STAT

UNCLASSIFIED
CLASSIFICATION (SECURITY INFORMATION when filled in)

STAT

LIST OF INCLOSURES

1. Fig. 1 - Kamchatka Peninsula (Map)
2. Fig. 2 - Kamchatka Peninsula (Map)
3. Fig. 3 - Administrative Subdivision of Kamchatka and Communications (Map)
4. Fig. 4 - Known Mineral Resources of Kamchatka (Map)
5. Fig. 5 - Known Timberlands of Kamchatka (Map)
6. Fig. 6 - Map of Fishing and Hunting Areas (Map)
7. Fig. 7 - The Headwaters of the Srednyaya Avacha River (Photo)
8. Fig. 8 - The Valley of the Srednyaya (Middle) Avacha River near the Bakenin Volcano (Photo)
9. Fig. 9 - Formation of Group of small "griffons" or sources on the banks of the Zhupanova River. (Photo)
10. Fig. 10 - The Bakenin Volcano (Photo)
11. Fig. 11 - Avachinskaya Bay. Petropavlovsk Basin (Photo)
12. Fig. 12 - New Building of the Administration of the Kamchatka Fish Industry in Petropavlovsk (Photo)
13. Fig. 13 - Petropavlovsk. May 1929 (Photo)
14. Fig. 14 - New Houses on Kamchatka (Photo)
15. Fig. 15 - Houses for Workers in Ust' Kamchatsk (Photo)
16. Fig. 16 - Ust' Kamchatsk. The Cannery of the Kamchatka Trade and Industrial Company (photo)
17. Fig. 17 - View of Ust' Kamchatsk from "Koshka" (Photo)
18. Fig. 18 - Kamchatka River Bay. Ust' Kamchatsk "Koshka" (sandspit) and the Kamchatka River (Photo)
19. Fig. 19 - Ust' Kamchatsk Settlement (Photo)
20. Fig. 20 - Apartment house of the Ust' Kamchatsk Fish Canning Plant, No. 1 (Photo)
21. Fig. 21 - View from the Sea of the Ust' Kamchatsk Fish Canning Plant No. 1 (Photo)
22. Fig. 22 - View of Kamchatka River. Near Mashura Village (Photo)
23. Fig. 23 - View of Kamchatka River Valley (Photo)

STAT

TABLE OF CONTENTS

STAT

TABLE OF CONTENTS (Con't)

STAT

INTRODUCTION

Kamchatka is a mountainous volcanic peninsula linked with the East Siberian mainland by a 40 km wide lowland and extending south for over 1,000 km as a huge barrier between the Sea of Okhotsk and the Pacific Ocean.

Virtually an island, Kamchatka is potentially almost self-sufficient. It has vast reserves of peat and also coal and petroleum deposits. Its rivers and the seas around it are the richest fish spawning and crab fishing areas in the Far east. Great timberlands cover a vast portion of the peninsula; and, wheat, potatoes, and barley grow in the fertile Kamchatka River valley that stretches through the central part of Kamchatka, sheltered between the Western and Eastern mountain ranges. Numerous mineral springs flow in picturesque mountain settings. The Paratunka spa is widely known. A military sanatorium with 100 beds, two houses and mud baths was to be built there in 1957 (N: Krasnaya Zvezda /Red Star/, No. 245, 16 Oct. 1957, p. 3) and was reported completed in March, 1958, (N: Krasnaya Zvezda /Red Star/, No. 52, March 2, 1958 p. 3).

Kamchatka is still imperfectly surveyed and its industrial development is not great, yet it has great strategic and military significance owing to its geographic position.

The peninsula belongs to the Far Eastern Military District, which extends over the Maritime Area, the Amur River area (Priamur'ye), Sakhalin Island, Kamchatka and the Kuril Islands. (N: Krasnaya Zvezda /Red Star/, No. 52, March 2, 1958, p. 3).

In an article published in the "Krasnaya Zvezda" newspaper on 11 November, 1956, Colonel L. Vysokoostrovskiy of the Far Eastern Military District, describes the life of permanent garrisons on the Kuril Islands. On a single "tiny island" he mentions the presence of a House of Officers, a dining room, individual houses, permanent barracks, warehouses and summer sports camp. He also speaks of men stationed there for 11 years with their families. (N: Krasnaya Zvezda, No. 262, 11 November 1956, p. 2).

References to Soviet forces stationed on Kamchatka and on the Kuril Islands are likewise made in other issues of the "Krasnaya Zvezda" newspaper (No. 196, 18 August 1957, p. 4, and No. 256, 2 November 1956, p. 3, respectively).

Speedy communications with the mainland and Moscow are assured by airplanes. Petropavlovsk-Kamchatskiy boasts of an airport able to receive the "Tu-104" airplane. A 31 December 1957, issue of "Krasnaya Zvezda" newspaper mentions the 10 1/2 hours long flight from Petropavlovsk-Kamchatskiy to Moscow of Ivan Ignat'yevich Malyakin, Hero of Socialistic Labor and Deputy to the Supreme Council of the USSR (N: Krasnaya Zvezda, No. 306, 31 December 1957, p. 3). I. Malyakin, a member of the kolkhoz im. Kirova is also captain of the "Sibir'" fishing trawler. He came to Kamchatka from Stalingrad in 1936. He also mentions the presence on Kamchatka of reserve and discharged sailors and soldiers who voluntarily remained there to work. (N: Krasnaya Zvezda, No. 158, 11 July 1956, p. 3).

STAT

INTRODUCTION (Con't)

The remoteness of the area and the harsh climatic and living conditions have made it necessary to offer privileges to the Armed Forces personnel stationed there. Soviet forces guarding the frontier areas of Chukotka, Kamchatka and other distant and undeveloped regions, are given more calorific rations, higher retirement benefits and living space priorities, among other privileges. (N: Krasnaya Zvezda, No. 148, 29 June 1956, p. 3).

So far the major handicap to the industrial development of Kamchatka has been its inaccessibility. The overland route northward and then westward to Eastern Siberia is extremely long and consists of little more than mere trails across almost impassable frozen mountains and wastes.

The maritime route, the only direct one, crosses the Sea of Okhotsk, notorious for its year round storminess, the winds and currents of which are still little known. Navigation there is always risky and apt to last far longer than scheduled owing to the excessive duration of the storms.

The west coast of Kamchatka offers no sheltered harbors or roadsteads. The port of Ozernovskiy, in the southwest of the peninsula, was scheduled to be developed during the Sixth Five-Year Plan (1956-1960), but so far only preparatory work has been done.

In spite of the handicaps of climate and geography, Kamchatka is gradually being developed and, settlements and highways are being built. According to I. Malyakin, people come from all parts of the USSR to develop the vast resources of Kamchatka. A main highway, some 360 km long, when completed, is going to link the port of Petropavlovsk-Kamchatskiy on the east coast with the west coast. (N: Krasnaya Zvezda, No. 158, 11 July 1956, p. 3). This will be the first real highway on the peninsula, where overland routes are mainly trails through high mountains, that isolate the west coast from the east coast.

The current Five-Year Plan calls for more than half of its capital investments to be spent for the industrial development of the Donbass, the Arctic, Kazakhstan, Siberia and the Far Eastern areas. About half a million youths were to be sent to the above mentioned projects in 1956-1957. (N: Krasnaya Zvezda, No. 117, 22 May 1956, p. 1). As Kamchatka is one of the areas to be developed, some of the youths were sent there. (N: Krasnaya Zvezda, No. 116 20 May 1956, p. 2) and also to Chukotka, where in 1956, more than 1,000 youths arrived to work in the mines and on various industrial and building projects. (N: Krasnaya Zvezda, No. 236, 10 Oct. 1956, p. 1).

STAT

CHAPTER I.

Geography of Kamchatka Peninsula

General Remarks.

Kamchatka Peninsula received its name from the Koryak inhabitants of the area, who called the Kamchatka River valley "Konchat".

The Kamchatka Peninsula covers an area of 350,000 sq km (1) and is linked in the north to the mainland by the Parapol'skiy Dol or depression. To the south, the peninsula terminates under Lat. 50°57'N., at Mys (Cape) Lopatka.(2)

Kamchatka was discovered by the Siberian traders about the middle of the 17th century, and first visited by the Cossacks about 1695, it was conquered by them in 1706 and was reached by the Russians by sea in 1717. (3)

The peninsula extends about 700 miles in a south south-westerly direction (4) and is separated to the south by the Pervyy Kuril'skiy Proliv (first Kuril Strait) from Shumushu Island, the first island of the Kuril chain. (5)

From the administrative point of view, the Kamchatskaya oblast', in the Khabarovskiy Kray of the RSFSR, was formed in October 1932. This oblast' includes the Koryakskiy natsional'nyy okrug, and covers the entire Kamchatka peninsula, and the Karaginskiy and Commander Islands. (6)

To the north, the Kamchatskaya oblast' is limited by the Chukotskiy national'nyy okrug, to the northwest, by the regions directly under the administration of the Khabarovsk Kray Administration. The northeastern shore of the oblast' borders the Sea of Bering, the southeastern, the Pacific Ocean, and the western shore, the Sea of Okhotsk. (7)

The Mountains of Kamchatka

General Description

The Kamchatka Peninsula includes three types of areas: volcanic mountains (called sopki), non-volcanic mountain ridges and lowland tundras. In some parts of the peninsula, these areas are closely related, and in other parts one type clearly predominates over the other. (8)

What could be considered as a fourth distinct area is the Kamchatka River valley, which by its location has very special climatic and agricultural conditions.

The Kamchatka peninsula, except for the shoreline tundras or plains of the Okhotsk seaboard, is a typical mountain country. (9)

Two principal parallel mountain ranges extend in a longitudinal direction through the middle part of the Kamchatka peninsula. These ranges are the Sredinyy Khrebet (Middle Range), also known as the Zapadnyy Khrebet or

STAT

Western Range, and the Vostochnyy Khrebet (Eastern Range) (10), and extend in a north-northeast direction (11), broken in places by volcanic areas. (12) The broad valley of the Kamchatka River stretches sheltered between these two main ranges. (13)

The Central Kamchatka depression is of tectonic formation (14). Formerly it was a great mountain lake (15). This depression extends for 350 km in a southwest to northeast direction in the central part of the Kamchatka peninsula, between the Valaginskiy Khrebet and the volcanic masses of the Tolbachik, Klyuchevskaya spoka, and the Shiveluch to the east and the Sredinnyy Khrebet to the west. The width of the Kamchatka depression increases from 4 km only in the south to 80-100 km in the north. (16)

The Kamchatka River valley, situated at the bottom of this depression, has numerous terraces situated up to 100 m above the river bed. (17)

The Kamchatka River, and its major left bank tributary, the Yelovka River, flow along the depression, filled with accumulated sediments. (18)

Apart from, and independent from the two main mountain systems, the Western and the Eastern, numerous separate ranges are situated on the peninsula: the Ipel'ka ridge, southeast of Bol'sheretsk village, on the west coast; the Medvezhiy ridge, rising parallel to the western shoreline, southwest of Utkholok village, (19), (north of the Khayryuzova River (20), the Tigil'skiy ridge, rising in the basin of the Tigil' River, the Koryakskiy ridge, extending north of the upper reaches of the Tigil' River, the Zarechnyy and the Kharchinskiy ridges, north of the village of Klyuchi.

The Kamchatka Ranges are in places interrupted by softly sloping anticlines or deep gorges. The Nachikinskiy, Malkinskiy, Sedankinskiy and other mountain passes were reported in 1936 to be so far the only overland means of communication between the eastern seaboard and the hinterland areas on one side and the Okhotsk seaboard area on the other. (21) No great changes seem to have taken place since.

The ranges of the Kamchatka peninsula are composed of shales, granites, sienite rocks, in places broken up by erupted rocks. There are likewise maritime sediments from the paleozoic to the tertiary period. During the glacial age, glaciers were greatly developed in places in Kamchatka. (22)

The quaternary glacial period has left a deep mark on the relief of the Kamchatka mountain ridges. Small glaciers still exist in places. (23)

The soils of Kamchatka belong to the podzolized, peat and meadow and marshy type. The most fertile are the peat and meadow soils, developed on the ancient alluvium of the Kamchatka River. These soils are covered with meadows and a sparse forest growth of white birch. (24)

a) The Sredinnyy Khrebet

The Tsentral'nyy or Zapadnyy Khrebet (Central or Western Range) of Kamchatka (25), the main mountain range of the Kamchatka peninsula, starts in southern Kamchatka, from Lake Kuril'skoye, and extends north along the central part of the peninsula, dividing the latter into two almost equal longitudinal parts. [illegible] the Sredinnyy Khrebet starts north of the

STAT

To the east, the Sredinnyy Khrebet is limited by the Kamchatka River valley, the lower reaches of the Yelovka River, a left bank tributary of the Kamchatka River, and the upper reaches of the Bystraya River (28), that empties in southwestern Kamchatka into the Sea of Okhotsk. (29)

The eastern slopes of the Sredinnyy or Zapadnyy Khrebet slope somewhat sharply down to the Kamchatka River valley. (30)

The western slopes of the Sredinnyy Khrebet on the contrary, descend gradually (31), towards the Sea of Okhotsk and merge into the lowlands of the seaboard. (32)

The Sredinnyy Range rises from 60-70 miles from the coast bordering the Sea of Okhotsk (33), and between the foothills and the shoreline lies a strip of forestless level lands often called tundra, some places reaching 600 to 750 m in elevation. (34)

Its composition includes maritime Pliocene and in part upper Cretaceous deposits. (35)

The numerous valleys resulting from the descent of the Sredinnyy Range to the coast are taken up by numerous (up to 18) rivers of the Okhotsk seaboard of the peninsula that take their source in the Sredinnyy Khrebet and are of considerable importance for the livelihood of the population. (36)

The Sredinnyy Khrebet bears clear traces of ice ploughing - through-like valleys and other formations. It is composed of phyllites and crystallic shales, covered with sandstones and shales, possibly of paleozoic age. On the western side, this series is covered with dislocated tertiary layers. (37)

The altitude of the Sredinnyy Khrebet varies. It is 3,621 m in the Ichinskaya sopka supposed to be the only not completely extinguished volcano in the Sredinnyy Khrebet on Kamchatka (38). The upper part of the volcano is covered with snow which descends in several hanging glaciers. (39)
Another source states that the Ichinskaya or Belaya sopka (Khveayain in the Itel'men tongue), which elevation reaches 3.048 m according to some data is still an active volcano. (40)

A later source mentions this volcano as dead. (41)

Apart from this altitude, the highest part of the Sredinnyy Khrebet or Range has an absolute elevation of 1,600 to 1,800 m. Mountain passes lie at an altitude of 900 to 1,200 m. (42)

To the north, the Sredinnyy Khrebet lowers to 300 to 400 m. (43).

b) The Vostochnyy Khrebet

The Vostochnyy Khrebet (Eastern Range) is a system of consecutive ridges, extending along the entire peninsula (44), along its eastern half, approximately from the estuary of the Kamchatka River down south to the Avachinskaya Bay (45).

To the west, the Vostochnyy Khrebet is bounded by the valley of the Kamchatka River, and to the north, by the Sea of Bering (46).

The slopes descending to the Kamchatka River are gentle, while those descending to the Sea of Bering are abrupt (47), with cliffs that make the shore completely inaccessible in places. The entire territory between the Bering Sea and the Vostochnyy Khrebet is therefore mountainous and only rarely traversed by deep river valleys (48).

The Vostochnyy Khrebet is lower than the Zapadnyy Khrebet (49). The average elevation does not exceed 2,000 (50), and reaches 1,450 m in the southern extremity, in the Ganal'skiye Vostryaki (51). Its ridges comprise 38 volcanoes, that reach altitudes of 3,00 to over 4,000 m. Some of them are active, other extinguished (52).

The Vostochnyy Khrebet is also subdivided into successive ridges separated by depressions so that it bears different names according to the locality. In the south, the Vostochnyy Khrebet begins with the Ganal'skiy Vostryaki. (53) Further north, towards the middle of the Vostochnyy Khrebet, rises the Valaginskiy Ridge, and still further north, the Kumroch Ridge (54), also called Kamroch (55).

The latter is also locally known as Valaginskiy, Mil'kovskiy and Verkhne-Kamchatskiy Khrebet (56).

The Vostochnyy Khrebet is frequently divided into two parts: the northern part, extending from the estuary of the Kamchatka River to the Kamchatskaya Vershina Mountain (about 54° Lat. N.) called the Valaginskiy Khrebet, and the southern part, called the Gonal'skiy Khrebet or Gonal'skiye Vostryaki (57), owing to its tooth-shaped summits (58).

To the west, the Vostochnyy Khrebet becomes a plateau, called the Gonal'skaya Mokraya tundra, (humid tundra), westward of which rises the main Kamchatka Range, called the Sredinnyy or Zapadnyy Khrebet. (59)

This Gonal'skaya Mokraya tundra lies between Lat. 53° and 54°N. and is a high marshy tableland, surrounded on all sides by mountains, the general elevation of this tableland being about 609.6 m. (60)

From this tableland, also run the principal ranges of the peninsula, the Kamchatka range extending in a northerly and southerly direction along the entire length, throwing out numerous spurs, and several secondary ridges. (61)

The Ganal'skiye Vostryaki, the highest range of non-volcanic origin of the peninsula, rises in the hinterland of Kamchatka, southeast of the Ganaly village situated on the Bystraya River, and extends on the eastern side of the so-called Ganal'skaya tundra, and descending to the northeast, breaks up into several spurs. (62)

STAT

The Ganal'skiye Vostryaki are an important watershed of the peninsula. Together with the Ganal'skaya tundra, a high marshy plateau, surrounded on all sides by mountains, it is the origin of the three main water arteries of the Kamchatka peninsula. The northeastern spurs are the headwaters of the Kamchatka River, the southwestern spurs, the headwaters of the Bystraya River (the Bol'shaya River system, flowing into the Sea of Okhotsk), and the eastern spurs, of the Avacha River, emptying into the Avachinskaya Guba (Bay). The spurs of the Ganal'skiye Vostryaki, stretching to the southeast, to the Avachinskaya Guba, are called the Pinachevskiye, those extending to the Mys Shipunskiy, are called the Zhupanovy. (63)

c) The Parapol'skiy Dol

At the spot where the peninsula adjoins the mainland, lies a low plateau called the Parapol'skiy Dol (lowland), extending from Korf Bay, at 60° Lat. N., until Penzhinskaya Guba (Bay) of the Sea of Okhotsk. This plateau, reaching 155 m in elevation is covered with tundra (64), and becomes lower in the west. (65)

Except for the spurs of the Sredinnyy and Koryakskiy ranges, the Parapol'skiy dol is a level maritime terrace on which occasionally rise small softly sloping elevations created by recent volcanic activity. (66)

The glaciers descending from the Sredinnyy Range terminate some 60-70 km from the present range and only individual glaciers evidently came out to the western Kamchatka Plain. The bottom of the Central Kamchatka depression was formerly covered with ice only in the extreme south. In places the glaciers reached the seashore. (67)

At the eastern edge of the Parapol'skiy dol, some 40 km from the shore of the Bering Sea, stretches a low, forestless ridge of andezite, up to 940 m high and which is the continuation of the Sredinnyy Khrebet of Kamchatka. (68)

Between Korf Bay and Rekiniki (sic) village, the elevation of the ridge does not exceed 950 m. In this spot the axis of the Sredinnyy Range is situated some 40 km from the eastern shore of the peninsula. (69)

Further to the northeast, the ridge rises and comes in contact with the Koryakskiy range. During the upper quarternary maritime transgression, Kamchatka peninsula separated from the mainland and a wide bay was formed in the area of the Parapol'skiy dol, and the peninsula thus became an island.(70)

The chains of the Sredinnyy Range are thus interrupted at the isthmus of the peninsula and resume further northeast, follow the same direction and become as said above, the Koryakskiy range as it was named by Obruchev. (Another Koryakskiy range is situated in the western part of the Kamchatka Peninsula. (71)

d) Volcanoes of Kamchatka Peninsula

The Kamchatka Peninsula, part of the Pacific volcanic area, lies at the intersection of the Kuril and Aleut arcs of islands and is thus a center of volcanic energy, and traces of volcanic activity exist throughout the peninsula. (72)

STAT

At about Lat. 51 1/2° N., rise two rows of volcanoes, which are prolongations of the Kuril series, and farther northward rises the first group of active volcanoes situated northward of Avachinskaya Bay, and comprising Sopka Kozel'skaya, and Sopka Avachinskaya. Still farther northward, rise Sopka Kronotskaya, Sopka Klyuchevskaya etc... (73).

The exact number of volcanoes on the peninsula does not seem to have been established as yet. (74)

According to one source, 17 volcanoes were known to be active in 1934 and 57 inactive (75). An earlier source said there were 12 active and 30 inactive volcanoes on Kamchatka. (76)

A 1937 source stated there were 127 volcanoes on Kamchatka, of which only 19 active (77). Another source said there were 120 volcanoes, of which 17 active (78). An official reference source of 1953 set the number of active volcanoes at 22 out of a total of 120 (79). Almost every source seems to have its own opinion about the number of active and inactive volcanoes in Kamchatka.

It is known that most volcanoes are concentrated in the Vostochnyy Khrebet, where the greatest and most active volcanoes are located: the Avachinskaya, Kronotskaya volcanoes and in the Kamchatka River valley, the Klyuchevskaya sopka. (80)

Except for the sopka Belaya, all other non active volcanoes are situated on the eastern side of the peninsula. (81)

During the past few years, the activity of the volcanoes has considerably increased. This increased effervescence is usually escorted by underground jolts that sometimes become strong earthquakes. The latter frequently cause the rivers to overflow their banks, and also tidal waves caused by the seaquakes. In 1923, such waves washed away part of the town of Ust' Kamchatsk and its cannery. (82)

According to a 1955 source, 18 active volcanoes lie between the Vostochnyy Khrebet and the seashore. Among the most remarkable ones is the Avachinskaya sopka, rising some 30 km northeast of Petropavlovsk (83). Another source gives this distance as 35 km and is 2,738 m high. (84)

The Avachinskaya sopka resembles the Vesuvius, but it is twice as high. Its lavas belong to the andezite type. (85) It is one of the most active volcanoes on Kamchatka and erupted for the last time in March, 1945, when it spouted mostly smoke, water vapour and ashes. (86) A 1948 source mentions the last eruption of the Avachinskaya sopka to have occurred in February 1946. (87)

The Avachinskiy volcano, together with its neighbour, the Koryakskiy volcano, can be easily seen from any point of Petropavlovsk. (88)

During periods of relative calm, the volcano erupts steam and gases, mostly sulfur dioxide, hydrogen sulfide and hydrogen chloride. Several glaciers descend from the volcano to an altitude of 1,600 to 1,700 m. (89)

The northern-most active volcano of Kamchatka is the Shiveluch at 56°39' Lat. N. (90), which has 6 glaciers suspended from it. This volcano, which an elevation of 3,300 m is reported to have erupted in 1948. (91)

STAT

The 3,730 m high Kronotskaya sopka on the shores of the 128 m deep Lake Kronotskoye (92), was considered inactive until 1923, when it became active again. (93)

The highest peak on Kamchatka is the Klyuchevskaya sopka (94), the highest volcano of the eastern hemisphere. (95)

The Klyuchevskaya sopka erupted in 1938, according to a 1955 source (96), and also in 1945 according to a 1952 source (97). It is an active volcano. (98)

This volcano rises to an altitude of 4,850 m. (99) It is usually overhung with gigantic cabbage head --like clouds of smoke. The diameter of its crater, according to explorations carried out in 1935, is of 250-300 m, and it has a depth of 50 m. (100)

Starting from an altitude of 3,500 to 2,700 m, the Klyuchevskaya sopka is completely covered with an ice blanket from which separate glaciers detach themselves and descend down the slopes to an altitude of 1,100 m. (101)

Next to the Klyuchevskaya sopka rises the inactive 4,620 m high Kamen' volcano, at the foot of which are clearly seen traces of former glacial periods. Another dead volcano is the 3,730 m high Tolbachik, that exudes steam. (102)

The sopka Bezymyannaya, (nameless), long considered inactive, started to erupt in late 1955. In January 1956, a photo shows it still smoking. Dark clouds covered the sky above Klyuchi, situated 45 km from the foot of the volcano. The eruption proper lasted several days and the streets of Klyuchi were covered with a 3 cm thick layer of ashes, while the day turned to night. Twenty thousand underground tremors were registered in 2 months, some of them being felt even without instruments. A pillar of smoke 4 to 5 km high rose above the volcano. A plane flying 3,600 m high took pictures when it became possible to approach the mountain but even then, long after the eruption itself, the gigantic smoke cloud still covered half the sky. (103)

Another important volcano is in the south the 2,931 m high Zhupanovskaya sopka (104). (Or 3,230 m high according to Piyp, p. 9, 1941).

The 3,458 m high Koryakskaya sopka (3,460 m according to Piyp, p. 9, 1941) erupted in 1896. (105)

On the western part of the peninsula, there is not a single active volcano but there exist about 15 old destroyed volcanoes and andezite laccolites. (106)

The Commandor Islands

The Commandor Islands, situated to the east of Kamchatka, at about 55° Lat.N., consists of two islands, Bering and Mednyy. The first was discovered on 4 November, 1741, by Vitus Bering, the second was noticed that same year by Steller, the companion of Bering. The islands are separated from Kamchatka by great depths of about 5,000 m, but these depths are less than at the Aleut islands. (107)

STAT

The detail of the coasts of the Commandor Islands, and the relative position of the off-lying islets, can only be considered as approximate. (108)

The islands are devoid of forests and are covered with tundra - the southernmost forepost of this type of vegetation in the northern hemisphere. The flora of the islands includes some 250 varieties (109).

The shores of the islands descend in places in vertical cliffs to the sea. The islands consist of volcanic rock, andezite tufa, basalts, and rise 670 m on Bering Island and 590 m on Mednyy Island. The tufa belongs to the upper pliocene or the lower miocene period. (110)

The island of Mednyy (copper) got its name from the copper that occurs in the erupted rocks. (111) Earthquakes occur on the islands. (112)

The climate of the Commandor Islands is oceanic, damp, cold and foggy. The winter is mild and the summer cool. (113)

The average temperature of February or March, the coldest months, is of 3 to 4 degrees Centigrade. The warmest month is August, with an average temperature ranging from 10 to 11 degrees, although the latitude is the same as in Moscow. (114)

The sea does not freeze even in the more sheltered places. The sea around the Commandor islands is everywhere clear from ice, but the lengthy westerly and north-westerly winds carry a large enough quantity of floating ices from the shores of the Kamchatka peninsula. (115)

The currents in the waters of the Commandor Islands have been studied but little. There is data indicating that a branch of the warm Kuro-Sivo current passes somewhere near the shores of the archipelago and that superficial sea currents caused by continuous north-westerly winds move from the shores of the Kamchatka peninsula, also currents along the entire north-eastern shore of the Asiatic continent. (116)

Tides come and go twice in 24 hours and do not reach great heights at the shores of the archipelago. The height of the high tide does not exceed 2 m. (117)

Navigation is rendered difficult by the very frequent gales and storms (118), and the continuous fogs that last three quarters of the navigation season (119), or four fifths of the navigation season according to another source. (120)

Precipitation in the islands amounts to about 500 mm per year. (121)

The steep shores, underwater dangers and the complete absence of real deep harbors sheltered from the winds add to the hazards of navigation. (122) This lack of harbors applies especially to the Bering and Mednyy Island although it is true for all islands. (123)

Vessels reduce their stay in Commandor waters to a minimum and always leave for the open sea when anticipating oncoming storms. All freight handling operations take place in the roadstead. (124)

STAT

Industrial Resources of Kamchatka

Kamchatka peninsula is a relatively untapped source of enormous and varied wealth. Fish and timber are its main produce, but there are likewise considerable deposits of coal, petroleum and vast reserves of peat. The peninsula has a great hydropower potential and the climate in its central belt, the longitudinally situated Kamchatka River valley, allows crops of many kinds during the summer periods.

