

such a belief, for I have never been able to consult a copy of his book and I rely on Wieland for my information. It is true that I have not seen the entire field covered by this formation, but I worked faithfully inspecting and photographing the cones, and I find no difficulty in agreeing with Lukas that there are more than 50,000 cones.

The cones of Cappadocia were characteristic features of the country in the third millennium before Christ. History and archæology cannot trace them further, because, as yet, nothing is known about periods in Asia Minor more remote than that; but the spade and the archæologist may soon reveal that history to a waiting world.

THE MURMAN COAST

Arctic Gateway for American and Allied Expeditionary Forces in Northern European Russia

THE relatives and friends of American troops comprising, with French and British units, an expeditionary force operating along the Archangel-Vologda Railway line in northern Russia, have an especial interest at this time in the Murman Coast, which has been the gateway through which have passed all the munitions and supplies of food and clothing for this army during the winter months, when Archangel itself has been closed to the shipping world by a barrier of ice.

Murmansk, the chief port of the Murman Coast, is more than 300 miles nearer the North Pole than is Archangel, but, thanks to the warm waters of the Gulf Stream, which temper the winds blowing over it, the Kola Inlet, on which this army entrepôt is situated, is open to navigation twelve months in the year.

Until the closing of her Baltic ports by German blockade and the sealing of her channel of egress to the south through the Dardanelles by the alliance of Turkey with the Teutonic Powers, imperial Russia had paid small heed to the greatest asset of her Arctic shores—the Kola Inlet, an arm of the sea penetrating deep into the Murman Coast. It is true that a naval base had been established in Catherine Harbor, Kola Inlet, 20 years ago; but its port of Alexandrovsk, which is 20 miles north of the new port of Murmansk, had lain neglected and the Slavs continued to depend entirely upon Archangel as a commercial gateway for this part of their vast domain.

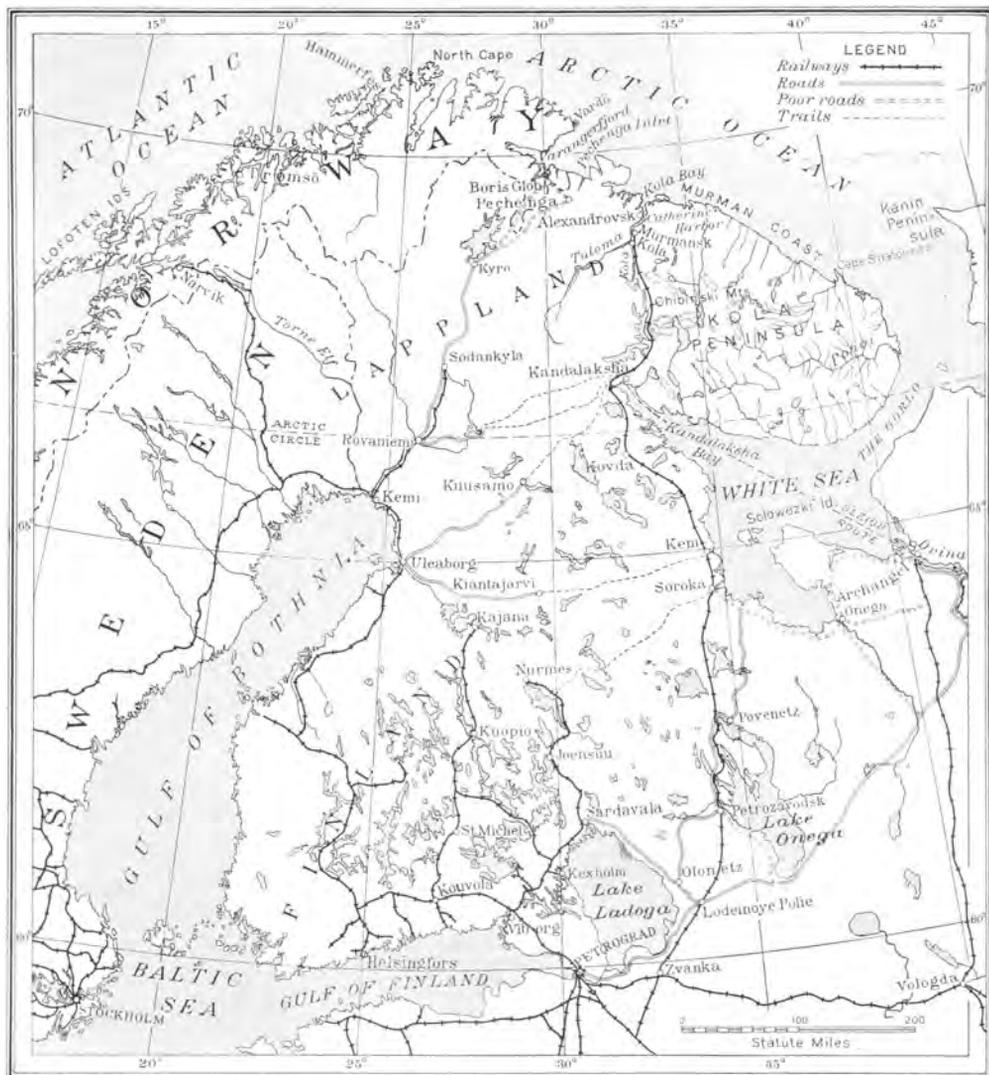
The port of Archangel, under the most favorable circumstances, is closed by ice to sailing vessels for six months in the year, to smaller steam craft for four months out of the twelve, and to the largest types of ice-breaking ships for at least two of the winter months.

