.
- 221 334 **Arkhypovka.** The upland surface becomes rough and rocky.
- 227 342 **Yermak.** In rocky country. The valley of the Chusovaya soon opens out westward and the descent begins.
- 231 349 **Chusovskaya.** (Altitude, 405 feet.) Railroad restaurant. The town is located on the right bank of the Chusovaya. The Chusovskaya Iron and Steel Works are near the station, which exports over 216,000 tons of iron and steel products annually.

A branch railroad which runs north from Chusovskaya 130 miles (196 versts) to Solovarni is designated Route P-3 in this handbook.

Route P runs south, crosses the Chusovaya River by a steel bridge and traverses a stretch of flat land. It then crosses the River Lysva, a branch of the Chusovaya, and climbs out of the valley.

- 242 365 **Kalino.** Railroad restaurant. Situated nearly on the upland surface. The station exports 18,000 tons of iron and steel products. Branch line southeast to Lesvinski Zavod (population, 3,000) 20 versts (13.2 miles), where there are machine and foundry shops.
- The route crosses a portion of the upland surface.
- 253 382 **Selyanka.** At the head of the valley opening westward. Forested country. The route continues on the upland.
- 265 400 **Komarikhinskaya.** Small station in a valley. Forested country. The route now descends into the valley and follows it to its junction with the Sylva Valley, 17 miles beyond.
- 272 411 **Valezhnaya.** A town in the valley. The station exports 4,500 tons of a variety of products. The railway crosses the Sylva River over a steel bridge.
- 282 425 **Sylva.** (Altitude, 325 feet.) Railroad restaurant. On the left bank of the navigable Sylva River. The station exports 7,200 tons of various products. The railroad follows down the Sylva River.
- 288 435 **Lyady.** At the junction of the Sylva with the Chusovaya. There is water transportation to the east, south, and west.
- 300 453 **Levshino.** At the junction of the Chusovaya and Kuma Rivers. A bronze factory is located here. Large warehouses are near the wharves on the



rivers. Agricultural products are brought up the river to this point, and carried by railroad to the mining and industrial centers in the Ural Mountains. The boats return with iron and steel products for interior Russia. About 14 miles to the north are large steel works which make open-hearth steel plates up to one-half inch in thickness, besides nails and horseshoes. The railroad proceeds down the Kama.

- 308 465 **Motovilikha.** A suburb of Perm on the Kama; population, 30,000. A large Government arsenal located here is described under Perm in notes on Route N.
- 311 469 **Perm.** See Route N.

## ROUTE P, BRANCH 1.

## NIZHNI-TAGIL TO ALAPAEVSK.

*Distance  
from  
Nizhni-Tagil.*

- | M. | V. |   |
|----|----|---|
| 0  | 0  | <b>Nizhni-Tagil.</b> The route goes northeast as it ascends the flank of the Bogorodskiya Mountain. It then goes through a low pass, descends the eastern slope, and crosses a valley.                                    |
| 18 | 27 | <b>Salka.</b> Small station. Rolling country. The route continues down grade.   |
| 29 | 44 | <b>Verkhni-Salda.</b> (Population, 5,000.) Near the station is an iron and steel plant with a smelter, machine shop, and foundry. The output is 10,000 tons of iron. The plant employs 1,500 people.                      |
| 39 | 59 | <b>Nizhni-Salda.</b> (Population, 12,000.) Near the station is an iron and steel plant, consisting of furnaces, a steel mill, machine shop, and a foundry. Water turbines and steam engines of 1,500 horsepower are used. |

The route curves to the southeast through rolling country.

- 60 90 **Yasashnaya.** A small station. A branch railroad runs for a short distance eastward to Verkne-Saldinski, which has important steel and iron works. Route P-1 continues northeast.
- 80 121 **Alapayvsk.** (Population, 10,000.) Railroad restaurant. A mining and smelting town on the Neiva River. There are several iron and steel works within a radius of 25 miles. A newly constructed extension of Route P-1 crosses the Neiva River and continues southeast across uplands and valleys.
- 44 66 **Yegovshinskoye.** In the neighborhood there are iron ore smelting plants. At this point Route P-1 meets the newly constructed railroad from Yekaterinburg to Irbit. It is reported that the railroad of Route P-1 has been extended through Yegovshinskoye to Bogdanovich. It may not be fully completed.

#### ROUTE P, BRANCH 2.

#### GOROBLAGODATSKAYA TO SHAKHTA VIA NADEZHDINSKI.

*Distance  
from  
Goroblagodatskaya.*

- | M. | V. |  |
|----|----|--|
| 0  | 0  | <b>Goroblagodatskaya.</b> From Goroblagodatskaya Route P-2 goes to the northeast through a low pass in a hilly ridge.  |
| 4  | 6  | <b>Kushva.</b> Railroad station near several Government iron and steel plants, among them the Kushva. This plant has four blast furnaces, open-hearth furnaces, a rolling mill, and a lumber mill. It has a machine shop equipped with modern American machines, tools, automatic and turret lathes for the manufacture of 3-inch to 6-inch shells and |

detonators. The iron ore comes from Mount Blagodat nearby.

- 6      9 **Blagodat Siding.** At foot of Blagodat Hill. A branch railway runs a short distance northwest to Verkhnyaya.
- 11     16 **Verkhnyaya.** Nearby are Government iron works, Verkhny Turinski, and a foundry. Some of the Government artillery equipment was made here during the war. The railway continues northeast and gradually swings to the north.
- 29     43 **Vyya.** From here a branch railroad runs 12 versts (8 miles) northwest to Nizhni Turinski Zavod, an important mining and manufacturing town. Another branch runs 28 miles north to Lesopisnaya, an iron and copper mining center (population, 6,000). Here are located Government steel and iron works, consisting of several blast furnaces, open-hearth furnaces, a steel mill, foundry, and machine shop. They produce cast iron and sheet steel.

From Vyya Route P-2 strikes to the northeast through a low pass in a hilly ridge and runs across uplands and valleys. Platina siding intervenes.

- 47     71 **Korelino.** Small station. The Tura Valley lies at the north. Just before Verkhoturys is reached the route descends into the Tura Valley and crosses the river.
- 65     98 **Verkhoturys.** (Population, 4,000.) Railroad restaurant. At the head of navigation of the Tura River. Capital of a district of the Perm Province. Headquarters for the platinum working of the surrounding region, which supplies about half of the total Russian output.

Many roads converge here. They follow along the uplands and tap the rivers at numerous points. There is a post road from Yekaterinburg,

which was formerly a main highway before the railroad was built. It is generally open for wheeled traffic from about April 1 to November 1, and for sleighs the rest of the year. The road is clayey and would be nearly impassable for heavy motors after heavy or prolonged rains.

The route proceeds northwesterly from Verkhoturys across an upland.

- 78 118 **Lyalya.** In the valley of the Lyalya where the railroad crosses the river. Another upland is crossed.
- 89 134 **Lobva.** In the Lobva Valley where the railroad bridges the river. A small valley is ascended.
- 102 155 **Vagranskaya.** Near the head of the valley. A short branch line runs southwest to the Koptyakovskaya iron mines, on the Lobva River. Route P-2 runs north across an upland, descends into the Kakva Valley, crosses the river, and reaches Nadezhdinski Zavod on the opposite slope.
- 121 182 **Nadezhdinski Zavod.** An important iron and steel center. This town supplies more rails for the Siberian Railroad than any other. Passenger trains do not run beyond Nadezhdinski Zavod, but freight is carried on on two small branches: one branch runs east 9 miles to Filkinskaya, at the junction of the rivers Kakva and Sosva and the center of a mining region. Near by are cement works, with 6,000 tons output. The other branch, which is considered as a continuation of Route P-2, runs northwest along a valley slope.
- 127 192 **Shakhta.** Junction. Near the head of the valley. A branch railroad runs 10 miles northwest to Bogoslovski Zavod (population, 3,000), where copper and gold mining and smelting are carried on. The gold mines yield 200 to 1,100 ounces per annum.

Route P-2 goes north across an upland.

- 130 196 **Anerbakhovski Rudnik.** On the right slope of the Turga Valley. Near the station are iron and steel works. Iron ore (50 to 65 per cent iron) is found near by. The deposits are estimated to have 2,250,000 tons. Other deposits of magnetite ore, about 4 miles distant, are estimated at 360,000 tons. The railroad crosses the valley and river to the opposite slope, to the next town.
- 133 200 **Lurinski Rudnik.** Nearby are copper deposits with some seams said to be 17.5 feet in thickness. A smelter is located here. The route proceeds across uplands and valleys.
- 157 236 **Shakhta.** On Vagrankye River. Nearby are large iron and copper mines and some smelters. One of the most important is Petrovski-Zavod.

## ROUTE P. BRANCH 3.

## CHUSOVSKAYA TO SOLEVARNI.

<i>Distance from Chusovskaya.</i>		
M.	V.	
0	0	<b>Chusovskaya.</b> Route P-3 runs north and climbs out of the Chusovaya Valley. For the first 106 versts, or until Kizel is reached, the route runs across uplands and valleys at the western base of a ridge of hills and mountains.
12	18	<b>Utyos.</b> Small station in a rugged forested country.
25	37	<b>Baskaya.</b> The line bends to the northwest and passes through a 350-foot tunnel. It soon descends into the Usva Valley and crosses the river.
37	55	<b>Usva.</b> In valley of same name. Station exports 18,000 tons of various products. A branch railroad runs to near-by coal mines, where there are about 80 coking ovens. The coal and coke are used at the Tagil iron works.

- 43 65 **Nagornaya.** Small upland station. The railroad soon descends into the Kosva Valley, crosses to the right slope, and ascends the valley a few versts to Gubakha.
- 52 78 **Gubakha.** (Population, 1,000.) Near the station are lignite coal mines. About 63,000 tons were shipped in 1913. Part went down the Chusovaya and Kama Rivers to the west, part went by rail to the manufacturing centers in the Urals. The route crosses an upland.
- 60 91 **Polovinka.** Small upland station. The route proceeds across a rolling upland.
- 70 106 **Kizel.** (Population, 8,000.) Station exports 180,000 tons of iron and steel and other products. The iron and steel works obtain ore (52 per cent to 62 per cent iron) from near-by mines. A branch railroad leads to lignite coal mines 3 miles distant. Annual coal output, 90,000 tons. The route now diverges from the range it has been following.
- 84 127 **Kopi.** (Population, 3,000.) An iron and steel plant uses iron ore from near-by mines. A branch railroad runs 7 miles to Lunevka, where are lignite coal mines at the base of a conspicuous hill.  
The route now goes toward the southwest and then curves to the northwest.
- 95 143 **Vsevolodo-Vilva.** (Population, 1,500.) There is an iron and steel plant one-half mile from station, which turns out 50,000 tons of products annually.
- 105 158 **Yaiva.** In the Yaiva Valley. Station exports 9,000 tons of mineral products. The railroad crosses immediately the small river Yaiva by a steel bridge. It then climbs out of the valley and runs due west across an upland.
- 115 174 **Shishi.** Small upland station. The route now descends into the Kama Valley.

- 128 193 **Usolskaya.** Important iron and steel center on the navigable Kama River. There are large iron and steel plants in the neighborhood.
- 130 196 **Solevarni.** With Usolskaya this town forms in reality a part of Dedyukhin, an important iron and steel center. With Solikamsk and Cherdyn, large river ports up the Kama, Dedyukhin has lively trade in products from the Ural mining centers and foodstuffs for them. A post road connects the three towns.

# ROUTE Q.

## CHELYABINSK TO YEKATERINBURG.

123

(142 miles=231 versts.)

### LIST OF STATIONS.

INDEX.—Numbers at left serve as a key to map which follows. Numbers at right show versts from Chelyabinsk. \* indicates a railroad restaurant. Jct. indicates a railroad junction. Important towns are shown in **black type**.

1. Chelyabinsk (Jct.).....*	0	ЧЕЛЯБИНСКЪ.
Shagöl.....		ШАГОЛЬ раз.
2. Essaùtskaya.....	24	ЕССАУЛЬСКАЯ.
Kasargl.....		КАСАРГИ раз.
Ishälino.....		ИШАЛИНО раз.
3. Argayâsh.....	52	АРГАЯШЪ.
Akakül.....		АКАКУЛЬ раз.
4. Kyshtým.....*	84	КЫШТЫМЪ.
Yekazà.....		ЕКАЗА раз.
5. Maùk.....	106	МАУКЪ.
Siding 84.....		РАЗЪБѢДЪ 84.
Ukagâch.....		УКАГАЧЪ раз.
6. Ufalèi.....*	133	УФАЛЕЙ
Karkodn.....		КАРКОДНЪ раз.



7. Poldnevaya.....	162	ПОЛДНЕВАЯ.
Sysert.....		СЫСЕРТЬ раз.
8. Mramorskaya.....*	191	МРАМОРСКАЯ.
Aramil.....		АРАМИЛЬ раз.
9. Uktus.....	221	УКТУСЪ.
Yekaterinburg II.....		ЕКАТЕРИНБУРГЪ II Омск.
10. Yekaterinburg I (Jet.).....*	231	ЕКАТЕРИНБУРГЪ I.