COAL deposits exist on Kamchatka along the Kamchatka River, along the Khayryuzova River on the west coast, and along some other rivers. The coals are brown, of a 6,600 cal. capacity. (125) But most of the coal deposits of Kamchatka have no industrial value. (125)

PETROLEUM was discovered on the Kamchatka peninsula in 1922 and the Bogachevskoye deposit was the most surveyed in 1937. Other petroleum deposits were found along the Vayampolka (sic) River, on the west coast. The quality of the Kamchatka petroleum is very high. It contains 76.3 % to 78.0 % of kerosene, 4.4 to 7.5 % of benzene, 16.2 to 17.0 % of mazout. (127)

Kamchatka has also enormous reserves of PEAT, mainly on the west coast, where peat layers reach 1.5 to 8 m in depth. There are also peat deposits near Petropavlovsk. (128)

The HYDROPOWER reserves of the peninsula are quite high, the areas of the Sredinnyy Khrebet and the Vostochnyy Khrebet being especially favorable for the construction of hydropower plants. (129)

In 1937, there were found indications of the presence of copper, silver, and tin ores and gold, the latter along the Mityuga, Utka, Khomutina and other rivers. (130)

PUMICE stone occurs in enormous industrial quantities in the Bol'sheretsk rayon, Zheltokhovskaya and Avachinskaya Bay areas. (131)

NATURAL SULFUR occurs in the Avachinskaya and Klyuchevskaya volcanoes. (132)

Fish compose the greatest industrial wealth of Kamchatka. The waters around the peninsula are an exceptionally rich spawning ground of salmon and other valuable fish. There are also rich cod banks in the Sea of Okhotsk and near the Commandor Islands. The most productive crab catching area is the sector of the Sea of Okhotsk near the western coast of Kamchatka, in the area of the Khayryuzova River estuary. Seals are of great value on the Commandor Islands and sea beavers in south Kamchatka waters, at Mys (Cape) Lopatka. Rehabilitation of sea beavers, seals and sable hunting is being carried out by the Soviet authorities. (133)

The fishing season on the west coast of Kamchatka, southward of Mys (Cape) Yuzhnyy, commences in May, and ends in August or September. (134)

While the mass fishing season of salmon ends in September, the fish products are ready (for export) only by the beginning of October, i.e., just when the navigation season comes to an end. As a result, from 40 to 65 % of the ready

STAT

produce is not exported every year. Its quality naturally drops heavily. Besides owing to lack of ports on the west coast, the fish catch frequently cannot be brought ashore. (135)

The trawlers fishing on the western coast of Kamchatka have to sail to Petropavlovsk to unload, and transport alone thus takes as much time as the fishing itself. (136)

The sedimentation process in river estuaries and the use of them for the standing of vessels combine to hinder the passage of salmon back to their breeding areas in the upper reaches of these rivers. This phenomenon reaches spectacular proportions on the rivers of Kamchatka, both on the east and west coast, as almost all sources testify. (137)

If therefore real ports are not built for vessels, within 5 to 10 years, salmon may disappear altogether from the western waters of Kamchatka. (138)

The absence of ports on the western coast of Kamchatka causes yearly 200,000,000 rubles in losses to the Ministry of the Fishing Industry alone. This sum includes losses due to the lowered quality of the fish produce, the demurrage and untimely loss and wearing out of the vessels. (139)

Special fish ports are urgently needed, and even in large ports like Petropavlovsk and Vladivostok, fishing ports handling small volumes of freight have been built in the area of the port. (140)

STAT

REFERENCE NOTES - CHAPTER I

1) BSE, v, 31. 1937, p. 148

2) Ibid.

3) BNG, p. 5.

4) Ibid.

5) BSE, v. 31, 1937, p. 148

6) BSE, v. 19, 1953, p. 555

7) Ibid.

8) Serg. p. 23-24

9) Serg. p. 24

10) Serg. p. 24, 1936; BSE, v. 19, 1953, p. 552; BSE, v. 31, 1937, p. 148.

11) BSE, v. 31, 1937, p. 148

12) Serg. p. 24

13) BSE, v. 31, 1937, p. 148

14) BSE, v. 19, 1953, p. 555; Berg, Priroda SSR, p. 432

15) Berg. Priroda SSR, p. 432

16) BSE, v. 19, 1953, p. 555

17) Berg. Priroda, SSR, p. 432.

18) BSE, v. 19, 1953, p. 555

19) Serg. p. 25, 1936

20) Kamchatskiy Kray, p. 7

21) Serg. p. 24, 25

22) BSE, v. 31, 1937, p. 148

23) BSE, v. 19, 1953, p. 552

24) Berg, 1955, p. 437, Priroda SSR

25) Serg. p. 25; Berg, 1952, p. 484; BSE, v. 31, 1937, p. 148

26) Serg. p. 24

STAT

27) BSE, v. 19, 1953, p. 552

28) Serg. p. 24

29) Serg. p. 46 and Berg, 1952, p. 484

30) Serg. p. 24

31) Serg. p. 24 and BNG, p. 560

32) Serg. p. 24

33) BNG, p. 560; Lotsiya, 1938, p. 461

34) BSE, v. 31, 1937, p. 148; Berg, 1952, p. 484; Berg, 1955, p. 433

35) Berg, 1952, p. 484; Berg, 1955, p. 433

36) Serg. p. 24

37) Berg, 1952, p. 484

38) Berg, 1955, p. 432; Berg, 1952, p. 484 and BSE, v. 19, 1953, p. 552

39) Berg, 1952, p. 484

40) BSE, v. 31, 1937, p. 148

41) BSE, v. 19, 1953, p. 552

42) Berg, 1952, p. 484

43) BSE, v. 19, 1953, p. 552

44) BSE, v. 19, 1953, p. 552 and SSE, v. 1, 1929, p. 555

45) SSE, v. 1, 1929, p. 555

46) SSE, v. 1, 1929, p. 555

47) SSE, v. 1, 1929, p. 555; Serg, p. 24

48) Serg. p. 24

49) Ibid.

50) BSE, v. 19, 1953, p. 552 and BSE, v. 31, 1937, p. 148

51) BSE, v. 31, 1937, p. 148

52) SSE, v. 1, 1929, p. 555

53) Serg. p. ; BSE, v. 19, 1953, p. 552; BSE, v. 31, 1937, p. 148

54) BSE, v. 19, 1953, p. 552; BSE, v. 31, 1937, p. 552

STAT

55) Serg. p. 24

56) Serg. p. 24

57) SSE, v. 1, 1929, p. 555

58) BNG, p. 5

59) SSE, v. 1, 1929, p. 555

60) BNG, p. 5

61) Ibid.

62) Serb. p. 25

63) Serg. p. 25

64) Berg, 1955, p. 434; Berg, 1952, p. 487; BSE, v. 31, 1937, p. 149

65) BSE, v. 31, 1957, p. 149

66) BERG, p. 434, 435

67) Berg, 1955, p. 434, 435

68) Berg, 1955, p. 434; Berg, 1952, p. 488

69) BSE, v. 31, 1957, p. 149

70) Berg, 1955, p. 434, Chemekov, p. 67, 1949

71) Serg. p. 26-27

72) BNG, p. 5-6

73) BNG, p. 6

74) Kamchatskiy Kray, p. 7

75) Ibid.

76) Sredi Trekh Morey, p. 126

77) BSE, v. 31, 1937, p. 149

78) Bytovoy, p. 37, 1948

79) BSE, v. 19, 1953, p. 553

80) Kamchatskiy Kray, p. 7

81) BSE, v. 31, 1937, p. 149

82) Kamchatskiy Kray, p. 7-8

STAT

83) Berg, Priroda SSR, p. 433, 1955; Bytovoy, p. 107

84) Berg, 1952, p. 486

85) Berg, Priroda SSR, 1955, p. 433; Berg, 1952, p. 486

86) Berg, 1952, p. 486

87) Bytovoy, p. 35

88) Sredi Trekh Morey, p. 107

89) Berg, p. 486, 1952

90) BSE, v. 31, 1937, p. 149; Berg, 1955, p. 434; Priroda SSR

91) Berg, Priroda SSR, 1955, p. 433

92) BSE, v. 31, 1937, p. 149; Berg, 1955, p. 433; Berg, 1952, p. 486

93) Berg, 1955, p. 433; Berg, 1952, p. 486

94) Berg, 1952, p. 486; BSE, v. 31, 1937, p. 149; Berg, 1955, p. 433

95) BSE, v. 19, 1953, p. 553; Bytovcy, p. 37

96) Berg, p. 433, 1955

97) Berg, 1952, p. 486

98) BSE, v. 31, 1937, p. 49

99) Berg, 1952, p. 486; BSE, v. 31, 1937; p. 149; Berg, 1955, p. 433 - also mentions 4,860 m.)

100) Berg, 1955, p. 433

101) Berg, 1955, Priroda SSR, p. 433-434

102) BSE, v. 31, 1957, p. 149

103) P: Ogonek, No. 10, March 1956, p. 29

104) BSE, v. 31, p. 149

105) BSE, v. 31, 1937, p. 149

106) Berg, 1955, p. 433

107) Ibid. p. 441

108) BNG, p. 446, 1954

109) Berg, 1952, p. 498; Berg, 1955, p. 441

110) Berg, 1955, p. 441; Berg, 1952, p. 498

STAT

111) Berg, 1955, p. 441

112) Berg, 1952, p. 498

113) Berg, 1955, p. 441; Berg, 1952, p. 498

114) Berg, 1952, p. 498

115) Sov. Ostrova Tikhogo Okeana, 1938, p. 22

116) Ibid. p. 22

117) Ibid.

118) Ibid.,; p. 22; Berg, 1955, p. 441; Berg, 1952, p. 498

119) Sov. Ostrova Tikhogo Okeana, p. 22

120) BNG, p. 446, 1954

121) Berg, 1955, p. 441

122) Sov. Ostrova Tikhogo Okeana, p. 22

123) BNG, p. 446, 1954; Sov. Ostrova Tikhogo Okeana, p. 22

124) Sov. Ostrova Tikhogo Okeana, p. 22

125) BSE, v. 31, 1937, p. 154

126) Serg. p. 665-668

127) BSE, v. 31, 1937, p. 154

128) Ibid.

129) Serg, p. 137

130) BSE, v. 31, 1937, p. 154

131) Ibid.

132) Ibid.

133) Ibid.

134) BNG, p. 561

135) N: Stroitel'naya Gazeta, No. 35; 22 March 1957, p. 3, col. 5

136) Ibid.

137) Ibid.
138) Ibid.
139) Ibid.

140) N; Promyshlenno-Ekonomicheskaya Gazeta, No. 41, 5 April 1957, p. 2 c. 4-5.

STAT

CHAPTER II

Climate of Kamchatka

General Remarks.

The climate of Kamchatka is varied owing to the great extension of the peninsula in a longitudinal direction. (1) Its southern tip being almost on the latitude of Saratov (2), and the northern extremity almost on the latitude of Petrozavodsk in the Karelo-Finskaya SSR.

The climate of Kamchatka is much harsher than its latitude would justify. (3) Permafrost occurs in northern Kamchatka (4), and the average yearly temperature on the Peninsula is -4° Centigrade, rising to 0° in the southern portion of the country. (5)

The harshness of the Kamchatka climate is due to the fact that the peninsula is situated between the east-Asia anti-cyclonic area and the barometric minimum of the north-western part of the Pacific Ocean and is subject to the cooling influence of the Okhotsk and Bering seas that border it to the west and east respectively. (6)

The atmospheric circulation is a monsoon one, for dry cold winds blow in the winter and humid winds from the ocean blow in the summer. (7)

In winter low pressure predominates over Kamchatka, decreasing from the western shore of the Sea of Okhotsk eastward to the western shore of the Sea of Bering and also from the north of Kamchatka to the south. Northwestern and north winds correspondingly prevail in winter in Petropavlovsk.(8)

But in the summer, a high pressure atmosphere extends over Kamchatka and in this season the pressure increases from the western shore of the Sea of Okhotsk to the western shore of the Sea of Bering and from north Kamchatka to the south. Therefore, in the summer, south-eastern, east and south winds prevail over Petropavlovsk. (9)

The topography of Kamchatka also plays an important part in the formation of its climate, for it divides the peninsula into 3 climatic regions. (10) West Kamchatka, East Kamchatka and the Central, Kamchatka River valley regions.

a) Climate of the West Coast

The area of the West Kamchatka lowland, bordering with the cold Sea of Okhotsk, in which ice floats until the end of June is the coldest climatic area of Kamchatka, (11) with a far harsher climate than that of the eastern shore. (12)

The climate of the western shore of Kamchatka is subject to the influence of the Sea of Okhotsk that cools it heavily in winter and warms it but little in the summer. (13)

The average temperature of February is there -15.1° in Ust' Bol'sheretsk.(14) March and April are always warm and sunny there and up to the latter month, the winter is generally without wind. (15)

STAT

Fogs are frequent on the west coast. Precipitation is abundant in the summer, when the average temperature is 12° in August at Bol'sheretsk, and poor in winter. (16)

In the northern part of the western seaboard of Kamchatka, at Tigil', for instance, the climate is more continental than in the south, at Bol'sheretsk. (17)

b) Climate in the Kamchatka River Valley

The most favorable climatic conditions exist in the Kamchatka depression or lowland, especially in the valley of the Kamchatka River, from Verkhne-Kamchatsk to Klyuchi and in the Yelovka River basin. These areas are removed from the sea and protected on both sides by mountain ranges. (18)

The climate in the central area of Kamchatka, as compared to the maritime areas, is dry, continental, and akin to the climate of eastern Siberia. (19)

The winter in the Kamchatka River valley is poor in snow with severe dry frosts. (20) The winter is colder than along the shoreline, especially on the eastern shore. (21)

The absolute minimum temperature in winter reaches 50° Centigrade (22), in Mil'kovo in February. (23)

In Klyuchevskoye, the coldest month is January, as in mainland climates (24), and the average January temperature is-18° Centigrade. (25)

In the Kamchatka River valley, spring comes earlier than in the seaboard areas. (26)

While snow still lies in drifts in June on the west coast, the daytime temperature of the Kamchatka River valley reaches 15 - 17° Centigrade and the bird cherries bloom. (27) Trees spout leaves by the middle or end of May. (28)

The greatest variations in temperature occur in Mil'kovo, where the maximum daily range exceeds 15°C. (29)

In the Kamchatka River valley, the summer is warmer than along the shoreline (30). The absolute maximum of temperature reaches over 30°C. (31) In Klyuchevskoye, the yearly range of temperature is over 31°, the warmest month being July, as in mainland climates. (32)

According to another source, the average temperature in Klyuchevskoye in July is 16°C and the yearly range of temperatures there is 34.8° (33)

c) Climate of the Eastern Shore.

The eastern shore of the peninsula is protected from the west by mountain chains and is open to the east to the action of the Pacific Ocean. The northern part of the shore undergoes the influence of the winter Pacific cyclones and the cold currents of the Strait of Bering, and the southern part belongs to the zone of warm currents that rise considerably the temperature of the sea in winter. (34)

STAT

The climate of the eastern seaboard is therefore more temperate than that of the western seaboard. The velocity of the wind is less high and likewise the number of stormy days. The average temperature during the year varies from 0.6 to 2.2°. (35)

Clouds and fogs are frequent, also sharp variations in temperature. Clear warm days are followed by cold ones and bad weather and severe frosts by camp friable snow and dense fogs. (36)

The winter is milder on the eastern shore of Kamchatka, (37) but long, and characterized by small frosts and extremely heavy and very thick snowfall. There are up to 200 to 220 days with frost on the east coast of Kamchatka.(38)

The summer on the east coast is moderately warm, there are few hot days. The average temperature of the warmest months, July and August, is 11° to 12°, and 13° to 14° Cent. respectively. (39)

Petropavlovsk, situated at the latitude of Orel (53° Lat. N.) has an oceanic climate. (40)

In Petropavlovsk, the average temperature of February, the coldest month, is -10.2° (41) or -11° according to another source. (42)

The average temperature of August, the warmest month, is there 12.5° (43), and during the day the temperature rises to about 16°, the average round the clock maximum. (44)

In Klyuchevskoye, the temperature rises to 18° in July. (45) The yearly range of temperatures is therefore either 23° (46) or 22.7°. (47)

d) Cloudiness and Fogs

Cloudiness on Kamchatka is great, particularly on the shoreline and especially so on the western shore. (48)

As a rule on the shores, cloudiness reaches its maximum, as in monsoon areas in general, during the summer, and its minimum during the winter, but in the hinterland, fogs almost never occur in the summer. (49)

On the western shore, the foggiest season is in May, June and July and part of August. (50) Fogs are rare after the end of August. With easterly winds the coast is often clear although fog is still persisting at sea. (51)

The fogs are denser and more frequent in the northern half of the western shore, particularly in the area of the Utkolokskiy and Omgonskiy massives, where the shoreline has the most stubborn fogs. A somewhat greater frequence of fogs is observed also in the extreme south of the peninsula, under the influence of the proximity of the Kuril' chain. (52)

Fogs predominate until elevations of 1,500 m on the western shore. (53) Cloudiness is heavy and the humidity is further developed by maritime fogs and the water resistance of the soils of the tundra. (54)

On the western shore, the highest number of cloudy days occurs in the southern part, in Bol'sheretsk, which has the greatest number of cloudy days in the peninsula. (55)

The climate is very dry in the mountains at elevations over 1,500 m. (56)

The greatest number of clear days in Kamchatka occur in the southern part of the Kamchatka River valley, in Mil'kovo (57), at 150 m of absolute altitude and at Klyuchevskoye (Klyuchi), at 30 m, of absolute altitude, where fogs almost never occur in the summer. (58)

On the eastern shore, cloudiness is also great. The yearly cloudiness in Petropavlovsk amounts to 60%; in June it is 73%, and in December 53%. In Petropavlovsk one day out of two has fog. (59)

The high degree of cloudiness on Kamchatka may be seen from the following table:

	Number of Days in Year		
	Clear	Overcast	Cloudy
Eastern seaboard			
Petropavlovsk	65	144.5	54.1
Ust'-Kamchatsk	39.1	183.2	39.5
Western Seaboard			
Ust'Bol'sheretsk	15.6	189.1	97.6
Tigil'	37.8	175.7	37.7
Kamchatka River Valley			
Mil'kovo	84	98.5	12.0
Klyuchi	29.4	189.5	16.7

(60).

e) Winds

Winds of great velocity and numerous storms are characteristic of the Kamchatka Peninsula.

Average Number of Stormy Days and Wind Velocity(in one year:)

		Velocity	No. of Stormy Days
Eastern Seaboard			
	Petropavlovsk	3.2	52.4
	Ust'-Kamchatsk	4.6	45.7
Western Seaboard			
	Ust'-Bolsheretsk	5.0	59.0
	Tigil'	3.0	51.6
Kamchatka River Valley			
	Klyuchi	3.1	20.5

(61)

Winds vary according to the months of the year, thus showing their monsoon character. Land winds prevail from December to March, sea winds in June and July, blowing from the shore to the mainland. May, August and September are transition months. (62)

The highest velocity is reached by the winter monsoon, which also brings with it the greatest number of stormy days. Beginning with early autumn, storms start to rage at sea and reach their maximum violence in January and February.

On the mainland the winter is characterized by heavy storms and blizzards.(63)

On the western shore, the prevailing winds in spring and early summer are between south south-west and south south-east. (64)

The quietest weather and that when winds are less strong is the spring and beginning of summer, when SSW through S to SSO winds predominate. (65)

According to a 1956 source, the summer months, July, August and part of September are the calmest months in the year. Cyclones, caused by momentary gales pass occasionally across the Sea of Okhotsk and sometimes Typhoons touch the south-eastern regions of the Sea... (66)

In summer, the easterly wind called "Kamchatka" blows from the Sredinnyy Khrebet to the western shore and brings first thaws and snow and then a cold and dry weather. The winds from the sea of Okhotsk also bring rain and fog.(67)

The most violent gales occur in the autumn, after the middle of August. The winds blow at first from south-west, and veer through west to north-west.(68)

The second half of August, September, October and November are the most difficult months for navigation, for storms are then the rule and quiet weather the exception. (69) The most frequent hurricanes occur in late autumn (November-December) when the differences of temperatures above the mainland and the ocean are the greatest. (70)

STAT

Towards February and March, when the sea is covered with ices, the difference becomes somewhat less pronounced and storms are less heavy. (71)

f) Precipitation

There is a high precipitation in Kamchatka, the number of days with precipitation varying from 120 to 200 a year, (72) a yearly maximum reaching 1,800 mm and a yearly average of 800 mm. (73)

But there are considerable seasonal variations in the volume of precipitation, which is poor in spring, the old snow remaining, and there being almost no rain. In the summer, precipitation increases but is much lighter than in winter. There are infrequent rains and occasional downpours in June and heavy monsoon rains in July, lasting until August, and then in September and in October the weather is stable. (74)

Precipitation varies not only seasonally but also geographically.

Although precipitation is comparatively low in the Kamchatka River valley (75), storms occur there occasionally, and precipitation averages 530 mm a year in Mil'kovo. (76)

Precipitation is on the other hand high on the eastern shore, where the humidity laden winds blow from the sea (77), and overcast days are numerous. (78)

On the western shore, precipitation is light in the spring and in the beginning of summer. This makes difficult the planting of potatoes in the Bol'sheretsk area. (79)

Summer storms are rare on Kamchatka, but in Petropavlovsk, 189 mm of precipitation fell once in a single October day. (80) The usual precipitation in Petropavlovsk is mentioned as being of 821 mm per year. (81) Such rainstorms have not been noted in other areas of the peninsula. (82)

The maximum precipitation occurs in August-October, as the rainstorm in Petropavlovsk above shows well, and the minimum in January. (83)

Yearly Volume of precipitation

Petropavlovsk	1.667 mm*	Tigil'	416 mm	
Ust'-Kamchatsk	518	Mil'kovo	357	
Ust'-Bolsheretsk	693	Klyuchi	435	(84)

* It reached 1.845 mm in some years.

STAT

Snowfall on Kamchatka

Snowfall is particularly heavy on the peninsula and frequently accounts for more than half of the yearly volume of precipitation. It is brought on by cyclones linked to the Aleut area of low pressure. (85)

The number of days with snow varies from 70.6 (Petropavlovsk) to 96.6 (Bol'sheretsk). (86)

The snow cover settles definitively on Kamchatka in the second half of October on the west coast (Bol'sheretsk, Tigil', Klyuchi) or in the beginning of November on the east coast (Petropavlovsk) and melts away in the end of May - beginning of June (Petropavlovsk, Ust'-Bol'sheretsk). (87)

The snow cover which as said above, remains sometimes until the beginning of June (88) , is heavy and damp attaining more than 1m in thickness, (89) and sometimes reaches 3m in places. (90) In Petropavlovsk, on the east coast, the snow cover occasionally exceeds 3 m and the houses have to be cleared from the snow that buries them several times each winter. The maximum thickness of the snow cover occurs in March. (91)

In Paratunka, snow falls at the end of September and remains until June. Blizzards still occur in May and sweep up snow drifts to the rooftops. (92)

But in the central part of the Kamchatka River valley, from Kozyrevsk to Mashura, the depth of the snow cover does not exceed 30 to 40 cm. (93)

On the western shore of Kamchatka, where dry westerly winds blow during the winter from the Siberian area of maximum pressure, the winter receives little snow. (94)

In Bol'sheretsk for instance, in 1910, only 17% (or 450 mm) of the yearly volume of precipitation fell as snow. (95)

The abundance of snow and the depth of the snow cover explain the small degree of freezing through of the ground, its speedy thawing in spring and the absence of permafrost in the southern and central part of the peninsula. (96)

Volcanic ashes, locally called, "sazha" (soot) falling from volcanoes hasten the coming of spring, particularly in certain areas of the peninsula, where they are a permanent factor in helping the growth of the crops. (97)

Hot springs (of volcanic origin) also help explain the non-freezing in winter of numerous streams of the peninsula and of parts of some rivers fed by hot springs, such as the Ozernaya River, flowing from Lake Kuril'skoye, Bannaya River (literally Bath River), the Nachiki tributary, the Malaya Nikolka River, a tributary of the latter, which empties into the Kamchatka River, and many others, and likewise the higher temperature of the water of the Kamchatka River in winter. (98)

STAT

Ice Conditions In Kamchatka Waters

a. West Coast

From the middle to the end of November, severe frosts cause the formation of ice along the shoreline strip of the western coast of Kamchatka. The ice forms first around the shoreline, more sheltered from the action of winds from the sea. The formation of this shoreline ice is helped by the rivers that carry their light or grease ice (salo) to the sea and this ice, with the help of falling temperatures, serves as the initial core of young sea ice. The latter gradually strengthens, spreads along the shore and finally forms a solid ice crust around the shoreline, then spread out to sea, and the width of this belt of ice decreases southward. (99)

Winds cause drifting, breaking up and then welding anew of the ices, thus, ice hummocks several meters high frequently form along the shoreline. Sometimes the ice is carried away by the wind and a strip of clear water, 2 and more miles wide, forms along the shoreline. (100)

The greatest formations of ice occur in the first half of March when impassable hummock ices mass at the Kamchatka shores. (101)

The Kamchatka rivers, having a swift current that grows stronger during the spring freshets, quickly throw off their winter ice cover, so that by the end of April, beginning of May, the shoreline strip of ice is rendered friable by the masses of relatively warm waters flowing from the rivers to the sea. Soon the ice can move freely, is then broken up by the winds that follow mainly an easterly direction and is carried south. During May and in the beginning of June, ships at sea encounter more or less broken ice along the western shore of Kamchatka. By the middle or last ten days of June, hardly any ice remains on the sea. (102)

b. East Coast

Heaviest ice occurs on the southern part of the east coast and takes the shape of a coastal belt in the northern part of the bight between Mys (Cape) Povorotnyy and Mys (Cape) Shipunskiy, and thence extending northward into Kronotskiy Bay. (103)

The ice on the southeast coast of Kamchatka is in general not as heavy nor as extensive as that along the coast further northward. The heaviest ice occurs in the region of Ostrov (Island) Karaginskiy. The heaviest ice on the southern part of the east coast is a coastal belt in the northern part of the bight between Mys Povorotnyy and Mys Shipunskiy, thence extending northward into Kronotskiy Bay. (104)

STAT

Between Mys (Cape) Lopatka and Mys Shipunskiy, ice begins to form in the bays, towards the end of October (105), and by the middle of November the bays are ice-bound. (106) The ice fringe on the coast attains its greatest development in late February or beginning of March (107), when impenetrable blocks congregate along the coast. A shore lead occasionally forms by the break-up of the fast ice. (108) At this time there is a belt of ice about 20 miles wide off Mys (Cape) Lopatka. Further north this belt widens, to about 35 miles off Mys Piratoryy, 55 miles off Mys Povorotnyy, and 45 miles off Mys Shipunskiy, extending northward into Kronotskiy Bay. (109)

The ice of the coastal belt may be very heavy, up to 1.2 m thick, and is often hummocked. (110)

While on the western coast of Kamchatka, the sea freezes every year, on the eastern coast in the south, ices do not appear every year and only the Avachinskaya Bay becomes covered with a thin crust of ice that usually breaks up under the pressure of frequent winds and the tides. (111)

The ice as a whole begins to break up in late April and May, at first usually in the extreme south. Throughout May and early June drift ice and sludge remain along the coast. The average date of final disappearance of all ice along the coast is in late June. (112)

In more severe years, it may be two weeks later. (113) But the conditions vary in different years and in some favorable years, the coast has been known to become quite clear as early as April. (114)

In general, the sooner the fresh north and northwest winds of spring commence, the earlier the date of the break-up of the ice. (115)

The ice from this coast is carried southward by the inshore current and passes through the northern straits of the Chishima-shoto group, southwestward of Mys (Cape) Lopatka. (116)

c. Ice Conditions on Rivers of Kamchatka

On the rivers of northern Kamchatka, grease ice appears at the end of October (117), and the ice cover becomes solid in the beginning of November. (118) The spring break-up occurs in the first half of May, and the clearing from ice in the second half of May. (119)

In the southern part of Kamchatka, the ice sets about half a month later, grease ice forms in the middle of November, on the Ozernaya River, for instance and the river freezes in the second half of November. (120) All rivers of the southern part of the west coast are frozen by November. (121) The break up, begins late in April, and the ice finally disappears during the first half of May. (122)

Another source states that the rivers in the south freeze towards the end of October or beginning of November, and open up in the end of March or beginning of April; (123) and yet another source says that the rivers of the

STAT

southern part of the Kamchatka peninsula freeze only by the beginning of December and break up in the middle of April, and the ice debacle ends in May. (124)

Discharge of Kamchatka Rivers

The discharge of waters in Kamchatka varies with the area. The gradual flow of thawing snows from various elevated areas, together with rainfall waters, produce a sustained rise in the water discharge during the warm period of the year. (125)

The rivers of the Kamchatka peninsula, although undergoing the influence of the monsoon type of climate prevalent in the Amur River basin, as to the character of their flood season, nevertheless have a higher volume of snow caused discharge. There is also a slighter variation in the range of the main flood wave, since additional secondary waves of rainfall cause floods and a more regular flow in winter. (126)

On elevations and in mountainous parts of the peninsula, the discharge increases with that of precipitation. The slopes of mountains and mountain ranges open to the action of the winds, bear the action of mostly moisture laden masses of air, which are richer in precipitation and have greater flow than the slopes not subject to the action of the winds. (127)

The yearly flow reaches its maximum on the slopes of the mountains facing the eastern shore of the Kamchatka peninsula, where the volume of discharge is of 25 L/sec, km ^{2} and more. For instance, on the Avacha River, near the village of Yelisovo, the volume of discharge increases to 34 l/sec. km ^{2} .(128)

On the western shore, under the wind slopes of the ranges, where precipitation is lighter, the discharge decreases to 15 - 15 l/sec. km^2. (129)

In winter, the rivers of the Kamchatka peninsula carry more water than those for instance, of the Amur River basin, owing to the hot water springs. From November to March, the discharge of the Kamchatka River near Nizhne-Kamchatsk is 20% of the yearly flow. In the spring (April-May) the flow is only 10 - 15% of the yearly flow, because the snow melting process in the basin spreads over a lengthy period and continues even in summer. The maximum water discharge is observed during the second half of June - beginning of July. During the summer, autumn period (June to October), the flow accounts for about 70% of the yearly volume. (130)

During the autumn ice movement and ice setting period, ice jams sometimes cause sharp raises in water level. (131)

STAT

Reference Notes - Chapter II

1) Berg, 1955, p. 435; Berg, Priroda SSR, 1952, p. 489

2) Berg, 1952, p. 489

3) BSE, v. 31, 1937, p. 149

4) Berg, 1955, p. 437; Berg, 1952, p. 490

5) BSE, v. 19, 1953, p. 553

6) BSE, v. 19, 1953, p. 553

7) BSE, v. 19, 1953, p. 553

8) Berg, 1952, p. 488; Berg, 1955, p. 435

9) Berg, 1952, p. 488-489; Berg, 1955,p. 436

10) BSE, v. 19, 1953, p. 553

11) BSE, v. 19, 1953, p. 553

12) Berg, 1952, p. 489; Berg, 1955, p. 436; Serg. p. 63

13) Serg, p. 63

14) BSE, v. 19, 1953, p. 553

15) BNG, p. 565

16) BSE, v. 19, 1953, p. 553

17) Serg, p. 63

18) Serg, p. 64; BSE, v. 19, 1953, p. 553

19) Serg, p. 64; BSE, v. 19, 1953, p. 553; Berg, 1952, p. 489; Berg, 1955, p. 436

20) Serg, p. 64; BSE, v. 19, 1953, p. 553

21) BSE, v. 31, 1937, p. 149

22) BSE, v. 19, 1953, p. 553; Berg, 1955, p. 436; Berg, 1952, p. 489

23) Serg, p. 64

24) Berg, 1955, p. 436; Berg, 1952, p. 489

25) BSE, v. 31, 1937, p. 149

26) Serg, p. 64; BSE, v. 19, 1953, p. 553

STAT

27) Serg. p. 64; BSE, v. 19, 1953, p. 553

28) Serg. p. 64

29) Ibid.