This interruption to commerce, owing to ice floes in the Gorlo, the neck of the White Sea bottle, was of small consequence to the Slavs in the easy-going pre-1914 days; but after the tragic rout of the Tsar's forces at the battle of Tannenberg, in the Mazurian Lakes region, and the subsequent debacle on the Dunajec, Russia and her Allies knew that her continuance in the struggle against the Prussians would depend upon an ever-increasing flow of supplies and munitions to the inadequately equipped armies of Brusiloff, Alexieff, and the Grand Duke Nicholas.

It became evident that any "time out" for the ice blockade of Archangel was unthinkable, and in this emergency the Murman Coast and its ice-free port was to come into its own. Until that time the region was almost as little known to the Russian people as to the rest of the world.

THE MURMAN NOW AIDS AMERICA

Having served Russia when that country was an ally of the Entente nations, the Murman region today is the short link in the chain which connects the forces of the Allies and America with their bases of supply overseas. The



A. H. Bumstead, Cartographer

A MAP OF THE MURMAN COAST AND THE TERRITORY THROUGH WHICH RUNS THE NEW MURMAN RAILWAY

The Murman Railway was the artery which supplied with food, clothing, and munitions the American and Allied forces in Northern Russia during the winter months.

journey from the United States to Petrograd is 5,000 miles shorter by way of Halifax and the Murman ice-free port of Murmansk than by way of Seattle to Vladivostok and thence westward on the Trans-Siberian Railway.

All during the past winter months 5,000 American troops, cooperating with 12,000 British, 2,700 French, 1,500 Siberians, and 1,400 Italians, received a constant flow of supplies of food, clothing, and munitions through Murmansk,

which did not come into existence until 1916.

Murmansk is the northern terminus of the Murman Railway, a single-track line which connects the ice-free port with Petrograd by way of Kandalaksha, Kem, Petrozavodsk, and Zvanda, 660 of the 900 miles of the line having been constructed since 1914 in the face of some of the greatest obstacles ever encountered in civil engineering.

War work on the Murman Railway



THE SEA NEVER FREEZES ON THE MURMAN COAST

The beneficent Gulf Stream, which saves England from a climate similar to that of Labrador, also rescues the Murman from six months of ice-bound waters, such as block the harbors of the White Sea.



Photographs by Nathalie Loubovitsky

MOST OF THE FISHERMEN OF THE MURMAN COAST ARE ONLY TEMPORARY RESIDENTS

The Pomoros, who dwell in the region west of the White Sea, travel northward to the Arctic shores in the summer and live in cantonments, or small, closely huddled villages. They are descendants of the Novgorod Russians, in whose annals there is mention of the village of Kola as early as the middle of the thirteenth century.



A LIGHTHOUSE TO THE EAST OF ALEXANDROVSK

In addition to such beacons to guide the mariner, stations have been established on the Murman Coast for the study of meteorological conditions in order that fishermen may be warned of stormy weather. Life-saving boats put to sea when storm signals fly.