## GENERAL DESCRIPTION.

**MILITARY IMPORTANCE.**

This route is of high importance militarily for two reasons: First, it forms an alternative route from Omsk to either Moscow or Petrograd. If the Omsk-Yekaterinburg line were overloaded or cut by the destruction of a bridge, for instance, Route Q would relieve the difficulty by maintaining rail communication with Petrograd. It would act similarly to relieve difficulties on the Omsk-Chelyabinsk line. Second, it taps a busy iron region that could turn out many products indispensable to military operations. Iron is mined, smelted, and manufactured at many places. These activities are becoming more and more dependent upon coal, since the local forests which were formerly abundant have been drawn upon almost to the point of exhaustion. At present, October, 1918, the coal is being brought from the east, thus helping to overload the Siberian Railway. Normally, it comes from the southwest, from the great coal fields of the Donetz Basin.

**TERRAIN.**

The first two-fifths of the route runs across an upland cut by many river valleys. The remainder is among the Ural Mountains. But because the route follows in the main the direction of the mountain ridges there are no difficult engineering structures like tunnels or long bridges. The Ural Mountains seen from the route would be called mere hills by the casual traveler.

**DETAILED DESCRIPTION.**

<i>Miles from Vladivostok.</i>	<i>Distance from Chelyabinsk.</i>	
4,042	0 M 0 V	<b>Chelyabinsk.</b> From Chelyabinsk this route runs northwest and north for 153.1 miles to Yekaterinburg. At about verst 5 the

- line crosses the river Miass by a 280-foot steel bridge, then ascends toward the watershed of the River Ufa and Miass. Leaving the latter, it crosses the River Zyuzelga and reaches the first station. A post highway connects Chelyabinsk with Yekaterinburg.
- 4, 058            16 M   24 V   **Essaulskaya.** From here the line runs through the steppe adjoining the Ural. This steppe is dotted by lakes of various sizes.
- 4, 076            35 M   52 V   **Argayash.** Small station. Is situated the Petrovski machine name. Beyond it the railroad leaves the Orenburg Government and enters into the confines of the Perm government (Yekaterinburg district), where it passes through forest regions before reaching the Ural Mountains.
- 4, 098            56 M   84 V   **Kyshtym.** Railroad restaurant. (Altitude, 1,400 feet.) A mile and one-half from the station is situated the industrial center of Verkhni-Kyshtym. Population about 18,000. The Kyshtym iron works, making water pipes, telegraph and lamp posts, some machinery, stoves, and railway supplies, are situated here. The works employ about 2,000 people, men and women. There is also a cast-iron foundry. Both concerns produce pig iron, steel, different kinds of machinery and

ammunition, about 9,000 to 10,000 tons of pig iron annually, and about 18,000 tons of steel. All the Kyshtym district contiguous to the works where the Ilmen Mountains stretch northward is richly provided with mineral deposits and contains deposits of copper, iron, nickel, and many other minerals. From here the railroad on its climb to Mauk station, crosses numerous valleys and streams, and ascends along a steep and broken slope toward the watershed of the Rivers Mauk and Ufaleika at a height of 1,680 feet above sea level.

- 4, 112            70 M   106 V   **Mauk.** (Altitude, 1,680 feet.) About 12 miles east of the station and between Lake Bolshoi-Kasli to the north and Lake Irisyat to the south, connected by the small River Vyazovskoi, are the Kaslinski steel and iron works. These works employ 1,500 persons and produce about 7,200 tons of pig iron annually. From here the railroad crosses the great swamps called "Constantine dale," then enters a rough, broken country.
- 4, 130            88 M   133 V   **Ufalei.** (Altitude, 1,750 feet.) This station annually exports about 20,000 tons of steel products. Among the hills, about one-fourth mile from the station, near the small Rivers Ufaleika

and Kamenka, the Verkhni-Ufaleiski steel and iron works are situated. They employ about 6,000 workmen. This concern produces annually about 8,000 tons of steel and 5,000 tons of pig iron. Several small companies in the neighborhood of these works engage in gold mining. About 10 miles from the works, just where the Ufaleika enters the Ufa, are the Nizhni-Ufalei iron and steel works, belonging to the same company. They employ about 4,500 workmen, and their annual output is about 7,200 tons of steel. About 35 miles west of the station, on the River Ufa, the Nyaze-Petrovski iron and metal works are situated. Their chief production is sheet steel. This product is shipped into interior Russia by the Rivers Ufa, Volga, Byelaya, and others. The iron ore used is taken from the neighboring mines. About 12,000 men and women are employed in the works. Belonging to the same company, about 15 miles northwest on the River Ufa, are situated the Petrovski machine works. They manufacture engines and river boats, and during the war they were engaged in making ammunition, employing about 2,000 men and women.

From here the railroad runs north and twice crosses the River Koroladin; then it ascends to the watershed of the Rivers Ufa and Chusovaya. Leaving the latter it proceeds along the Poldnevaya River.

- 4, 150      108 M   162 V   **Poldnevaya.** (Altitude, 1,708 feet; population, 300.) Stands in a deserted and wooded country. The famous chrysolite mines, unique in the Trans-Ural, are situated on the right bank of the Chusovaya River, on land belonging to the Polevsk works. Proceeding farther through a level country, the railroad twice crosses the upper reaches of the Chusovaya on bridges, 70 and 105 feet each, and enters the district containing the Sysert mining works.
- 4, 169      127 M   191 V   **Mramorskaya.** (Altitude, 1,734 feet.) Close by is the Mramor marble works, employing 1,000 workers. The marble quarries are situated about 3 miles from the village. Although living in a healthful climate, a large percentage of the population is affected by tuberculosis, owing to the bad air in the workshops. The Sysert works are situated about 14 miles to the southeast, and farther on the Verkhni-Sysert and Ilyinsk works, which, together with the Sysert and

Polevsk works, employ 10,000. The neighborhood contains about 50 different iron and copper factories. During the war they were equipped to make artillery supplies and munitions. There are blast furnaces, puddling, and welding works. Over 12,000 tons of pig iron and 2,800 tons of iron products are produced. The works are provided with a central electrical station. The Verkhni-Sysert works, containing puddling and welding furnaces, stand 6 miles southwest of those of Sysert. They employ about 2,000 men. The annual output of iron is about 7,200 tons. The Ilyinsk works, manufacturing only sheet iron, are situated on the River Sysert, about 4 miles from the Sysert works. The Seversk works (population, 4,000, with 500 workmen and over 1,000 supplementary hands) lie southwest of the railway within about 8 miles of the Mramor works. They contain three blast furnaces, one puddling furnace, two Martens furnaces, and a machine shop. The annual production of pig iron exceeds 16,200 tons. The Polevsk works lie about 4 miles from the Mramor works, and are surrounded by a population of 7,000. Puddled.

fagoted, and rolled iron are manufactured at the works. The Seversk works supply the pig iron required.

After leaving the Mramor station, the railroad runs along the watershed of the Chusovaya and Iset Rivers through a level country, which farther north becomes more mountainous.

4. 189            147 M   221 V   **Uktus.** (Altitude, 1,274 feet.) In a treeless plain. The village of Uktus is 1 mile away. Its inhabitants are engaged in farming and domestic industries, mainly pottery making, which is carried on in about 30 shops. The wares are of good quality and find a ready sale. The Nizhni-Iset Government works (population, 3,500) are situated within about 3 miles of the station. The annual production amounts to 3,600 tons of pig iron, 216 tons cast-iron, and about 270 tons of sheet iron.

From here the railroad runs across a plain covered with dwarf bushes, and after having crossed the River Iset by a bridge 105 feet long, joins the main line to Petrograd (Route N) at Yekaterinburg.

1. 195            153 M   213 V   **Yekaterinburg.** See station 31. Route N.



## WAGON ROAD—OMSK TO PERM.

### GENERAL DESCRIPTION.

From Omsk the post road leaves the steppe region and rises to the summit of the Ural Mountains, from which it descends on the European side to Perm. The road closely follows the railway, which is never more than 35 miles distant (see Route N).

The Ural section of the road is the most difficult, not only in winter, but also in summer. Owing to the relatively large precipitation in this region the roads are apt to be muddy in summer and the snow fairly deep in winter (3 to 4 feet).

Even though the Ural Mountains are not rugged, steep grades are common. The habit of the engineers has been to build roads in a bee line without respect to topography. The steep grades are easily avoided, however, by leaving the road and traveling across the grassy downs.

### DETAILED DESCRIPTION.

M.	V.	
0	0	<b>Omsk.</b> Crossing the River Om on a bridge, the road runs northwest.
28	43	<b>Krasnoyarskaya.</b> A small town on the Irtysh River, which may be crossed by a ferry. The road still continues northwest.
85	128	<b>Tukalinsk.</b>
158	240	<b>Abatskoye.</b> A small village. The River Ishim is crossed. Birch and farther on pine trees are in evidence. An important highway runs north from here to Tobolsk, 130 versts.
205	310	<b>Ishim</b> (see Route N). An important post road runs south to Petropavlovsk, 140 versts. Beyond Ishim the railroad lies close to the highway.
348	525	<b>Yalutorovsk</b> (see Route N). Ten versts west of this city an important highway runs southwest with branches to Kurgan, Shadrinsk, and Chelyabinsk.

- 397 600 **Tyumen** (see Route N). The steppe comes to an end at Tyumen. After leaving the town the road approaches the forest. At 50 versts from Tyumen the trees meet over the road and form a cool, shady way. Thirty versts farther west the road comes out of the woods into clearings and fields. Many undulations, depressions, and the crossing of unsteady little wooden bridges make the road very poor.
- 516 780 **Kamyschlov**. The way is very straight beyond this town. After passing over some low hills on a fairly good road, a thick pine forest, typical of the Ural Mountains, is entered. Throughout are a few clearings.
- 603 910 **Yekaterinburg** (see Route N). From here a post road runs north into the Ural Mountains and another south to Chelyabinsk. Leaving Yekaterinburg the route crosses the Ural Mountains into Europe. The road is very broad, good, and quite straight. It runs for a few miles through the forest and then out upon the open grassy plain.
- 649 980 The road here passes south of the railroad, which is not rejoined until Kungur is reached. At its most distant point it is 32 miles to the north. The road often becomes muddy and difficult. A few steep hills may be avoided by going over the grass on the downs.
- 649 980 The road here passes into European Russia, the frontier line being marked by a white stone at the summit on which is inscribed "Asia" on one side and "Europe" on the other.
- 703 1,065 **Achit**. A branch road runs south, 4 miles to Krasno-Ufimsk.
- 754 1,145 **Kungur**. See Route N.
- 803 1,215 **Perm**. See Route N.

## ROUTE W.

### ROUTES IN THE KIRGHIZ STEPPE.

#### GENERAL DESCRIPTION.

The routes described below lie in the region bounded on the north by the Siberian Railway, on the east by the Irtysh River, and on the south by Lake Balkash. They are important from three points of view :

First. In proportion to the population the number of horses is larger here than anywhere else in Siberia. The annual summer gatherings of horse traders at At Bazar and especially at Bayan Aul are probably the most important gatherings of the kind in Russia or even in the world. If horses are to be purchased, agents should be sent to these places.

Second. This region contains a number of coal mines. Coal from the Voskresenski mines can be sent by rail to Pavlodar on the Irtysh River. The Karagandy mine is too far from railroad transportation to be important.

Third. Some of the largest copper mines of Siberia are located in this region, and their development might be an important help in the rehabilitation of Siberia.

#### ROUTE W. 1., PETROPAVLOVSK TO USPENSKI MINE.

*Terrain.*—Near the Siberian Railway the land is flat and fairly fertile. For about 200 miles toward the south it is a well-watered prairie, with little forest but much wheat. The most important forest area is that surrounding At Bazar, about 260 miles south. The next 100 or 200 miles is steppe country, rolling and fairly well watered. Much of it is devoted to horses and cattle, although good crops of wheat are raised in favorable years. Still farther south, to the west and northwest of Lake Balkash, is a desert area with practically no water and few settled inhabitants. Only the running water is good, all the still water being brackish. In the villages practically every house has its own well, the settlements being built along small water courses or subterranean flows or basins. The coun-

try is composed of sedimentary rocks, broken with islands of granite, some of which are large. The sedimentary rocks are chiefly sandstones and conglomerates, with some beds of slate and limestone. The general elevation is higher than in the north, and the surface is broken by rocky hills.

*Climate.*—The summer climate is dry and fairly hot, the winter very cold and severe, the mercury sometimes going as low as 60° below zero. Typical Siberian blizzards of great intensity are encountered and must be reckoned upon. At such times the wind attains a velocity of from 80 to 100 miles an hour, and the light snow is sometimes whirled 100 feet in the air and drifted badly. The barometer is said to invariably give warning, and from continuous records one observer states that the intervals between blows are from 10 days to 2 weeks. Any cuts on north and south railroads would be unworkable. The first frosts are in September, with gradually increasing cold to November. From then until spring there is continued intense cold, a day warm enough to thaw being almost unknown. At 48° north the spring thaw is usually in March, and the change, which generally follows an extremely cold spell, is precipitate. From 48° to 52° north it occurs about two weeks later. The change from extreme cold to full spring weather without any frost occurs in a week's time. The snow melts quickly, and for weeks and sometimes a month traveling is impossible. The postal service has been held up for six weeks. The watercourses are flooded, and small streams become great rivers. As boats are nowhere available, large bodies of men could easily be cut off and marooned.