30) BSE, v. 31, 1937, p. 149; Berg, 1955, p. 436; Berg, 1952, p. 489

31) Berg, 1955, p. 436; Berg, 1952, p. 489

32) Berg, 1955, p. 436; Berg, 1952, p. 489

33) BSE, v. 31, 1937, p. 149

34) Serg. p. 62

35) Ibid.

36) Ibid.

37) BSE, v. 19, 1953, p. 553; Serg. p. 62

38) Serg, p. 62

39) Ibid.

40) Berg, 1952, p. 489; Berg, 1955, p. 436

41) BSE, v. 31, 1937, p. 149

42) BSE, v. 19, 1953, p. 553

43) BSE, v. 31, 1937, p. 149; Berg, 1955, p. 436; Berg, 1952, p. 489

44) Berg, 1955, p. 436

45) Berg, 1955, p. 436

46) Berg, 1952, p. 489; Berg, 1955, p. 436

47) BSE, v. 31, 1937, p. 149

48) Berg, 1955, p. 431; Berg, 1952, p. 489

49) Berg, 1955, p. 437; Berg, 1952, p. 489

50) BNG, p. 560, Lotsiya, p. 467, 1938

51) BNG, p. 560

52) Lotsiya, p. 467

53) Berg, 1955, p. 437; Berg, 1952, p. 489

54) Serg. p. 63

55) Serg. p. 61

56) Berg, 1955. p. 437; Berg, 1952, p. 489

STAT

57) Serg. p. 61

58) Berg, 1955, p. 437; Berg, 1952, p. 489

59) Berg, 1955, p. 437; Berg, 1952, p. 489

60) Serg. p. 61

61) Serg. p. 59

62) Ibid.

63) Ibid.

64) BNG, p. 560

65) Lotsiya, p. 467

66) Belinskiy & Istoshin, 1956, p. 37

67) Serg. p. 63

68) BNG, p. 560

69) Lotsiya, p. 467, 1938

70) Belinskiy & Istoshin, p. 37, 1956

71) Ibid.

72) Serg. p. 61

73) BSE, v. 19, 1953, p. 553

74) Serg. p. 61

75) Berg, 1952, p. 490

76) Berg, 1955, p. 437

77) BSE, v. 31, 1937, p. 149; Berg, 1952, p. 490; Berg, 1955, p. 437

78) BSE, v. 31, 1937, p. 149

79) Berg, 1952, p. 490

80) Berg, 1955, p. 437

81) BSE, v. 31, 1937, p. 149

82) Berg, 1955, p. 437

83) Berg, 1955, p. 437; BSE, v. 31, 1937; Berg, 1952, p. 490

84) Serg. p. 61

STAT

85) Berg, 1952, p. 490

86) Serg, p. 61

87) Ibid.

88) Berg, 1952, p. 490

89) Serg. p. 61

90) BSE, v. 19, 1953, p. 553

91) Serg. p. 61-62, 1934

92) P: Ogonek, No. 26, June, 1956, p. 32

93) Serg. p. 64

94) Berg, 1955, p. 437; BSE, v. 31, 1937, p. 149

95) Berg, 1952, p. 490

96) Serg. p. 62

97) Ibid.

98) Ibid.

99) Lotsiya, 1938, p. 469

100) Ibid.

101) Ibid.

102) Ibid.

103) BNG, p. 10

104) Ibid.

105) Ibid. BNG, p. 592

106) BNG, p. 592

107) BNG, p. 592, also p. 10

108) BNG, p. 560

109) BNG, p. 10

110) BNG, p. 560

111) BSE, v. 19, 1953, p. 553

112) BNG, p. 560

STAT

113) BNG, p. 11

114) BNG, p. 561

115) Ibid.

116) BNG, p. 592

117) Lotsiya, p. 469

118) Lotsiya, p. 469; Ocherki Akad, p. 225

119) Lotsiya, p. 469

120) Lotsiya, p. 469

121) BNG, p. 562

122) BNG, p. 562

123) Serg. p. 63

124) Ocherki Akad. p. 225

125) Ibid.

126) Ibid.

127) Ibid. p. 226

128) Ibid.

129) Ibid.

130) Ibid. p. 225

131) Ibid.

CHAPTER III

Rivers of the Kamchatka Peninsula

General Remarks

The rivers of Kamchatka belong to the basin of the sea of Okhotsk and to that of the Pacific Ocean. (1)

Most of the several hundred rivers of Kamchatka flow, according to the position of the main watershed (2), either in a latitudinal direction eastward to the Sea of Bering, or westward to the Sea of Okhotsk. (3) Only ten rivers have a southerly flow. (4)

The direction of the valleys of the major rivers, for instance the Kamchatka, Bystraya, Kozyrevka and Yelovka and other river valleys, is determined by the situation of the mountain ranges. (5)

The numerous rivers emptying into the Sea of Okhotsk are usually comparatively short, their length varying from 100 to 150 km, because of the short distance between the longitudinally situated mountain ranges and the sea. (6)

The rivers flowing through plains are of secondary importance, so that most of the rivers of Kamchatka may be considered mountain streams. (7)

Because of the mountainous character of the country, most rivers of Kamchatka (8), have an abundance of rapids, sandbanks and shallows making them for the most part not navigable. As a rule, only the lower reaches of the rivers are accessible to shallow draft motor boats. (9) The rivers are generally extremely inconvenient for floating. (10) According to one authority, there is no regular navigation on Kamchatka rivers, and even the navigable Kamchatka River is navigable only for small craft some 100 km upstream. (11) Yet rivers are the only means of transport downstream in summer, dogs being used for the upstream journey (12), and the Kamchatka River is known to be navigable all the way to Mil'kovo. (13)

The smaller rivers may be utilized for floating to a very limited extent for short distances and only during the short flood season. The Kamchatka River alone has relatively favorable conditions for floating, and this explains the construction of a lumber industry kombinat in the Klyuchi area in the Kamchatka River valley. (14)

Serious obstacles to navigation are the numerous bars and shoals in the river estuaries. (15) In the estuary reaches, the rivers form wide labyrinths of channels of old rivers and lakes bordered by steep banks. As they approach the sea coast, most rivers meet in addition a stormy "val" or wave and change their direction sharply, flowing for several km along the shores. (16)

Otherwise, the lower reaches of the rivers, usually flowing through plains have a slow peaceful flow, the river bed splitting into channels and forming sandbanks with numerous islands. (17)

a) Rivers of the West Coast of Kamchatka

The river network of the western slopes of the Sredinnyy Khrebet is the most developed in the peninsula as the precipitation is the heaviest there. Most of the 120 or so rivers (18) of this part of Kamchatka take their source in glaciers, lakes and snow covered "cars" of the Sredinnyy Khrebet, (19) or its spurs (20), and flow through wide, well developed valleys with a whole series of river terraces. The width of river valleys varies from 4 to 10 km in the lower reaches of the rivers. (21)

The rivers of the western part of Kamchatka, the upper reaches of which start in the Sredinnyy Khrebet, are mountain streams flowing through narrow canyons or between steep banks over a stony and rapid-ridden bed. (22) They are shallow and swift and their waters are limpid. (23)

The upper and middle reaches of these rivers are accessible only to narrow boats ("baty") made of hollowed out tree trunks and used by the natives.(24)

In their upper reaches, the rivers of the Western part of Kamchatka have usually narrow valleys that sometimes vanish completely and occasionally widen and become valuable meadow land. These meadows are in part completely free for pastures and in part need clearing from bushes. (25)

Once the rivers leave the narrows of the Sredinnyy Khrebet, they enter the tundra lowland and flow between wide low banks. Their valleys are barely defined and merge with the surrounding tundra. (26)

Apart from the larger rivers, there are also small streams that flow from mossy marshes of the shoreline strip. (27)

There are likewise so-called tundra rivers, starting in the tundra of the western shore. In their lower reaches, these rivers usually flow between wide banks, through tundra lowlands and soft soils and are very convenient for fishing. (28)

The rivers and streams flowing along the western coast of Kamchatka rarely flow directly into the sea, being obstructed by the strip of gravel thrown up along the coast by the heavy seas. They turn and flow inside this gravel strip, sometimes for several miles, and eventually find an outlet through it. The mouths of the principal rivers are marked by beacons which are useful as landmarks. The outlets are usually fronted by shifting bars. (29)

The location and shape of the spits, bars, estuaries and fairways are subject to change, (30) depending on the river freshets and storms from the sea. (31)

The greatest changes in the river mouths take place when the storm from the sea coincides with the freshet period. (32)

The numerous rivers and streams cause the alluvial spits and strips rising only a few feet above water, to surround the shoreline completely so that the mainland comes out directly to the sea only on small distances. Such conditions prevail in the entire area of the west coast of Kamchatka from the Ozernaya River to Mys (Cape) Kharyuzova, i.e. between 51° 30' Lat. N., and 57° Lat. N. (33)

The main rivers of the western coast of Kamchatka are the following (from south to north):

Kambal'naya, Ozernaya, Yavina, Koshi(ye)gochik, Golygina, Opala, Bol'shaya, Mitoga, Utka, Mukhina, Kikhchik, Nemtik(Pymta), Kol', Vorovskaya, Oblukovina, Kol(m)pakova, Krutogorova, Icha, Sopochnaya, Moroshechnaya, Belogolovaya, Khariuzova (Khayryuzova), Kovran, Utkholok, Tigil', Amanina, Va(o)yampolka, Kakhtana, Palana, Kinkil', Lesnaya, Shamanka, Podkagernaya, Pustaya(Evrevvayam), Rekinniki, Kuyvivayam, (34).

Not all of the rivers mentioned are significant enough to justify description, therefore, only a few are discussed below, starting from the south.

The Kambal'naya River starts in the foothills of the Kambal'naya sopka (hill) (35) and discharges into the bay between 2 gravel spits, about 5 miles northward of Mys Kambal'nyy. The buildings of a fishery can be seen on the beach 3/4 of a mile southward of the mouth of the river. (36)

The Kambal'naya River does not have navigation significance. Its entrance is narrow, the bar is shallow and during the outgoing tide the entrance into the river becomes extremely narrow. The bar of the river is accessible to schooners with a draft not exceeding 1.5 m and only in the high waters of the syzygy. During the syzygy, the height of the incoming tide reaches 2.1 m, being 0.9 to 1.5 m during the quadrature. (37)

The mouth of the Kambal'naya River does not freeze completely. In the winter of 1928-29, there were 38 days of ice, between January and March. (38)

The Ozernaya River, flowing from Lake Kuril, with its right bank tributary, the Pauzhatka River, is one of the largest rivers in Kamchatka. (39) The headwaters of the Ozernaya River are situated somewhat closer to the eastern shore of Kamchatka than to the western. The river takes its source from Lake Kuril'skoye, or as it is locally called Ksuay, a large mountain lake, from the south-west part of which starts the Ozernaya River. The lake lies in a wide depression between the Opal'naya and Il'yinskaya mountains to the north and the Kambal'naya mountain to the south. The entire course of the Ozernaya River does exceed 42 km(sic). It is a typical mountain stream, with a rapid flow and a sinuous bed. It flows in a latitudinal direction and it comes out to the sea in a narrow valley, bordered on both sides by the steep slopes of mountains (40), and discharges through an opening in the coastal strip of sand and gravel. (41)

Just before entering the sea, the river bed widens and forms a sort of basin separated from the sea by two blunt rounded spits widening in their extremities and between which is situated the relatively narrow entrance to the river. (42)

The least depth at the bar, s tuated between the ends of both spits, reaches 0.8 m to 1 m. (43)

In low water, the entire eastern half of the lagoon dries up.*(44) In the western part of the lagoon, at the inner border of both spits, there is no drying up, and the depth during low water reaches 1.4 to 1.8 m. (45)

A fishing station and a cannery were reported to be situated on the southern spit in 1938. On the right bank of the river, immediately before the exit into the lagoon, there lies a small village. (46)

Anchorageis safe abreast the Ozernaya River. Depths of 16-17 m occur about 2 miles from the estuary and then decrease to 9.0 m to 10 m. (47)
Another source states that vessels may obtain anchorage off the mouth of Ozernaya River in convenient depths ranging from 17.4 m about 2 miles off shore, to 10.1 m about three-quarters of a mile off shore. (48)
Up to 0.7 miles from the shore there is a sandy bottom. (49)

At a distance of 0.5 to 0.7 miles from the shore, the depths vary from 9.0 to 14.5 m according to one source and the bottom is mainly sand, stone occurring rarely. (50)

There is a fishery on the southern side of the opening, and there are a few sheds on the northern side. On the mainland near the entrance of the river is the settlement of Ozernoye. A light is exhibited at the mouth of Ozernaya River. (51)

Ozernaya River freezes towards the end of October or beginning of November, and opens up by the end of March or the beginning of April. (52)

The mouth of the Ozernaya River does not freeze completely during the winter. The amount of ice in the open sea in January and February varies considerably. (53)

The Yavina River takes its source in the elevations around Lake Kuril'skoye. The river and the bar fronting its estuary are very shallow. The mouth may be identified by two ports standing close southward of it. (54)

The Golygina River also starts in the elevations around Lake Kuril'skoye.(55) The river discharges after turning northward within a narrow strip of land at the end of which is a flat. The depth on the bar is 0.6 m (56) in low water (57), increasing to 2.7 m (58) for a short distance and then decreasing rapidly. (59) Only native boats can ascend the river. (60)

The settlement of Otradnoye stands on the west bank of Golygina River, a short distance inland. (61)

The entrance to the Golygina River from the sea and its estuary are not very noticeable from the sea. (62)

The Golygina River freezes in the middle of November and breaks up in early May. (63)

STAT

The Opala River, with its tributary the Savan River, flows from the east and empties into the same estuary as the Golygina River and is sometimes considered a tributary to the Golygina River according to one source. (64)

The Opala River discharges about 3 miles (65) or 2 miles according to another source (66) north of the mouth of the Golygina River. Before reaching the sea, the Golygina River turns sharply south and is separated from it by a fairly broad strip of sand and gravel, from the end of which a flat extends southward. (67)

The Opala River is formed by the confluence of two tributaries, the Nachikinskaya River (Nachiki) and the Bystraya River. (68)

The Nachikinskaya tributary is itself a large river with numerous left bank tributaries (Bannaya, Karimchina, Ipel'ka, etc.,) and is sometimes called Plotnikova below the confluence of the Karimchina River. (69)

Between the end of the flat and the mainland there is a bar with a depth of 0.9m over it. For a short distance within the bar the depths are from 3.0 to 4.3 m, after which they rapidly decrease. The settlement of Opala stands on the spit about 2 miles northward of the mouth of the river. Near the mouth of Koshogochek River, about 8 miles of the mouth of Yavina River, low sand dunes begin to come down close to the beach. (70)

During high tide, the current in the estuary of the Opala River stops and during low tide reaches speeds of 4 to 4.5 knots. (71)

The Opala River freezes in the middle of November and breaks up in early May. (72)

The Bol'shaya River, locally known as the Kushka (73) flows in the southern part of the Kamchatka peninsula and takes its source on the slopes of the Gonal'skiye mountains (74) near the north-western slopes of the Sopka Vilyuchinskaya (75) considerably closer to the eastern shore of Kamchatka than to the western. (76)

The Bol'shaya River is some 200 km long (77), and is the largest river of the western coast of Kamchatka. (78)

The upper current of the Bol'shaya River is a typical mountain stream flowing in a north-northwest direction. Close to Lat. 53° 8' N., near the village of Nachikinskoye, the river describes a sharp bend and changes its course to a west-southwest direction that it maintains to its mouth. (79)

The middle reaches of the Bol'shaya River pass likewise through a mountainous area that gradually levels off as it approaches the shoreline. (80)

Some 40 km from the estuary (81) or 27 miles according to another source (82) the Bol'shaya River receives the Bystraya River (83), its largest and right bank tributary, the importance of which is not inferior to that of the Bol'shaya River. (84)

The Bystraya River starts in the Gonal'skiye mountain massive (85) in its northwestern slopes (86) and is 200 km long. Its headwaters comes close to those of the Kamchatka River, the largest river of the peninsula (87), but flowing towards the east coast.

At the junction of the two streams lies the settlement of Bol'sheretsk (88) and there the Bol'shaya River widens sharply and definitely enters the plain that lies between the spurs of the Kamchatka range and the Sea of Okhotsk. (89)

STAT

Tides reach as high upstream as the village of Bol'sheretsk. (90)

Further upstream from Bol'sheretsk are the settlements of Apacha and Nachika. The Nachika settlement is situated at the spot of the upper reaches of Bol'shaya River, where it bed turns westward. The village of Nachikinskoye (sic) lies near the mountain chain pass that forms the watershed between the rivers of the western and eastern seaboard of Kamchatka. (91)

In the XVIIIth century, small seagoing craft sailed on the Bol'shaya River from the estuary to Bol'sheretsk, but at present only shallow draft cutters and flat bottomed kungas boats can pass there with difficulty. (92)

The Bol'shaya River flows towards the sea until close to 52° 47' N. Lat. and there describes a sharp bend and flows further on for 24.5 km in a south-southwest direction parallel to the seashore, separated from the latter by a sand and gravel strip. This lagoon-like river bed extends along the seashore for 13 miles (93) or 22 km according to another source (94) and then empties into the sea at Lat. 52° 35' N., and Long 156° 17' E. (95) In its estuary there is a narrow and deep bay, that in the eighteenth century was the main port of the western shore of Kamchatka. (96)

The entrance to the lagoon of the Bol'shaya River is located between the end of a spit and the main shore, that is here bent so that first it trends parallel to the spit and then further south from the entrance, forming as it were its prolongation. (97)

A sand bar, drying during low water in its part closest to the spit, sets out from the end of the spit along its prolongation. Between the end of this sandbar and the mainland there is a bar that prevents access to the river.(98)

The shallowest depth at the bar during lowest water level is 1.4 to 1.8 m. But the depths of the bar and the direction of the fairway are subject to frequent changes and great care should be observed by entering vessels. (99)

Above the bar, the depths in the lagoon increase considerably, reaching 6.0 to 6.6 m (100) or 6.1 to 6.7 m according to another source. (101) In places it reaches 9.0 m (102) or 9.1 m according to another source (103). Further within the lagoon, depths gradually decrease and near Mys (Cape) Levasheva, i.e. where the river enters abruptly the mainland, they do not exceed 2.4 to 3 m. (104)

The flood current in the entrance of the inlet has a rate of 3 to 3 1/2 knots, and the ebb current 4 to 5 knots. (105)

The Bol'shaya River brings down with it much mud and sand, silting up the mouth, and reducing the depths 3 to 4 miles off shore. (106)

Two leading beacons are reported abreast the entrance to Bol'shaya River.(107)

Skippers with knowledge of locality may anchor one to 1 1/4 miles from the mouth of the Bol'shaya River, in a depth of 9.1 m, on fine sand and good holding ground. (108)

Bol'shaya River usually freezes up in the first half of November, and breaks up in the first half of April (109) or the end of March according to another source. (110)

STAT

In the open sea, the earliest appearance of ice is 11 December, the latest, 24 January. The earliest final disappearance of ice is 12 March, the latest is 27 April. (111)

Vorovskaya River is 150 km long and its headwaters are located in the western slopes of the Sredinnyy Khrebet. It flows in an almost latitudinal direction. (112) Another source sets the length of the river at 90 miles only. (113)

The settlement of Vorovskaya is situated 15 km upstream. (114)

The river discharges about 19 miles northward of the mouth of the Kol' River, forms a Bay near its mouth called Zaliv Ukangych (115), or Vorovskiy (116), a shallow lagoon which, with a width of about 4 cables (117) extends nearly 20 miles northward, and is separated from the sea by a narrow spit of sand and gravel, on which is a continuous chain of fisheries and some storehouses.(118)

The entrance is narrow, and the bar is subject to change, but small schooners can pass over it at high water, the greater of the neap tides rising 2.1 m. (119)

The Vorovskaya River flows into the lagoon about 5 miles northward of the entrance. Vorovskoye settlement is 9 miles above the mouth. (120)

Vorovskiy light, the position of which is approximate, is exhibited, at an elevation of 7.9 m, from a triangular pyramid, 6.1 m high, at the Russian fish cannery situated on the coast near the mouth of Vorovskaya River. (121)

In the open sea off Vorovskaya River, drift-ice appears in December and clears in April. The river mouth is completely frozen by February. The break up begins in February and March. (122)

The Kikchik River is a small River that flows 2 miles northward inside a narrow strip of land on which is a fishery, and then discharges 30 miles northward of Utka River. There is a minimum depth of 0.9 m on the bar, and 3.7 m at high water springs. Anchorage may be obtained by vessels with local knowledge, about half a mile off shore, in a depth of 8.2 m. From the anchorage a hill with a saddle-shaped summit, 18 miles inland bears 090°.(123)

Before emptying into the sea, the Kikchik River breaks up into two channels. According to a 1938 source, the northern channel was closed at that time and became a lake. The river thus flows into the sea through its southern channel that shortly before reaching the sea turns northward, separated from the sea by a spit. (124)

A fishing station is situated on the spit 1.3 miles south of the estuary of the Kikchik River. (125)

During average swell, the fairway leading into the river can be seen easily as there are no breakers on the sandbanks bordering the spit. (126)

Between the Kikchik and the Vorovskaya Rivers, situated 89 miles apart, the shoreline is straight and sandy. Numerous small rivers and streams empty into the sea between the above two rivers, from south to north, among which are the following: the Kodomach, Khemych, Pympta, Noka, Mysovaya, Okshush, Uchkhyl', Luzhe, Kol', Anuzha, Tezhmaach, Kekhta, Kaktyo, Agdegatch rivers.(127)

STAT

The Kol' River, also known as Medykh (128) discharges 21 miles north of the Kikchik River and is fronted by a bar which dries. The depth about 2 miles off shore is 20.1 m. The water of the river is reported to be fit for drinking, and fish abound in it. Kol' village, about 5 miles (129) or 9.6 m (130) upstream, is connected to the general telegraph system. (131) The river is very shallow. (132)

The estuary of the Kol' River, is situated near Lat. 53° 50' N. The river bed approaches the shore normally and forms a small lagoon extending along the shore southward from the river mouth. The estuary of the Kol' River is very narrow and does not exceed 18 m in width and its bar dries up during low water. (133)

The Kol(m)pakova (134) or Kompakova (135), River is a typical river of the western shore of Kamchatka, and is called by the natives Kukkyuyu. (136) It discharges about 39 miles north of the mouth of the Vorovskaya River after flowing 7 miles north inside a narrow sand and gravel spit. (137)

The lower reaches of the Kompakova River, like those of most rivers of the western coast of Kamchatka, flow through the tundra. The river bed is sinuous, the current is rather swift, and the river breaks up into channels before flowing into the shoreline lagoon. (138)

At the entrance to the lagoon there is a 1.4 m deep bar in low water. Beyond the bar and the spit there are depths of 4.6 to 6.0 m, (139) in which small vessels with local knowledge can anchor. (140) Another source mentions that schooners, having passed the bar at high tide, enter a relatively deep area and can anchor there, a thing that happens frequently during the fish spawning season. (141)

The shoreline approach in the area of the Kompakova River lagoon is easy. The shoreline rises very gradually. A mile from the shore, depths of 11 m occur and then decrease to 5.4 to 6.4 m some 0.5 miles from the shore. (142)

Ships should not approach directly the entrance of the lagoon, for there, shallow depths prevail further out to sea and the inward and outward lagoon currents are felt more strongly directly near the estuary. (143) Another source mentions that the tidal streams off the outlet of this river are weaker than elsewhere on the coast. The flood stream sets northward. (144)

Kompakova village is situated about 5 miles (7.5 km) up the river. (145)

There is an anchorage with a depth of 10.5 m about 1 1/2 miles off shore, with Kompakova cannery chimney bearing 076°. (145)

An 11 m shoal lies about 8 1/2 miles westward of the mouth of Kompakova River. (146)

Krutogorova River (Lat. 55° 03' N., Long. 155° 36' E.), flows northward along the coast for 4 miles inside a narrow strip of sand and gravel, and discharges through an outlet, about 22.9 m wide, about 18 miles northward of the mouth of Kompakova River. The depth on the bar is about 0.6 m (147) and within the bar the depth is from 1.5 to 3.7 m. (148) About 1 1/2 miles north of the outlet, there are a few houses. The ebb stream has a rate of 4 knots. (149)

There is an anchorage with a depth of 9.6 m about 1 1/2 miles off shore, with Krutogorova cannery bearing 089°. (150)

Oblukovina River discharges about 13 miles north of Krutogorova River, after flowing 5 miles northward along the coast inside a strip of sand and gravel, which is an island 13 miles long, there being an opening at both ends of it. The depth on the bar is 0.9 m (151) or 0.8 m in low water according to another source. (152) The entrance is easy and small vessels with local knowledge can find shelter inside, in depths of 4.0 to 5.2 m. (153) Two other rivers discharge into this lagoon. (154)

The lagoon of the Oblukovina River has a southern outlet to the sea at Lat. 56° 06' N., serving simultaneously as a connection with the sea of the lagoon of Krutogorova River so that actually the estuary of the Oblukovina River is not separated from the sea by a spit, but by a narrow, 13 mile long, island extending along the shore. (155)

Both entrances to this lagoon, owing to the very low and exceedingly monotonous shoreline, are very difficult to spot from the sea. A light has been set up a little above the northern entrance of the lagoon, half a mile from the seashore. (156)

The lagoon of the Oblukovina River also recives the Khykha River, the estuary of which is situated 1.5 miles south of the Oblukovina River estuary, and 1.5 miles north of its southern exit. The lagoon receives the Sheagach River. Between the estuaries of the Khykha and Sheagach rivers, also south of the latter, until the southern exit of the lagoon, a small cliff of grey-yellow sandstone, approaches the eastern shore of the lagoon and is well seen from the sea. (157)

Off the mouth of the Oblukovina River, the earliest recorded appearance of ice is 20 December, the latest, 15 January. The earliest disappearance of ice is 20 February, the latest, 28 April. (158)

The Icha River, one of the largest of the western shore of Kamchatka, (159) is 168 km long (160) and receives numerous tributaries. (161)

The Icha River discharges about 26 miles north of the mouth of the Oblukovina River. For the last 6 miles of its course it flows north inside a long narrow strip of sand and gravel which extends 22 miles south from the outlet of the river, and encloses a lagoon into which several streams flow: a large fishery is situated 2 1/2 miles southward of the northern end of the lagoon. (162)

This lagoon, into which numerous small streams and rivers empty is the shoreline basin into which three other rivers empty. (163)

The Soichets River empties into the extreme northern part of the lagoon, the Chvyvycha and the Kokon Rivers empty into the lagoon near Lat. 55° 30' N. (164)

The mouth of the Icha River, situated almost 6 miles south of the exit of the lagoon into the sea, is located at 55° 40' N. The entire lagoon extends along the shoreline for 22 miles, terminating at Lat. 55° 24' N., and extends only southward from its entrance into it. This entrance is situated near its extreme northern end. The mouth of the Icha River lagoon is situated at Lat. 55° 45' [illegible] and Long. 155° 28' E. The lagoon is separated from the

STAT

sea by a narrow sand spit consisting of an accumulation of sand and gravel, on which a fishing station is situated. It is completely devoid of forest and only grasses grow in its more elevated parts. No elevated shore exists on this spit separating the lagoon from the sea. (165) The entrance to the lagoon (outlet of the river) is narrow and the depths (at the entrance of the bar) are from 0.9 to 1.2 m. (166)