Photographs by Nathalie Loubovitsky

FISHING BOATS IN A QUIET HARBOR ON THE MURMAN COAST

Murmansk, Russia's only ice-free port in the north, is situated on the eastern shore of the Kola Inlet, 30 miles south of the Arctic coast. The inlet is a mile and a half wide at this point and there is a depth of 32 feet at the piers, while it is 70 feet deep a few hundred yards from shore. The inlet has no currents and large ships may be shifted from one side of the pier to the other without the aid of tugs. There is an eleven-foot tide.



THE RAPIDS OF THE PASVIK RIVER EIGHT MILES FROM ITS INFLUX INTO
VARANGER FJORD

Boris Glob, the most westerly Russian settlement of the Murman Coast, is situated on the banks of this river (see page 338).



Photographs by Nathalie Loubovitsky

TYPE OF CANOE USED BY MURMAN FISHERMEN

Until the war-time necessity arose for an open harbor twelve months in the year, even the Russians knew little about the Murman country, but with the outbreak of the European conflict Kola Inlet became of vital importance to the whole Slavic empire.



A SINGLE HABITATION IN THE MIDST OF MILES OF DESOLATION

Most of the houses of the Murman region are one-story structures, built of unhewn logs. The crevices are packed with native moss. In the western end of the Murman, forests of birch, pine, and spruce are to be found within 20 or 25 miles of the Arctic shore, but farther east, where the influence of the Gulf Stream wanes, the timber line is 60 to 70 miles inland.



Photographs by Nathalie Loubovitsky

SUMMER HOMES OF MURMAN FISHERMEN

Whaling was a profitable industry on this coast more than forty years ago, but these animals have now entirely disappeared. Cod, herring, and salmon are the principal food fish.



A ZIRINIAN AND HIS FLEET-FOOTED FOUR-IN-HAND

During the nineteenth century a few Zirinians (also called Syrenians), a nomadic people residing on the west side of the Urals, migrated to Lapland in an effort to outrun a disease which was destroying their herds of reindeer. The animals which they brought with them were of a splendid stock. The Zirinians are skillful in handicraft and are excellent hunters.



Photographs by Nathalie Loubovitsky

PECHENGA MONKS AT WORK ON TIMBERS FOR A HIGHWAY BRIDGE

Wood is an extremely valuable commodity along the Arctic coast, but there are vast forests of birch and pine in the interior. Under the imperial régime the forests were strictly regulated by the administration of Archangel.



WHERE RUSSIA AND NORWAY MEET: THE WESTERN EXTREMITY OF THE
MURMAN COAST

At the mouth of the Pasvik River the two houses, the church, and the Lapp huts in the left foreground comprise the most westerly Russian settlement on the Murman Coast. The town is known as Boris Glob and is located on one square mile of Russian ground in Norwegian territory, this part of the coast having been given to Norway, with the exception of Boris Glob, in the treaty of 1825.



Photographs by Nathalie Loubovitsky

AT THE OTHER END OF THE MURMAN: ON THE SHORES OF THE WHITE SEA

A Russian town which is inhabited almost exclusively by trading people and fishermen. In the summer-time it is practically deserted, as the fisher-folk journey westward to the various settlements on the Murman Coast. This photograph was taken at midnight in June.



LOW TIDE AT MIDNIGHT IN JUNE: EASTERN MURMAN



Photographs by Nathalie Loubovitsky

HIGH TIDE IN THE SAME FISHING VILLAGE HARBOR SHOWN ABOVE

While the hauls of fish during the spring and summer on the Murman Coast are extraordinarily heavy, much of the catch is wasted, owing to improper methods of cleaning, drying, and salting. For this reason a large part of Russia's sea food is imported from Norway. Many fishermen in the early spring sail to Tromsö and Hammerfest, Norway, with their schooners loaded with flour, which they exchange for Norwegian fish, while much of their own bountiful catch is permitted to spoil.



ON THE BLEAK TUNDRAS OF ARCTIC RUSSIA

Many years ago the Russian Government made a brave effort to colonize this part of its vast domain, but the attempt proved abortive. The colonists cut away even the sparse woods which the region supported and introduced vodka among the native Lapps. The result was mutually tragic.



Photographs by Nathalie Loubovitsky

CODFISH HUNG OUT TO DRY AT A POPULOUS FISHING SETTLEMENT ON THE
MURMAN COAST

These villages, where only men are to be found, present a curious aspect in summer. The fisher-folk come and go, busy night and day repairing their tackle and cleaning their catch. It is a land of the midnight sun, but no tourists ever find their way to it.