*Health.*—The chief disease is typhoid, due largely to the water. Smallpox also occurs, but apparently has not recently been epidemic. In 1916-17 yellow jaundice was very prevalent, due to food conditions. A trouble like scurvy also takes hold of everyone, perhaps because of the unfavorable winter conditions, including frozen meats, lack of fresh vegetables, and unventilated, overheated houses. The symptoms are abnormal swelling of the limbs and fleshy parts of the body. The disease is not fatal. The eating of fish from shallow lakes is said to

bring on "walking typhoid," epidemics of which in some cases have developed seriously.

*Population.*—Four distinct types of people inhabit the region—Russians, Tartars, Kirghiz, and German colonists. Tartars and Kirghiz form the bulk of the population, but the Russians are the leading element. The latter are hardier, more alert and dependable than the Russian in European Russia. The Tartars are usually located near the railroad. They are Mohammedans and a clean, progressive, patriotic people, usually connected with the larger local farming and commercial enterprises. The Kirghiz are Mohammedan nomads, engaged for the most part in raising horses, sheep, cattle, and camels. They are the guides, coachmen, and freight handlers of the district, but are untrustworthy, unpatriotic, and dishonest. The German colonists are scattered over a wide area. They were brought from Germany and given lands. Although naturalized Russians, they should be watched, especially on account of their influence over the Kirghiz. Their farms, products, and cattle are the best in the section.

*Post stations.*—A Government post road and telegraph line extends along the route. Post stations north of Akmolinsk are located at intervals of approximately 20 versts (13 miles), about half of them being located in villages of from 200 to 1,000 people. South of that point the country is more sparsely settled, but stations are still found from 13 to 17 miles apart.

*Supplies—Crops.*—Wheat and oats are grown nearly the whole way from the railroad to Uspenski, and ordinarily are shipped to the railroad by teams after harvest. Immense quantities were stored at Petropavlovsk and Omsk, usually in the open, covered with tarpaulins. The people all live in towns for protection and go out to their fields in the surrounding area. The stocks of hay and straw are invariably kept close to the houses in the villages to prevent theft by the Kirghiz.

*Domestic animals.*—The comparatively few sheep, cows, and oxen belonging to the villages are driven to pasture each day in charge of a community herdsman. The large herds are all owned by the Kirghiz, who keep them in the south during the

winter, driving them north in the spring after the thaw and returning south with them in the fall. The beef and mutton are eatable but tough and stringy and seem to lack nutriment. Hogs are scarce, being kept, if at all, only by the Germans and Russians, as the Mohammedan will not have them about.

*Timber.*—For the most part, the country is bare of timber. A little birch is found near the railway, and one area of pine between Bayan Aul and Karkarali and another about 150 miles north of Akmolinsk. When possible, wood is the only fuel used. When not available, ox droppings are utilized.

*Horses and camels.*—These are plentiful. Like the domestic animals, they are owned in herds by the Kirghiz and are driven north and south, according to season. All these herds are, for the most part, located south of Akmolinsk. The number of horses is said to have greatly decreased since the war, but camels are as numerous as ever.

*Mines.*—The country contains important deposits of coal and copper. The most prominent mines are those of the Spasski Copper Mine (Ltd.) (coal and copper) and those of the Voskresenski Co. at Ekibastus, near Pavlodar. The latter belong to an English company and are connected with the Irtysh River by a railroad. They are near enough to the river to be a practical source of coal supply, but the works were taken over by the Bolsheviki March 3, 1918, and operation stopped. The mines of the Spasski Co. were actively operated up to May, 1917, but their present condition is unknown. The coal and copper deposits offer great prospects of development. Clay, limestone, quartz (for fire brick), and salt are also plentiful.

*Transportation.*—(See also general introduction.) Although the roads are only trails, they are usually good, owing to the presence of silicious rocks. In fact, one can generally travel from place to place even where there are no roads. Travel is usually in small carts or sleighs drawn by one horse, one camel, or a pair of oxen. The latter are used in the northern area as far as At Bazar, while camels are more commonly employed farther south. Motor cars can be employed locally from May to

September, but not in winter, and even in summer the sandy river crossings offer serious difficulties. The Spasski Co. tried steam traction engines for hauling coal, but abandoned them. The company owns 250 good German-made wagons, 2-inch tread iron tires, with poles complete. The local type of freight wagon is the high two-wheeled cart for camels and the four-wheeled wagon for camels or oxen. Camp sites for large bodies of men are available along the routes.

The distance between Petropavlovsk and Spasski is 477 miles. In 1913 the ordinary time of transit for the mining company's freight was 30 to 33 days. The average time consumed by the company's officers in making the trip was 60 hours, the quickest trip on record being 42 hours, of which 36 were actually consumed in traveling. (See section on Roads, under Akmolinsk, p. 142.)

The River Irtysh is an important highway. Large steamers run from Semipalatinsk to Tobolsk during the open months and smaller steamers ascend further into the Altai region.

*Place names.*—These are very confusing, as there are frequently four in use for any one place, viz, the postal designation, the Russian peasant name, the Kirghiz name, and in some cases a German name.

### DETAILED DESCRIPTION.

**Petropavlovsk.** Population, about 43,000. (See Route M, p. 15.)

Leaving the town from its southern section, the road bears south, crossing the railroad in about one-fourth of a mile. There is a slight down-grade to a wooden pile bridge about one-half mile from Petropavlovsk. The bridge is about 100 feet long and is said to be in poor repair. Loads of 3 tons can ordinarily pass. The stream is shallow, except during the spring thaw. The banks are about 10 feet high. A pumping plant is located by the stream bed about one-fourth of a mile west of the road. From the bridge, the road passes for about 3 miles over flat country, which is an old river bottom. No work is ever

done on the road, and an ordinary rain causes deep mud. At about 3 miles from Petropavlovsk, a slight upgrade brings one to a small Kirghiz camp, on the west side of the road. Along the first 14 miles there are a few ranch houses here and there off the road, and some scattered small timber.

Miles.

- 14 A Government post station and small Kirghiz settlement of a dozen houses situated in a slight hollow. Water is derived from wells and small springs, and there are many large trees. A good, covered corral stands on the east side of the road.
- 28 **Karatamar.** A Government post station.
- 47 **Kamyshlovka.** Government post station, with corral 300 yards south on the road. Also large covered corral on west side. The country is level and flat, and the road is firm and can be traveled at all seasons. The water from wells in inclosures is good, and there is good grass. This stretch has no trees or farms.
- 63 **Emantus.** Government post station. A few dwellings on the west side of the road and ruined turf houses on each side of the post house. Behind it is a well with a long weighted sweep. There is a new low growth of trees. Numerous Kirghiz farms and corrals along the route, short distances from the road. A mile south is a village of about 20 log houses with thatched roofs and corrals. There are cattle and horses. Water is from wells. The road is firm, with pasture on each side.
- 76 **Mizgily.** Government post station. Near this station the telegraph line from Petropavlovsk, which follows the road thus far, turns off. The station is in a small forest of low, new growth, and consists of two houses and a corral. Close by are some fenced fields. Water is plentiful from shallow wells. The road in the immediate vicinity is soft and boggy. From this station for nearly 20 miles it passes through a Government forest reservation of good timber. The forest is laid



out in sections about a mile wide. These are separated by cleared strips about 50 feet wide and running east and west where seen along the post road.

- 84 A Government sawmill is located here, with covered inclosed lumber sheds and new wooden dwellings with iron roofs. About 2 miles farther is a large log house on the west side of the road. Roads through the forest reserve have been drained to some extent, but are soft with deep mud in wet weather and are slow in drying.
- 94 A Russian village. This is at the southern edge of the reserve. It has one long street about 100 yards wide, with houses on each side about 200 feet apart; about 30 in all. They are of logs and adobe bricks, with thatched roofs. Each has water from its own well, and there are numerous covered corrals. Some cattle and many geese are kept. The surrounding country is fertile and cultivated.

About 5 miles beyond the village the road passes through a stretch of lowland some 10 miles long, which is under water in the spring thaw and sometimes impassable for six weeks. The road is good in summer or fall. For a stretch of some 50 miles the road is wide and good, bordered by farming communities at distances of 5 or 10 miles. Each village has numerous houses, all using wells, and most having covered corrals. Hay is plentiful.

- 151 **Shushi.** This is a large and prosperous Russian village, situated on the shore of a lake. The lake is about 1 by 2 miles in size, with a wooded, rocky hill rising from the opposite side. The granite hills of the surrounding region contain primitive health resorts. The water of the lake is good and fish are plentiful. The village is laid out in parallel streets, with about 30 or 40 houses. The ground is good farming land and much hay is raised. To the westward is a large extent of forest, where all the lumber for the southern district of

Akmolinsk is cut. The Spasski Co. have concessions there and own a sawmill. Some gold mining is carried on in the hills.

The road from here swings around the western end of the lake and follows the banks of its outlet over a fine stretch of country for about 5 miles. No timber.

- 156 A Russian settlement and the halfway station to Akmolinsk, located at the foot of a low, treeless hill. It is well laid out, has about 60 houses, and can accommodate many men. Water is obtained from wells and from underground drainage from the lake described above.

About 3 miles beyond the road crosses a small stream on a wooden bridge about 50 feet long. The bridge is set on piles and is in bad shape. In summer the stream has only a foot of water and there is a ford beside the bridge. About 2 miles beyond the bridge and a little off the road is a Government hospital building not in use. The road is good here and on somewhat higher level ground. It passes through numerous villages scattered at distances from 10 to 15 miles. All are prosperous farming communities, usually with plenty of hay. Water is obtained from wells. The country becomes somewhat more rolling, with some small timber. The extremely wide road is well marked and can not be missed. It would easily be distinguishable from aeroplanes.

- 196 **Matinski.** A Russian village. The road continues through a timbered district and is muddy and rough in bad weather, although always passable.
- 228 A Russian village of about 20 houses, with good covered corrals. Water from wells. Good feed and a good road through slightly wooded, rough country. The Omsk Road joins the road from Petropavlosk near here.

- 248 **Alekseyevski.** About 10 houses, located on high ground. Good haystacks and pasture. The road from here is along humpy ground, with few trees. Occasional houses are passed.
- 257 Village on the edge of a small lake about a mile long and a half mile wide. Open level country without trees. The main telegraph line passes through here and there is a station. The village contains a good-sized church. The road, which continues good, passes over rolling ground.
- 267 **Kushaki.** The village has one long street and is on the edge of a forest of small trees, which begins just behind the houses on higher ground. This is the limit in this direction for trees of any kind, except such as have been planted around houses and cared for. The street is about a mile long, with houses at intervals on both sides. A Russian church is located about half-way up. To the north of the village, about 2 miles away, in a small clump of trees on a knoll, is a wooden tower, which has been there many years, and seems to have been a well-drilling frame.

The road from here is practically level and runs over a broad steppe, dotted occasionally with houses or small settlements. The grass is good, but water is scarce.

- 314 **Akmolinsk.** Population probably 12,000 to 13,000; Cossacks and Kirghiz. The town is located in a slight depression of the rolling ground of the steppe. The country is grass grown and there is good feeding for ox transport, but it is barren of trees. Aeroplanes could land anywhere. The town is prosperous, and is the seat of government for the Akmolinsk Province. It contains a telegraph station, post office, branch of the Imperial Bank, police headquarters, large stores, a tallow factory, a soap factory, a power flour mill, and about 100 small wind gristmills. These are of the Dutch type and are the most striking feature of the village, being grouped on high ground at the eastern

end. There is a small machine shop with small swing lathe, shaper, drill presses, and blacksmith outfit. The power is a gasoline engine. A fair with a turnover of 1,500,000 rubles is held each year. The chief trade is in cattle. The dwellings are about 200 feet apart on laid-out street, with inclosed yards. The roofs are generally of iron with a 30 per cent pitch. The village also has a number of churches, the domes of which are visible for a long distance. Camp sites are available anywhere outside the city, but water is not very abundant. There are a number of town wells with power and hand pumps, and the water is delivered in wagons. Fuel is not readily available, the nearest timber being about 46 miles north. Cattle are numerous in all the surrounding country, and in all directions are farms and ranches worked by Russians and Kirghiz. Good stocks of food supplies are kept here. There is direct telegraph connection north to Petropavlosk and Omsk and south to Karagandy.

In 1915 and 1916 the town was a mobilization center for the district drafts sent north. In August, 1916, there were 2,000 troops in the immediate vicinity, to prevent Kirghiz uprising in protest to the mobilization of the Kirghiz who were exempt by treaty. About 100 German officer prisoners were confined here.