The tidal streams at the entrance to the lagoon at springs have a rate of 4.0 to 5 knots, (167) and are especially strong during the ebb tide, when the current coincides with the ebb tide. (168)

A light is exhibited at an elevation of 53.9 m from a triangular wooden pyramid 7.0 m high, situated on a cliff near the Russian fish cannery in the vicinity of the mouth of Icha River. A settlement is located 27 miles up the river. (169)

The lagoon is not always convenient for anchorage, because it becomes inaccessible precisely during windy weather, when the swell is especially strong and when vessels need to seek shelter there. Generally speaking, the lagoon is shallow. (170)

During the winter, the mouth of the Icha River does not freeze completely.(171)

At Mys (Cape) Kharyuzova, fast-ice begins to form in most years in November, and the sea is ice-covered in December with ice up to 0.6 m thick. The break up occurs in April and ice finally clears in May. (172)

The Sopochnaya river, 150 km long, flows into the sea at 56° 07' Lat. N., in a single estuary. This estuary lies among cliffy banks and the river itself penetrates into the mainland between hills receding widely on both sides. Almost at its entrance into the sea, the Sopochnaya River receives from the south a left bank tributary, the Sigikan River. The river bed of the Sopochnaya River, locally known as Petoay, flows around the Petoay elevation on its northern side, while the Sigikan River flows around the same elevation around its southern side. (173)

The estuary of the Sopochnaya River is somewhat difficult to find from the sea. But an elevation of the same name, situated nearby, and dominating the hilly landscape by its characteristic, although slightly flattened conus, may serve as a landmark. Fishing shacks may be seen on closer approach, along the shore. (174)

Moroshechnaya River, about 200 km long (175) has a fairly wide mouth with a bar in front of it, part of which dries (176) in low water (177). In its lower course, the river flows in a northerly direction along the coast, and is separated from the sea by a narrow strip of land and gravel. (178) The settlement of Moroshechnoye stands about 27 Miles up the river. (179)

A bank extends from the mouth of Moroshechnaya River with a depth of 5.9 to 6 m off shore. (180)

Khayryuzova (181) (Kharyuzova) River with its tributaries the Tikhaya and Bystraya rivers, is 250 km long. Kharyuzova River (182) discharges about 4 1/2 miles northeast of the mouth of Belogolovaya River. (183)

STAT

A fishery is situated near the mouth of Kharyuzova River. (184)

Shoal water extends for a considerable distance off the entrances of Belogolovaya River and Kharyuzova River and vessels approaching from the north on the eastern side of Ptichiy Ostrov, should not stand farther south than the parallel of the northern end of that island. (185)

Vessels with local knowledge wishing to communicate (sic) with either Belogolovaya or Kharyuzova River should anchor about 1 1/2 miles north-northwest of Mys Kharyuzova, in a depth of 11.0 m. (186) Neither of these rivers is accessible to boats at low water. (187)

The Tigil' River is considered the most important stream on the western shore of Kamchatka peninsula. (188) Also called the Tichil' (189). It is over 260 miles long (190) or about 350 km long according to another source. (191)

The lower reaches of the Tigil' are navigable for 100 to 110 km and its main tributaries are to the right the Kalgats, Sedanka, Pirozhnikova, Gavenka and to the left, the Napana River. (192)

The estuary of the Tigil' is accessible during high tide to ocean going vessels. (193)

Near its estuary, the Tigil' River is fronted by a bar, over which there is a depth of about 0.9 m, and which is subject to considerable shifting, especially during the autumnal westerly winds. (194)

Near its mouth, the river flows southward, separated from the sea by a narrow strip of sand and gravel. Shoals, which dry, extend one mile from both sides of the entrance. Vessels wishing to enter must obtain a pilot. (195)

The width of the estuary during low tide is no less than 100 m and the depth 8 1/2 m. Even on the bars and sandbanks, the depth reaches 5 m during high tide and 1 m during low tide. (196)

There is anchorage off the river for vessels with local knowledge, but near the bar the holding ground is not good. (197)

At the anchorage the tidal streams have a rate of 1 1/2 to knots, the flood s setting in a northeasterly and the ebb in a southeasterly direction. (198)

Vessels approaching the Tigil' River during fog remain in a depth of not less than 31.1 m until the fog has lifted. (199)

There is a small village near the mouth of the river, and about 33 miles above is the town of Tigil', with a population of about 1,000 (in 1944). It is the center of the fur industry. There is telegraphic communication between Tigil' and Petropavlovsk. (200)

The Tigil' River freezes at the end of October, beginning of November, and opens up at the end of April, beginning of May. (201)

The Va(o)yampolka River, (202) also called Vayama- (Vayam) - Palka, discharges about 19 miles northeast of Mys (Cape) Kamatyan, after running a short distance along the coast within a narrow strip of sand and gravel. The depths do not exceed 0.8 m at its entrance, and both depths and direction are liable to change. Close to the river is a small settlement and a fishery. (203)

STAT

The anchorage available only for vessels with local knowledge, is 2 1/2 miles west of the mouth of the Vayama-Palka River, with a depth of 9.1 m. There is a 3.7 m shoal situated about 18 miles northeast of Mys (Cape) Kamatyan and about 1 1/2 miles offshore. (204)

Off the mouth of the Vayama-Palka River, the earliest recorded appearance of ice is 2 November, the latest, 15 January. The earliest final disappearance of ice is 11 February, the latest 24 April. (205)

The Palana River takes its source in the large Lake Palanskoye (206). It is also called Polana and discharges about 5 1/2 miles north-northeast of the Mys (Cape) Pyatibratskiy, inside a narrow strip of sand and gravel. A cannery and fishery are situated on the left bank of the mouth of the river. Anchorage may be obtained by vessels with local knowledge, in a depth of 6.7 m. (207)

A reef extends about 1 1/4 miles west-southwest from a rocky point about 6 miles north-northeast of the mouth of Palana River. (208)

Lesnaya River, also called Lesnovskaya* discharges about 9 1/2 miles northeastward of Mys (Cape) Kinkil'skoy. The last 6 miles of its course has a southerly direction, and is separated from the sea by only a narrow strip of sand and shingle. There is a bar at its entrance. The settlement of Lesnoye is on the left bank of the river, 4 miles from its mouth. (209)

Mys (Cape) Pensepel' is a low headland, and within it is the low broad valley through which the Lesnaya River flows. The mountains on either side of the valley are from 609.6 m to 853.4 m high. (210)

The Lesnaya River freezes at the end of October or beginning of November, and opens up at the end of April or beginning of May. (211)

The Shamanka River, discharges south of Mys (Cape) Ostrovnoy. A rocky spit, which dries, extends about 1 3/4 m north from a headland about 24 miles northeast of Mys Ostrovnoy. The depth about 3 miles offshore southwest of this headland is about 54.9 m and northeast of it, 11.9 m to 16.5 m. (212)

The Podkagernaya River, from the estuary of which starts the eastern shoreline of the Penzhina Bay, discharges into the southeastern part of this bay by two branches. It is inaccessible even to small boats. (213)

* The Kambal'naya, Golygina, Ozernaya, Bystraya, Kikhchik, Kolpakova, Icha, Khayryuzova, Tichil' (elsewhere Tigil') and Lesnovskaya rivers, are of great importance to the fishing industry of Kamchatka. (Kam, Kray, p. 8)

STAT

CHAPTER III - Reference Notes

a) Rivers of the West Coast of Kamchatka

1) Davydov, p. 509, v. II, 1955

2) Serg. p. 42, 1936

3) Serg. p. 42, BSE, v. 19, 1953, p. 553

4) Serg. p. 42

5) Ocherki Aked. p. 233

6) Kamchatskiy Kray, p. 8

7) Ocherki Akad, p. 233

8) Ocherki Akad, p. 233; Serg. p. 46

9) Bol'shakov & Rub. p. 20, Serg. p. 46

10) Bol'shakov & Rub. p. 20

11) Sredi Trekh Morey, p. 40

12) Serg. p. 780

13) BSE, v. 19, 1953, p. 553; 554; Serg. p. 48

14) Bol'shakov & Rub. p. 20

15) Serg. p. 46

16) Davydov, p. 510, v. II, 1955

17) Ocherki Akad. p. 233

18) Lotsiya, p. 463, 1938; Serg. p. 42

19) Davydov, p. 509, v. II 1955

20) Serg. p. 42

21) Davydov, p. 509, v. II. 1955

20) Serg. p. 42

21) Davydov, p. 509, v. II, 1955

22) Bol'shakov & Rub. p. 19, 1934

23) Davydov, p. 509, v. II, 1955

24) Bol'shakov & Rub. p. 20

STAT

25) Bol'shakov & Rub. p. 19

26) Ibid.

27) Davydov, p. 509, v. II, 1955

28) Serg. p. 42

29) BNG, p. 562

30) BNG, p. 562, Lotsiya, p. 463, 1938

31) Lotsiya, p. 463, 1938

32) Lotsiya, p. 463, 1938

33) Ibid. p. 464

34) Serg. p. 42-43

35) Serg. p. 42

36) BNG,p. 563

37) Lotsiya, p. 495

38) BNG, p. 563

39) Serg. p. 42

40) Lotsiya, p. 492, 1938

41) BNG, p. 563

42) Lotsiya, p. 493

43) Lotsiya, p. 493

44) BNG, p. 536; Lotsiya, p. 493, 1938

45) Lotsiya, p. 493

46) Ibid.

47) Ibid.

48) BNG, p. 563

49) Lotsiya, p. 493

50) Lotsiya, p. 493

51) BNG, p. 563

52) Serg. p. 63

53) BNG, p. 563

STAT

54) BNG, p. 563

55) Serg. p. 42

56) BNG, p. 564

57) Lotsiya, p. 491

58) BNG, p. 564

59) BNG, p. 564, Lotsiya, p. 491

60) BNG, p. 564

61) Ibid.

62) Lotsiya, p. 491

63) BNG, p. 565

64) Serg. p. 42

65) BNG, p. 564

66) Lotsiya, p. 491

67) BNG, p. 564

68) Serg. p. 42

69) Ibid.

70) BNG, p. 564

71) Lotsiya, p. 491

72) BNG, p. 565

73) BNG, p. 564; Lotsiya, p. 488

74) SSE, v. 1, 1929, p. 371

75) BNG, p. 564, Lotsiya, p. 488

76) Lotsiya, p. 488

77) SSE, v. 1, 1929, p. 371; BSE, v. 19, 1953, p. 553

78) Lotsiya, p. 488

79) Ibid.

80) Ibid. p. 489

81) Lotsiya, p. 489, 1938

STAT

82) BNG, p. 564

83) Lotsiya, p. 489; BNG, p. 564

84) Lotsiya, p. 489

85) Ibid. p. 490

86) SSE, v. 1, 1929, p. 428

87) Lotsiya, p. 490

88) BNG, p. 564; Lotsiya, p. 489, 490

89) Lotsiya, p. 489

90) Ibid.

91) Ibid. p. 490

92) Bol'shakov & Rub. p. 20

93) Lotsiya, p. 489

94) SSE, v. 1, 1929, p. 371

95) Lotsiya, p. 489

96) Serg. p. 42

97) Lotsiya, p. 489

98) Ibid.

99) Ibid.

100) Ibid.

101) BNG, p. 564, 1952

102) Lotsiya, p. 489

103) BNG, p. 564

104) Lotsiya, p. 489

105) Lotsiya, p. 489; BNG, p. 564

106) BNG, p. 564

107) BNG, p. 564

108) BNG, p. 565

109) BNG, p. 564; SSE, v. 1, 1929, p. 371; Lotsiya, p. 490

110) Serg. p. 63

STAT

111) BNG, p. 564

112) Lotsiya, p. 486

113) BNG, p. 566

114) Lotsiya, p. 486

115) BNG, p. 565

116) Lotsiya, p. 485

117) BNG, p. 565; Lotsiya, p. 485

118) BNG, p. 565; Lotsiya, p. 486

119) BNG, p. 565

120) BNG, p. 566

121) Ibid.

122) Ibid. 567

123) Ibid. p. 565, Lotsiya, p. 487

124) Lotsiya, p. 487

125) Ibid.

126) Ibid.

127) Ibid. p. 486, 487

128) Ibid. p. 487

129) BNG, p. 565

130) Lotsiya, p. 487

131) BNG, p. 565

132) Lotsiya, p. 487

133) Lotsiya, p. 487

134) Serg. p. 43

135) BNG, p. 566; Lotsiya, p. 484

136) BNG, p. 566; Lotsiya, p. 484

137) Lotsiya, p. 484-485, BNG. p. 566

138) Ibid. p. 484

STAT

139) Lotsiya, p. 485;

140) BNG, p. 566

141) Lotsiya, p. 485

142) Ibid.

143) Ibid.

144) BNG, p. 566

145) BNG, p. 566; Lotsiya, p. 484

146) BNG, p. 566

147) BNG, p. 566

148) Ibid.

149) Ibid.

150) Ibid.

151) Ibid.

152) Lotsiya, p. 483

153) Lotsiya, p. 483; BNG, p. 566

154) BNG, p. 566

155) Lotsiya, p. 483

156) Ibid. p. 483

157) Ibid. p. 483

158) BNG, p. 567

159) BSE, v. 31, 1937, p. 148, Serg, p. 42

160) BSE, v. 19, 1953, p. 533

161) Serg. p. 42

162) BNG, p. 566

163) Lotsiya, p. 481

164) Ibid.

165) Ibid.

STAT

166) BNG, p. 566

167) Ibid.; Lotsiya, p. 482

168) Lotsiya, p. 482

169) BNG, p. 566

170) Lotsiya, p. 482

171) BNG, p. 567

172) Ibid.

173) Lotsiya, p. 481

174) Ibid.

175) Serg. p. 43

176) Lotsiya, p. 480; BNG, p. 567

177) Lotsiya, p. 480

178) BNG, p. 567; Lotsiya, p. 480

179) BNG, p. 567

180) BNG, p. 567

181) Serg. p. 43

182) BNG, p. 567

183) Ibid.

184) Ibid.

185) Ibid. p. 568

186) BNG, p. 568

187) Lotsiya, p. 475; BNG, p. 568

188) Serg. p. 19

189) Kamchatskiy Kray, p. 8

190) BNG, p. 580

191) Serg. p. 43

192) BNG, p. 580

193) Serg. p. 43, p. 19

STAT

194) BNG, p. 580

195) Ibid.

196) Serg. p. 19

197) BNG, p. 580

198) Ibid.

199) Ibid.

200) Ibid. p. 581

201) Serg. p. 64

202) Davydov, p. 510, v. II, 1955; Serg. p. 43.

203) BNG, p. 581

204) BNG, p. 581

205) Ibid.

206) Serg. p. 43

207) BNG, p. 581

208) Ibid. p. 582

209) Ibid.

210) Ibid.

211) Serg. p. 64

212) BNG, p. 582

(213) Ibid.

STAT

b) Rivers of the East Coast of Kamchatka

The eastern shore of Kamchatka Peninsula is heavily indented and is a volcanic plateau with elevations reaching from 700 to 1,300 m. Mountainous peninsulas are separated by large bays, the shores are partly lowlands, and partly elevated in the places where the slopes of volcanic plateaux, above which rise the cones of active or extinguished volcanoes, covered with eternal snows, descend and break off sharply at the shoreline. (1)

The eastern part of the peninsula has fewer rivers and their dimensions are inferior to those of the rivers of the western shore. The largest rivers are the Empovey, the Avacha, the Zhupanovaya that flow in wide, well developed valleys. (2)

The main rivers of the eastern seaboard of Kamchatka peninsula are as follows, from south to north:

Kha(o)dutka, Asacha, Mutnaya and Vilyuchik, flowing into the sea between Cape Lopatka and Avachinskaya Bay, Sarannaya and Avacha with several tributaries.

The Khalyger (Kolyger), Zhupanova, Berezovaya, Semyachik and Kronotskaya Rivers, which flow into Kronotskiy Bay. (3)

Bogachevka, Chazhma, Storozh, Stolbovaya, Kamchatka rivers empty into the the Kamchatskiy Zaliv (Bay). (4) The Ozernaya River, flowing further north, empties into the Ozernaya Bay of the Bering Sea. The Uka (also called Nachika) (5), Rusakova, Ivashka, Pankara, Dranka, Karaga, Tymlat, Kichiga, Ualavayam and Anapka empty into the enormous Litke or Karaginskiy Strait with its numerous Bays. (6) The eastern seaboard of the Kamchatka peninsula ends in Zaliv Uzla, which receives the Ualavayam River. (7)

The Khalaktyrka, Nalycheva, Ostrovnaya and Vakh(g)il' rivers flow into the Sea of Bering. (8)

Only the more significant rivers of the eastern shoreline of Kamchatka are discussed in some detail in this chapter, with the Kamchatka River being the subject of a chapter to itself.

The Avacha River, also called (Sauchu), starts at the foot of the Bakang mountain in the system of the Gonal'skiye (sic) mountains (9) and empties into the Avachinskaya Bay. (10)

The Avacha River is 125 km long and has a drainage basin of 4,368 km^2. (11) It consists of the Zapadnaya or Pravaya Avacha, the Srednyaya Avacha and the Vostochnaya or Levaya Avacha (Western or Right, Middle and Eastern or Left Avacha respectively). (12)

The Avacha River has a series of islands caused by the floating trees welded together by gravel and sand. At its estuary it forms channels. (13)

Floating on most rivers is extremely difficult. In the spring of 1930, an effort was made to float timber on the relatively large Avacha River, but the

STAT

timber was dispersed along the numberless tributaries where it dried up. Further such experiments are useless without previous clearing works and the installation of booms. (14)

By 1934, more or less regular communications existed along the Avacha River between Petropavlovsk and the kolkhoz im. XVI Party of Congress, via the Avachinskaya Bay. (15)

The healing Timanovskiye hot sulphur springs, rich in sulphuric acid are situated on the Srednyaya Avacha. The warm mineral springs and basins called "Ozerenka", "Teplyy" and "Kekhkuyskiy" are located on the Pravaya Avacha.(16)

The Zhupanova or Zhupanovaya River (17) discharges at the head of the Zhupanovaya Bay. It is of considerable size and has two mouths, each fronted by a bar. The eastern channel into the river has at least a depth of about 1.8 m. There is a lagoon at the mouth of the river. (18)

This lagoon is situated within a sand and shingle neck which connects the rising ground of Zhupanova peninsula to the mainland. The lagoon runs parallel to the coast, gradually widening northward to the mouth of the Zhupanova River. (19)

Zhupanova village is situated on the slope of the hill at the end of a peninsula dividing the lagoon. It is the largest habitation on the coast between Petropavlovsk and Ust' Kamchatsk, about 60 miles southwest and 175 miles northeast respectively, of the village. The inhabitants live by fishing and hunting. (20)

The hull of a large steam vessel lies stranded about half a mile northwestward of the mouth of the Zhupanova River, and another lies somewhat farther northward. (21)

Anchorage may be obtained by a large vessel in a depth of 10.1 m, sand and mud, with Mys (Cape) Zhupanova bearing 100°. (22)

This berth is sheltered from winds from the southeast, through south and west, to northwest. A small vessel can anchor farther inshore, in depths of 4.1 m, to 4.6 m, with the cape bearing 080°. The area with depths of 6.9m to 7.8 m is not extensive and the depths decrease rapidly eastward towards the peninsula and decrease more gradually westward toward the mainland.(23)

The mouth of the Semlyachik River, is situated about 27 miles north from the mouth of the Zhupanova River, at 54° 06' Lat. N., 159° 59' Long. E., at the entrance to the wide valley. (24)

Before entering the sea, the Semlyachik River flows south parallel to the coast, being divided from the sea by a narrow sand and shingle spit, from the southern end of which, a bar, with a minimum depth of 0.9 m, extends across the mouth of the river, which, owing to its exposed position, is very difficult to enter. There is a fish cannery there. (25)

Northward of the mouth of the Semlyachik River, the coast is low, so that the mouth can be distinguished once the cliffs south of it have been sighted. (26)

There is a convenient landing place in a small cove, about 1 1/2 miles south of the mouth of the river, westward of a small, rocky point from which a reef extends north and provides fairly good shelter from easterly to southerly swells. (27)

About 8 cables of the mouth of the Semlyachik River, the depths range from 9.1 m to 10.1 m. (28)

About 36 miles northeast from the mouth of the Semlyachik River, lies the mouth of the Kronotskaya River. (29)

The Kronotskaya River issues from a mountain lake situated west-northwest of Sopka Kronotskaya (Lat. 54° 45' N.) (Long., 160° 33' E.) and flows for 24 miles southeastward to the coast. An affluent falls into it from the north, close to its mouth, which is fronted by a narrow bar. There is a fishing station on the spit between the river and its affluent. The current of the river is rapid. Owing to its exposed situation, the bar and coastal banks in the vicinity are continually shifting. Considerable changes were observed during a period of only 3 days by a vessel lying off the mouth of the river. (30)

South and close to the mouth of the river the depths are even and the coast steep. No irregularities in the depths have been observed there. Anchorage may be obtained at a depth of 12.8 m., half a mile offshore, with the peak of Sopka Kronotskaya, bearing 338°, and the mouth of Reka Kronotskaya, about 008°. It is difficult to distinguish the mouth of the river from the offing. (31)

The Storozh River, has its mouth situated about 19 miles south-southwest of Mys (Cape) Shubert (Lat. 55° 43' N., Long. 161° 45' E.) There is a fishing station about 2 miles north of the mouth of the Storozh River, and a small river flows into the sea about 7 miles farther north. The depths, about 8 cables off this stretch, of coast, are remarkably even, and range from 12.8 to 14.6 m. (32)

Stolbovaya River issues from a small lake called Lake Stolbovoye (see map) near Lake Nerpich'ye, and flows for a short distance southeast parallel to the coast, separated from the sea bya narrow spit, and then turns northeast to its mouth. The bar has a depth of about 0.9 m over it. The channel runs close to the left bank with depths of up to 2.4 m. The current in the river, before it enters the sea, attains a rate of from 6 to 7 knots. Local craft can enter this river and proceed to Ust' Kamchatsk. (33)

The mouth of Stolbovaya River is situated 6 miles southwest of Mys (Cape) Pokatyy. (34)

Stolbovaya River, connects the northern side of the smaller lake with Ozernyy Bay. This system of lakes and rivers, together cover the whole of the isthmus, which is 29 miles wide and connects the peninsula to the mainland. From these lakes the land rises to the western slopes of the coastal mountains. A wide valley extends right across the peninsula and ends in a bay, situated about half-way along its eastern side. It divides the southern and northern groups of mountains and is prominent from the offing. The coasts of the peninsula are almost everywhere high and are bounded by cliffs in the southern and northeastern parts. They are only slightly indented and there is no fully sheltered anchorage. (35)

STAT

Ozernaya River empties into the Ozernyy Zaliv of the Bering Sea and is 110 km long. (36)

The Ozernaya River rises in the mountains of central Kamchatka. Its total length is about 100 miles. Before flowing into Ozernyy Bay, the river forms a large lagoon, which is enclosed by a low sand and shingle spit. The southern and western sides of this lagoon are low-lying and are covered with grass and small bushes, but its northern side is formed by a cliff at the foot of some hills which rise to an elevation of about 100.6 m. (37)

The mouth of Ozernaya River (Lat. 57° 21' N., Long. 162° 45' E.) is situated between the northern end of the spit and this cliff. It is fronted by a bar which can easily be noticed by the seas breaking over it. The current of the river is strong and, at times, attains a rate of 4 knots. (38)

The mouth of Ozernaya River, 30 miles southwest of Mys (Cape) Ozernoy, can be distinguished by the light yellow, sandy cliffs just north of it, the shore south of it being low. (39)

Local inhabitants report that Ozernaya River is frozen over towards the end of October or in early November and becomes clear of ice about the beginning of middle of May. Also that the mouth of the river and the channel to it are very liable to shift as a result of the fierce southeasterly gales, prevalent in the autumn. They further report that no fixed ice forms along this coast in winter, but that broken drift ice is brought down every year from the north in February and March which disappears later either by the effects of offshore winds or by the action of the swell. (40)

The mouth of the Malan-Vayam River (Lat. 57° 46' N., Long. 162° 29' E.) is located at the extreme southeastern corner of Karaginskiy Bay. (41)

A channel, with depths of 2.3 m to 2.7 m, leads close the eastern side of the bay to the entrance of Malan-Vayam River. The bottom is this vicinity is sand or mud, with rare patches of rock. (42)

A wooden tripodal beacon, about 6.4 m high, painted white, stands near the edge of the cliff at the northwestern extremity of the islet. (43)

The mouth of the Malan-Vayam River, in the extreme south-eastern corner of the bay, is wide and is obstructed by a bar, with depths of 2.7 m over it, lying between its entrance points. Inside the entrance there are depths of from 6.9 m to 9.1 m. The banks of the river are low, sandy and marshy in places. (44)

The mouth of the Uka River, is situated 11 1/2 miles west-northwest of the mouth of Malan-Vayam River. (45)

Uka River, also known as Nachika River, is of considerable size and enters the sea by a single mouth (Lat. 57° 49' N., Long. 162° 06' E.), which is difficult to distinguish from the offing, but can be identified by the sandy cliff described above. The southern entrance is marked by a wide, blunt, low spit containing marshy land bordered by a shingle beach. The northern is marked by a small narrow shingle spit extending in the general direction of the coast. A short sandbank extends at right angles to the coast, from the southern, and a shorter one extends eastward from the northern entrance

point. The mouth itself is clear and faces eastward. Before entering the sea, the river flows north through two lagoons, and then makes a right-angled turn just within its mouth, which is more than one cable wide, and discharges in an easterly direction. The lower reaches of the river are bordered by low-lying sandy or marshy land.