AFTERNOON TEA IN ONE OF THE ARCTIC OUTPOSTS OF CIVILIZATION

These are men of Pechenga, a settlement situated on the Pechenga Inlet, 18 miles from the Arctic seacoast and 65 miles northwest of Murmansk, the terminus of the Murman Railroad. A new wagon road, built since the outbreak of the world war, connects Pechenga with Kyro, 100 miles to the southwest. From Kyro a fair road, over which an automobile has passed, leads to Rovaniemi, the northern terminus of the Finnish Railway which runs to Kemi, 65 miles distant, at the head of the Gulf of Bothnia (see map, page 332).



Photographs by Nathalie Loubovitsky

WE WOULD CALL THIS CAMPING OUT IN AMERICA, BUT IT IS THE STERN REALITY OF LIFE RATHER THAN RECREATION ON THE KOLA PENINSULA

When the old régime sent settlers to the Murman Coast, each family was promised 2,000 rubles as a household nest-egg, but even with this bonus the frugal peasants failed to find life attractive.



Photographs by Nathalie Loubovitsky

MONKS OF THE SOLOVETSKY MONASTERY AT PECHENGA

Founded in the sixteenth century by a hermit known as "Holy Trifan," the monastery was destroyed by a Swedish invasion early in the seventeenth century. In the nineteenth century it was restored under the direction of Father Jonathan, a simple peasant who spent thirty years at Pechenga and died in 1915, leaving the monastery as a powerful agency for civilization.



A TAILORING SCHOOL IN PECHENGA CONDUCTED BY MONKS

The pupils are placed in the monastery of this Murman settlement for a year or two at a time in fulfillment of religious vows made by their parents. Children came from places 1,000 miles distant before the world war. Pechenga is a fair-sized village with macadam roads. The wagon road to Rovaniemi (see also page 341) can be traveled at any time of the year, but is best in winter.



A LAPP AND HIS BEST FRIEND

What the banana is to the native of Central America and the palm tree to the dweller in the Saharan oasis, the reindeer is to the Lapp. This animal furnishes both food and clothing to his herder, and in addition is the native's sole means of transportation over miles of snow and ice.



A WELL-TO-DO WOMAN OF THE MURMAN COAST

The population of the Kola Peninsula is composed of two groups—the natives and the immigrants. The aborigines are Lapps. They are widely distributed, both on the coast and inland. While civilization has affected them only slightly, they are nominally Christians as the result of the efforts of Russian missionaries.

Photographs by Nathalie Loubovitsky



Photographs by Nathalie Loubovitsky

HAY AND GRASS GROW ABUNDANTLY DURING THE BRIEF SUMMER MONTHS, WHEN THE SUN SHINES ALMOST CONTINUOUSLY "NIGHT" AND DAY

- Most of the northern coast of the Kola Peninsula is a vast expanse of bogs, but where there is natural drainage the vegetation is luxuriant during the few weeks when the sun is constantly above the horizon. Small quantities of potatoes, rye, and barley are also raised.



A MONK OF PECHENGA (TO THE RIGHT) AND A WORKMAN EMPLOYED AT THE MONASTERY ROWING OUT TO MEET A PASSING STEAMER

- The religious recluses in this outpost of Christianity derive some income from the down of the eider ducks which they gather on the near-by Aino Islands. The eider-down is collected without destroying the nests or frightening the birds.



"SUN-KIST" SEA FOOD ON THE MURMAN COAST

The natives have only two ways of preserving fish—to salt them in barrels and to dry them in the sun. When the salt supply runs low and the sun fails to shine, quantities of food spoil.



SNOW SISTERS ON THE KOLA PENINSULA

The winter lasts long and the spring is late, cold, and rainy in this part of the world. Snowstorms are not infrequent in June, and in mid-winter, in the forests, snowdrifts 15 and 20 feet deep are encountered.

Photographs by Nathalie Loubovitsky



THE CITY OF THE DEAD IN PECHENGA

Monuments erected to the monks of the famous Greek Church monastery founded by the "Holy Trifan" in the sixteenth century.