Roads radiate from here in all directions; eastward covering the Irtysh River section; southward to the rich farming country, the copper and coal mines, and farther to the wool and hide section; westward toward At Bazar. They are merely the natural surface of the steppe, no work ever having been done on them. They are fair in dry weather, but generally muddy and boggy in wet, and after the spring thaw. Hundreds of wagons pass over the main roads in a day, but owing to the fact that they do not track and because of the wobbly wooden wheels there are no ruts. The road

limit is the horizon. Heavy touring automobiles average about 20 miles an hour.

Leaving Akmolinsk the road leads to the south up a 10 per cent grade for a short distance, then over hills for a few miles. A few miles from the city it crosses the River Ishim at a ford, which would be troublesome for a motor car. The first village is about 10 miles out. About 15 miles south it traverses a piece of low, flat country, which is inundated in the spring sometimes for weeks. From the first village all the way to the Nura River there is farm after farm, mainly held by German colonists, who have the best breeding stock in the country. Large quantities of natural hay are cut and much wheat and oats are raised. The road continues over the open country of the broad, rolling steppe.

348 **Kubelisk.** Post station. A village with one long street. The posthouse is on the west side of the road. At the north end of the village is a 20-foot wooden bridge over a deep gully. The road passes through many villages.

370 **Nurinsk.** Population about 500. A compact village of prosperous German colonists, with well-built houses, mostly thatched. There is plenty of hay and 300 or 400 head of cows. The water is from wells.

The road continues level and good through a well-grassed country to the Nura River. Just before reaching the river a low range of hills is encountered, which parallels the stream. The grades are about 12 per cent. The river crossing, a ford, is dominated by the heights. In addition to the ford there is a short wooden bridge over a washed-out dam at an old flour mill. At this point the crossing is from 50 to 100 feet wide. (There is another crossing and ford 10 miles farther up.) On the opposite bank is a low, flat hill.

410 A German village. This is on the south bank of the above river. It consists of about 20 houses, well built.

The road from here goes up a slight gradual grade through a good grass country to Karagandy. About halfway is a partly demolished house and stable.

- 440 **Karagandy.** Population about 300 normally, mostly Kirghiz miners, Russians, and an English-speaking staff. The buildings include dwellings for staff, workmen's barracks, store warehouses, and stables. The latter have accommodations for 30 animals in winter. About 500 men could be housed. This is the coal-mining camp of the Spasski Co., furnishing all coal used for power, heating, smelting, etc., at Spasski, Sara Su, and Uspenski. The equipment includes two hoisting engines, good for 500 feet; 4 Babcock & Wilcox tubular boilers, of approximately 100 horsepower each; a compressor of about 1,000 feet of free air per minute; complete blacksmith shop, with 1 small lathe, 20-inch swing drift press, grinders, etc. The mine is operated by two shafts, 300 feet deep, both fully equipped, but only one in use. It is capable of furnishing a minimum of 100,000 tons a year by continuous work. The coal is a gaseous lignite, 25 to 30 per cent ash, and practically free from sulphur.

The water supply is good and sufficient for 2,000 men. It is capable of quick development.

A narrow-gauge railway,  $27\frac{1}{2}$  miles long, runs to Spasski. It has 3 locomotives, about 4 flat cars (about 10-ton capacity), and 20 bottom dump. They are all in fair condition only. The track is good, rails about 75 pounds. Karagandy is the terminus of the post road from Petropavlovsk and of the telegraph line from Akmolinsk and the north. A telephone line runs south to Spasski, Sara Su, and Uspenski. Roads follow the ground formation westward to numerous settlements of Russians, Germans, and Kirghiz, and south to Spasski and beyond.

The Spasski road proceeds over the nearly level steppe, following the railroad closely and passing many

farms. There are two water stations on the railroad, about 8 miles apart. The water is pumped by connecting the steam of the locomotives to small pumps. About 13 miles south the road and railroad cross the River Sokar, the former by a ford and the latter on a trestle. The ford is good, but the river has caused the railroad much trouble in flood time. At about 20 miles the Spasski Co.'s farm is located to the west of the road. This is fully equipped. Just before reaching Spasski there is a long hill with about a 10 per cent grade to the top.

- 465 **Spasski.** Population about 1,500. This is the headquarters of the Spasski Copper Mines Co. (Ltd.). The village is located at the foot of a considerable hill (200 to 300 feet high), which commands the entire settlement. The main road traverses the hill and enters the town on a 12 per cent grade from its top. The railroad enters by a curve on the level ground from the northwest. The ground is rocky and there are no trees, but to the south and southwest it is level and well grassed. Aircraft could land anywhere in those directions. To the north and northwest are large fields of natural hay and numerous farms on which fodder corn, wheat, and oats are raised.

The village contains the various mining buildings, a Russian bath, company's store, laboratory, and electric light power station, flour mill, brick plant, church, workmen's barracks, staff houses, doctor's house, powder magazine (on the hill), a hospital, and other buildings. The roofs are of iron with a 30 per cent pitch. The hospital is well equipped for 100 patients. It is a large brick building with sun porches on the south and west, and has a complete kitchen. In March, 1917, the stock of medicines was very complete except for iodine and aspirin. The company's plant includes a complete blacksmith and machine shop, small (300-pound) iron

cupola, carpenter shop with electric-driven saws, planes, and edger, common red, silica, and fire brick plants and kilns, with accompanying crushing and grinding plant, electric light and power, complete copper smelting, converting and refining plant, a concrete stack 75 feet high and 4 iron stacks 50 feet high, a small flour mill, lime kilns, hay harvesting and baling machines, wagons, sleds, traveling carriages, sleighs, all necessary harness, about 150 head of camels, 200 oxen, and 100 horses. Nearby are excellent deposits of fire clay, red-brick clay, silica, and lime.

Water is obtained from wells and carted, but there is lack of surface drainage, and the shallow wells are easily polluted. Typhoid is very prevalent at times, and all water should be boiled. Otherwise general health conditions are good. The road proceeds through a grass country. About 11 miles out is a well-built covered camel corral with a well and good water. At about 20 miles the route passes over some hills (grades 8 per cent) and down into the valley of the Nura River.

487 **Nura crossing.** The stream is crossed on a low-piled bridge about 40 feet long. It is also fordable except in freshets. There is a good covered camel shed here. From the crossing to Darrier the road is good and parallels a fairly high range of mountains. The grass continues good.

500 **Darrier.** This is a camel-shed station, with water at shallow depth. There are wells and splendid grass. The road passes over a slight rise to the next village.

512 **Russian village.** This straggles from the road back for a mile or so over an underground water channel. It has a good covered camel shed. The road continues up a slight grade and then over a mile or so of soft ground to a point where it divides, a branch going to Sara Su, and the main road proceeding to Uspenski.

520 **Sara Su.** (Population about 100.) About one-third Russians and two-thirds Kirghiz, all employed at the com-



pany's works. The houses and works are stone buildings with iron roofs. The barracks consist of 3 to 12 room houses, rooms 10 by 12 feet, with storm entrances. The Russian staff quarters consist of six 2-room apartments, each with storm entrance. The director's house has 6 rooms and a bath. There is also a well-equipped Russian bathhouse. The winter camel shed is 100 by 100 feet, covered with thatch, and with harness and teamsters' rooms. The stable accommodates 12 horses.

The company's works are built on the western slope of an isolated granite butte which rises about 80 feet above the surrounding country. The extent of the higher ground is about 4,000 feet north and south, and about 300 feet wide. A 65-foot, 54-inch round iron smoke stack rises from the apex of the hill and is connected by a stone flue to the power plant of the works below to the west. This stack can be seen at distances of from 16 to 25 miles and is an exceptional landmark. There is a complete blacksmith shop with 26-inch lathe, drill press, grinder, pipe, and bolt threading tools up to 2 inches; two 150-horsepower Wolff compound condensing locomobile engines, developing a total of 200 horsepower, a 530-volt 60 A. M. P. generator, belt-driven transformer 530 to 110 volts, a 25-horsepower motor for pumping plant, and a 20-horsepower motor for incline hoist. The crushing machinery consists of one 12 by 20 and two 6 by 20 Blake type crushers, two 12 by 30 crushing rolls, two Harding pebble mills, and flotation concentrating plant with drier. There is also a small double-drum hoist, electrically driven, capable of raising 3,600 pounds on a 25 per cent grade. There are two wagon scales.

Water for the works is from a 25-foot well located a quarter of a mile from the river. It furnishes 250 gallons per minute of splendid water which is filtered into the well through a natural gravel bed capped by nu-

merous layers of compact clay. It is pumped and delivered to a height of 125 feet to the works through 3,200 feet of 6-inch iron pipe by a 12 by 14 geared triplex electric pump. The pipe is buried 4 feet and freezes.

No fuel is available except ox droppings and coal from Karagandy.

Herds of cattle, horses, sheep, and camels are pastured in all directions except in winter when they are driven south. The pasture is good in spring and summer and well into the fall.

The telephone line from Spasski passes through here and, by switchboard, to Uspenski.

The country is open rolling steppe, without trees, and aeroplanes could land anywhere.

The Sara Su River flows east to west about 300 feet south of the works and is ordinarily a small stream only a few feet in width, but during the spring freshets is from 50 feet to a half mile wide varying with the rapidity of the thaw and the amount of snow.

About 40 miles to the east on the river is a large German colonist settlement and another about 36 miles to the northwest. In 1916 a motor car traveled west to Jez Kaagan, following the river for the first 70 miles through a series of Russo-German villages. After leaving the river there were no villages or farming, and the route crossed the open steppe, broken only by a few camel caravan routes.

529 Uspenski. Population about 700 (about 600 Kirghiz, with Russian and English staff). This village is the farthest outpost of modern civilization. Roads lead to the south and west, but only Kirghiz camps are found. The most important copper mine of the Uspenski Co. is located here. The mine and village are situated on a long, low hill slope with lower ground to the north and east and higher to the west. The highest point is about 200 yards from the main road. There are no trees, but natural hay grows everywhere outside the town. Aircraft could land anywhere.

The barracks are well built of brick and stone, with iron roofs. The company has a store and a well-equipped hospital. A dynamite magazine is located about one-fourth of a mile northeast and is protected with 20-foot poles carrying lightning rods. The building is short-circuited to the ground by an envelope of  $\frac{3}{4}$ -inch iron rods, bound together at 4-inch intervals.

The water supply is very limited and poor. Fuel is hauled from Karagandy. Forage for animals is not to be counted on, but pasture is good and unlimited from April to September.

The mine produces only low 6 per cent copper, the high-grade ore being exhausted. The life of the mine is now said to be limited unless new deposits are discovered. There are two hoisting steam engines, good for 700 feet with 2-ton lift; four Babcock & Wilcox tubular boilers, 100 horsepower each; a 2,400-cubic feet free-air Ingersoll Rand compound steam and air compressor; and two 1,000-cubic feet free-air Ingersoll Rand single-steam and compound air compressor in fair shape; air-drill sharpeners (new); about twenty 2 $\frac{3}{4}$  air drills and six small jack hammer drills; and complete blacksmith shop for all work.

About a half mile south of the town is a quarry of good sandstone for building. There are also lime deposits within a couple of miles and clay for bricks as well as kilns for burning both.

To the south runs a road which eventually strikes the Kara Su River, which leads to the Turkestan Railroad from Samara to Tashkent. This road is seldom used and is not suitable for the movement of troops. To the southeast the country toward Lake Balkash is sandy and extremely alkaline. Water is very scarce, and partly for this reason and partly owing to the scarcity of pasture and the unreliability of guides, the country is dangerous for traveling. There is some travel in it in the springtime between Tashkent and

the large horse fair held at Kuyandi. In Lake Balkash the water is said to be sweet on the north side and somewhat brackish on the south.

ROUTE W-2—PAVLODAR TO KARKARALINSK.

- 0 **Pavlodar.** (See Pt. III, p. 119.) Leaving the town the road crosses the River Irtysh by means of a ferry. The road passes over dry, barren country interspersed with many salt lakes. At 14 miles it crosses the railroad which connects the coal mines of the Voskresenski Co. with the River Irtysh at Voskresenski Landing, 24 miles by river above Pavlodar. Road good.
- 26 **Kalkoman.** A Government post station. Road continues through a dry, barren land.
- 52 **Jermantus.** A Government post station on the shore of an intensely salt lake, the beach of which is incrustated with heavy deposits of salt. These are removed annually, but grow again by natural processes.
- 72 **Kaida-ul.** A Government post station. Road continues through same type of country.
- 99 **Chak Chan.** A Government post station in barren, rolling steppe. At this point a road branches off to the west to the mines at Bayandi Kuduk and thence to Akmolinsk. (See Route W. 3.) The mountains around Bayan Aul are faintly visible from here.
- 120 **Kandi Kara Su.** A Government post station near the foot of the Granite range of mountains which dominates Bayan Aul. Road passes around mountains, and in bad weather is heavy and rough.
- 140 **Bayan Aul.** A Cossack town in a valley in the Granite Mountains which are thickly wooded. Very beautiful country with numerous fresh-water lakes.
- 250 **Karkaralinsk.** A Cossack town. The headquarters of a large forestry industry under Government control. The road passes through the site of the Kuyandi fair, the largest fair for the sale of live stock in Siberia, probably in the world.