The mouth is fronted by a bar, with a minimum depth of 2.4 m, situated half a mile off it. The depths increase regularly on either side of the bar to 6.9 m one mile off shore, and from 9.1 m to 11.0 m in the middle of the river's mouth. The right bank is steep-too with depths of 6.9 m, close under it. Uka village stands on the left bank nearly abreast the entrance. It is one of the largest habitations on this coast. (46)

The tidal streams in the mouth of the river attain a rate as high as 4 knots. (47)

From the mouth of the Uka River, the western shore of the bay trends northward for 14 miles to the mouth of Khalyulya River. It is a uniform stretch of sand and shingle beach, backed by very gently rising slopes, covered nearly to the coast by grass and farther inland by bushes, and reaching to a line of hills running a great distance inland. This stretch is clear of dangers, with depths of from 5.5 m to 5.9 m, about half a mile off shore; the bottom is everywhere sandy. (48)

There is a fish cannery 5 1/2 miles north of the mouth of Uka River, and a fishing station stands on the coast about 2 miles farther north. (49)

Khalyulya River empties into the sea 14 miles north of the mouth of Uka River. (50)

In its lower reaches Khalyulya River flows south, and not far from its mouth (Lat. 58° 03' N., Long. 162° 02' E.,) splits into several channels, which rejoin just within its entrance, where it is also joined from south by another branch, which connects with the northern branch farther inland and forms a low-lying, sandy island between them. At its entrance, which lies within a narrow sand spit, the river is less than half a cable wide with minimum depths of 1.8 m to 2.1 m, and the same depths within. Khalyulya village is situated on the right bank of the western branch more than one mile north of its mouth. (51)

Two mountains, which form the easternmost spurs of the range (52) which runs parallel to the coast at a considerable distance inland, lie 10 miles west of the mouth of Khalyulya River. The southern is 1,015 m high and has a pointed summit rising from a rocky base. The northern is 1.033.3 m high, with several jagged peaks lying in a north-northeasterly and south-southwesterly direction, and is joined to the former by a spur. These mountains are good navigational marks. (53)

The depths in the entrance to Ukinskaya Bay vary between 21.9 m and 32.9 m thence they decrease regularly to its western and southern shores, off which there are depths of 5.5 m to 5.9 m, half a mile offshore. On the eastern side of the bay the depths are less regular. (54)

STAT

Anchorage may be obtained off the mouth of the Uka River, in depths of 8.2 m to 9.1 m, from one to 1 1/2 miles off shore, with the northern entrance point bearing 190°. Anchorage closer inshore is difficult because of shoal patches, with depths of 5.0 m to 6.9 m, extending seawards. (55)

The mouth of Russakovka River (Lat. 58° 18' N., Long. 162° 09' E.,) lies 15 miles north northeast from the mouth of the Khalyulya River. The southernmost of four fishing stations on this stretch of coast is situated at the northern entrance of the Khalyulya River. (56)

The Russakovka River (also called Rusakova) (57), flows into the sea through a narrow lagoon, which extends 9 1/2 miles north from its mouth, inside a narrow sand and shingle spit. Many streams and small rivers flow into this lagoon. The mouth of the Russakovka River which is also the exit of the lagoon, lies between the ends of two narrow spits, and is less than one cable wide and fronted by a wide bar with a depth of 2.7 m. Sandbanks, marked by breakers, extend off the ends of each of the spits. Directly within the bar, there are depths of from 3.7 m to 5.5 m. In the lagoon the depths vary from 2.7 m to 4.3 m, but there are bars with depths of 0.9 m to 1.2 m over them. (58)

The line of cliffs, extends to a point half a mile south of the mouth of Russakovka River, The ground rises very gradually from the western shores of the lagoon and the whole of the plain near the coast is covered with grass and bush. The nearest mountain range lies far inland. (59)

There is anchorage, in depths of from 9.1 m to 10.1 m on sand and shingle, about 8 cables off shore from a fishing station, situated 4 miles north of the mouth of Russakovka River. (60)

The mouth of Pankara River lies north northeast 20 miles from the mouth of Russakovka River. For the first 10 1/2 miles the coast is formed by a narrow sand and shingle spit enclosing the lagoon, then it rises in light yellow sandy cliffs for the next 6 1/2 miles. These cliffs are from 30.5 to 45.7 m high at their center and gradually become lower towards each end. The coast becomes low and sandy at the mouth of the Pankara River. Two fish canning factories are located there, one about 5 miles north of the mouth of Russakovka River, the other 2 3/4 miles south of the mouth of Pankara River. There is a fishing station between them. (61)

The Pankara River enters the northern part of the mentioned lagoon which is shallow and has a bar extending northeastward with a depth of 1.8 m over it. (62)

Ivashka village stands on the bank of the river about 5 miles west of its mouth. On the northern spit and 3 cables from the river mouth is a fishing station. The best anchorage is 6 cables off shore about halfway between the fishing station and the river mouth, in a depth of 9.1 m shingle. The holding ground is poor. (63)

The outgoing stream in the entrance and also in the channels of the lagoon attains a rate of from 3 1/2 to 4 knots. At half-flood an almost imperceptible stream sets into the lagoon. (64)

DrankaRiver flows southeastward from the inland mountain range, but in its lower reach, it turns abruptly northeast 7 miles from its mouth and flows

STAT

parallel to the coast, being separated from the sea by a narrow sand and shingle spit. It forms a lagoon within its mouth where it is joined by the Utki Vayam River which is connected with it by side channels. These rivers flow into the sea through a single mouth, the entrance channel to which lies between the northern entrance spit and a sandbank which extends for 3 cables as a prolongation of the southern entrance spit. The bar is narrow and has a minimum depth of 1.5 m over it. Within it, the depths increase from 2.7 m to 3.7 m, in the entrance and decrease upstream from 2.4 m to11.8 m. (65)

The village of Dranka is situated 10 1/2 miles upstream, 3 3/4 miles from the coast. A building, formerly a church, in this village, is prominent in the offing. (66)

The depths about one mile southeast of the mouth of Dranka River, were reported in 1937 to be less than charted, and the "Daisan-unyu-Maru", with a draft of 5.0 m reported, also in 1937, touching bottom in a position about 8 1/4 miles east northeast of the mouth of the same river. (67)

From the mouth of the Dranka River, the coast trends northeast for 6 1/2 miles to a cliffy headland, and north northwest for 1 1/2 miles to the mouth of the Makarova River. (68)

The Makarova River and the Kayum River from separate lagoons before entering the sea through a common mouth, which is 8 cables wide. These lagoons are separated from the sea by narrow sandy spits. (69)

The lagoon formed by the Makarova River is extensive and consists of two basins. Its southern shore is a low cliff and its northern and western sides are low swamps intersected by many channels of the river. There are several islets in it. The mouth of the river (Lat. 58° 53' N., Long. 162° 48' E.,) is fronted by a bar with a depth of 1.8 m over it. Between the southern entrance spit and the islet the depths increase from 3.7 m to 5.5 m. In the central part of the northern basin they vary from 3.0 m to 4.3 m and in the southern basin, from 1.2 m to 2.7 m. (70)

The bar of the Kayum River is situated off the entrance of its lagoon and has a depth of 0.9 m. In the entrance there are depths of 1.8 m to 3.0 m, gradually decreasing to 0.6 m at the upper end of the lagoon. As the depths in the vicinity are irregular, this locality should be avoided. (71)

The outward flow from these rivers causes discoloration for some distance off shore. (72)

Two fishing stations stand on the spit, one mile and 3 miles, respectively, north of the mouth of Kayum River. About half a mile off this stretch of coast, the depths are 6.4 to 8.2 m, mostly sand, occasionally mixed with shingle. (73)

Karaga River flows into the head of Karaga Bay of Mys (Cape) Seleniya, the mouth of this river is shallow and boats can hardly enter at low water. (74)

Ossora Bay, north of Karaga Bay is entered between Mys (Cape) Lozhno-Kuzmicheva and the southwestern extremity of a spit, 5 miles north northeastward. (75)

Tymlat (Tuumlyat) Bay is entered between a point about 5 miles north of the northern end of the spit previously mentioned, and Cape Pakklan (Lat.59°38'N.,

STAT

The Tymlat River discharges into the Tymlat Bay 10 1/2 miles southwest of Mys Pakklan. (77)

A fishing station, with a large storehouse, is situated about 4 miles southeast of the mouth of Tymlat River, and Tymlat village, with a trading post and a school, is situated on the river about one mile from its mouth. (78)

According to reports from local fishermen, the depths in the mouth of the Tymlat River are not more than 1.5 m at high water with numerous shoals extending half a mile off shore. (79)

c) Lakes On Kamchatka

The numerous lakes of Kamchatka may be divided into volcanic, tundra and river estuary lakes. (80)

The largest lakes on Kamchatka are the Kronotskoye, Nerpich'ye, Kuril'skoye and Palanskoye. (81)

Lake Kronotskoye, the largest lake of volcanic origin, has an area of some 2,000 sq km (Kamchatskiy Kray, p. 9) and is surrounded on all sides by active and inactive volcanoes of the Vostochnyy Khrebet. (82)

Lake Kronotskoye, situated near Kronotskaya sopka, which is 3,528 m high (83) and is about 20 km long (84) and 128 m deep. (85)

Stormy Lake Kuril'skoye, in south Kamchatka, (86) is the most remarkable of the lakes (87). It is over 300 m deep (88), 306 m deep according to some sources (89), is surrounded on all sides by inactive volcanoes (90) and lies itself in the crater of a dead volcano. (91)

The shores of Lake Kuril'skoye consist mainly of pumice stone and the lake got its name from the Kuril or Ainu people once inhabiting the southernmost tip of Kamchatka. (92)

In the northern part of Kamchatka lies the large Palanskoye Lake (93).

The Nerpich'ye Lake, locally known under the name of Kolkokro (94), separated from the ocean by sandy spits, is situated on the eastern shore of Kamchatka, at the estuary of the Kamchatka River, and is about 25 km long and wide. It is connected with the river by a laguna-channel 4 to 6 m deep. Seals enter the lake along this channel, coming from Kamchatka Bay. The north eastern part of the narrow straits links the lake with another large lake called Kultuchnoye, which is about 20 km long and up to 12 km wide. (95)

Lake Ushki, in the Kamchatka River valley, is almost 1 km long and a little less wide, narrowing considerably at the channel that links it with the Kamchatka River. (96)

Lake Ushki does not freeze in the winter and its year-round temperature is 5 Centigrade. It is a fish-spawning place, but the area being too small for all the fish during the spawning season, only the strongest manage to find a spawning place. The excess fish is caught and bred at the fish breeding farm on the lake. (97)

STAT

Lake Utinskoye, near Paratunka village, some tens of km from Petropavlovsk, has healing muds. The sanatorium at Paratunka treats rheumatism and gynecological diseases. (98)

As in other volcanic areas, there are numerous hot springs in Kamchatka, such as the Paratunskiye near Petropavlovsk, the Nalachevskiye, situated between the Avachinskaya and the Zhupanovskaya mountains. These springs with waters of 72° and issuing from lava flows of andezite, are very rich in boron and arsenic. They deposit great quantities of arsenic travertine. (99)

In the Eastern volcanic zone there are many hot springs and geysers. Some of the latter spout boiling water to a height of 10 - 15 m. (100)

STAT

b) Rivers of the East Coast of Kamchatka

1) BSE, v. 19, 1953, p. 552

2) Davydov, p. 510, v. II, 1955

3) Serg. p. 44

4) Ibid.

5) BNG, p. 490, 1954

6) Serg. p. 44-45

7) Serg. p. 44-45

8(a) Serg. p. 44

9) SSE, v. 1, 1929, p. 6

10) SSR, v. 1, 1929, p. 6; BSE v. 1, 1949 p. 63

11) BSE, v. 1, 1929, p. 63

12) SSE, v. 1, 1929, p. 6

13) Ibid.

14) Bolshakov & Rub. p. 20

15) Serg. p. 780

16) SSE, v. 1, 1929, p.6

17) Serg. p. 44

18) BNG, p. 464, 1954

19) BNG, p. 463, 1954

20) BNG, p. 464, 1954

21) IBID.

22) Ibid.

23) Ibid., p. 465

24) Ibid.

25) Ibid.

26) Ibid.

STAT

27) BNG, p. 465, 1954

28) Ibid.

29) Ibid.

30) Ibid. p. 466

31) Ibid.

32) Ibid., p. 472

33) Ibid. p. 483

34) Ibid.

35) Ibid. p. 478

36) BSE, v. 19, 1953, p. 553

37) BNG, p. 484, 1954

38) Ibid.

39) Ibid. p. 481

40) Ibid. p. 484

41) Ibid. p. 490

42) BNG, p. 490

43) BNG, p. 490

44) Ibid.

45) Ibid. p. 491

46) Ibid.

47) Ibid.

48) Ibid.

49) Ibid.

50) BNG, p. 491

51) Ibid.

52) Ibid.

53) Ibid. p. 492

54) Ibid.

55) Ibid.

STAT

56) BNG, p. 492

57) Serg. p. 45

58) BNG, p. 493, 1954

59) Ibid.

60) Ibid.

61) Ibid. p. 500

62) Ibid. p. 501

63) Ibid.

64) Ibid.

65) Ibid.

66) Ibid.

67) Ibid.

68) Ibid. p. 502

69) Ibid.

70) Ibid.

71) Ibid.

72) Ibid.

73) Ibid.

74) Ibid. p. 503

75) Ibid. p. 504

76) Ibid. p. 506

77) Ibid.

78) Ibid., p. 507

79) Ibid.

80) Kamchatskiy Kray, p. 9

81) BSP, v. 31, 1937, p. 149

82) Kamchatskiy Kray, p. 9

83) Berg, 1952, p. 488

84) BSE, v. 31, 1937, p. 149

STAT

85) BSE, v. 19, 1953; p. 553; BSE, v. 31 1937, p. 149; Berg, 1952, p. 488

86) Kamchatskiy Kray. p. 9

87) BSE, v. 31, 1937, p. 149

88) Kamchatskiy Kray, p. 9

89) Berg, 1952, p. 488; Berg, 1955, p. 434; BSE, v. 19, 1953, p. 553

90) Berg, 1955, p. 434

91) Berg, 1952, p. 488; Kamchatskiy Kray, p. 9

92) Berg, 1952, p. 488

93) BSE, v. 19, 1953, p. 553

94) BSE, v. 19, 1953, p. 553

95) SSE, v. 1, 1929, p. 736, 737

96) Bytovoy, p. 115

97) Ibid. p.

98) P: Ogonek, No. 26, June 1956, p. 32

99) Berg, 1955, p. 434

100) BSE, v. 19, 1953, p. 553

STAT

CHAPTER IV

The Kamchatka River - General Remarks

The Kamchatka River, the largest river in the Kamchatka Peninsula (1) is about 700 km long (2) and has a drainage basin of 56,400 sq km (3). The river flows at the bottom of the long and broad Kamchatka River valley. (4)

The Kamchatka River valley, locally called Dolina (valley) or Kamchatka lies between the Middle and the Eastern mountain ranges (5).

The total area of this valley, including the slopes of the bordering elevations is about 2,000,000 ha (6). The valley is some 500 km long (7) and widens gradually northward, reaching a maximum of over 60 km at Lat. 56° N(8)

The soft slopes of the valley are covered with birch and mixed forests and grass (9). The taiga in this valley is extremely ancient (10). In its clear areas, as on the banks of the rivers of the western coast of the peninsula, there are good meadowlands. (11)

The climate of the Kamchatka River valley and the presence of the major river of the peninsula have made it economically the most important and also the most populated area of the Kamchatka peninsula. (12)

Description of the Kamchatka River

a) Upper Reaches

The Kamchatka River is formed by the confluence of two small streams (13), the Kenuzin River (left stream) and a small nameless stream (right stream)(14) that takes its source from the sopka Bakenina (15) in the southern part of the Kamchatka peninsula. (16)

The Bakenina sopka or volcano lies in a mountain area called the Kamchatskaya Vershina (Kamchatka Summit) from where starts the Srednyaya Avacha River, the right hand headwaters of the Kamchatka River and the left hand headwaters of the Kovycha River. The volcano is about 2,300 m above sea level and may be seen not only from the village of Koryaki, 75 km away, but also from the Avacha Bay, about 120 km away. (17)

Sources still vary as to the exact origins of the Kamchatka River. One source states it starts in the northern slopes of the Malkinskiye mountains (18). Another source says it takes its source in the northeastern spurs of the Ganal'skiye Vostryaki (19). One authority also says it starts in the marshy plains of the Ganal'skaya tundra plateau (20) and this is confirmed by Berg, who mentions that the Kamchatka River starts close th the headwaters of the Bystraya River, in the same marshy plain as that stream which empties into the Sea of Okhotsk on the Western shore of the peninsula. (21) The Kamchatka River belongs to the basins of two seas: the sea of Bering and the sea of Okhotsk. (22)

The Kamchatka River flows north to the confluence of the Yelovka River, a left bank tributary, then turns sharply east, breaking through the Vostochnyy Rnage (23) or that part of it called Kumroch range, (24) and finally empties into the Kamchatka Bay of the Bering Sea. (25)

In its upper reaches, the Kamchatka River is a mountain stream flowing in a valley 8 to 12 km wide, with a single stony bed, from 20 to 35 km wide and abounding in shoals and rapids. (26)

Below the village of Pushchino, in the upper reaches, the Kamchatka River bed splits into channels, becomes sinuous and cluttered with tree stumps. (27) The valley widens and there occur lacustrian depressions. (28)

Further downstream, from the village of Sharoma (Sharomy according to another source - (Bol'shakov and Rub. -- see map), to the estuary of the Kirganik River, a left bank tributary, the Kamchatka River flows between low, easily eroded banks, in a river bed composed of sand and shingle sediments, with numerous sand spits and is cluttered with tree stumps. The width of the river increases to 40 m. Marshy sectors occur frequently along the banks and the confluence of the tributaries usually cause the formation of rapids and shoals. The river alternately breaks up into channels or again flows in a single bed. (29)

b) The Middle Reaches of the Kamchatka River

The middle reaches of the Kamchatka River may be said to start at Mil'kovo, where the Kamchatka River becomes navigable for shallow draft vessels (30) although another source states it is navigable already from Mashury (31), and yet another says it is navigable from Verkhne-Kamchatsk. (32)

Between Mil'kovo and Kirganik lies a level area criss-crossed by the small tributaries of the Kamchatka River. This area is reported by one source to be the most convenient for agriculture. Pastures are excellent, climatic conditions favorable not only for vegetable growing, but also for cereal crops. The Kamchatka River is deep enough in this area to allow navigation of small craft and rafts until autumn. In the spring and early summer, heavy cargo can be easily brought up the river. (33)

From Mil'kovo village to Klyuchi, much further downstream, small vessels with a draft not exceeding 1 m can navigate the river (34).

Mil'kovo is connected to Petropavlovsk by a telephone line. In 1931 it was planned to build a road from Mil'kovo to Petropavlovsk. (35)

Below the confluence of the Kirgana River (also called Kirganik), where the village of Kirganik is located on the left bank of the Kamchatka River (36), the character of the Kamchatka River changes sharply. Cliffs or bluffs up to 85 m high occur either on one or the other bank. In places the banks drop to a height of only 2 m. The river bed becomes 80 m wide and below the estuary of the Kimitina River (37), a left bank tributary emptying into the Kamchatka River downstream from Mashura village, (38) it is 100 m wide. (39)

STAT

Below Dolinovka, the current of the Kamchatka River slows down, and small boats sail downstream at 14 km per hour. (40)

Below the estuary of the Tolbachikha River, a right bank tributary, the Kamchatka flows in its lower reaches, through a sinuous bed, breaking up occasionally into channels, and becomes as much as 450 m wide. (41)

Downstream from the estuary of the Kozyrevskaya River, a left bank tributary, lies the village of Kozyrevsk, on the right bank of the Kamchatka River (42) which was the largest sovkhoz of the oblast' in 1934 (43). At that time it had a club, a radio center, a telephone line connection with Petropavlovsk. (44)

Since that time, the landing stage of Kozyrevsk has been the object of considerable improvements according to a September 1957, report (45).

Beyond Kozyrevsk lies the village of Kamenka (Bol'shakov and Rub. map) and below Kamenka, on the sector between the village of Ushki and the village of Kresty, the Kamchatka River crosses two small lakes. (46)

The Kamchatka River flows northward from its sources until shortly before it receives its main and left hand tributary, the Yelovka River. Between the confluence of the Yelovka River, and the Belaya River, another left hand tributary, the Kamchatka River turns sharply east and henceforth, flows in an almost latitudinal direction, cutting its way through the "cheeks" of the Vostochnyy Khrebet (Range). (47)

c) The Lower Reaches of the Kamchatka River

The lower reaches of the Kamchatka River may be said to begin at the confluence with the Yelovka river, where is located the village of Klyuchi, reported to be the "most populated place in Kamchatka after Petropavlovsk". (48)

Then the Kamchatka River crosses the foothills of the Klyuchevskaya sopka (volcano) and somewhat further forms the Krekurlinskiy rapid and still further downstream, the rocky Pingrinskiy shoal. (49) Great depths alternate with shoals all the way from Klyuchi to the estuary. (50)

Upstream from the village of Kamaki, the Kamchatka River cuts its way through rocky banks (51) and flows through a wide flood bed reaching 10 to 12 km in width. Below the village of Kamaki, numerous islands appear in the river bed. (52)

Further downstream, from the village of Kamaki, the Kamchatka cuts its way through almost sheer rocky banks for some 34 km. (53)

Upon leaving the mountains, the Kamchatka River flows between low floodable banks, splitting into channels and forming numerous islands. The width of the river varies here from 400 to 1.000m. (54)

After the confluence of the Kamchatka River with the Nerpich'iy rukav (channel), linking the river to Lake Nerpich'ye, the Kamchatka widens even more. (55)

Nearing its estuary, the Kamchatka River receives to the left the Ozernaya River tributary, linking it to Lake Nerpich'ye. (56)

STAT

After the confluence of the Ozernaya River, the Kamchatka turns sharply to the right and for some 12 km flows along the seashore, separated from the sea by a long sandy "koshka" or spit (57) caused by river and sea sedimentation, developed in the estuary of the Kamchatka River. (58)

d) Estuary of the Kamchatka River

The Kamchatka River empties into the Kamchatskiy zaliv (Bay), on the eastern shore of the Kamchatka peninsula. The bay is 141 km wide from north to south and extends 74 km inland. The bay is open to winds and not convenient for anchorage of vessels. The more sheltered northeastern part is not convenient owing to its uneven bottom. (59)

The Kamchatka River is 2 km wide at its estuary (Bol'shakov and Rub. p. 20) the depth is of 8 m. (60)

The entrance channel to the river runs between two broad sandbanks, which extend off the ends of the two spits which form the mouth of the river. This entrance is obstructed by a bar, which a minimum depth of 1.5 m to 1.8 m over it, and which lies between the extremities of the banks (61) that hinders the passage of deep draft vessels from the ocean into the river. (62) In the approach the depths decrease gradually, but within the bar, they increase immediately to 5.5 m and 6.4 m. The entrance channel, the bar, and the banks change after the spring freshets and particularly with on shore gales. Vessels drawing up to 3.0 m with local knowledge can enter the river at high water springs. (63)

Westward of the mouth of the Kamchatka River, the depths are very regular and are from 11.0 to 12.8 m, a little less than 5 cables off shore. East of the mouth of the Kamchatka River, the depths are greater, being from 14.6 m to 20.1 m about 5 cables off shore. (64)

The whole of the low sandy coast at either side of the mouth of the river is steep and safe, except for the banks at the entrance, referred to above. In consequence, the breakers, though high and very short, do not extend far off shore. (65)

The tidal streams set parallel to the coast at a rate of one to 2 knots but, near the head of the bay, they occasionally attain a rate from 3 to 4 knots. Tide-rips and eddies are sometimes formed. (66)

Anchorage may be obtained in depths of from 11.0 to 12.8 m west of the mouth of the Kamchatka River, or in depths of 14.6 to 20.1 m, eastward of the mouth. A long swell often sets in during calm weather without warning, and soon becomes heavy. The surf is particularly heavy abreast the anchorages and it is not advisable to anchor within one half to three-quarter of a mile of the beach. The tidal streams cause a vessel to ride beam on to the swell. (67)

Although the entrance to the river is clear of dangers, it is completely exposed to southerly swells, which prevail during the summer and cause heavy and dangerous breakers on the coastal banks. The ebb stream is too strong for boats under oars and the breakers are the heaviest.

STAT

The best time for entering is shortly before high water, when the breakers are smallest and the current weakest. At the coastal fishing stations, mentioned below, landing can only be made by means of specially built local craft called kungas. (68)

At the spit where the estuary of the Kamchatka River meets the ocean current, high waves prevail even during quiet weather. The least wind or tidal surf causes the formation of enormous white breakers called "bary". Only experienced navigators know how to handle a cutter through a "bar". (69)

When a cutter approaches the bars of the Kamchatka River at low tide, the very swift current flowing towards the Kamchatka mainland becomes even swifter. Water brought in by the high tide flows from Lake Nerpich'ye into the river. This lake serves as a deep auxiliary reservoir of the ocean. The future of the town of Ust' Kamchatsk which is located on the shore, is dependent on the development of the lake. There is a project to build a canal from the lake to the ocean and to create a sheltered harbor there. The completion of such a project would facilitate the movement of boats, cutters and steamers from and to the river. (70)

Tributaries of the Kamchatka River

The Kamchatka River has some 120 tributaries (70a), the largest being the left bank Yelovka River. (71)

Starting from the headwaters, the main tributaries of the Kamchatka River are the following:

> Pushchina, Sheroma, Bol'shaya and Malaya Klyukvina, Adrianovka, Kovycha, Mil'kovka, (Shigachik), Kirganik (72) or Kirgana (73), Kimitina (Kitkhlinykh), Mashura (Kontopshokh), Shchapina, Bol'shaya Nikolka, Tolbachik, Kozyrevka, Studenaya, Ushki, Kryuki, Krestovaya, Yelovka, Khapicha, Il'chunets (Il'chinoch'), Rat(d)uga, and Ozernaya. (74)

The largest tributaries of the Kamchatka River are the following left bank tributaries: the abundant and wide Kirganik, the Kimitina, the Yelovka which is 150 km long, with several tributaries. Large right bank tributaries are the Kovycha, Shchapina, Tolbachik and the Khapicha rivers. (75)

Peculiarities of the Kamchatka River

The Kamchatka River is extremely capricious. It has been known to wander away from its main river bed 20 to 30 m in a single season. (76)

The fairway of the Kamchatka River is greatly cluttered by uprooted trees carried by the swift current into the center of the stream. The river continually erodes its banks and the entire course of the Kamchatka River is strewn with submerged and above water tree stumps, a dangerous obstacle to navigation. (77)

STAT

The Kamchatka River also has numerous shoals and sandspits (78). Sandy shoals called "peski" form in places where the River describes a bend and are so numerous that the native calculate distances by the number of "sands".(79)

The width of the Kamchatka River varies from 0.5 km to a very narrow channel (80). The Taiga extends over an enormous extent of the river. In 1948, there were two lumber enterprises, the Shapinskiy and the Kozyrevskiy, reported in 1948 to be in operation on the Kamchatka River (81) exploiting the great timber wealth of gigantic pines, larches and birches. (82)

Thousands of channels, streams and small rivers empty into the Kamchatka covering the fairway with fantastic accumulations of driftwood. (83)

Freight Traffic on the Kamchatka River

Despite its shortcomings, as a waterway, the Kamchatka River has enormous significance for the peninsula, because it is the only important waterway that penetrates deep inland (84) and traverses the economically most developed area of the Kamchatka peninsula. (85)

The river is the principal means of communication between the hinterland the seaboard (Ust' Kamchatsk and Petropavlovsk (in the summer), Timber growing along the river is carried downstream in rafts by the Ust' Kamchatsk port fleet to the estuary of the river. (86)

The navigable qualities of the Kamchatka River are not fully utilized as in 1936, the entire fleet sailing on the Kamchatka River consisted of 22 units, including self-propelled and non self-propelled vessels, and most of the self-propelled craft were shallow draft motor boats in 1933. (87)

In 1934, the entire river fleet of this stream consisted of 25 boats, most of which were not mechanized. (88)

Efforts were made to increase traffic on the Kamchatka River. The pre-war Five-Year plans called for 50,000 to 60,000 tons increase of freight traffic as compared with 1937. (89)

This increase in traffic was urgently needed as lack of sufficient means of river transport on the Kamchatka broke up the supply of the Kamchatka valley population, supplies being brought in not more than once a year by sleds. It also made the shipment of timber to canneries difficult and rendered problematic the sale of timber by the Klyuchi kombinat of forestry. (90)

After the war, efforts continued, and freight turnover of freight destined for points upstream the Kamchatka River, as well as the importance of the port of Ust' Kamchatsk, increased from year to year. (91)

During the six months of the 1957 navigation season, shipments of timber on the Kamchatka River increased almost 20% as compared to the same period in 1956. (92)

STAT

Timber was formerly shipped only during the summer, but now Ust' Kamchatsk works all year around, and in the first quarter of 1957, the port workers and sailors of the Kamchatka River had fulfilled their quarterly plan of timber shipments. (93)

Tug boats on the Kamchatka River tow rafts of a volume reaching 2,500 cu m, and barges of from 100 to 1000 register tons with general cargo. The runs are from 70 to 380 miles long. (94)

Ice Conditions and Hydrography

The ice setting period of the Kamchatka River varies owing to the presence of hot springs in the valley along its course and its swift current. (95)

The swift current and the abundance of warm springs cause the ice cover on the Kamchatka River not to be solid. There are places free of ice in the winter. (96)

The Kamchatka River freezes by the end of November and in some years in December. It opens up by the end of April or beginning of May. (97) But a 1957 source reported that the Kamchatka River was free of ice only by 30 May, thus, retarding considerably the opening of the navigation season. (98)

The Kamchatka River is at its highest level during the spring freshets that occur in June, when it rises 2.7 m above its normal level. The river is at its lowest level at the end of September. During the spring freshets no salt waters enter the river in its estuary sector. (99)

STAT

UNCLASSIFIED
CLASSIFICATION (SECURITY INFORMATION when filled in)

Reference Notes - Chapter IV

1) Berg, 1952, p. 484; BSE, v. 19, p. 554; Ocherki Akad. p. 233

2) Serg. p. 47; BSE, v. 19, 1953, p. 554

3) BSE, v. 19, 1953, p. 554

4) Map

5) BSE, v. 19, 1953, p. 554

6) Bol'shakov & Rubinskiy, p. 19, 1934

7) BSE, v. 19, 1953, p. 552

8) Serg. p. 47

9) Bol'shakov & Rub. p. 20

10) Bytovoy, 1948, p. 89

11) Bol'shakov & Rub. p. 20

12) Serg. p. 47

13) BSE, v. 19, 1953, p. 554

14) Davydov, p. 510, v. II, 1955

15) BSE, v. 19, 1953, p. 554; B. I., Piyp, 1941, p. 33

16) Kamchatskiy Kray, p. 8

17) Piyp, 1941, p. 33

18) Ocherki Akad. p. 233

19) Davydov, p. 510, v. II, 1955

20) Serg. p. 46

21) Ibid. Berg, 1952, p. 484

22) Berg, 1952, p. 484

23) Kamchatskiy Kray, p. 8

24) Kamchatka, 1929, p. 78-79

25) Kamchatskiy Kray, p. 8

26) BSE, v. 19, 1953, p. 554

27) Davydov, p. 510, v. II, 1955

STAT

28) BSE, v. 19, 1953, p. 554

29) Davydov, p. 510, v. II, 1955

30) BSE, v. 19, 1953, p. 553, 554

31) Davydov, p. 510, v. II, 1955

32) BSE, v. 31, 1937, p. 154

33) Kantorovich, p. 141

34) Bol'shakov & Rubinskiy, p. 20

35) Kantorovich, p. 141

36) Bol'shakov & Rub. see map

37) Davydov, p. 510, v. II, 1955

38) Bol'shakov & Rub. map

39) Davydov, p. 510, v. II, 1955

40) Bytovoy, p. 76, 1940

41) Davydov, p. 510, v. II, 1955

42) Bol'shakov & Rub. map

43) Ibid. p. 107

44) Kantorovich, p. 114

45) N: Vodnyy Transport, No. 114, 21 Sept, 1957, p. 4, col. 1.

