

The background of the cover is a detailed painting of a grand Ukrainian church, likely the Holy Trinity Cathedral in Kyiv. The church features multiple golden domes and intricate architectural details. In the foreground, a large crowd of people in traditional Ukrainian attire is gathered, some sitting on the ground, others standing, creating a sense of a busy public square or market. The overall scene is bathed in a warm, golden light, suggesting a bright day.

UKRAINE

**THE LAND AND
ITS PEOPLE**

STEPAN RUDNYZKYJ

Ukraine

The Land and its People

An Introduction to its
Geography

STEPAN RUDNYZKYJ

Ukraine - The Land and its People, S. Rudnyzkyj
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86450 Altenmünster, Loschberg 9
Deutschland

ISBN: 9783849661946

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Publisher's Preface

The first appearance of this book, which is from the pen of Stephen Rudnitsky, the famous geographer of the University of Lemberg, was in the Russian Ukraine. The book was printed in Ukrainian, at Kieff, and the date under the publisher's imprint was 1910. The first translation into a foreign language was into German. This translation appeared at Vienna in 1915, with many improvements and additions.

The English translation which appears in this volume is an authorized translation of the German edition above-mentioned.

The reader is respectfully requested to note that the few unpleasant references to Russia are of course meant to apply to the Russia of the Czars, as the book was written during the Czarist regime.

Ukrainian Alliance New York City of America
1918

Book I. PHYSICAL GEOGRAPHY

Ukraine as a Geographic Unit

There are few lands upon the whole globe so imperfectly known to geographic science as the one which we shall try to describe in this little work. The geographic concept of the Ukraine does not exist in the geography of today. Even the name has been almost forgotten in Europe in the course of the last century and a half. Only occasionally on some maps of Eastern Europe the name "Ukraine" shows timidly along the middle of the Dnieper. And yet it is an old name of the country, originating in the 11th Century, generally known throughout Europe from the 16th to the end of the 18th century, and then, after the abrogation of the autonomy of the second Ukrainian state, gradually fallen into oblivion. The Russian Government has determined to erase the old name of the land and the nation from the map of Europe. Little Russia, West Russia, South Russia, New Russia, were officially introduced in place of the old name Ukraine, the Austrian part of the Ukraine receiving the name of East Galicia. The people were named Little Russians, South Russians, Ruthenians, and all remembrance of the old name seemed to have been blotted out. But, in the speech of the people and in the magnificent unwritten popular literature of the nation, the name of the land could not be destroyed, and, with the unexpected rise of Ukrainian literature, culture, and a feeling of national political independence in the 19th Century, the name Ukraine came into its own again. Today there is not an intelligent patriotic Ukrainian who would

use another name for his country and nation than Ukraine and Ukrainian, and, slowly, these designations are penetrating foreign lands as well.

The Ukraine is the land in which the Ukrainian nation dwells — a great solid national territory embracing all the southern part of Russia in Europe, besides East Galicia, Northwest Bukovina and Northeast Hungary.

This district is a definite geographic unit. A discussion of its exact boundaries shall be reserved for the anthropogeographical part of this book.

A division of Europe into natural regions almost invariably stops at Eastern Europe. While all the other portions of our globe have long been the object of the most detailed classification, Eastern Europe remains, as before, an undivided whole. To be sure, there have been many attempts at classification, but they are all based upon a non-geographical point of view. Only the Baltic provinces and Poland are, in their present political extent, regarded as possible geographic units.

These deficiencies in the geographic material relating to Eastern Europe are due, above all, to our imperfect knowledge of this great region. Russian science is devoting far more intensive study to the Asiatic borderlands of the immense empire than to the European home country. For this reason, our literary aids in this direction are few and unreliable. The latter criticism applies even to the twenty-volume *Geography of Russia* by Semyonoff and the *Geography of Krassnoff*. Apart from the consideration that it is relatively out of date, the fifth volume of Reclus' "Gographie universelle" still offers the best insight into this unique region of Eastern Europe.

If we glance at the map of Eastern Europe, we perceive at once that the great uniformity of this immense region makes it quite impossible to apply to Eastern Europe as a criterion the division of Western or Central Europe. It is not seas and mountains that separate the natural regions and

anthropogeographical units of Eastern Europe, but imperceptible morphological transitions, hydrographic and climatic boundaries, petrologic and floral conditions.