## ROUTE W-3—CHAK CHAN TO AKMOLINSK VIA BAYANDI KUDUK.

- 0 **Chak Chan.** A Government post station on the Pavlodar-Karkaralinsk post road, 99 miles from Pavlodar. (See Route W-2.) There is no Government post road system on the Chak Chan-Akmolinsk Road. The road turns abruptly west from Chak Chan and proceeds through a barren rolling country without any obstructions.
- 33 **Bayandi Kuduk.** This is situated in a barren rolling country interspersed with numerous shallow lakes. A good seam of coal is found here, but the mine is poorly developed. Numerous copper prospects within a radius of 40 miles, none of which are developed. A roughly equipped copper smelter with houses and rough plant. From Bayandi Kuduk a branch road branches off to the southeast to Bayan Aul; distance, 42 miles. This road joins the Pavlodar-Karkaralinsk road at Kandi Kara Su. (See Route W-2.) Here there is an old abandoned mine of the Popoffs. Like other steppe roads, this runs through an open, unobstructed country until it approaches the mountains at Kandi Kara Su. From Bayandi Kuduk the main road proceeds westward through an unsettled, rolling country, with numerous traces of copper ore. At 64 miles it crosses the road from Bayan Aul to Petropavlovsk. At 72 miles passes Mount Tas Cheku. At 96 miles passes a large lake, Saumal Kul. At 100 miles passes Mount Aman Tau. Shortly after, crosses the Chiderty River.
- 112 **Tasty Adir copper mine.** This is an important mine which has been worked since prehistoric times. The road continues through open country.
- 200 **Akmolinsk.** (See Route W-1.)

## ROUTE W-4, BAYAN AUL TO KARAGANDY COAL MINE.

- 0 **Bayan Aul.** This is a point on the Government post road between Pavlodar and Karkaralinsk. (See Route

W-2.) Distances are only estimated. After leaving the timber area the road proceeds west over an open country without any settlement except the huts of a few Kirghiz.

- 170 **Karagandy coal mine.** A point on the Petropavlovsk-Uspenski road. (See Route W-1.) The reporter made the journey in severe winter weather in March, 1913; the storms were bad.

	Hours.
Total lapsed time on trip-----	120
Total actual travel time-----	50

Made the same trip on 21st May (after spring thaw) in 70 hours lapsed time without effort.

There are no obstructions on this route, except that the River Nura (North Fork) must be crossed at Sannikoff, near Karagandy. Crossing impossible in flood times; not bad at other times.

#### ROUTES W-5 AND W-6, KARKARALINSK TO KARAGANDY AND KARKARALINSK TO USPENSKI.

**Karkaralinsk** is the terminal station of the post road from Pavlodar to Karkaralinsk. (See Route W-2.)

**Karagandy** is a station on the Akmolinsk-Uspenski road. (See Route W-1.)

**Uspenski** is the terminal station on the post road from Akmolinsk to Uspenski. (See Route W-1.)

These routes need no special description. They run through the usual open country of the Steppes and are constantly used by the timber carriers, who bring timber from the forested area around Karkaralinsk to the mines of the Spasski Co. They are also used by the general public for transport of produce between Semipalatinsk, Akmolinsk, etc. Distance, about 150 miles.

## ROUTE W-7, PETROPAYLOVSK TO JUSALI.

- 0 **Petropavlovsk.** On the Siberian Railway (Route M).
- 103 **Azatski** (via Route W-1). At this point the main Government post road swerves to the west toward At Bazar, whence it runs toward Akmolinsk.
- 150 **Kokchetovsk.**
- 260 **At Bazar.** Population, about 5,000, except during a week in May, when there is a large fair. The Kirghiz from the south then exchange wool, cattle, horses, wheat, etc., for imported wares of all kinds. There is a bank, stores, etc.<sup>6</sup> During the fairs the dealings total several million rubles. From At Bazar the post road swings east to Akmolinsk. It passes through a series of villages 20 to 25 versts apart. These villages raise wheat, cattle, and horses. From At Bazar to Jes Kasgan the country is inhabited only by nomadic Kirghiz, who travel with their horses, camels, sheep, and goats. There is a fair amount of grass until within about 100 versts (66 miles) of Jes Kasgan, where the sagebrush country begins.
- 590 **Jes Kasgan.** At Jes Kasgan are situated the mines of the At Bazar Co., owned by the Spasski Copper Fields (Ltd.). They are well developed, but not producing, as the enterprise is new. There are quarters for about 500 men, with gas power house, a small machine shop, etc.
- 630 **Kassark Pai.** About 40 miles south of Jes Kasgan. This is the site of the uncompleted works for the reduction of the copper ore from the Jes Kasgan mines. It is local headquarters of the Spasski Co. and contains offices, houses for about 20 families belonging to the staff, and workmen's quarters for about 500 to 1,000 men. The works consist of an up-to-date machine shop, carpenter shop run by electricity, and partially completed concentration, gas, power, and smelting plants. There is a reservoir reported capable of hold-

ing 20,000,000 gallons of water collected during the spring freshets of the Kummala River watershed. At Bai Kanur, 25 miles southwest of Kassark Pai, is the site of the coal mines of this enterprise. The deposit is lignitic, of about 8,000 British thermal units. The mines are well developed. A 3-foot railway connecting Jes Kasgan, Kassark Pai, and Bai Kanur is under construction.

- 760 **Jusali.** A station at Fort No. 2 on the Orenburg-Tashkent Railway. This railroad was built primarily for military purposes. Jusali has extensive side tracks, large station, buildings, etc. It is situated on the Sara Su River, which empties into the Sea of Aral. Between Kassark Pai and Jusali the country is sandy and is covered with sagebrush. There is little water, and most of it is brackish. The transport is entirely by camel, or, in summer, by motor cars.



## UFA (CHISHMY) TO SIMBIRSK (KINDYAKOVKA).

(585 versts = 388 miles.)

## LIST OF STATIONS.

INDEX.—Numbers at left serve as a key to map which follows. Numbers at right show versts from the Samara Zlatoust Station of Chishmy. \* indicates a railroad restaurant. Jet, indicates a railroad junction. Important towns are shown in heavy type.

1. Ufà.....*	УФА.
2. Chishmÿ (Sam. Zlat. Station) (Jet.).....	0 ЧИШМЫ Сам. Злат.
3. Chishmÿ (Bugulma Station).....	4 ЧИШМЫ Волг.-Бугул.
4. Blagovâr.....	32 БЛАГОВАРЪ.
5. Buzdyâk.....	62 БУЗДЯКЪ.
6. Kandÿr.....	92 КАНДРЪ.
7. Tuimâza.....	121 ТУЙМАЗА.
8. Yutazâ.....	153 ЮТАЗА.
9. Zai.....	184 ЗАЙ.
10. Bugulmâ.....*	202 БУГУЛЬМА.
11. Dÿmka.....	236 ДЫМКА.
12. Klyâvino.....*	269 КЛЯВЛИНО.
13. Shelashnikovo.....	287 ШЕЛАШНИКОВО.
14. Sheutalâ.....	321 ШЕНТАЛА.

15. Чёлна.....	348	ЧЕЛНА.
16. Nurlät.....*	369	НУРЛАТЬ.
17. Pogružnaya.....	400	ПОГРУЗНАЯ.
18. Yäkuška.....	425	ЯКУШКА.
19. Meleköss.....*	456	МЕЛЕКЕССЬ.
20. Bryändino.....	478	БРЯНДИНО.
21. Völkovo.....		ВОЛКОВО пл.
22. Čherdakly.....	512	ЧЕРДАКЛЫ.
23. Čhasovnyä Vörkhnyä.....*	531	ЧАСОВНЯ ВЕРХНЯЯ.
24. Simbirsk II.....	541	СИБИРСКЪ II.
25. Kindyäkovka.....	545	КИНДЯКОВКА.

## GENERAL DESCRIPTION.

**MILITARY IMPORTANCE.**—(1) This route would furnish an important supply line if a battle front were maintained along the Volga or farther west. (2) It runs through a region that ordinarily has a surplus of food products, especially cereals, honey, and animals. (3) It furnishes an alternative route between Moscow and Ufa. (4) It offers another crossing of the Volga by bridge in addition to the bridge at Syzran.

**TERRAIN.**—The first third of the route runs through a low plateau, broken by broad river valleys several hundred feet deep. There are no great elevations, but sometimes the sides of the valleys are quite steep where they have been undercut by the water.

In the second third the valleys broaden, the slopes become gentler, and the country assumes the aspect of a rolling plain sloping to the west. In the last part of the route the rolling plain merges into the flat lowland of the Volga valley with gentle, isolated hills between the rivers. Much of the country is forested, but still larger areas are in fields.

**COMMUNICATIONS.**—From Ufa to Chishmy this route is identical with the main railway from Zlatoust to Samara (Route M). At Chishmy it diverges to the west and runs through Bugulma to Simbirsk on the Volga. Throughout its whole length the railway is roughly paralleled by a telegraph line and post road, while other post roads meet it from the north and south. Both Ufa and Simbirsk are river ports, Ufa being the head of navigation on the Byelaya River and Simbirsk being one of the important Volga ports.

**INDUSTRIES.**—The region traversed by this route is chiefly agricultural. Grains, hemp, flax, and fruits are the chief crops. Bees are kept by many of the farmers. Grazing interests are important, and sheep, horses, and cattle are numerous.

## DETAILED DESCRIPTION.

<i>Miles from Vladivostok.</i>	<i>Distance from Chishmy.</i>	
4,340 M		<b>Ufa</b> (Route M). From Ufa to Chishmy the line is identical with the Zlatoust-Samara line.
4,369 M	0 V	<b>Chishmy I</b> (Route M). Main station on the Zlatoust-Samara line.
	0 M	
4,371 M	4 V	<b>Chishmy II</b> . A station on the Simbirsk Railway. The Simbirsk line follows a small valley to the northwest, while the main line runs southwest.
	3 M	
4,390 M	32 V	<b>Blagovar</b> . The line crosses a low divide and descends into a small valley.
	21 M	
4,410 M	62 V	<b>Buzdyak</b> . The line follows the small valley to the southwest and west, then continues to the northwest and crosses a low divide.
	41 M	
4,430 M	92 V	<b>Kandry</b> . The line runs to the west and follows a small valley into the Ik Valley.
	61 M	
4,449 M	121 V	<b>Tuimaza</b> . In the Ik Valley. The line ascends the west slope of the valley, following a small tributary to the northwest.
	80 M	
4,470 M	153 V	<b>Yutaza</b> . The line runs to the northwest, then turns to the southwest, leaving the small valley. It crosses a low divide and descends into the Zai Valley.
	101 M	
4,491 M	184 V	<b>Zai</b> . On the Zai River near its headwaters. The line runs to the southwest and avoids a big turn of the river.
	122 M	
4,503 M	202 V	<b>Bugulma</b> . (Population, nearly 10,000.)
	134 M	. Railway restaurant. This town on the Zai River has 6 schools, including an industrial school, a Government agricultural station, a hospital, and distilleries. Fairs are held here twice a year. The

principal trade is in linen, hides, wool, horses, and cattle. The surrounding region is agricultural. Post roads lead northwest to Chistopol and south to Buguruslan.

The railway leaves the Zai Valley and runs southwest and south across a low divide to the Sheshma Valley.

<i>Miles from Vladivostok.</i>	<i>Distance from Chishmy.</i>	
4,525 M	236 V 156 M	<b>Dymka.</b> On the Sheshma River. The line leaves the valley and runs to the southwest, making turns to the west and south, following in general an upland.
4,547 M	269 V 178 M	<b>Klyavlino.</b> The route turns to the northwest, following the upland.
4,559 M	287 V 190 M	<b>Shelashnikovo.</b> The line continues to the northwest along the upland and makes a sharp turn to the southwest before reaching the next station.
4,582 M	321 V 213 M	<b>Shentala.</b> Soon after leaving this station the line runs west and descends into the Kondurcha Valley.
4,600 M	348 V 231 M	<b>Chelna.</b> On the Kondurcha River. The post road crosses the line and branches to the southeast. The railway follows the valley to the west, keeping close to the river.
4,614 M	369 V 245 M	<b>Nurlat.</b> Railway restaurant. A post road runs to the northwest. The line leaves the valley, turns to southwest, and follows the upland parallel to the river.
4,634 M	400 V 265 M	<b>Pogruznaya.</b> On the upland. A post road runs northwest and southeast through the village. The railway turns to the west and descends gently into the valley of the Cheremshan, a tributary of the Volga.