46) Davydov, p. 510, v. II, 1955

46) Bol'shakov & Rub. map

47a) See map

48) Bytovoy, p. 115, 1948

49) Davydov, p. 510, v. II, 1955

50) Bol'shakov & Rub. p. 20

51) BSE, v. 19, 1953, p. 554

52) Davydov, p. 510, v. II, 1955

53) BSE, v. 19, 1953, p. 554; Davydov, v. II, 1955, p. 510

54) Davydov, p. 510, v. II, 1955

STAT

55) Kantorovich, p. 72

56) Davydov, p. 510, v. II, 1955

57) Davydov, p. 510, v. II, 1955

58) BSE, v. 19, 1953, p. 554

59) BSE, v. 31, 1937, p. 159

60) BSE, v. 31, 1937, p. 153

61) BNG, p. 474, 1954

62) Bol'shakov & Rub. p. 20

63) BNG, p. 474

64) BNG, p. 474, 1954

65) BNG, p. 475, 1954

66) BNG, p. 475, 1954

67) BNG, p. 475, 1954

68) BNG, p. 475, 1954

69) Bytovoy, p. 212, 1948

70) Kantorovich, p. 73
70a) Kamchatskiy Kray, p. 8
71) BSE, v. 19, 1953, p. 554

72) Serg, p. 47

73) Bol'shakov & Rub. map

74) Serg, p. 47

75) Ibid.

76) N: Vodnyy Transport, No. 65, 30 May 1957, p. 4 col. 5

77) Kantorovich, p. 103

78) N: Vodnyy Transport, No. 65, 30 May 1957, p. 4, col. 5

79) Kantorovich, p. 104

80) Ibid. p. 103

81) Bytovoy, p. 89, 1948

82) Kantorovich, p. 103

83) Ibid.

STAT

84) Bol'shakov & Rub. p. 20

85) Serg. p. 781

86) N: Vodnyy Transport, No. 114, 21 Sept 1957, p. 4, col. 1

87) Bol'shakov & Rub. p. 107

88) Serg. p. 781

89) Ibid. p. 782

90) Ibid.

91) N: Vodnyy Transport, No. 45, 13 April, p. 1, col. 2, 1957

92) Ibid. No. 114, 21 Sept. 1957, p. 4, col. 1

93) Ibid. No. 45, 13 April 1957, p. 1, col. 2

94) Ibid. No. 31, 13 March 1958, p. 3, col. 7

95) BSE, v. 19, 1953, p. 554

96) BSE, vol. 31, 1937, p. 153

97) BSE, v. 19, 1953, p. 554

98) N: Vodnyy Transport, 30 May 1957, p. 4, col. 5

99) BNG, p. 475, 1954

STAT

CHAPTER V

A. Petropavlovsk Na Kamchatke

The town of Petropavlovsk stands on the northern and eastern shores of the inner harbor (1) on the slopes of the Mishennaya, Petrovskaya and Nikol'skaya hills (2).

Petropavlovsk was founded in 1740 by Captain Bering, and was named after the vessels "St. Petr" and "St. Pavel", the first two vessels that wintered there. (3)

By 1939, over 20,000 people inhabited Petropavlovsk, and over 500 houses had been built. The main part of the population consisted of workers of the machine shops, the tin can factory, the cannery, the refrigerator plant and the bakery. (4)

In 1944, the town had an estimated population of 40,000. It is the administrative center (5) and principal port of the Kamchatka Peninsula. (6)

In 1948, an author mentions its four parallel streets lined with new houses the first street, Lenin Street, starting at the harbor (7). A 1954 source reports that in the spring of that year, young poplars were planted on the Lenin Street. (8)

The fourth, Nagornaya street, seems to crown the crests of the hills. (9)

A 1954 source also added that a new street was reported to have been built in Petropavlovsk and was called Okeanskaya street. Two new settlements have also been built in Petropavlovsk according to one source (10) and another source reports that a large settlement was built there recently. (11)

The wide Kultushnoye Lake divides the town into two sections. The lake lies like a deep crystal cup, at the foot of the imposing Mishennaya sopka. (12) In 1948 it was reported that the city had developed greatly recently and that it took at that time 2 hours to cross the city from end to end. (13)

There are as many monuments as streets in Petropavlovsk. A small monument to Laperouse, an explorer, stands on Lenin Street, in the little square where there are fountains. (14)

On the same street stands a simple obelisk of granite, the latest erected in Petropavlovsk, in honor of the sailors of the Pacific Fleet, who fell during the liberation (sic) the Kuril Islands. (15)

On Sovetskaya Street, in front of the new brick building of the Radio Committee, on a hillock surrounded by an iron grating, stands a monument erected to Vitus Bering, the founder of the city, and with the date of 1741 on it. (16)

The "Slava" or Glory memorial, an iron obelisk 10.7 m high, commemorating the victory of the Russians over the Anglo-French landing party in 1854, (17)

STAT

rises on the top of Nikol'skaya Gora (mountain), in the Park of Culture and Rest. According to another source, it is made of red stone and is adorned with a mace and a cross. It can be seen from all parts of the Avachinskaya Bay. (18)

A motor road leads along a sinuous mountain route above the Avachinskaya Bay from Petropavlovsk to the airport, mentioned as being "somewhere near the city." (19)

Airplanes from Khabarovsk land three times a week in Petropavlovsk (19a) and "PO-2" planes are mentioned as linking the oblast' center of Kamchatka to its rayons. (20)

Petropavlovsk airport must be a large one at present, because an article on developments in the Far East published in the 31 December 1957 issue of "Krasnaya Zvezda" newspaper mentioned that "recently Ivan Ignat'yevich Malyakin, Hero of Socialistic Labor and Deputy of the Supreme Council of the USSR, left Petropavlovsk in the morning on board a "TU-104" airplane and that same evening in the Bol'shoy Theater" in Moskva, the flight lasted 10½ hours. (21)

The largest industries in the city are a shipyard producing cutters, fleet barges, etc., a machine plant which makes spare parts for the fishing and various equipment for the fishing industry of Kamchatka, including automatic fish cleaning machines and fish pumps, a can producing factory, a bread kombinat, etc. (22)

A sovkhoz supplying the city with vegetables and potatoes is situated near Petropavlovsk. (23)

Petropavlovsk has 5 decondary, 8 seven year schools, and 13 primary schools, a factory training school, a children's school of music, a trade school, a teacher's college, a navigation school, an assistant surgeon's school. (24)

Petropavlovsk has a drama theater, a cinema, 8 clubs, 61 libraries, a Kray museum, a park of culture and rest, squares, stadiums, etc. (25)

There is a scientific research laboratory of the Pacific Ocean Scientific Institute of Fishing Industry and Oceanography. (26)

A pilot is stationed in the Petropavlovsk harbor area. Vessels must embark a pilot at Bukhta (Bay) Akhomten before entering Avachinskaya Guba. (27)

There is an anchorage in the approach to Petropavlovskaya harbor, about 3½ cables south of Mys Signal'nyy, in depths of 18.3 to 20.1 m. (28)

Petropavlovsk harbor is a small, but well sheltered anchorage, with convenient depths and good holding ground. It is enclosed by Poluostrov (Peninsula) Signal'nyy of which Mys (Cape) Signal'nyy (Shackoff) is the southern extremity, situated about 2¼ miles north of the northern extremity of Poluostrov Izmennyy. The harbor is divided into two parts by a low gravel spit, extending north-westward from the mainland to within half a cable of Signal'nyy Peninsula. The outer harbor is called Vneshnaya Petropavlovskaya Gavan' (Outer Petropavlovsk harbor), and the inner harbor, Vnutrennaya Petropavlovskaya gavan' or kovsh (basin). (29)

A wharf and quay, about 548.6 m long, extends along the south-western side of the gravel spit dividing the harbor and the eastern side of the outer harbor and is reported to have a depth of 9.1 m alongside. Travelling

STAT

cranes, with a lifting capacity of 50 tons, and a crane on the wharf, reported to lift 100 tons, are available. (30)

A wharf, about 121.9 m long, is situated on the eastern side of Mys Signal'nyy and has a depth of 7.0 m alongside. (31)

On the northwestern side of the inner harbor are two piers extending 45.7 m southeastward, parallel with each other, with a depth of 7.0 m at their heads. (32)

A small amount of coal is maintained. Fresh water is laid on to the wharves. Fresh provisions may be obtained. There are several hospitals in the town. (33)

There is a floating crane with a lifting capacity of 30 tons. (34)

As Petropavlovsk is probably, according to a 1956 source, the only port city in the Soviet Union without railroad approaches, freight and passenger transport take place only by sea. (35)

By August 1956, the number of passenger vessels running on the Petropavlovsk Vladivostok line was still insufficient. There were only 3 vessels in operation in the 1956 navigation season. Petropavlovsk urgently needs more passenger vessels during the summer navigation season and the construction of the new passenger maritime terminal should be speeded up. (36)

Recently the Far Eastern Steamship Line assigned three more freight and passenger vessels to serve on the above line but even they proved insufficient. (37)

The Maritime passenger terminal of Petropavlovsk is obviously inadequate. The construction of a new passenger terminal was planned for several years in the Ministry of the Maritime Fleet. Mirzabeyli, head of the port of Petropavlovsk, journeyed several times to Moscow to the effect. Funds needed for the construction were finally obtained and the future port terminal area cleared for construction. But the Kamchatkmorstroy, headed by Gurevich, was slow in carrying out the construction works, and the port was not expected to be ready in 1956. (38)

Petropavlovskaya Gavan' (Port)

Depths below chart datum level		Rise of tide	
In Channel of Approach (Fathoms)	In Anchorage (Fathoms)	Springs (feet)	Neaps (feet)
6	5 to 9 (Outer Harbor) 3 to 7 (Inner Harbor)	6.5	4.7

(39)

STAT

b. Ozernovskiy Port

The importance of the construction of the port of Ozernovskiy is due to the fact that the western coast of Kamchatka does not possess a single convenient harbor and that vessels are forced to drop anchor far from the shore. (40)

Ozernovskiy poselok (settlement), in the Bol'sheretskiy rayon of the Kamchatskaya oblast', is situated on the southern tip of the Kamchatka peninsula, on the shores of the Sea of Okhotsk and boasts of a fish kombinat. In 1954 there were also in the settlement a secondary, 3 seven-year and 5 primary schools, a club and a library. (41)

On 15 January 1956, "Izvestiya" announced that the construction of the port of Ozernovskiy was to begin in the 1956-60 Five-Year Plan on the west coast of Kamchatka. (42)

A. Lovachev, Chief Engineer, of the projected Ozernovskiy port, stated more than a year later, that much of the construction of this port could be carried out with locally available building materials. The basic sectors of the projective structures would be filled in with basalt rock and all retaining walls could be built of tufa stone. (43)

According to Lovachev, the Ozernovskiy port must and can be built gradually the ready sectors being placed in operation as they are completed. The initial works were planned to last 3 years and to require 253,000,000 rubles of capital investment. Construction of the port and adjacent settlement was to cost 376,000,000 rubles. Savings realized in means of transport and the liquidation of the losses by the fishing industry (owing to the construction of the port) were to cover the cost in six years only. (44)

Actually construction of the Ozernyy or Ozernovskiy port of Kamchatka was to have been started already in 1953 and in 1956, the construction of the protective breakwaters was to have been completed. A construction organization was even created, but as late as March 1957, this organization had nothing to do. (45)

The Ministry of the Maritime Fleet took more than a year to study the project, which, was then passed on to the Gosstroy of the USSR. The Gosstroy required the elaboration of plans of the construction of adjacent building projects have no direct relation to the port. The plans were drawn, but by March 1957 the documentation presented had not received approval. Meanwhile, Lovachev complained that construction of this port was an urgent matter and the only means to reduce the enormous unproductive demurrage of the fleet. (46)

STAT

UNCLASSIFIED
CLASSIFICATION (SECURITY INFORMATION when filled in)

c. Ust'- Bol'sheretsk

Ust' Bol'sheretsk is a village, center of the rayon of the same name. It is situated on the west coast of Kamchatka peninsula. There is a fishing kolkhoz, a secondary school, a House of Culture, a club and two libraries. Fishing is developed in the rayon which has 5 fish kombinats, 8 fishing kolkhozes, a motor fishing station. There is also an animal husbandry and vegetable raising sovkhoz. Pelt hunting is developed in the rayon. (47)

In 1944, the settlement of Bol'sheretsk had between 300 and 500 inhabitants. It is connected to the general telegraph system. (48)

d. Mil'kovo

Mil'kovo village is situated on the Kamchatka River (49) and is the center of the Mil'kovskiy rayon. It is the starting point of navigation on the Kamchatka River and is situated 323 km north of Petropavlovsk. (50)

Mil'kovo was in 1931 the wealthiest village in the Kamchatka River valley. (51)

Mil'kovo is reached in the warm season by motor cutters that sail upstream the Kamchatka River, but this is possible only during high water. At other times the cutters go not further than Dolinovka, and even during the high water season they have to wait a long time. (52)

In the winter, Mil'kovo can be reached only by teams of dog sleds. (53)

The importance of Mil'kovo can be judged from the fact that in 1953 there were a secondary school, a school for rural youth, a House of Culture, a club and a library. (54)

Vegetable and potato crops are developed in the Mil'kovskiy rayon, grain crops, likewise the meat and dairy industry. There is also a machine and tractor station, a machine and improvement station, and an experimental field and animal husbandry station. Trapping is developed. There are two lumber industry enterprises. (55)

e. Dolinovka

Dolinovka village consists of three regular streets bordered with new houses. (56) Almost all the houses are new with 3 or 4 windows each. Every homestead has two or three buildings. (57) There is a radio transmitting station and a telegraph with the telegraphic pole near the building of the village soviet. (58)

Dolinovka village was settled by White Russian settlers (59) that came to the Amur, the Maritime Kray and Kamchatka during the German occupation of White Russia. (60)

STAT

Only occasionally does one still see old Kamchadal huts, covered with bark and having black, smoke covered fish drying stands in their yards. (61)

Communications with Dolinovka are even more difficult than with Mil'kovo. Planes do not fly there and even the motor cutter arrives seldom. The "bat" (a local type canoe) can only sail downstream and it is almost impossible to push it upstream. (62)

The Kolhoz im. "XIV Year of October" is the largest and most prosperous of the Mil'kovskiy rayon and could prosper even more if a road were built, but in local conditions, even 300 km of roads appear to present too difficult a task. (63)

In the winter, snow blizzards and in the summ floods cut communicatcns between Dolinovka and Mil'kovo. (64)

f. Klyuchi

The settlement of Klyuchi, is the largest populated point in Kamchatka after Petropavlovsk. (65) It is situated in the Kamchatka River valley.

The volcanological station of the USSR Academy of Sciences is located there (66) and in 1948, A. A. Menyaylov was mentioned as being the head of this station. (67)

The settlement of Klyuchi is also known for its large timber kombinat that produces building materials, containers for the fishing industry, boats and open boats. (68)

In 1957, the "Vodnyy Transport" newspaper reported that "maritime and river workers (sic) repaired the piers at Klyuchi and also built there comfortable living quarters. (69)

g. UST' Kamchatsk

Ust' Kamchatsk village (Lat. 56° 13' N., Long. 162° 25' E.) is situated on the right bank of the Kamchatka River, where it makes a sharp bend before flowing into the sea. It is the administrative center of the Ust' Kamchatskiy rayon. (70)

The small bay of Ust' Kamchatsk cannot shelter vessels from ocean waves and steamers stop at a distance of half a km from a narrow sandy spit separating one of the c hannels of the Kamchatka River from the Pacific Ocean. (71)

Two fish canneries were situated on the spit in 1931. They were protected from the sea by a dam built of trees and stones. During the great Japanese earthquake of 1923, the ocean swept over the spit, and washed away the Dembi kombinat. (72)

STAT

Ust' Kamchatsk is located beyond the spit, on the bank of the Kamchatka River. (73)

In clear weather, the chimneys of the fish canneries by day and their lights by night, help to identify the position of the anchorage. The village of Ust' Kamchatsk with its radio masts is visible for about 8 miles. (74)

In 1931 there were about 200 homestead in Ust' Kamchatsk.(75) By 1933, the population reportedly consisted of some 500 people (76) and in 1938, there were 3,000 people. (77)

In 1948, Ust' Kamchatsk was considered a good location for a first rate port. But at that time no port actually existed there and the steamers berthed in the roadstead far from the Kamchatka Cape. (78)

As only small boats can approach the piers, freight handling is difficult in Ust' Kamchatsk. It is carried out mainly in the outer roadstead, exposed to wind and waves. (79)

Freight handling is carried out in motion by cutters sailing the bars during the incoming and ebb tide hours. Only once did the "Yakut" ocean going steamer, enter the estuary of the river. The vessel managed to pass the bars, when waves covered the sandbanks and having awaited full tide, slowly proceeded further upstream, to the fish wharf of the kombinat. (80)

Workers in Ust' Kamchatsk have their own method of handling freight with ships and barges moving alongside and reloading being performed in motion.(81)

Ust' Kamchatsk is poorly equipped with freight handling facilities. The floating crane can not be fully utilized, because it lacks equipment to handle timber. The shipyard in Petropavlovsk could not provide mooring blocks to Ust' Kamchatsk and vessels have to moor at electric posts. (sic) These shortcomings seem not to attract enough attention of responsible authorities and the port workers complain that the directors of the Far Eastern Consolidated Steamship Line seldom visit the port of Ust' Kamchatsk. (82)

The workers of the port themselves carry out repair of equipment and landing stages. They built a clinic, an electric power plant, a timber landing stage and dormitory for longshoremen. (83)

The houses in Ust' Kamchatsk are small, wooden, with roofs of corrugated iron. (84) Like in all permanent Kamchatka settlements, the houses stretch out in a straight line along the river, near its estuary. (85) Three long streets thus extend from the river estuary to the dry and green tundra. (86) Fishing boats, motor boats, and fishing nets crowd the shores. (87)

There are some fish canning factories on the northern shores of Kamchatskiy Zaliv (Bay) not far from Ust' Kamchatsk. Near these factories long lines of nets are laid out, extending from 1 1/2 to 5 cables off shore. These factories are brilliantly lit by electricity. A white light, clearly visible from the offing, is exhibited from the look-out tower of the factory situated about 3 miles east of the mouth of Kamchatka River. (88)

STAT

In 1936, Ust' Kamchatsk had fishing enterprises, a fish cannery, a radio station. (89)

By 1956, further development had taken place. The town was mentioned as a port with a fish kombinat, a motor and fishing station, a can factory, 3 secondary schools, a House of Culture, a cinema, 3 clubs and 5 libraries. Fishing, vegetable growing, forest industry and pelt hunting were developed in the area. (90)

Ust' Kamchatsk is called the "port of green gold" because timber is the major item of its freight traffic. (91)

Excellent building timber grows on the banks of the Kamchatka River and is transported in rafts to the estuary by the Kamchatka River fleet. (92)

The main occupation in Ust' Kamchatsk are fishing in summer and trapping in winter. There is a Customs office and meteorological observatory here. (93)

STAT

CHAPTER V - Reference Notes

1) BNG, p. 602

2) BSE, v. 32, 1955, p. 621

3) BNG, p. 602

4) Rodina, 1939, p. 341

5) BNG, p. 602, p. 5

6) BNG, p. 5

7) Bytovoy, p. 12, 1948

8) P: Ogonek, No. 36, 1954, p. 12

9) Bytovoy, p. 12, 1948

10) P: Ogonek, No. 36, Sept. 1954, p. 12

11) P: Morskoy Flot, No. 1, Jan. 1957, p. 4

12) Bytovoy, p. 12, 1948

13) Ibid. p. 12

14) Ibid. p. 14

15) Ibid.

16) Ibid. p. 15

17) BNG, p. 603

18) Bytovoy, p. 15, 1948

19) Ibid. p. 31

19a) Ibid., p. 31

20) Ibid. p. 35

21) N: Krasnaya Zvezda, No. 31, Dec. 1957, p. 3, col. 5-6

22) BSE, v. 32, 1955, p. 622

23) Ibid.

24) Ibid.

25) Ibid.

26) Ibid.

27) BNG, p. 602

STAT

28) BNG, p. 602

29) Ibid. p. 601

30) Ibid. p. 603

31) Ibid.

32) Ibid.

33) Ibid.

34) Ibid.

35) N: Vodnyy Transport, No. 102, 28 August 1956, p. 2, col. 7

36) Ibid.

37) Ibid.

38) Ibid.

39) BNG, p. 610

40) Rodina, p. 334, 1939

41) BSE, v. 30, 1954, p. 562

42) Izvestiya, No. 13, 15 January 1956, p. 4, col. 2

43) N: Stroitel'naya Gazeta, No. 35, 22 March 1957, p. 3, col. 5

44) Ibid.

45) Ibid.

46) Ibid.

47) BSE, v. 44, 1956, p. 414

48) BNG, p. 564

49) Bytovoy, p. 33, 1948

50) BSE, v. 27, 1954, p. 490

51) Kantorovich, p. 140

52) Bytovoy, p. 67, 1948

53) Ibid. p. 74

54) BSE, v. 27, 1954, p. 490

55) BSE, v. 27, 1954, p. 490

56) Tikhookeanskaya Vesna, p. 70

STAT

57) Bytovoy, p. 73

58) Tikhookeanskaya Vesna, p. 231, 1929, p. 70

59) Ibid. p. 71; Bytovoy, p. 73

60) Tikhookeanskaya Vesna, p. 71

61) Bytovoy, p. 73, 1948

62) Ibid. p. 74

63) Ibid. p. 73-74

64) Ibid. p. 75

65) Bytovoy, p. 115, 1948

66) Ibid. p. 116

67) Ibid. p. 119, 1948

68) Rodina, p. 341, 1939

69) N: Vodnyy Transport, No. 114, 21 Sept. 1957, p. 4, col. 1

70) BNG, p. 475, 1954

71) BNG, p. 70

72) Kantorovich, p. 70, 1931

73) Ibid. p. 70

74) BNG, p. 476, 1954

75) Kantorovich, p. 73

76) BSE, v. 56, 1936, p. 395

77) BNG, p. 475, 1954

78) Bytovoy, p. 212, 1948

79) N: Vodnyy Transport, No. 114, 21 Sept. 1957, p. 4, col. 2

80) Bytovoy, p. 212

81) N: Vodnyy Transport, No. 114, 21 Sept. 1957, p. 4, col. 2

82) Ibid.

83) Ibid.

84) Kantorovich, p. 73

85) Sredi Trekh Morey, p. 126

STAT

86) Bytovoy, p. 212

87) Kantorovich, p. 73

88) BNG, p. 475, 1954

89) BSE, v. 56, 1936, p. 395

90) BSE, v. 44, 1956, p. 418

91) N: Vodnyy Transport, No. 114, 21 Sept. 1957, p. 4, col. 1

92) Ibid.

93) BNG, p. 475, 1954

STAT

CHAPTER VI

Kamchatka Maritime Transport

General Remarks

Although part of the Asiatic continent, Kamchatka is actually deprived of overland connections with the mainland and all communications are by the sea. (1)

Because of its peculiar position, waterway transportation in Kamchatka must carry out various functions:

1) export local products,
2) import supplies for workers and entire population of Kamchatka,
3) bring to the various industries seasonal workers and fishing, hunting and industrial equipment; and
4) bring back seasonal workers from Kamchatka. (2)

In 1934, all above operations had to take place in the period extending from April to September. The first two months of navigation (April and May) taking care of the shipping in of workers, equipment and building materials, and the following two months (June and July) being used for outgoing shipments of products, while only part of the month of September was devoted to return trips of the seasonal workers to the mainland. In order to fulfill the shipment plan, the transport organizations had to use all available transport facilities and thus, divert these from other duties and services. (3)

a. Navigation Conditions

1. West Coast

The best time for navigation on the western coast of Kamchatka is in the spring, April and the first half of May. In clear weather there are no difficulties, and the central Kamchatka range may be seen from a great distance, and the longitude may be checked by soundings. (4)

There are no natural sheltered harbors along the entire western coast of the Kamchatka Peninsula (5) for other than very small craft southward of the anchorage under Mys (Cape) Yuzhnyy. Schooners with local knowledge can find protection within the mouths of rivers. (6)

The construction of needed harbors is hampered by serious difficulties. The stormy character of the Sea of Okhotsk and its great alluvial activity are factors which make the construction of protective walls very difficult and costly. (7)

STAT

[redacted]

The river estuaries of this coast are usually separated from the sea by long alluvial spits. The length of such a spit in Bol'sheretsk for instance, is 20 km. The construction of a port utilizing the spits would require much dredging and would threaten the normal course of the shoals of fish that regularly swim up the river for the spawning season. (8)

Construction of a single Ust' Bol'sheretsk port, would not solve the problem of laoding and unloading for the western shoreline, where a whole series of points should be equipped for freight hauling. (9)

The Sea of Okhotsk is very stormy. Even during the lightest winds, waves are heavy in the surf zone. But when the winds become stronger, vessels cannot pass the surf strip and freight handling stops completely. (10)

Storms are especially heavy in the autumn when they further complicate navigation conditions. (11)

A 1956 source mentions that by the end of September of that year, the weather was so stormy that many vessels could not deliver coal from Sakhalin to Nagayevo, on the eastern shore of the Sea of Okhotsk, nor to Petropavlovsk-Kamchatskiy. (12)

The Sea of Okhotsk is moreover so unpredictable that Far Eastern sailors rightly say that to "anchor" in Okhotsk waters does not mean that one has reached destination. (13)

Steamers sometimes wait off shore for days and even weeks for a chance to unload (14) and all the time must maintain full steam in order to be able to leave at a moment's notice to reach open water away from the dangerous shore. (15)

Storms last longest in the autumn starting from mid-August and usually come suddenly and develop very fast. The most dangerous storms blow mainly from the southwest or the northwest, so that the wind always blows towards the shore and the vessels anchored near the shelterless shore are in danger when there is considerable turbulence coming from the open sea. (16)

2. East Coast

The eastern shore of Kamchatka Peninsula is quite different from the western shore. It is heavily indented and is a volcanic plateau with elevations reaching from 700 to 1,300 m. Mountainuous peninsulas are separated by large bays. The shores are partly lowland and partly elevated. The slopes of volcanic plateau, topped by the comuses of active or extinguished volcanoes capped with eternal snows, break off sharply at the shoreline. (17)

There are four major peninsulas on the eastern shore of Kamchatka and the large Karaginskiy Island, located c lose to the shore. (18)

A series of fiord-type bays, among which is the famous Avachinskaya Bay, a natural harbor, lie on the southern part of the easternshore. (19)

STAT

The presence of numerous convenient and sheltered bays and anchorage all along the Pacific seaboard of Kamchatka makes the area very convenient for navigation and in general navigation conditions on the eastern shoreline of Kamchatka are far better than on the western seaboard. (20)

In the southern regions of the peninsula, navigation starts in March and lasts until December. (21)

In the northern areas, spring navigation starts later than in the south, in June or July, depending on ice conditions. In the Litke Strait, near Karaginskiy Island, the sea is cleared of ice only in June and as a result navigation is retarded not merely in this area, but on the Korf Bay and Olyutorskiy Bay seaboard further north, that is cleared of ice already in the beginning of May. But vessels equipped for sailing among floating ice find this area accessible all year round, because the bays do not freeze in winter and only a small shore ice crust forms in some places. (22)

When approaching the coast in a fog, along the low-lying coast between the parallels of 52° N and 57° 30' N., vessels anchor on arriving in depths of 12.8 m or 14.6 m, and wait for the fog to clear. (23)

Sandbanks unapproachable even for the shallow open kungases, during low tide, lie before the estuary of the rivers. It is necessary to wait for hours for high tide in order to be able to enter the estuary of the rivers. It is frequently necessary to haul freight by hand over the sandbanks. (24)

As only small tonnage coastal vessels can enter the estuaries of the rivers all freight handling operations are carried out in open roadsteads. (25)

Large heavy tonnage vessels usually stand at anchor 2 or 3 miles off shore. Small tugs then ply between them and the shore. They haul open wooden boats carrying 30 tons each, so that in order to unload 3,000 tons of freight, a small kungas boat has to make 100 trips to the ship, covering some 600 km. (25)

As soon as the wind rises, freight handling stops, the boats hasten to shore and motor boats likewise seek shelter in the estuaries of nearby rivers,(27) while the ship sets for the open sea.