The Ukraine is an Eastern European country. Its situation, its decidedly continental character, its geologic history, tectonic construction and morphologic conditions, its climate, plant and animal life, its anthropogeography — all are characteristic of Eastern Europe. But within Eastern Europe the Ukraine occupies a unique position, which fully warrants our conceiving of this great land as a geographic unit standing on an equal basis with the other natural units, as Great Russia, North Russia, the Ural, White Russia, the Baltic Provinces. But it also forms a characteristic transition country from Eastern to Central and Southern Europe on the one side, and to Western Asia on the other.

The location of the Ukraine causes us necessarily to consider it as the easternmost of the Mediterranean countries of Europe. The Ukraine differs from these other Mediterranean countries in that it is not hemmed in on the north by mountains. The back-country of the Black Sea, which the Ukraine really is, therefore merges gradually into the lands lying further to the north — Great Russia and White Russia. Of all the regions of Eastern Europe, the Ukraine alone has access to the Mediterranean.

The geological history of the Ukraine is entirely different from that of the rest of Europe. The pre-Cambrian core of gneiss-granite of the Ukraine, unlike other parts of Eastern Europe, was not flooded by the sea either in the Cambrian period or the lower Silurian, while in the upper Silurian the sea covered only a slight part of Western Podolia and Northern Bessarabia. The Devonian sea crossed the boundaries of the Ukraine only in the farthest east (Donets Plateau) and west (Western Podolia). The carbon deposits and Permian formations, so widely distributed in Eastern Europe, are found in the Ukraine only on the Donets;

Triassic rock hardly at all. The Jurassic Sea confined its action almost wholly to the plicated borderlands of the Ukraine, although it actually flooded great stretches of Eastern Europe. Only the extension of the chalk seas thru Eastern Europe affected Ukrainian territory, especially the northern and western borderlands. The old tertiary sea, on the other hand, confined itself for the most part to the Ukraine, with the result that a goodly section of the northeastern boundary of the old tertiary deposits coincides exactly with the anthropogeographical boundaries of the Ukraine. The inland seas of the lower green-sand formation of Eastern Europe, too, are confined almost entirely to Ukrainian territory.

The geologic history of the Ukraine in the diluvian period was also decidedly different from that of the other districts of Eastern Europe. The Northern European inland ice covered the northwestern borderlands of the Ukraine only in the main ice period, for the boundary set for the glaciation of the north, on the basis of the investigations of Russian scholars, applies in great measure only to the limits of the distribution of northern glacial boulders, which were carried to their present site not by ice but by flowing water. The two indentations of the glaciation-boundary in the Don and Dnieper district merely mark the sphere of action of two glacial river systems.

The absence of a one-time inland-ice-cap differentiates the Ukrainian district very markedly from the other parts of Eastern Europe. As we perceive, even from this short description, the Ukraine has had an entirely different geologic history from the rest of Eastern Europe.

More plainly still, the independence of the Ukraine as a natural unit is revealed in its contour-line and surface-relief. The Ukraine is the only portion of the Eastern European plain which has access to the mountainous region, for it rests upon the Carpathians, the Yaila Mountains and the Caucasus. Important individual districts

of the Ukraine lie in these mountains and lessen the Eastern European uniformity of the country. The formation of the Yaila and the Caucasus began at the end of the Jurassic period — its completion and the building up of the Carpathians occur in the late tertiary period.

The plains and plateau of the Ukraine, while at first glance quite similar to those of Central Russia, are in reality very different from these as to structure and surface-relief. The nucleus of the Ukrainian plateau group, which is surrounded by the two plain districts of the Ukraine, consists of the so-called Azof Horst (so named by E. Suess), which stretches from the banks of the Sea of Azof in a northwesterly direction as far as Volhynia and Austrian Podolia. This primeval rock surface, composed of granite gneiss, is bounded by quarries and edged with declivities, which are hidden by more recent sediment deposits. Since this extended Horst stretches thru practically the whole length of the Ukraine, we shall call it "the Ukrainian Horst."

This Ukrainian Horst is of great importance for the entire process of folding, all over the earth. To the west of this Horst is the immense fold-system of the Altai, folded far into North America toward the north and northeast, in direct opposition to the main parts of the enormous system which lie to the east of it. In the east of the Horst we see the straight line of the mountain system of the Caucasus; in the west the winding guide-lines of Central Europe.