<i>Miles from Vladivostok.</i>	<i>Distance from Chishmy.</i>	
4, 651 M	125 V 282 M	<b>Yakushka.</b> The line runs along the flat valley of the Cheremshan to the southwest and west.
4, 671 M	456 V 302 M	<b>Melekess.</b> (Population, 8,500.) Railway restaurant. A town in the district of Stavropolsk in the Government of Samara, located at the junction of the Melekess and Cheremshan Rivers. The town has a bank, Government hospital, a store for farm machinery, a drug store, 8 flour mills, a distillery, and 50 small establishments.
		About 10 miles southwest of the town is the village of Myllovka, with a population of about 2,000. Nearby is a linen mill employing 800 men and a distillery employing 60 men. This is a grain and fruit raising country.
		The railway ascends the bluffs on the west side of the river and runs northwest along the highland.
4, 686 M	478 V 317 M	<b>Bryandino.</b> The line turns to the west, continuing on the divide, and then descends to the flat of the valley.
		<b>Volkovo.</b> Platform stop.
4, 708 M	512 V 339 M	<b>Cherdakly.</b> On the valley flat. The line continues west to the river.
4, 721 M	531 V 352 M	<b>Chasovnya-Verkhnyaya.</b> Railway restaurant. On the east bank of the Volga. The line crosses the river by a long steel bridge, a modern structure. This bridge was injured by the Bolsheviki in October, 1918, but was reported to have been speedily repaired.

<i>Miles</i> <i>from</i> <i>Vladivostok.</i>	<i>Distance</i> <i>from</i> <i>Chishmy.</i>	
4,728 M	541 V	Simbirsk. (Population 75,000.) Capital of the Government of Simbirsk.
	359 M	

*Strategic importance.*—(1) From its height the city commands the surrounding region. (2) It guards the bridge across the Volga, a very important structure. (3) Simbirsk is the main station on the Ufa-Chishmy-Simbirsk line, which runs west to connect with the main line of the Trans-Siberian route at Inza. The city is also the terminal of post roads from different directions. It is important in the river trade of the Volga. (4) Simbirsk is surrounded by a food-producing region, from which supplies could be obtained in large quantities.

*Location.*—The city is on a hill, 560 feet above sea level, between the west bank of the Volga and the Sviyaga Rivers. It is about midway between Samara and Kazan.

*Details of the city.*—The best part of the city is on the hill. The commercial quarters, including the warehouses and the poorest suburbs are on the slopes between the hill and the rivers.

In 1901 the city had 30 Government buildings, 1,480 stone houses, 1 Lutheran, 1 Catholic, and 29 Greek Orthodox Churches, a Jewish Synagogue, and a Tartar Mohammedan Mosque. The city has 39 schools, including a high school for boys and girls and a military school. Almost 9 miles from the city is the Karamzin Hospital with 120 beds.

## UFA TO SIMILRISK.

*Industries.*—The region around Simbirsk is agricultural. Not far from the city is an 800-acre orchard. During the fair held here, which has an annual turnover of \$2,000,000, the trade in grain is the most important. Other articles of exchange are potash, wood and wooden wares, wool, hides, fruits, cattle, horses, and small manufactured products. Only 37 industrial establishments were registered in 1900, which together employed 500 men.

*Transportation.*—Simbirsk has railway communication with Russia by a line to the west through Inza, with Siberia by the line to the east through Ufa.

Post roads extend to Syzran and Samara on the south, to Karsun on the west, to Kazan on the north, and to Ufa on the east.

The chief trade is carried on by water on the Volga. One large wharf receives 40,000 tons of lumber, salt, and crude oil annually, and distributes up the river 96,000 tons of grain and other agricultural products.

<i>Miles from Vladivostok.</i>	<i>Distance from Chishmy.</i>	
4,730 M	545 V	<b>Kindyakovka.</b> Railway restaurant. The main station of the railway in Simbirsk. It is in the south part of the city.
	361 M	



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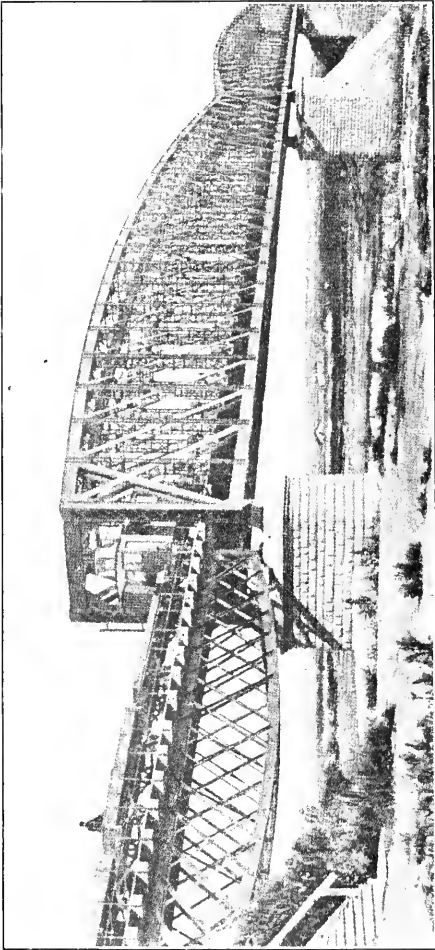


Fig. 1.—Route L. Bridge over the Ishim at Petropavlovsk.

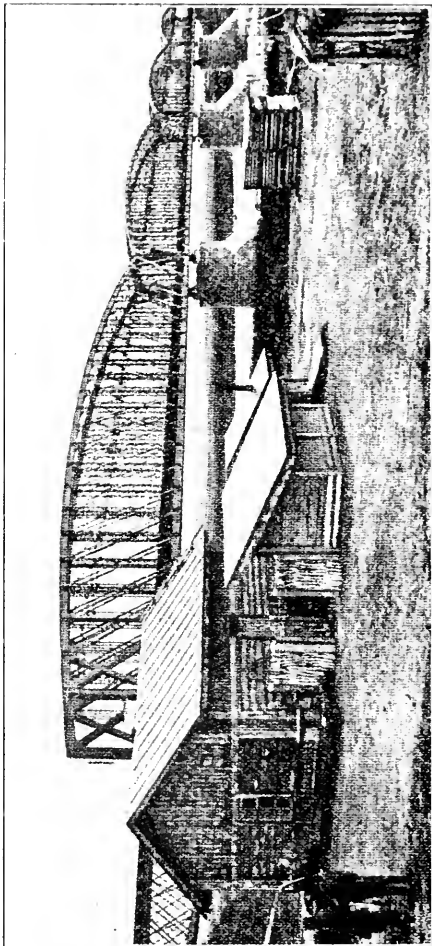


Fig 2.—Route L. Bridge over the Tobol at Kurgan.

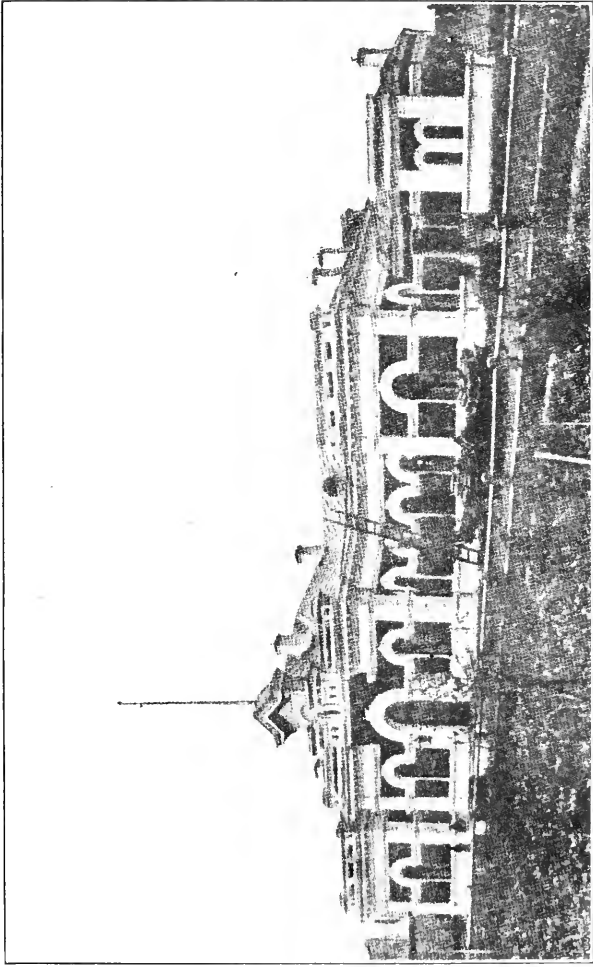


Fig. 3.—Route L. Station at Kurgan.

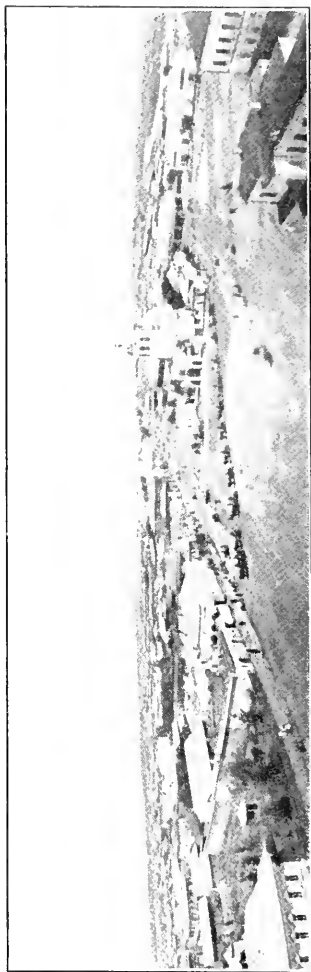


Fig. 4.—Route L. Kurgan.

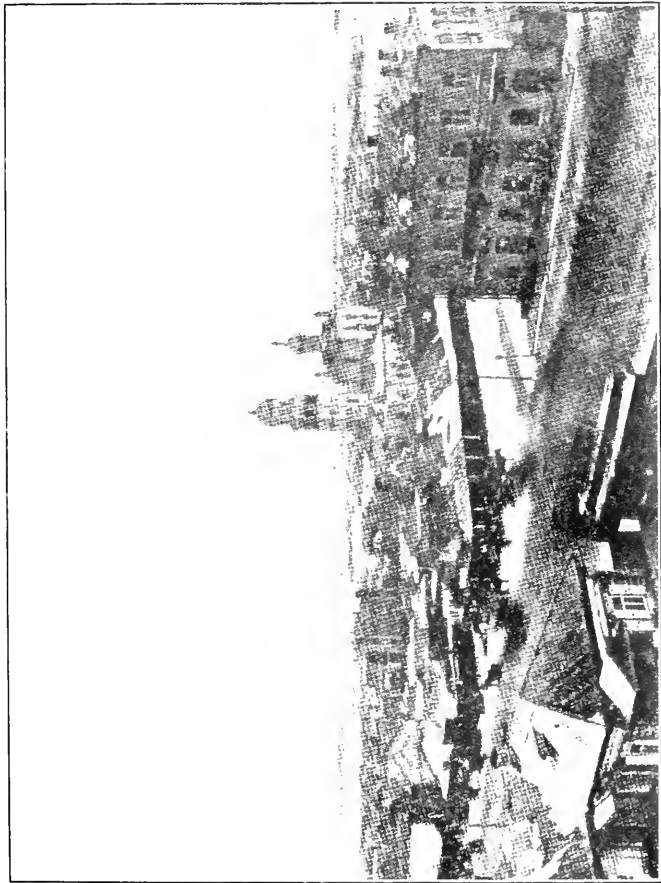


Fig. 5.—Route L, Chelyabinsk.

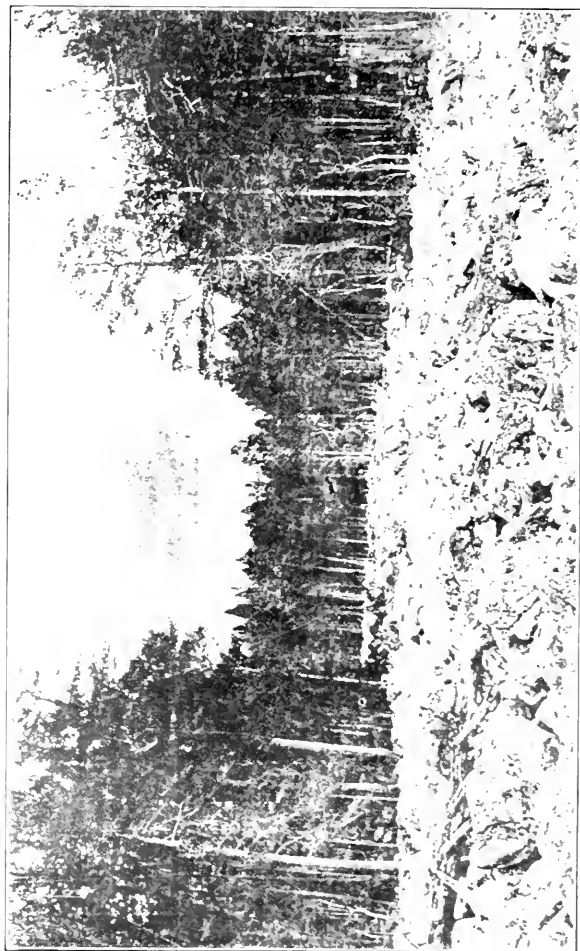


Fig. 6 Route M. Rough country in the Ural Mountains. This is an exception. Smooth rounded hills are the rule.