Tidal currents which are particularly strong in the Sea of Okhotsk, are an additional handicap to freight handling. (28) The currents in the Sea of Okhotsk which are not fully studied yet, show a general counter-clockwise circulation around its shores. From about 25 to 30 miles off the western coast of Kamchatka, the current sets northward at the rate of about half a knot. Nearer in, a cold counter-current sets southward. (29)

These difficult navigation conditions hamper the economic and industrial development of this area of Kamchatka. (30)

The short navigation season reduces the fishing season and prevents expansion of the fishing industry which lasts only 3 months instead of 6 to 7 months. (31)

Coastal sailing is an extremely underdeveloped sector of the Kamchatka transport. Its insufficient development prevents points in need of supplies to receive them on time, thus, affecting every branch of the economy of the peninsula, from the c oal to the lumber industry, and especially the fishing industry that all suffer from a shortage of industrial equipment and labor force. (39)

STAT

b) Shipping and Freight Traffic

Sea cutters link points on the Okhotsk seaboard, the Penzhina Bay and the northern areas of the Pacific Ocean seaboard (Korfovskiy, Olyutorskiy and Anadyrskiy) and maintain connections between fishing sectors and between the latter and populated points. Transport significance of this traffic is very small because of the very small number of these cutters. (32)

Coastal shipping has been developed to some extent in the southern waters of the Kamchatka peninsula. There has been organized a regular, although extremely rare connection between Petropavlovsk and Ozernaya (on the east coast) and Ichey (west coast). The first is carried out by schooners, the second, by seagoing cutters. (34)

In 1934, Kamchatka did not have its own fleet. All its needs were served either by Soviet vessels, concentrated in Vladivostok, or by chartered foreign vessels. (35)

Steamers serving Kamchatka sail between Vladivostok and the entire coast of Sakhalin, the Sea of Okhotsk, the western coast of Kamchatka to Penzhina, the eastern coast of Kamchatka to Anadyr', Uellen (the Bering Strait), the Vrangel' island and the coastline of the Arctic Ocean. (36)

By 1934, already the number of regular runs between Vladivostok and Kamchatka amounted to 40 trips per navigation season. (37)

In 1934, the freight turnover of Kamchatka peninsula was mainly limited to local navigation or "malyy kabotazh" within the boundaries of the Dal'nevostochnyy Kray. (38)

The "bol'shoy Kabotazh" or freight shipping operations to ports of other basins of the Soviet Union did not exist. As to foreign trade, the export amounted according to planned forecasts of the Narkomvod (Peoples Commissariat for Waterway Transportation) to 79.250,000 tons in 1933 and was planned to increase to 159,750,000 tons in 1937. The import figures were not given. (39)

Yet the predominance of incoming freight over outgoing freight is the main characteristic of the Kamchatka freight traffic. Imports not only predominated over exports for all years of the first Five-Year Plan, but had even a definite tendency towards a relative increase. During 5 years, the exports increased only 78%, while the imports increased 207%. (40)

According to data of the Narkomvod, the incoming and outgoing freight volume in the Kamchatskaya oblast' were to be of 66.3% and 33.7% respectively in 1933, and 61% and 39% respectively in 1937. (41)

From the point of view of the interests of transportation, the excess of imports over exports in Kamchatka are unprofitable as it creates a shortage of tonnage loading in the return trips from Kamchatka to the ports of the mainland. (42) The freight traffic of this area was and still is hampered by local conditions.

STAT

Complaints about the fact that the Eastern basin in general suffers from a shortage of properly equipped ports was repeatedly stressed throughout the years, and reported again in 1957. The vessels serve over 400 points, of which only 13 are really ports, the rest being only open maritime roadsteads. Scattering of the traffic objectives along the coastline, small volume of goods shipped in and out, cause a thinning out of the freight flow. Present conditions cause vessels to visit and unload and load in several points, and to demurr. (43)

The poor development of port facilities in the Far Eastern basins resulted in a discrepancy between the transit capacity of the fleet and the transit capacity of the roadsteads. Great shortcomings in transportation are due to the fact that the overwhelming majority of freight shipments is carried out by vessels of the Transport Ministry and loading and unloading operations are carried out by customers. (44)

Demurrage is one of the main shortcomings of the fleet operation in the area. On Kamchatka, demurrage lasts as much as 30 full days and more or tens of times over the foreseen demurrage norm. Lack of mechanization ashore, lack of preparation of sailing means on roadsteads, increase the losses to a million ton-days per year. (45)

The vessels receiving 3,000 tons of freight demurr from 15 to 30 days in the roadsteads. Such unproductive demurrage covers half of the entire navigation period. In such conditions, the large tonnage vessels are transformed into floating warehouses. (46)

Yet efforts are being made to increase foreign shipments to compensate in part for the inter-basin shipments. As early as 16 May 1957, the planned volume of freight shipments for 1957 had been fulfilled already by 90%. (47)

Growth of Freight Traffic In The Port of Petropavlovsk

During the First and Second Five-Year Plans

Year	Freight Traffic (in tons)	Passenger Traffic	Number of Vessels
1929	21,829	3,039	77
1930	41,243	9,863	111
1931	44,526	14,161	106
1932	43,371	9,390	126
1933	60,706	12,649	113
1934 (by 1 October)	72,752	13,730	95
1935 (plan)	160,525	26,047	-

(48)

c) The Far Eastern Consolidated Steamship Line

The Far Eastern Consolidated Steamship Line (Dal'nevostochnoye ob'yedinennoye morskoye parokhodstvo), the main offices of which are located at No. 15, ul. Oktyabrya, in Vladivostok, also includes the Kamchatka - Chukotka* and the Sakhalin steamship lines. (49)

In addition to the above lines, freight of this area is also moved by vessels of the Ministry of the Fish Industry and by those of the Dal'stroy**. (50)

As their operations are not strictly divided, the vessels of the Kamchatka - Chukotka - Sakhalin and the Far Eastern and Eastern Arctic Steamship Lines serve the same ports and sail in the same direction. (51)

Moreover the Sea of Japan, the Sea of Okhotsk and the Sea of Bering are considered as one single sea for navigation purposes. Navigation on these seas is therefore considered as "malyy kabotazh" or navigation between USSR ports on one single sea. (52)

Although operating under similar conditions, the steamship lines and ports of the three consolidated agencies have widely different production and cost indices charge unequal freight costs for freight shipments on the same runs and pay the seamen varying salaries for identical working conditions. The indices and standards of operation of the fleet and ports of the Ministry of the Maritime Fleet are higher than those of the Dal'stroy and the Ministry of the Fish Industry. (53)

The sailors of the Far East complain that the present administrative organization of the fleet of the Far Eastern basin allows the co-existence of three steamship lines (consolidated), in addition to the presence, as in some other basins, of a large specialized fleet (sic) belonging to other agencies, (54)

The present transport system in the Far Eastern Maritime Basin does not satisfy shipping needs. It increases shipping costs, and causes interruptions in shipment dates and delivery of freight. (55)

Recent reorganization of the administration of the industry and new constructions planned in the Far East should result in changes in the organization of the work of the fleet and ports in this area. (56)

In order to bring up to date the transport system of the Far Eastern basin, it would be logical to unite all steamship lines. The organizational duplication could be abolished if transport functions were concentrated in the

* The offices of the Kamchatsko-Chukotskoye gosudarstvennoye morskoye parokhodstvo (Kamchatka-Chukotka State Maritime Steamship Line) are located at No. 8, Sovetskaya ul. (Street) in Petropavlovsk-Kamchatskiy.(Oberg,p.5, 1957)

** Glavnoye Upravleniye Stroitel'stva Dal'nego Severa (Main Administration of Construction in the Far North), [illegible], [illegible] York, [illegible], Appendix, p. 23.

single Far Eastern administration. Rayon departments should also be created to ensure transport connections between shoreline territories for shipment and transshipment of local freight and also a Maritime agency of the icebreaker fleet. (57)

Another author suggests the organization in the Far East of a single steamship line, to which the transport fleet of the Dal'stroy and the Ministries of the Fish and Forest Industries would be also transferred. The now existing Sakhalin and Kamchatka - Chukotka steamship lines should be reorganized into agencies for local shipments with only the local coastal fleet and traffic under their jurisdiction. Fishing ports must remain only as enterprises serving to process fresh fish and fish products requiring refrigeration and also as bases for the supply of the fishing fleet. (58)

Large transshipment points should be installed on the main directions of freight flow and roadstead points of loading and unloading, should be enlarged and mechanized and dredging works in the largest of these should be carried out. (59)

The new transport organization should be set up with the use of up-to-date methods of fleet exploitation. This concerns in the first place the organization of freight shipments by regular line runs of heavy tonnage between the main transshipment ports and the subsequent distribution of freight along the coastline by the local fleet belonging to rayon administrations. (60)

The ports of this area would maintain their significance (with Vladivostok Nakhodka, Vanino, etc.) being main traffic centers, but the organization of their operation will be modified, introducing specialization as to type of freight. The operational plans within the ports would be also changed. for speedy handling of vessels of regular line traffic. (61)

In October 1956, the Far Eastern Consolidated Steamship Line was reported to be lagging in the shipments of petroleum and dry goods (especially timber and mineral building materials) to Soviet ports in and out of the Sea of Okhotsk, Sea of Bering and Sakhalin waters. The orders of the Ministry of the Maritime Fleet to receive and ship freight from the ice bound areas of the basin were not complied with. Transportation of freight was not assured to points on the Kuril Islands and the Okhotsk seaboard. Mass demurrage of vessels was taking place in the basin and in roadstead points of Kamchatka in particular. (62)

By the beginning of 1957, the Far Eastern Consolidated Steamship Line still did not fully utilize its capacities to increase freight shipments during the first quarter of the year. Shipments of coal, mineral building materials, timber and firewood were below the quota. The local shipments plan in this basin was not being fulfilled. It was pointed out that the insufficient utilization of the fleet was due to a certain extent to stormy weather. (63)

In the first part of April, the Far Eastern Consolidated Steamship Line had fulfilled its shipment plan for the first half of the month only 54.6% in tons and 53.2 in ton/miles. (64)

In November 1957, the "Vodnyy Transport" newspaper complained that shipments in the Kamchatka - Chukotka Steamship Line were carried out unsatisfactorily. The main part of the fleet of the steamship line was being delayed at freight handling points in the roadsteads of Kamchatka. (65)

In 1957, it was reported that training of sailors was not efficient on many vessels of the Kamchatka - Chukotka Steamship Line and that as a result, only 12 out 112 students had passed successfully the examinations for transfer to a higher grade. In 1956, the number of students of correspondence schools had dropped to 70 owing to inefficiency in operation. (66)

Guzhenko, Chief of the Sakhalin Steamship Line, was accused of not paying enough attention to the organization of correspondence courses for sailors although the need for such courses has been felt for a very long time. (67)

The above and other critical remarks did not seem to have affected the status of Guzhenko, who in October of 1957 was still reported to be the Head of the Sakhalin Steamship Line. (68)

d) List of Vessels Mentioned

"Admiral Senyavin" steamer. Mentioned sailing in a storm off the west coast of Kamchatka. (69)

"Albatross" trawler of the Kamchatka trawler fleet. Among the most efficient vessels of this fleet during the 1952 fishing season.(70)

"Aral'sk" transport vessel. Mentioned as operating efficiently in 1957. (71)

"Argun'" fishing launch. Mentioned rescued by "Astrakhan'" steamer, in a storm off the west coast of Kamchatka. (72)

"Astrakhan'" steamer. Captain I. I. Ul'yanov. Rescued crews from fishing launches "Argun'" and "Sevastopol'", but the latter sank in a storm off the west coast of Kamchatka in 1945. (73)

"Aziya" passenger vessel steamer. Docked at Petropavlovsk after sailing on the Pacific Ocean and seas of Japan and Okhotsk. (74) In 1953 "Aziya" steamer was reported to operate between Vladivostok and Petropavlovsk Kamchatskiy. More than 80 members of the crew had at that time recently enrolled in a high school correspondence course. (75)

"Balkhash"vessel. Arrived at the pier of the maritime port of Petropavlovsk in 1948. (76)

"Beloostrov" steamer. Mentioned for "stakhanovite" accomplishments. (77)

"Gaga" trawler of the Kamchatka River fleet. In January 1953 its crew was mentioned as the most efficient of the fleet. It fulfilled the 1952 fishing quota ahead of schedule. (78)

"Gdov" motor vessel. Worked particularly efficiently during the first quarter of 1957. It carried timber. (79)

"Gogol'" passenger vessel. Mentioned as approaching Ozernovskiy fish kombinat and lowering anchor in roadstead in March 1957. (80)

STAT

On 19 November, the "Gogol'" was reported unloading vegetables somewhere in the west coast of Kamchatka. (81)

"Griboyedov" motor vessel. Mentioned as having "Stakhanovite" accomplishments. (82)

"Itel'men" steamer. In 1931 it was new and came for the first time to Ust' Kamchatsk. (83)

In 1954, the "Itel'men" steamer of the Kamchatrybflot (Kamchatka Fishing Fleet), (A. Ye. Mironov captain), brought to Petropavlovsk the first street watering machines. (84)

"Kamchatskiy Konsomolets" trawler of the Kamchatka trawler fleet was among the most efficient vessels of this fleet in the 1952 navigation season. (85)

In 1953 it was mentioned sailing in the Avachinskaya Guba (Bay) after returning from the Sea of Okhotsk. (86)

"Kapitan Gastello" motor ship. Mentioned as having stakhanovite accomplishments. (87)

"Kapitan Zakheyev" trawler of the Kamchatka trawler fleet was among the most efficient vessels of this fleet during the 1952 fishing season. (88)

"Kashalot" tug boat. Mentioned as leaving Petropavlovsk carrying salt and bound for Ust' Kamchatsk. It runs between these two ports. From Ust' Kamchatsk it tows rafts and was mentioned shipping salt to Ust'Kamchatsk from Petropavlovsk. (89)

"Khabarovsk" steamer. Mentioned as belonging to the Kamchatka - Chukotka Steamship Line. (90)

"Korsakov" motor vessel. Hauled hundreds of tons of freight in excess of the 1957 plan of freight shipment. (91)

"Krasnogvardeyets" steamer. Mentioned in a storm off the west coast of Kamchatka in 1955. (92)

"Lev Tolstoy" motor vessel. On 18 May 1957, the vessel was reported demurring in Western Kamchatka from April 26th. It was laden with freight for the fishing season. (93)

"Luga" diesel ship of the Kamchatka - Chukotka Steamship line. This vessel was awarded a 3rd prize in 1952, (94) and worked efficiently in 1957. It carried timber. (95)

"Nogin" steamer. In 1953, this vessel delivered a large cargo at Petropavlovsk. (96)

STAT

UNCLASSIFIED

CLASSIFICATION (SECURITY INFORMATION when filled in)

"Noril sk" steamer. Reported in 1954 to have taken 4 full days to bring passengers from Vladivostok to Petropavlovsk. (97)

"Om'" Motor Vessel. Worked particularly efficiently during the first quarter of 1957. It carried timber. (98)

Also mentioned efficient in November. (99)

"Ostrov". A large diesel ship reported to have arrived in September 1954 to Petropavlovsk to operate on the Kamchatka - Chukotka Steamship Line. (100)

"Perekop" steamer. Mentioned as having "stakhanovite" accomplishments in 1953. (101)

"Pinsk" steamer. Mentioned in 1957. (102)

"Polyarnik" trawler. Left for the Sea of Okhotsk to fish for salmon. In 1952 it caught the equivalent of 100 railroad cars of fish. (103)

"Radishchev" motor vessel. It was reported on 18 May to be laden with freight for the fishing season and demurring in Western Kamchatka from 17 April. (104)

"Rybinsk" steamer of the Kamchatka - Chukotka Steamship Line. Pledged itself to carry 2,500 tons of freight in excess of the plan in 1957. (105)

"Sedov" tug boat. Since 1955 under the command of Sedov. It tows timber rafts on the Kamchatka River. (106)

"Sergyey Tyulenin" motor vessel. Efficient in 1957. Carried timber. (107)

"Sim" vessel. Mentioned as leaving Petropavlovsk, laden with salt and rivetings, and bound for the western coast of Kamchatka. (108)

"Sovetskiy Soyuz" passenger steamer. Reported on 20 August 1957 to have already made several runs on the Kamchatka run. It sails from Petropavlovsk to Vladivostok and the trip takes 3 days. (109)

"Svoodnyy" motor vessel. Kazakov captain, towed timber rafts in 1957. (110)

"Tikhookeanskaya Zvezda" trawler of the Kamchatka trawler fleet. Mentioned as being among the most efficient trawlers of this fleet during the 1952 fishing season. (111)

"Turgenev" motor vessel laden with freight for the fishing season, was demurring somewhere in Western Kamchatka from 19 April, according to an 18 May report. (112)

"Turkmenistan", a large steamer, is mentioned as being loaded in Petropavlovsk before leaving for a run to Chukotka peninsula. (113)

"UK-12" cutter. Mentioned by a 1948 source as commanded by Vassiliy Krasnoshapko and sailing around Mys Afrika. (114) The cutter finding itself 20 nautical miles from Toporkovaya Laguna, knew it was 30 miles away from Mys Afrika. (115) The light from the Mys Afrika lighthouse shows 1 sec. of light and 5 sec. of darkness. (116)

UNCLASSIFIED
CLASSIFICATION (SECURITY INFORMATION when filled in)

"Volga" A white refrigerator ship. Mentioned loading at Petropavlovsk.(117)

"Yakut" Steamer Mentioned as having arrived from Ust'-Kamchatsk. (118)

CHAPTER VI - Reference Notes

1) Bol'shakov & Rubinskiy, p. 102
2) Ibid.
3) Ibid., p. 103
4) BNG, p. 561
5) Lotsiya, p. 462, 1938; Bol'shakov & Rub. p. 111
6) BNG, p. 561
7) Bol'shakov & Rub. p. 111
8) Ibid.
9) Ibid.
10) N: Stroitel'naya Gazeta, No. 35, 22 March 1957, p. 3, col. 4-5
11) Serg. p. 767
12) N: Vodnyy Transport, No. 118, 4 Oct. 1956, p. 2, col. 7
13) Serg. p. 767
14) Ibid.
15) Lotsiya, p. 473, 1938; Serg. p. 767
16) Lotsiya, p. 472, 1938
17) BSE, v. 19, 1953, p. 552
18) Ibid. p. 553
19) Ibid.
20) Serg. p. 766
21) Ibid.
22) Ibid.
23) BNG, p. 561
24) N: Stroitel'naya Gazeta, No. 35, 22 March 1957, p. 3, col. 4
25) Ibid.
26) Ibid.
27) Ibid.

28) Serg. p. 767

29) BNG, p. 33

30) Serg. p. 767

31) Ibid.

32) Ibid. p. 778

33) Ibid.

34) Ibid.

35) Bol'shakov & Rub. p. 103

36) Ibid.

37) Serg. Kamchatskiy Kray, p. 80

38) Bol'shakov & Rub. p. 105

39) Ibid. p. 106

40) Ibid.

41) Ibid.

42) Ibid. p. 107

43) N: Promyshlenno-Ekonomicheskaya Gazeta, No. 41, 5 April, 1957, p. 2,c. 4-6

44) Ibid.

45) Ibid.

46) N: Stroitel'naya Gazeta, No. 35, 22 March 1957, p. 3, col. 4-5

47) N: Vodnyy Transport, No. 60, 18 May 1957

48) Serg. p. 775

49) Oberg, p. 5, 1957

50) N: Promyshlenno-Ekon. Gazeta, No. 41, 5 April 1957, p. 2, col. 4-6

51) Ibid.

52) Oberg, 1957, p. 6

53) N: Promyshlenno-Ekon. Gazeta, No. 41, 5 April 1957, p. 2, col. 4-6

54) N: Vodnyy Transport, No. 45, 13 April 1957, p. 1, col. 1

55) N: Promyshlenno - Ekon. Gazeta, No. 41, 5 April 1957, p. 2, col. 4-6

STAT

56) N: Vodnyy Transport, No. 49, 23 April 1957, p. 4, col. 1

57) N: PromyshHenno-Ekon. Gazeta, No. 41, 5 April 1957, p. 2, col. 5

58) N: Vodnyy Transport, No. 49, 23 April 1957, p. 4, col. 2-3

59) N: Promyshlenno-Ekon. Gazeta, No. 41, 5 April 1957, p. 2, col. 5

60) Ibid.

61) Ibid.

62) N: Vodnyy Transport, No. 125, 20 Oct. 1956, p. 3, col. 2

63) N: Vodnyy Transport, No. 47, 18 April 1957, p. 1, col. 4

64) Ibid.

65) N: Vodnyy Transport, No. 138, 19 Nov. 1957, p. 3, col. 2

66) N: Vodnyy Transport, No. 65, 30 May 1957, p. 2, col. 6

67) Ibid.

68) N: Vodnyy Transport, No. 125, 17 Oct. 1957, p. 1, col. 4

69) N: Izvestiya, No. 40, 17 Feb. 1955, p. 2, col. 4

70) N: Izvestiya, No. 16, 20 Jan. 1953, p. 1, col. 6

71) N: Vodnyy Transport, No. 136, 14 Nov. 1957, p. 1, col. 2

72) N: Izvestiya, No. 40, 17 Feb. 1955, p. 2, col. 4

73) Ibid.

74) N: Izvestiya, 17 August 1952

75) N: Komsomol'skaya Pravda, No. 195, 19 August 1953, p. 1, col. 4

76) S., Bytovoy, p. 13

77) N: Zarya Vostoka, 6 Feb. 1953, p. 1

78) N: Izvestiya, No. 16, 20 Jan. 1953, p. 1, col. 6

79) N: Vodnyy Trans. No. 45, 13 April 1957, p. 1, col. 3

80) N: Stroitel'naya Gazeta, No. 35, 22 March 1957, p. 3, col. 4

81) N: Vodnyy Transport, No. 138, 19 Nov. 1957, p. 3, col. 2

82) N: Zarya Vostoka, 6 Feb. 1953, p. 1

83) Sredi Trekh Morey, p. 218

84) P: Ogonek, No. 36, p. 12, Sept. 1954

STAT

85) N: Izvestiya, No. 16, 20 Jan. 1953, p. 1, col. 6

86) N: Zarya Vostoka, 6 Feb. 1956, p. 1

87) Ibid.

88) N: Izvestiya, No. 16, 20 Jan. 1953, p. 1, col. 3

89) Bytovoy, p. 213-214

90) P: Morskoy Flot, 22 March 1952, p. 2

91) N: Vodnyy Transport, No. 136, 14 Nov. 1957, p. 1, col. 2

92) N: Izvestiya, No. 40, 17 Feb. 1955, p. 2, col. 4

93) N: Vodnyy Transport, No. 60, 18 May 1957, p. 1, col. 2

94) P: Morskoy Flot, 1 Nov. 1952, p. 2

95) N: Vodnyy Transport, No. 45, 13 April 1957, p. 1, col. 3

96) N: Kommunist, No. 207, 2 Sept. 1953, p. 1, col. 6

97) P: Ogonek, No. 36, Sept. 1954, p. 12

98) N: Vodnyy Transport, No. 45, 13 April 1957, p. 1 col. 3

99) N: Vodnyy Transport, No. 136, 14 Nov. 1957, p. 1, col. 2

100) N: Pravda Ukrainy, No. 217, 15 Sept. 1954, p. 1, col. 6

101) N: Zarya Vostoka, 6 Feb. 1953, p. 1

102) N: Vodnyy Transport, No. 45, 13 April 1957, p. 1, col. 3

103) N: Gudok, No. 301, 23 Dec. 1953, p. 1, col. 3

104) N: Vodnyy Transport, No. 60, 18 May 1957, p. 1, col. 2

105) N: Vodnyy Transport, No. 114, 21 Sept. 1957, p. 2, col. 1-2

106) N: Vodnyy Transport, No. 114, 21 Sept. 1952, p. 4, col. 1

107) N: Vodnyy Transport, No. 45, 13 April 1957, p. 1, col. 3

108) Bytovoy, p. 13

109) N: Vodnyy Transport, No. 100, 20 August 1957, p. 4

110) N: Vodnyy Transport, No. 47, 18 April 1957, p. 3, col. 6

111) N: Izvestiya, No. 16, 20 Jan. 1953, p. 1, col. 6

112) N: Vodnyy Transport, No. 60, 18 May 1957, p. 1, col. 2

113) Bytovoy, p. 13

STAT

114) Bytovoy, p. 232

115) Ibid. p. 233

116) Ibid. p. 237

117) Ibid. p. 13

118) Ibid. p. 13

APPENDIX

Development of the Productive Capacities of the Kamchatka Oblast'

Scientific Session of the
Commission for the Problems of the North
From:

Vestnik Akademii Nauk SSR. No. 12, 1957, p. 94-96.

From 3 to 9 July 1957, the Commission for the Problems of the North of the USSR Akademy of Sc iences held a scientific session in Petropavlovsk-Kamchatskiy to study the productive capacities of the Kamchatka oblast'.

Existing data on the natural resources and perspectives of development of the productive reserves of Kamchatka were studied at this session which was attended by some 500 representatives of the Akademy of Sciences and its various branches, various institutions of the Kamchatka oblast', scientific and industrial organizations of Moskva, Leningrad, Sverdlovsk, Khabarovsk, Vladivostok, Magadan and Sakhalinskaya oblast'.

The session heard and discussed fifty-six (56) lectures on the fishing industry, mineral resources, agriculture and other problems of the economic development of the Kamchatka oblast'.

Lectures given during the first plenary session stated that the industrial production of the Kamchatka oblast' was scheduled to increase 50% during the 6th Five-Year Plan through a speedy development of the power facilities and transportation network.

During the present Five-Year Plan, the fish industry must improve the methods of fishing and processing of fish, the operation of the fishing fleet, the quality of production of fish products, and the profits realized from the fishing industry of the Kamchatka fisheries.

The Kamchatka peninsula is one of the greatest fishing areas of the USSR, permitting the catch of fish, crabs, whales and sea animals to reach 7 million centners during the next decade.

Lectures given during the sessions likewise outlined the main lines of the geological structure of Kamchatka and pointed out the tasks to be carried out by scientific research. Systematic complex geological works using modern geophysical methods of research are of special importance.

The section of mineral resources studied problems arising from geological structure and the presence of useful minerals in the Kamchatka oblast'. Fifteen lectures indicated that so far geological surveys on Kamchatka have been insufficient, scattered and of little effectiveness. In spite of this,

STAT

already more than 60 coal deposits have been discovered, mainly in the western part of the peninsula, also structures pointing to the formation of petroleum deposits. Ores have been discovered in the zone extending from the upper reaches of the Kamchatka River to the northeastern extremity of the Koryakskoye nagor'ye. A series of deposits contains considerable amounts of mercury. Copper lies in the East Kamchatka ore bearing zone and (simultaneously with molybdenum) in the zone of the Sredinnyy Range.

Gold has likewise been discovered in the southern part of the Sredinnyy Range and a series of deposits have industrial significance. Hydrothermal resources are likewise great on Kamchatka.

The session admitted that it found it indispensable to organize an independent Kamchatka Geological Administration (on the basis of the numerous scattered geological institutions now working on Kamchatka) with its own well equipped laboratories. Geological charting of the territory on a scale of 1:500,000 - 1:100,000; a systematic geological charting of areas with perspectives of petroleum and coal deposits and likewise of areas where ores have been found and in a scale of 1:200,000 - 1:100,000 must be completed by 1959. Research in stratigraphy, tectonics, metallogenesis etc. (sic) is also to be organized.

Fourteen (14) lectures delivered at the session devoted to the fish industry showed that development of the fishing industry on Kamchatka is lagging. By the end of the decade the fish catch must increase 4 to 4.5 times as compared to 1956, all the while maintaining the achieved level of passive shoreline fishing. New fisheries and new objectives must be used, the catch of cod varieties must be increased, the assortment of products must be improved. Large fish processing enterprises must be organized in the most important points of the peninsula through liquidation of the numerous small enterprises. The fleet should also be concentrated in the important points and servicing facilities established. Fishing in the Kamchatka fishing area must be carried out only by the fleet based in the ports of Kamchatka. Fishing must be developed in kolkhozes who are to take care of the shoreline fisheries, and part of the fish production is to be processed on floating fish canneries.

During the combined sessions, the sections of power and transport and the sections of the fish industry discussed the different means of power supply and the transport network of Kamchatka.

Kamchatka has numerous small electric power plants, working on imported fuel. Yet the oblast' is rich in power resources. Estimated reserves of coal amount to 522 million tons, but only 13 to 15 million tons per year are mined.

Estimated reserves of peat amount to about 8 hundred million tons, yet they are not being exploited.

The Kamchatka peninsula has some 200 mountain streams and the total capacity of their potential reserves reaches 12 to 20 million kwts according to preliminary estimates. A series of rivers has been surveyed and projects of hydroelectric power plants have been drawn out, but so far the oblast ' does not have a single hydropower plant in operation or under construction. (p. 95)

Despite the abundance of power resources (including geothermal and wind power), Kamchatka imports up to 400,000 tons of coal yearly.

Electric power costs a great deal on Kamchatka, as much as 1 to 3 rubles per kwt-hr. Yet the fuel resources of Kamchatka are quite sufficient to provide an independent power base. The Krutogorovskiy deposits can satisfy the needs in coal and electric power of the western part of Kamchatka (if electric power plants are built). The coal deposits of Bukhta (Bay) Korfa and Ugol'naya Bukhta must become the fuel base of the eastern coast of Kamchatka.

Drilling works should be carried out first of all in the Pauzhetskiye springs and a geothermal station built there. The hot springs must be surveyed and drilling carried out in the Petropavlovsk area. The hydropower resources of the oblast' must be utilized and the project of the construction of a hydropower plant on the Bystraya River to supply power to Petropavlovsk must be started. The interests of the fish industry should likewise be taken into consideration.

The session devoted considerable attention to the forest industry and agriculture of Kamchatka. Seventeen lectures were heard and the session declared that although the agriculture of Kamchatka is only at its initial stage, natural conditions allow the creation of a local foodstuffs base that by the end of the Sixth Five-Year Plan could fully supply the oblast' with milk, meat, vegetables and potatoes.

The session deems it indispensable to organize a series of new sovkhozes, to enlarge by merger the numerous small farms in existence, to increase the areas under crops to 18-20,000 ha in the nearest Five-Year Plan as against 9,000 ha in 1956.