The region of the Ukrainian Horst has influenced not only the formation of the plicated country. In connection with it we find, arranged on a grand scale, but not very intensive, disintegrating lines, which traverse the entire Ukrainian country from N. W. to S. E. These tectonic disturbances have led to strong folding and dislocation of the more recent sedimentary layers which lie close to the Horst. This folding district can be observed only in the trunk range on the Donets and in a few isolated places to the northwest;

beyond this it is buried under the huge cover of the tertiary layers. The folding process took place in the Donets Mountains, continuing with long interruptions from the end of the Paleozoic era to the beginning of the tertiary period. As pre-tertiary disturbances of this kind we consider the disturbance of Isatchky, Trekhtimirov, etc., as well as some dividing lines at the northwestern extremity of the Ukrainian Horst.

There is no doubt that the Ukrainian Horst was also the origin of more recent tectonic disturbances — tertiary and post-tertiary. The two main lines of Karpinsky (the northern — Volga, bend of the Don, source of the Donets, delta of the Desna, South Polissye, Warsaw; the southern — delta of the Don, end of the Porohy of the Dnieper, source of the Boh, Western Podolia) for the most part go back to these more recent post-Cretaceous disturbances. Besides, we are already able, despite our insufficient morphological data on the Ukraine, to establish the fact that the entire Ukrainian plateau-group is the scene of a significant post-glacial elevation. The strikingly parallel courses of the main streams, the Dniester, the Boh, the Dnieper as far as Katerinoslav, the Donets and the Don, together with the precipices frequently accompanying them, lead us to infer the existence of tectonic influences. That the precipices of Podolia are very recent we may now confidently maintain, and that the precipitous bank of the Dnieper is quite as recent is shown by the familiar dislocation near Kaniv, where the tertiary is affected. Seismic movements of the most recent past and morphological observations show us that the tectonic disturbances of the Ukraine are continuing into our own day. From this tectonic characterization of the Ukraine we perceive that this country occupies an independent position in relation to the rest of Eastern Europe. The much more intensive tectonic disturbances of the Ukrainian region have produced a greater variety of plateau and plain country here than in

White, Great or North Russia. The Ukrainian plateaus attain the contour-lines of 400 and even 500 meters and reveal precipices of tectonic origin, which for a long time were considered proof of Baer's law and have recently been explained as Davis Cuestas. The extensive working out of valleys in the Ukrainian plateau regions, the characteristic canon-like type of the valleys, the frequent occurrence of hills formed by erosion, lack of glacial formations and deposits, but evidences of great erosive and flattening action — these are the chief elements of difference between the plateau lands of the Ukraine and other Eastern European plateau lands. The plains of the Ukraine possess similarities to neighboring Central Europe only in the Northwest. Beyond this, they are all more or less decided steppes, the like of which are not met with in Central Europe, Hungary not excepted. At the same time the character of the steppes of the Ukraine is different from that of the steppe-region of Eastern Russia as well, chiefly because of the detail of the country and the peculiarities of vegetation, which are occasioned by differences of climate.

Hydrographically the Ukraine is distinguished by a web of rivers concentrating in the Pontus. The Ukraine embraces the river systems of the Dniester, Boh, Dnieper, Don and Kuban — not entirely, to be sure, yet by far the greater part, leaving only the sources of the two greatest rivers to the White and Great Russians. Only the most western borderlands of the Ukraine lie within the watersheds of the Baltic Rivers (the Vistula district); only the most eastern mountain-spurs in the water-shed of the Caspian Sea (Terek and Kuma). We may therefore, without hesitation, conceive of the Ukraine hydrographically as the northern part of the Eastern European water-shed.

In respect to climate, the Ukraine occupies an independent position in Eastern Europe. In fact, de Martonne recently declared "the Ukrainian climate to be one of the main types of climate of the earth." We shall not

go so far as this, but we must emphasize the fact that the climate of the Ukraine differs no less from that of Poland, White Russia and Great Russia than does Germany's climate from that of England or France. An important wind-partition crosses the Ukraine in winter from East to West, subjecting the entire southern part to the sway of the east wind. Winter in the Ukraine is strictly continental, with a coldness of 30 degrees, but not with the semi-polar character of the Russian or the Central European character of the Polish winter. The east and southeast winds by day prevent the snow-blankets, produced by the moist south winds of the Pontus, from ever becoming too heavy, especially in the Southern Ukraine, and cause them to disappear quickly in the spring. In the spring the temperature rises very rapidly. The summer of the Ukraine is the hot continental summer, and despite the predominant Atlantic west winds and the abundant precipitation, it is not sultry. Autumn is pleasant and dry.