Fig. 7.—Route M. Tuganai Mountain near Zlatoust. Although this scene is in the Ural Mountains it is not typical. The Urals are mostly evenly rounded.

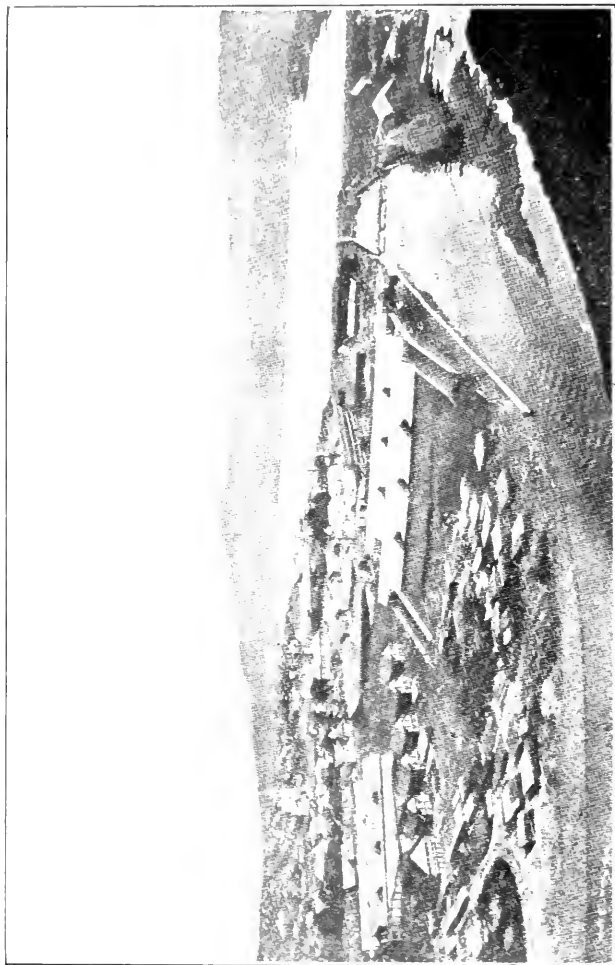


Fig. 8. Route M. Salka Iron Works between Chelyabinsk and Zlato-Ust. The background illustrates the rolling country typical of the Ural Mountains in this region.



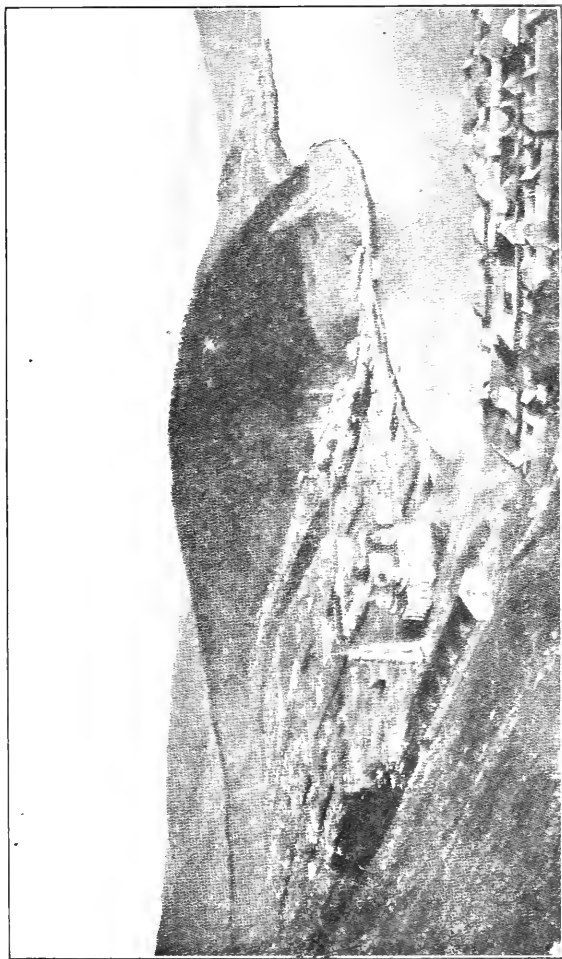


Fig. 9. — Route M. Zlato-Ust.

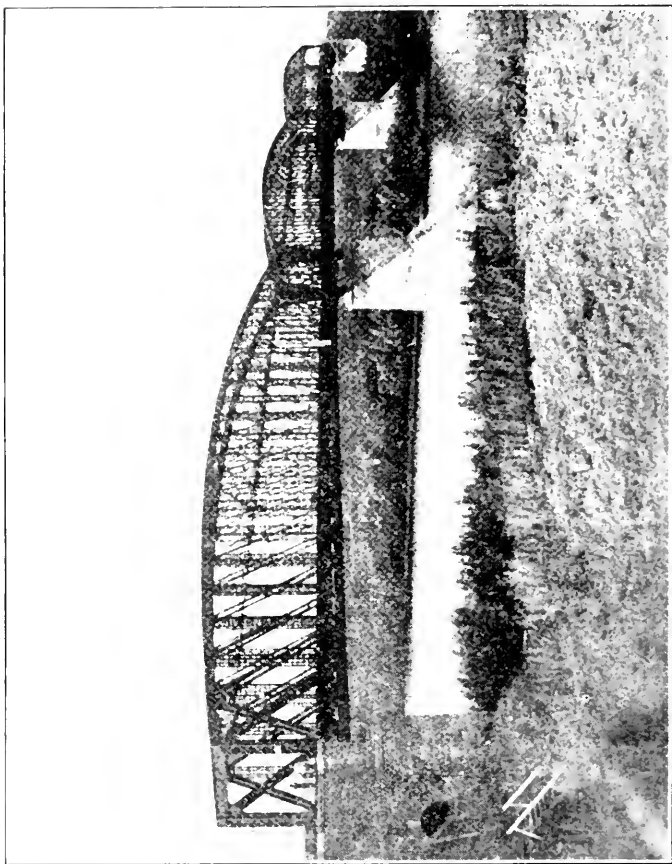


Fig. 10.— Route M. Bridge over the Ufa River.

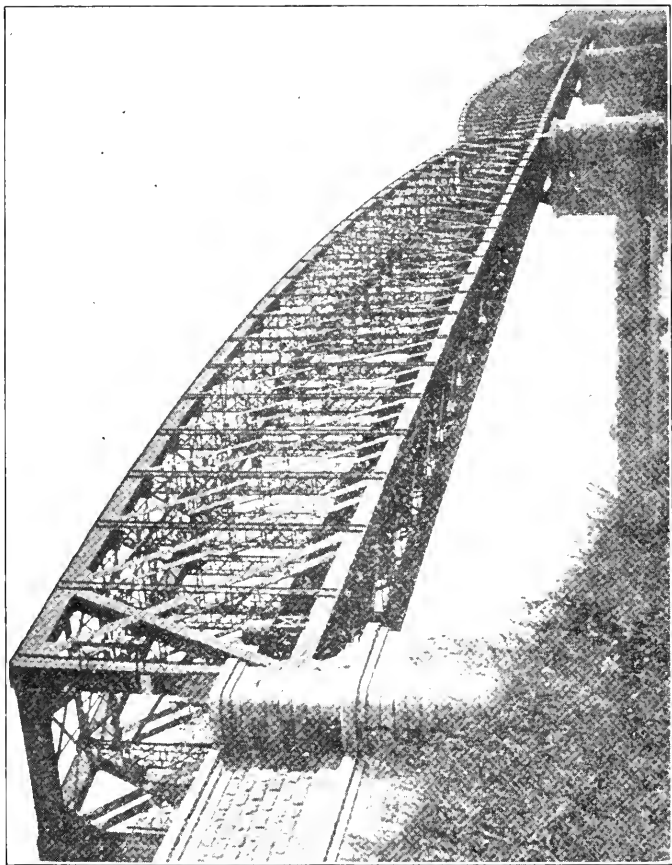


Fig. 11.—Route M. Bridge over the Byelaya River at Ufa

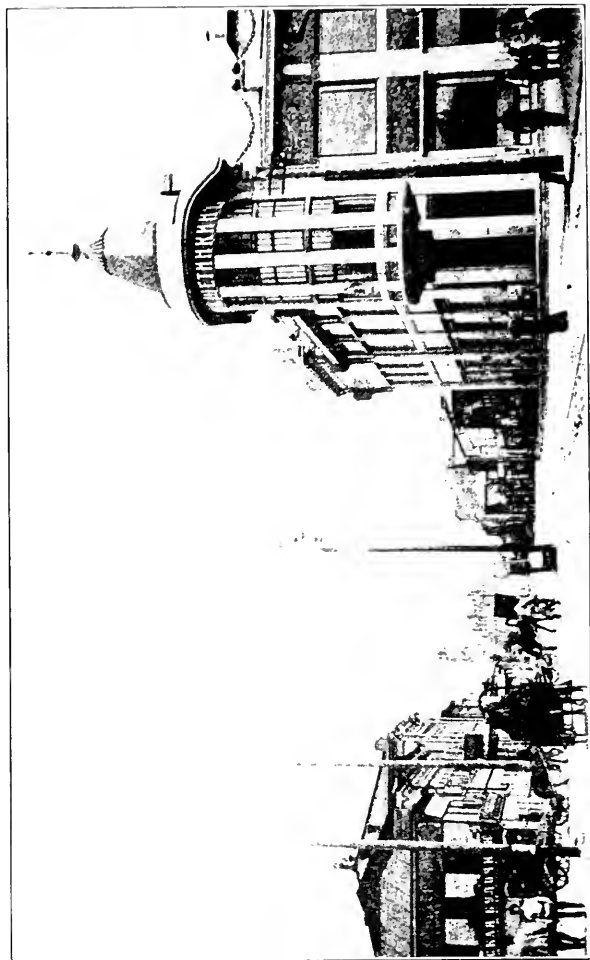


Fig. 12.—Route M, Samara.

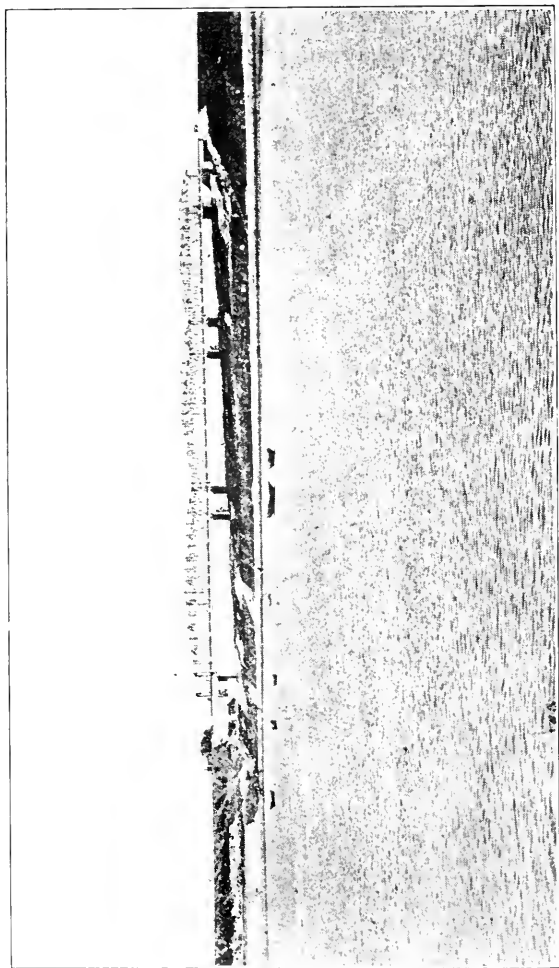


Fig. 13. Route M. Bridge over the Samarka River near Samara.

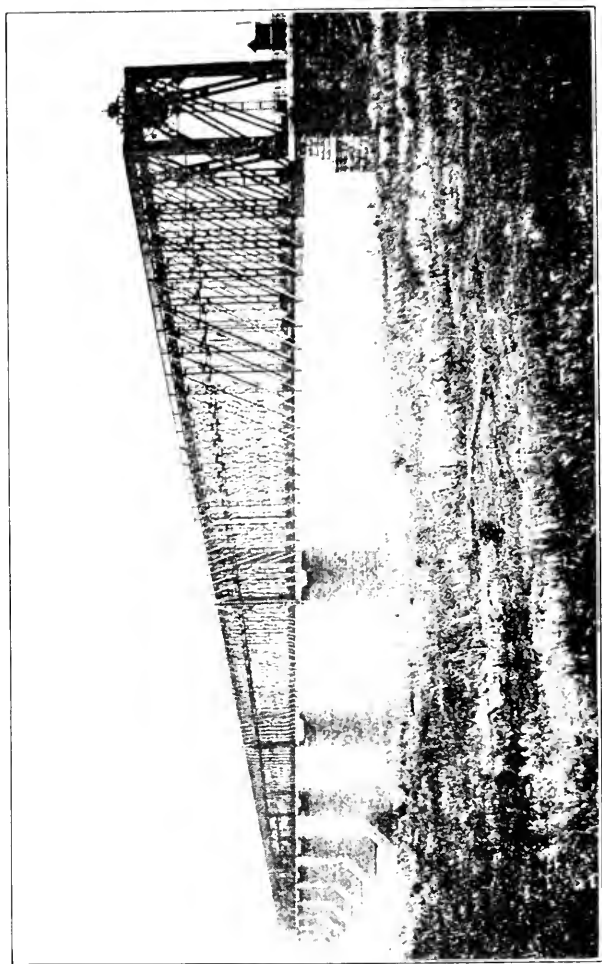


Fig. 14 - Route M. The Alexander bridge over the Volga River between Syzran and Samara.