A sufficient quantity of fertilizers, meliorative and agricultural machinery must be imported into Kamchatka. It is at the same time necessary to start local production of fertilizers and also feed fertilizers for cattle out of fish waste.

Grain farms and experimental grain sectors must be established, soil and botanical surveys made and the utilization of hot springs for agriculture must be studied. A cattle breeding sovkhoz on the basis of the Kholmogorsk type of cattle and an experimental cattle farm must also be established.

Reindeer breeding is one of the main economic activities of Kamchatka. Reindeer meat accounts for 60 to 70% of all meat consumed on the peninsula and costs 10 to 15 times less than other varieties of meat. The session considered that production of reindeer meat was to reach 25,000 centners, such an increase requiring veterinary and zootechnical work, regulation of the utilization of pasture lands. Improvement of cultural, living and working conditions for reindeer breeders is likewise an important problem.

STAT

UNCLASSIFIED

Kamchatka is rich in fur bearing animals. Pelts obtained there plan an important part in the export of furs. The principal furs are sable, fox, silver fox and seal. At present there exists a certain decrease in the hunting industry and to improve it, the number of sables must be increased by winter feeding and resettling along rivers, the number of Kalan must be augmented. The beaver reservation must also be rehabilitated on Mys (Cape) Lopatka, and a reservation established on Mednyy Island. The fur bearing fauna of Kamchatka must be enriched by acclimatization there of the norka, ondatra and other animals, protective measures for pinnipedia and snow sheep and reindeer.

Speaking at the final plenary session, the President of the Commission for problems of the North, Academician D. I. Shcherbakov characterized the main results of the session and expressed the hope that it laid the foundation of large scale works for the study and development of productive capacities of Kamchatka oblast. M.A. Orlov, secretary of the Kamchatka oblast' committee of the CP noted that the session for the first time in history of Kamchatka attracted such a considerable number of scientific and industrial institutions to the widespread solution of economic problems of the oblast. He stressed that Kamchatka needs scientific recommendations and help of the USSR Academy of Sciences.

The session pointed out the main lines of the study and development of the productive resources of Kamchatka oblast' for the coming 10-15 years. It was in particular decided to turn to the Presidium of the USSR Academy of Sciences to ask for the organization starting in 1958 of a Kamchatka complex scientific expedition. This expedition would include leading specialists of the head institutes of the USSR Academy of Sciences and a series of agencies, also young scientific workers that would lay the foundations for a permanent scientific center on Kamchatka for the complex study of its productive capacities.

Closing the session, V. Pstovalov, corresponding member of the USSR Academy of Sciences pointed out that the natural riches of Kamchatka including the mineral wealth, were sufficient to permit a sharp rise of its economy in the near future.

The session contributed considerably to the study of Kamchatka and it is hoped that in the coming years surveying will develop on a large scale and attract large scientific forces.

D. L. Mozeson, Candidate of Geographic Sciences

BIBLIOGRAPHY

Monographs

Appollov, B. A. : Ucheniye o Rekakh (Course on Rivers), Moskva, 1952, 522 p.

Berg, L. S. : Geograficheskiye Zony Sovetskogo Soyuza (Geographic Zones of the Soviet Union), Geografgiz, Moskva, 1952, 510 p.

Berg, L. S. : Priroda SSR (Nature of USSR), Geografgiz, Moskva, 1955, 496 p.

Bergman, Sten : Na Dalekoy Kamchatke (On Far-Away Kamchatka) Moskva, 1929, 111 p.

Bodnarskiy, M.S. : Slovar' Geograficheskikh Nazvaniy (Dictionary of Geographic Names.) Moskva, 1954, 368 p.

Bol'shakov, M. : Kamchatskaya Oblast' (Kamchatka Oblast'), Moskva, 1934.

Bol'shakov, M. Rubinskiy V. : (Kamchatksaya oblast') Moskva, Leningrad, 1934, 145 p.

Bytovoy, Semen : Kamchatskiye Vstrechi (Kamchatka Meetings) Leningrad, 1948, 240 p.

Bytovoy, S. : Tikhookeanskaya Vesna (Pacific Ocean Spring), Leningrad, 1949, 231 p.

Davydov, L. K. : Gidrografiya SSR (Hydrography of the USSR), Leningrad, 1953, v. I, 184 p.

Davydov, L. K. : Gidrografiya SSR (Hydrography of the USSR), Leningrad, 1955, v. II, 600 P.

Geologo-petrograficheskiye issledovaniya i poiski poleznykh iskopayemykh v Tsentral'noy Kamchatke. Trudy Kamchatskoy Kompleksnoy Ekspeditsii, 1936-37. (Geological and Petrographic Surveys and Search for Useful Minerals in Central Kamchatka. Works of the Complex Expedition of Kamchatka.) 1936-37. USSR Academy of Sciences Publication, Moskva, Leningrad, 1940, 175 p.

Kantorovich, V. : Po Sovetskoy Kamchatke (Through Soviet Kamchatka), Ogiz, 1931, 160 p.

Klimentov, P. P.: Gidrogeologiya, Gosgeoltekhizdat, Moskva, 1955, 312, p.

Kratkaya Spravochnaya Kniga po Rechnomu Transportu (Brief Handbook on River Transportation), Moskva, Rechizdat, 1953, 417 p.

Lotsiya Okhotskogo Morya (Sea of Okhotsk Pilot), Gidrograficheskoye Upravleniye RKKF, Leningrad, 1938, 509 p.

Nasha Strana (Our Country), Moskva, No. 12, 1940.

Oberg, R. R. ; Kratkiy Spravochnik dlya klientury morskogo transporta (Brief Handbook for Customers of Maritime Transport), Moskva, 1957 386 p.

STAT

Ocherki po Gidrografii Rek SSR (Outlines of Hydrography of USSR Rivers). USSR Academy of Sciences, Moskva, 1953, 324 p.

Piyp, B. I. : Materialy po geologii i petrografii rayona rek Avachi, Rassoshiny, Gavanki i Nalachevy na Kamchatke. Trudy Kamchatskoy Kompleksnoy Ekspeditsii, 1936-37. (Materials on the Geology and Petrography of the Avacha, Rassoshina, Gavanka and Nalacheva Rivers on Kamchatka. Works of the Kamchatka Complex Expedition, 1936-37). USSR Academy of Sciences Publication, Moskva, Leningrad, 1940. 175 p. (Abbreviated to "Piyp").

Polyanovskiy M. and Sayanskiy L. : Sredi Trekh Morey (Amidst Three Seas), Moskva, Leningrad, 1931, 224 p.

Rodina (Fatherland), Preface by Akademician V. L. Komarov, 1939, 567 p.

Sergyeyev, M. A.: Kamchatskiy Kray, Moskva, 1934, 92 p.

Sergyeyev, M. A.: Narodnoye Khozyaystvo Kamchatskogo Kraya (National Economy of the Kamchatka Region), Academy of Sciences, Moskva, Leningrad, 1936, 815 p.(Abbreviated to "Serg").

Sergyeyev, M. A.: Sovetskiye Ostrova Tikhogo Okeana (Soviet Islands in the Pacific Ocean), Leningrad, 1938, 282 p.

Zhilin, S. : Kamchatka, Detgiz, Moskva, Leningrad, 1949, 95 p.

Periodicals:

Ekonomicheskaya Zhizn' Dal'nego Vostoka (Economic Life of the Far East), 1926, 1927

Morskoy Transport (Maritime Transport)

Ogonek (Little Flame)

Rechnoy Transport (River Transport) 1956-57

Smena (The Shift)

Vestnik Akademii Nauk (Messenger of the Academy of Sciences) 1957.

Newspapers:

Gudok, 1953

Izvestiya, 1952, 1953, 1955, 1956,

Kommunist, 1953

Krasnaya Zvezda, 1958

STAT

Pravda Ukrainy, 1954

Promyshlenno-Ekonomicheskaya Gazeta, 1957

Stroitel'naya Gazeta, 1957

Vodnyy Transport, 1956-57-58

Zarya Vostoka, 1953

Other References:

Bol'shaya Sovetskaya Entsiklopediya: vols. 56, 1936; v. 31, 1937; v. 19, 1953; vol. 27, 1954, v. 30, 1954; v. 32, 1955; vol. 44, 1956.

Sibirskaya Sovetskaya Entsiklopediya; vol. 1, 1929, v. II, 1929; vol. III, 1931.

STAT

References to Illustrations

1. Bol'shakor & Rubinskiy:Kamchatka Oblast' (Kamchatka Oblast'), Moskva, Leningrad, 1934,Appendix Map.

2. Sibirskaya Sovetskaya Entsiklopediya (Siberian Soviet Encyclopedia) v. I, 1929

3. Bol'shakov & Rubinskiy: Kamchatskaya Oblast' (Kamchatka Oblast'), Moskva, Leningrad, 1934, pp. 149-150.

4. Ibid. p. 148

5. Ibid. p. 147

6. Ibid. p. 150

7. B. I. Piyp: Materialy po Geologii i Petrografii Rayona Rek Avachi, Rassoshiny, Gavanki i Nalachevy na Kamchatke. Trudy Kamchatskoy Kompleksnoy Ekspeditsii 1936-37. p. 34 and 125. (For full trans. see biblio)

8. Ibid. p. 34

9. Ibid. p. 58

10. Ibid. p. 32

11. Narodnoye Khozyaystvo Kamchatskogo Kraya (Economy of Kamchatka Kray) 1936. p. 16

12. Kamchatka, 1949, p. 47

13. Narodnoye Khosyaystvo Kamchatskogo Kraya, p. 16

14. Kamchatka, 1949, p. 30

15. Narodnoye Khosyaystvo Kamchatskogo Kraya, p. 250

16. Kamchatskaya Ekspeditsiya, Part I, p. 23.

17. Ibid. p. 21

18. Ibid. p. 24

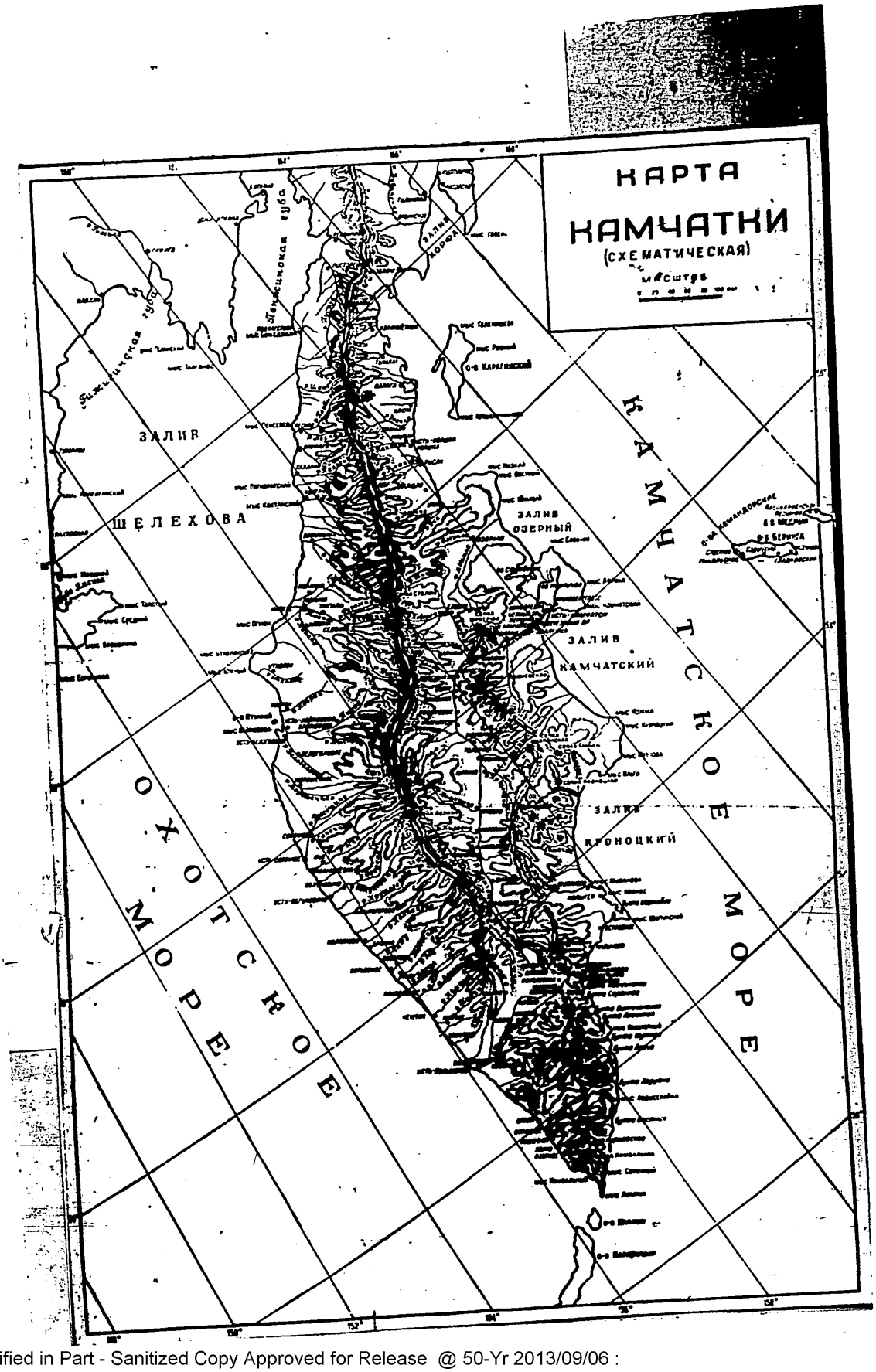
19. Ibid. p. 24

20. Kamchatskaya Oblast' (Kamchatka Oblast'), 1934, p. 136

21. Ibid. p. 65

22. Narodnoye Khozyaystvo Kamchatskogo Kraya, 1936, p. 198

23. Ibid. p. 625



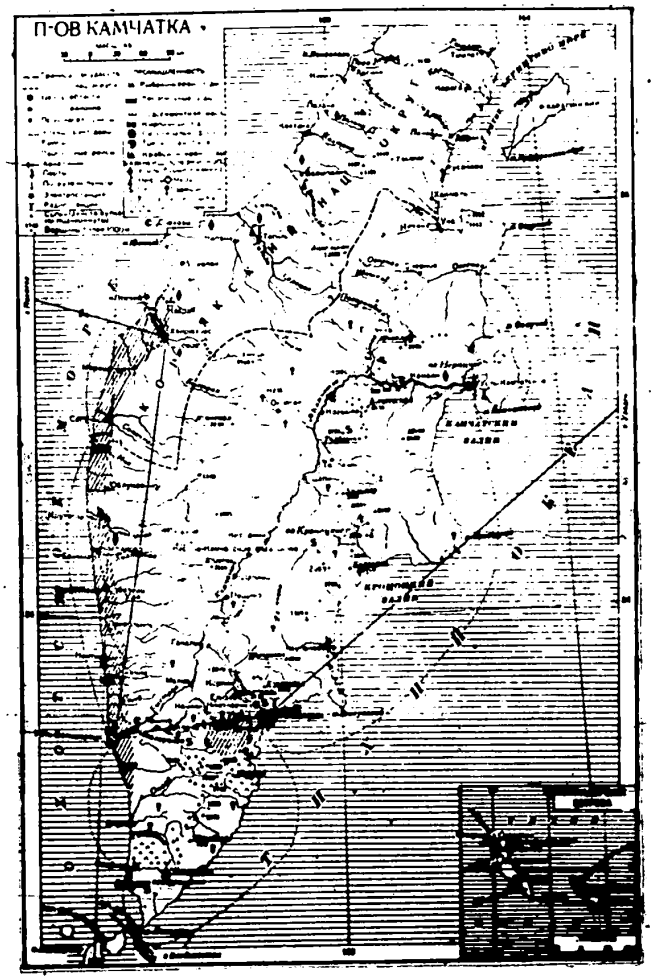


Fig. 2 - Kamchatka Peninsula

STAT

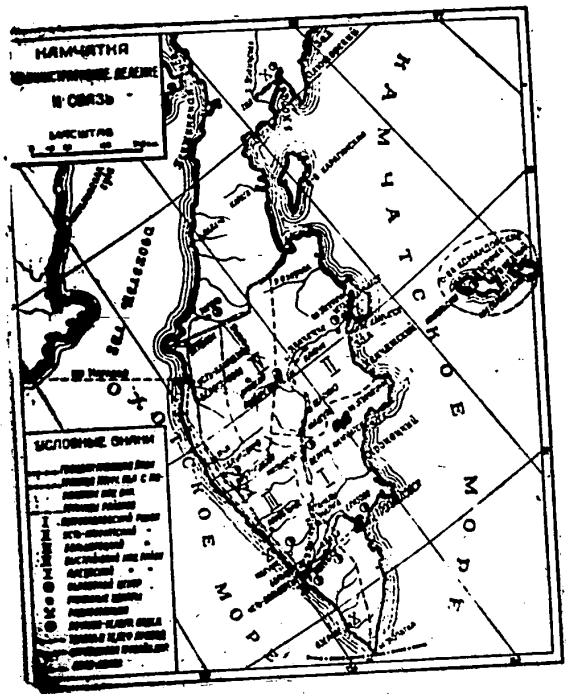


Fig. 3 - Administrative subdivision and communications on Kamchatka

STAT

Fig. 5 - [illegible]

STAT

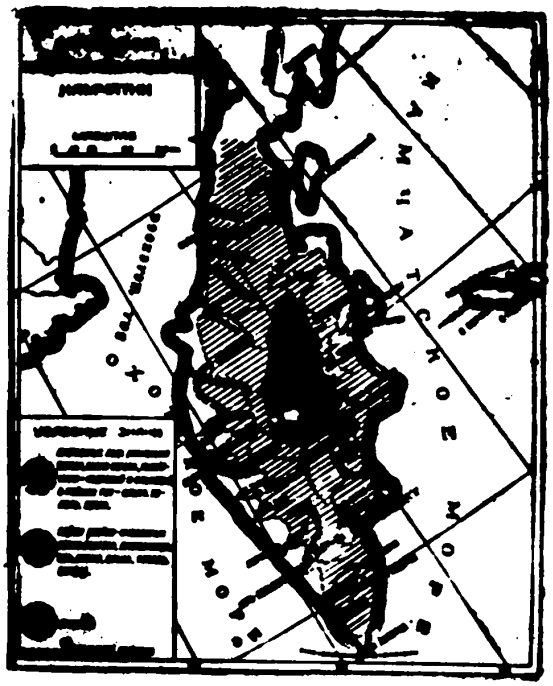


Fig. 5 - Known timberlands of Kamchatka

STAT

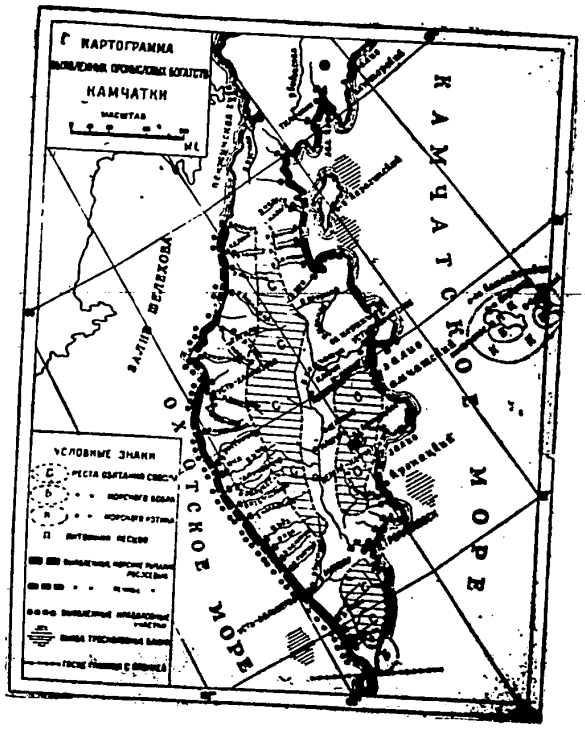


Fig. 6 - Map of fishing and hunting areas

STAT

[redacted]

Fig. 7 - The headwaters of the Srednyaya Avacha River

STAT

Bakenin Volcano

STAT

Fig. 9 - Formation of groups of small "griffons" or sources on the banks of the Chapanove River

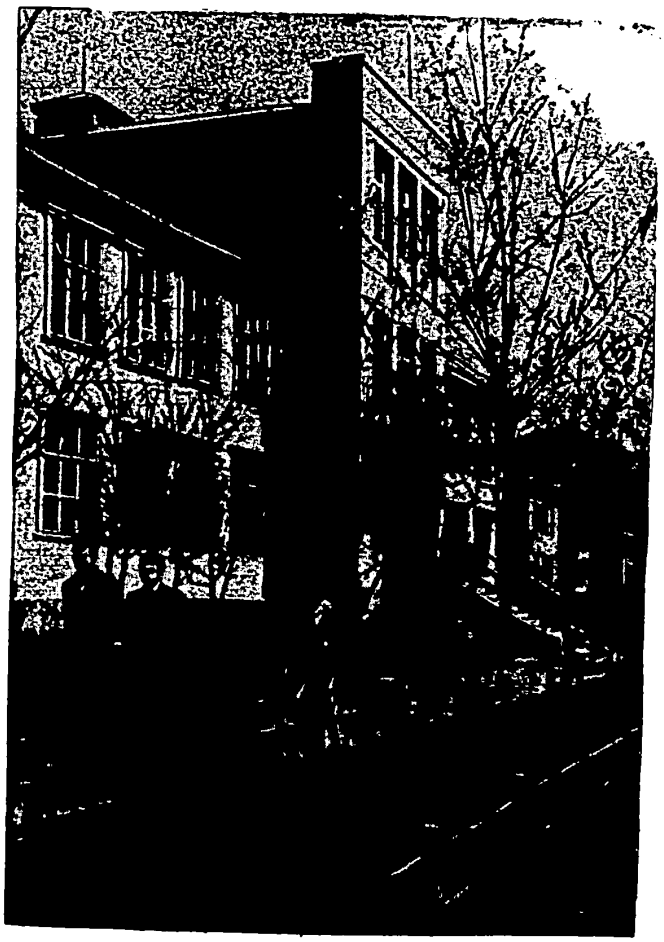
STAT

STAT

Declassified in Part - Sanitized Copy Approved for Release @ 50-Yr 2013/09/06 : CIA-RDP81-01043R002500080006-6

Fig. 11 - Avachinskaya Bay - Petropavlovsk Kamch.

STAT



STAT

Declassified in Part - Sanitized Copy Approved for Release @ 50-Yr 2013/09/06 :
CIA-RDP81-01043R002500080006-6

Fig. 13 - Petropavlovsk - May, 1929

STAT

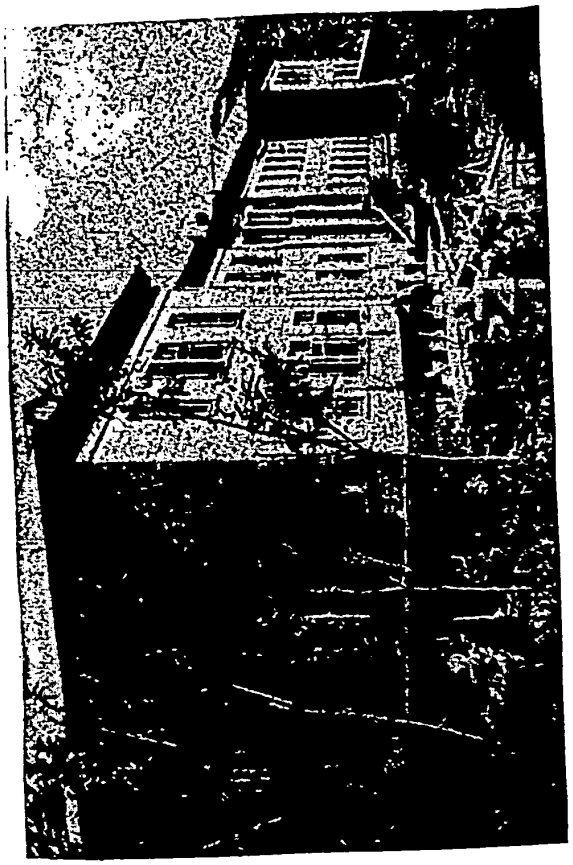


Fig. 14 - New Houses on Kamchatka

STAT

Fig. 15 - Houses for Workers in Ust' Kamchatsk

STAT

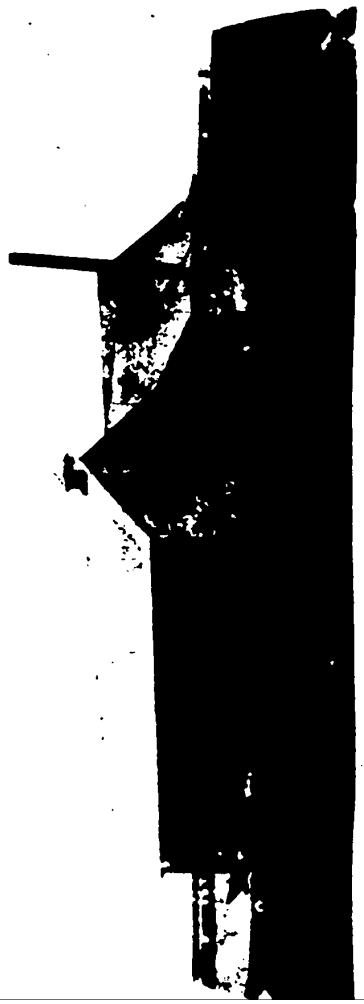


Fig. 16 - Ust' Kamchatsk - The Cannery of the Kamchatka Trade and Industrial Company

STAT

Fig. 17 - View of Ust' Kamchatsk from "Koshka"

STAT

Fig. 18 - Kamchatka River Bay. Ust' Kamchatsk "Kosmka" (Cosmos) and the Kamchatka River

STAT

Fig. 1y - [illegible] settlement

STAT

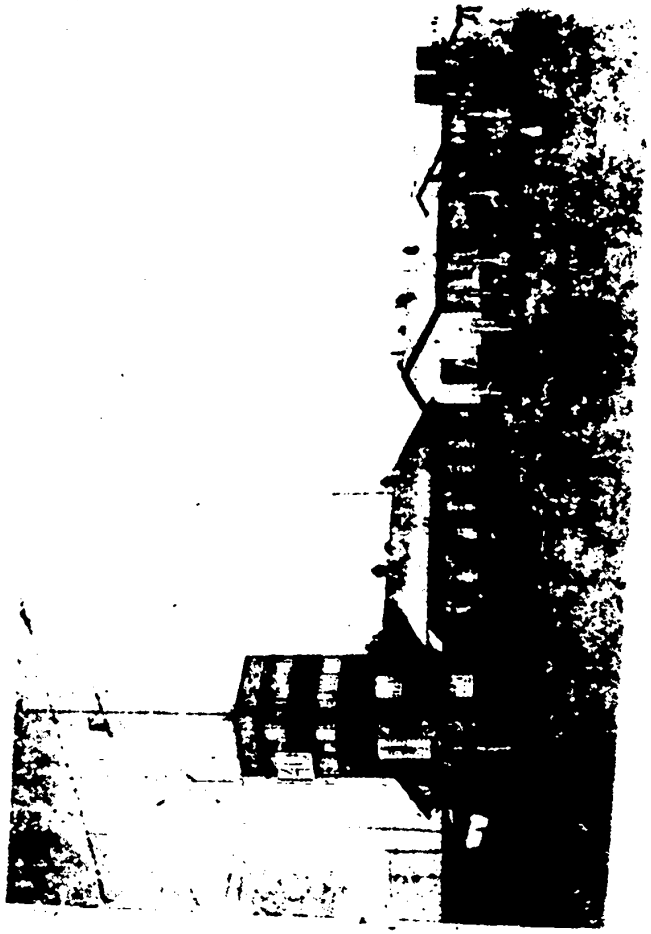


Fig. 20 - Apartment House of the Ust' Kamchatsk Fish Canning Plant No. 1

STAT

STAT

Fig. 22 - View of Kamchatka River. Near Mashura Village

STAT

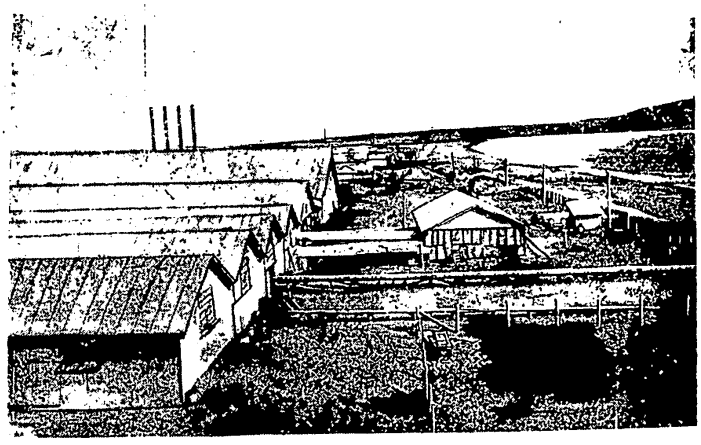


Fig. 23 - View of Kamchatka River Valley

STAT