The climate of the Ukraine, then, is the continental climate of the Pontus. Toward the west it merges into the Central European climatic zone at the border of Poland, into the Eastern European continental climate at the border of White and Great Russia, into the Aralo-Caspian dry climate at the eastern border. The southern borderlands of the Ukraine, like those of France, constitute a transition to the Mediterranean climate.

In respect to its flora, the unique position of the Ukraine depends upon the fact that it embraces almost the entire region of the prairie-steppes of the Pontus, with their regions of transition to the Northern and Central European forest zone. Right east of the Don begin the steppes and desert-steppes of the Caspian region. Consequently, the Ukraine is the only country in Europe which has the prevailing character of the steppes. Here, again, this circumstance is of geographical importance and makes the Ukraine, in this respect also, a geographic unit.

The most important signs of independence as a geographic unit, however, are imparted to the Ukraine by its anthropogeographical conditions, to which we shall turn our attention in Book II of this little work.

We have now become acquainted with the natural foundations of the Ukraine as a geographic unit. One important characteristic of this geographic entity must especially attract our attention. The name of the country is Ukraine, which means border-country, marchland. It is an old historical name which originated in the course of the centuries and has become customary. And yet it is significant as hardly another name of a land or people could well be. For the Ukraine is a true borderland Europe, between Eastern Europe, and Western Asia. It lies on the borders of the European plicated mountain-girdle and of the Eastern European table-land. The Ukrainian Horst constitutes a tectonic border-post for the development of the entire European folded area. In the morphological sense as well, the Ukraine constitutes a decided borderland. Here the glacial formations give way to the erosive and flattening formation. Climatologically, too, the Ukraine is a decided borderland. Yet, most of all, does the character of the Ukraine as a land of boundaries and transitions appear in its biogeographical and anthropogeographical conditions. In the Ukraine are merged the boundaries of two European forest regions — of the sub-steppes, transition-steppe, prairie-steppe zone, and of the Mediterranean region. The Ukraine is situated upon the boundaries of the European family of peoples — of Slavdom, of European culture — and, at the same time, upon the boundaries of that anthropogeographical structure which is so remarkable and so little known — the body social of Eastern Europe.

Location and Size

The Ukraine lies between 43° and 54° north latitude and between 21° and 47° east longitude from Greenwich, if we look for our country on a map we will find that it lies as the northern hinterland of the Black Sea, in the southern part of Eastern Europe, just on the threshold of Asia. From the foot of the Tatra Mountains, from the sunny Hegyalia and cloud-wreathed Chornohora, from the silver-rippled San, from the dark virgin forest of Biloveza and the immense swamps of Polissye, to the delta of the Danube — so often sung in the lore of the Ukrainian folk — to the Black Sea, to the gigantic Caucasians and the Caspian, surrounded by brown desert steppes, extends our fatherland, the Ukraine. From the beginnings of the historical life of Eastern Europe, for one thousand two hundred years, the Ukrainian race has resided in this region, and has been able, not only to preserve its boundaries, but, after heavy losses, to regain and even to pass beyond them. And this continued thru centuries of stress, thru bloody wars, after the loss of the first and second national governments, and under the merciless pressure of neighboring states and peoples. That other nations, as the French, the Italians, the Spaniards, should have preserved their original seats, is not surprising; they were protected on all sides by high mountains and deep seas. All the more, therefore, must we admire the great vitality of the Ukrainian nation, which has been able to retain in its possession a mother-country lying open, almost without any protection, to mighty enemies.

For the Ukraine lies at the southeastern edge of Europe, on the threshold of Asia, at the point where the easiest overland route connects the two continents. For an entire period of a thousand years, this border position was most disadvantageous and dangerous for the Ukraine; for Nature and History did not bring the Ukraine, placed as it is, into the proximity of that part of Asia which for thousands of years past had been inhabited by the rich civilizations of

that continent. The Ukraine has always been the nearest European neighbor of the steppe-country of Central Asia. There, from the earliest beginnings of history, dwelt pillaging hordes of Nomads, who would flood Europe from this point. The Pontian steppes of the Southern Ukraine were, for these steppe-people, the natural military road to the West and Southwest, where the rich, civilized lands of the Mediterranean region lay invitingly open. For more than a thousand years, from the beginnings of the history of the Ukraine, these nomadic Asiatic tribes traversed the South Ukrainian steppes, covering the entire Ukraine with war and unspeakable misery. Huns, Avars, Khazars, Magyars, Pechenegs, Torks, Berendians, Polovs, Tatars, Kalmucks, infested the Ukraine in succession. Of all the European peoples, the Ukrainians always had to be the first to oppose these steppe-plunderers. The nomads always had first to force their way thru the Ukraine. Many of them were annihilated by the ancient Ukrainians; thus, the Khazars, Pechenegs, Torks and Berendians; others were held off, as the Polovs or the Kalmucks. But the Ukraine exhausted its strength in this eternal warfare, and, in the terrible stress occasioned by the Tatars, lost their ancient culture and their mighty state.