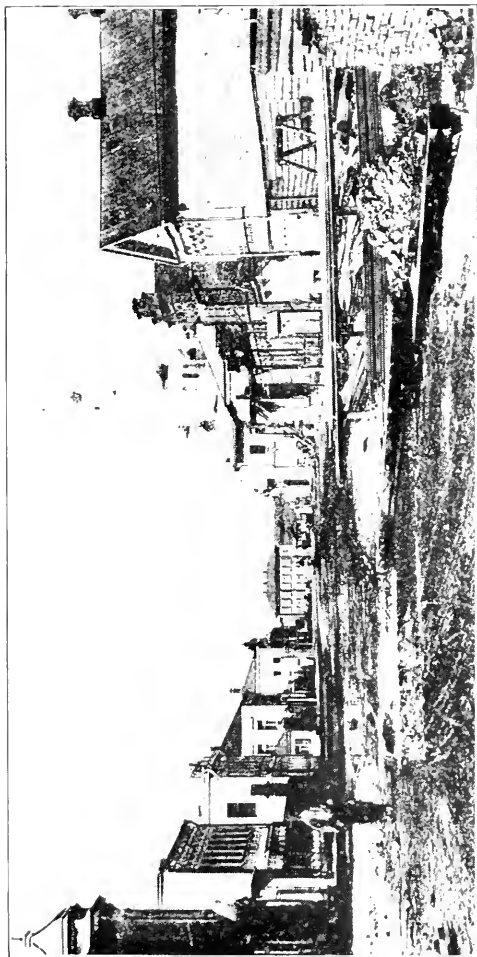


Fig. 15.—Route M. Syzran. A typical street in a Russian city. Unpaved and in the rainy season a sea of mud. Most of the houses are of wood.



Fig. 16.—Route M. Syzran.



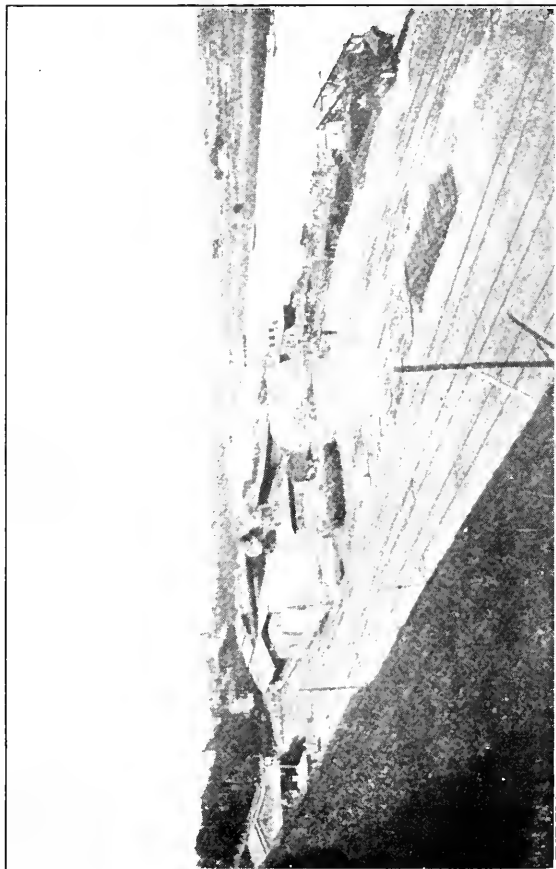


Fig. 17.—Route N. Tyumen. Landing place. This is the western terminal of the great Irtysh-Ob River transportation system. Goods can be shipped by water from here halfway across Siberia. Since the building of the railroad much of the former importance has been lost.



Fig. 18.—Route N. Tyumen.

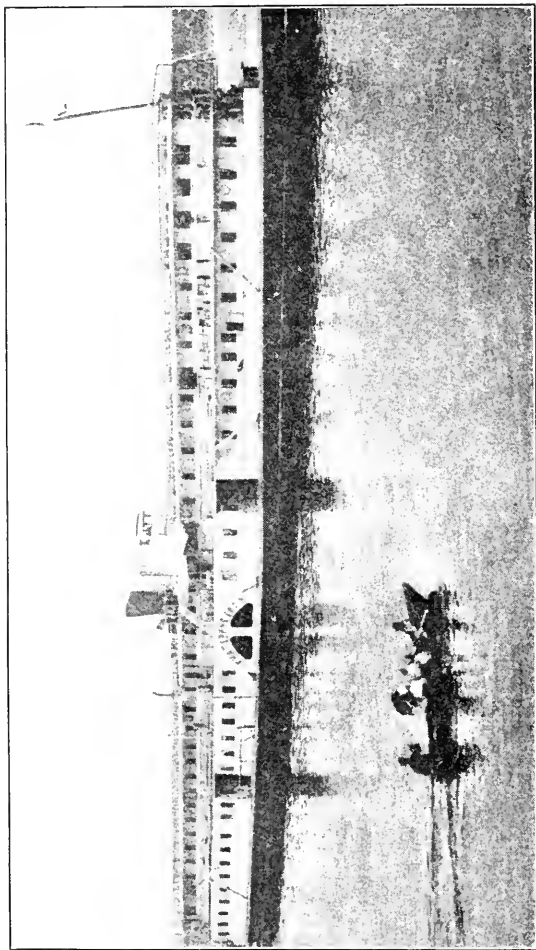


Fig. 19.—Route N. A typical steamer on Kama River at Perm.

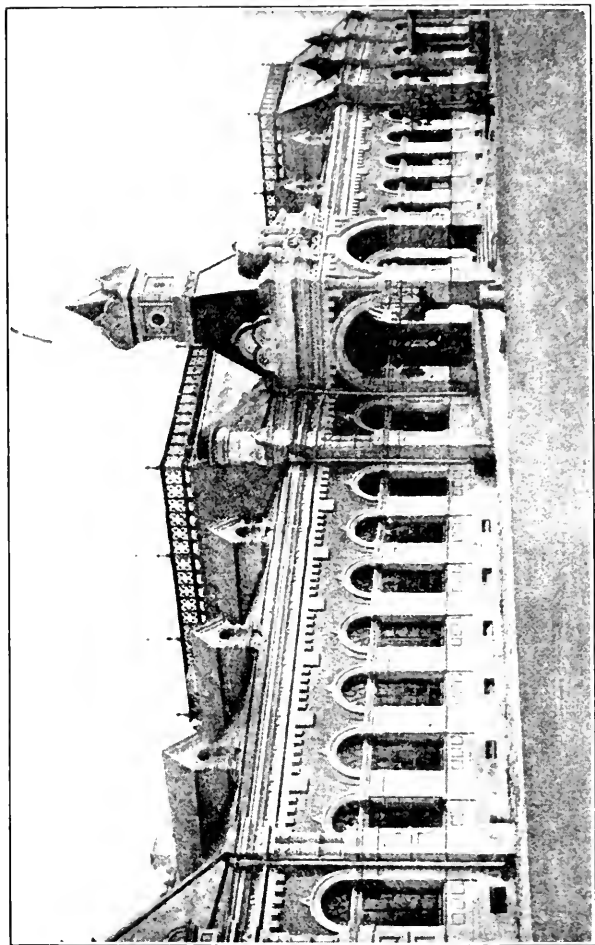


Fig. 20. Route P. Yekaterinburg. Old railroad station.

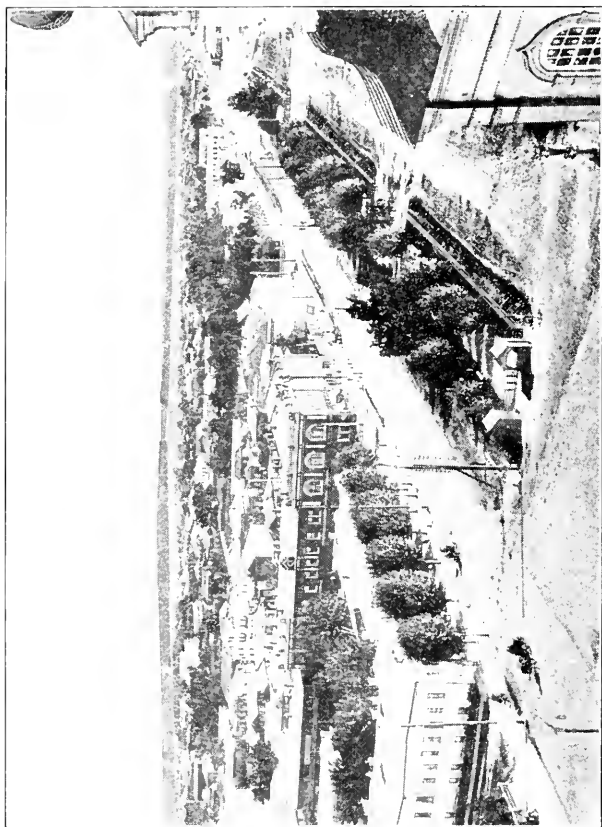


Fig. 21.—Route P. In Yekaterinburg.

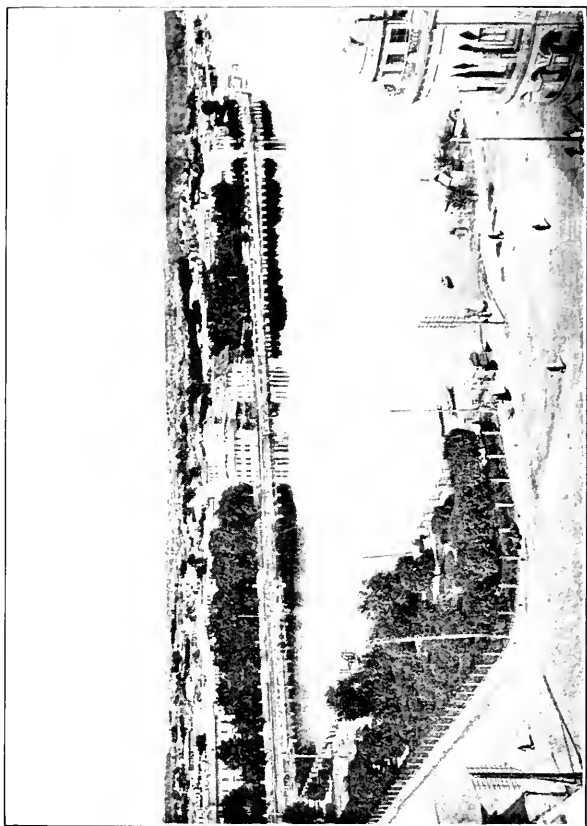


Fig. 22. Route P. Yekaterinburg. Reservoir.

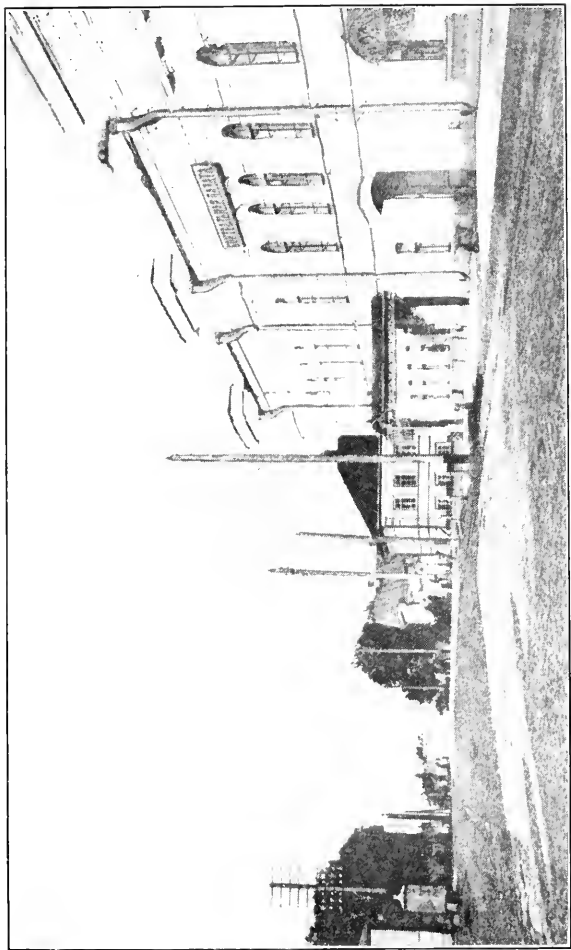


Fig. 23.—Route N. Perm.



Fig. 24.- Route N. Perm. Railway and warehouses near the Kama River below the bridge.





















































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