Photographs by Nathalie Loubovitsky

LADIES OF LAPLAND

The two women with the tall hats are married. Those with the scarfs are débutantes. The youngest, the one with the striped waist, is fifteen years of age. The Lapps are a semi-nomadic people, depending largely on their reindeer herds for food and winter clothing. They comprise a large element of the population of the Murman region.



FISHERMEN'S HUTS BUILT UPON SAND AND SNOW: MURMAN COAST

It matters not whether their foundations are shifting, as they are for use through the summer stay only.



Photographs by Nathalie Loubovitsky

THERE IS LITTLE TO ENLIVEN HUMAN EXISTENCE HERE—NOT EVEN A MOVIE
EVER FLICKERS

The temperature sometimes rises to 80 or 90 in the shade in summer and will last for a week. Then a strong northeast wind sends the mercury down to 45 degrees. The temperature is affected by the icebergs which are brought down by the cold currents from the north.

began January 1, 1915, with the appointment by the Russian Government of Vladimir Goriachkovsky as the engineer. At his disposal were placed 100,000 workmen recruited from all parts of the empire.

The line had to run through a terrain presenting the most discouraging difficulties—swamps, bogs, frozen lakes, and almost impenetrable forests.

In Russia's peril, construction work could not wait upon the advent of spring. Soundings were made through the ice by means of long iron rods to determine earth contours, in order to establish the safest roadbeds in swampy country. Much of the surveying during the long nights of the Arctic winter had to be done by lantern light.

The German propaganda bureau spread reports of frightful mortality among the workmen, but as a matter of fact, although the laborers lived under the most primitive conditions, in tents, the death rate was extremely low. About one per cent of those taken ill succumbed to scurvy.

It is true that when the first trains began to run over the partly completed road there were occasions when the track suddenly subsided, due to the fact that the rails had been laid upon what were thought to be rocks, but which proved, with the thaw of spring, to be ice. Under the circumstances, however, these mishaps were comparatively rare, and no serious accidents resulted. The swampy character of the right of way is indicated by the fact that there are 1,110 bridges on the line.

To maintain American and Allied troops operating along the Archangel-Vologda line in the winter of 1918-1919, when the harbor of Archangel was sealed, supplies were shipped by steamer to Murmansk, where they were unloaded and sent by rail to Kandalaksha, a distance of 170 miles, and thence transported by sledges across the frozen White Sea to Archangel, 200 miles to the east.

MURMANSK'S DAY IN THE SUN

Even before the boom occasioned by the decision of the Allies and America to dispatch an expeditionary force to Russia, Murmansk had grown to be quite a

settlement, with its 3,500 to 4,000 inhabitants augmented from week to week by refugees whose number fluctuated from a few hundred to 3,000.

As was the case with all building operations in the empire, the Russian Revolution interfered materially with the growth of the port, which is situated on the east bank of the Kola Inlet, 30 miles south of the Arctic shore. Most of the buildings are of one story and are constructed of unhewn logs, chinked with native moss. The streets under the Russian régime were entirely of dirt. On both sides of the inlet, which is one and a half miles wide at this point, hills rise to a height of several hundred feet. The harbor is unobstructed by hidden rocks or shoals, and the ship berths can accommodate the largest ocean-going freighters.

The Murman (a corruption of Norman) is the name given to the 260-mile stretch of Arctic seaboard which forms the northern boundary of the Kola Peninsula, a vast plateau having an average elevation of 1,000 feet and covered with swamps, peat-bogs, forests, and lakes, lying almost entirely within the Arctic Circle and embracing an area as large as England and Wales combined.

Before the war the Murman Coast was practically uninhabited throughout the greater part of the year. In summer, however, Lapps and Russian fishermen from Archangel and the Pomorya district (lying west of the White Sea) formed fishing communities to take advantage of the bountiful schools of salmon, cod, and herring off shore.

The Lapps live in the interior of the peninsula in winter, tending their herds of reindeer, which furnish them with food, clothing, and transportation. In times of peace there is a considerable lumber industry, but otherwise the peninsula is comparatively non-productive, as only the scantiest crops of rye, barley, potatoes, and hay can be grown. The animal life is similar to that of most other high latitudes, including foxes, bear, martens, otters, elk, deer, and hares.

Mosquitoes are a serious pest in summer, even the reindeer being forced to flee to the high ground of the Chibinski Mountains, near the middle of the peninsula, to escape the harassing swarms.