If, therefore, any one of the European nations may claim the credit of having been Europe's shield against Asiatic barbarism, it is the half-forgotten Ukrainian nation.

The border position of the Ukraine was fatal also, for the reason that the country lay, and lies, so far distant from the cultural centers of Europe. As long as the Byzantine Empire, with its cultural wealth, remained firm, a strong stream of culture flowed from the Pontus into the Ukraine. The decline and fall of the Byzantine Empire suddenly transferred the Ukraine to the furthest (in respect to culture) corner of Europe, close to the Ottoman Empire, which was at that time hostile to culture. The western neighbors of the Ukraine, the Magyars and Poles, acquired

little of the culture of Western Europe in the time of their independence, and allowed still less to slip thru into the Ukraine. The Russians entered the circle of European culture only two centuries ago, and have made only superficial cultural progress since.

And yet the geographical location of the Ukraine is not without favorable features. The Ukraine embraces the entire northern coast of the Black Sea and the Sea of Azof, and holds considerable possibilities for oversea commerce. The proximity of Asia is no longer dangerous, but, on the contrary, very advantageous. A century and a half has passed since the power of the steppe-races was finally broken. Their heritage has been taken possession of, although in a different manner, by the Ukrainian peasant, who has thickly settled the Pontian steppes. With plow in hand, he has reconquered the lands which his ancestors tried in vain to defend with the sword. Ukrainian colonization is still advancing irresistibly in the Crimea and in the forecountry of the Caucasus, and will, no doubt, within a very short time, flood these countries completely.

A further advantage of location lies in the circumstance that the Ukraine is situated on the shortest land-route from Central Europe to the southern part of Central Asia and India, and commands a good portion of this route. This fact may, in the very near future, be of the greatest political and economic importance. At the same time, the Ukraine is the only one of all the East European countries which, thru its location, stands in the closest relations to the Mediterranean countries.!

Reserving the detailed discussion of the Ukraine's geographical location for the anthropogeographical part of my little book, let us now consider the size of the Ukraine.

The area of the Ukrainian territory is 850,000 square kilometers.

We see before us, therefore, a European country which is surpassed in area only by present-day Russia in Europe. No

European people, with the solitary exception of the Russians, possesses so large a compact national territory as the Ukrainians. This characteristically Eastern European spaciousness of the territory, combined with the natural wealth of the region would, if coupled with Western European culture, make a fit dwelling-place for a world-power. On such ground as this, the possibilities for the development of a material and intellectual culture are almost unlimited. / But alas! The greatest poet of the Ukraine, Taras 'Shevchenko, has characterized his fatherland all too fittingly as "Our Land, but not belonging to us." Upon its large and rich territory the Ukrainian nation has had to endure so many hard buffets of fate, that it must be considered, along with the Jews, the most sorely tried civilized race on earth. Even down to the present moment the Ukrainians are a helot race, which is forced to unearth the treasures of its fatherland for its hostile neighbors.

The Black Sea and its Coasts

Although for many centuries separated from the Pontus by the nomad-haunted steppe-border, the Ukrainian nation is closely identified with this sea. An enormous number of legends and songs of the Ukrainian people deal with it; even in fanciful love-songs it is mentioned. And the intimacy of this East European nation with the Sea need not surprise us. The Black Sea, with which so much in Ukrainian song and story is connected, has had a significance in the history of the Ukraine which has not been forgotten in the unwritten traditions of the people. How many cultural and warlike memories are connected with the Black Sea! How much Ukrainian blood has mingled with its waters!

The Black Sea is not large (450,000 square kilometers). It is a landlocked sea, situated between Europe and Asia, and

connected with the Mediterranean Sea by the narrow Straits of the Bosphorus and the Dardanelles and the Sea of Marmora, which, geologically speaking, is a basin formed by subsidence. Great subsidences of the earth's surface created the deep basin of the Pontus. The Pontus was a part of the extensive upper Miocene and Sarmatian inland sea, which slightly flooded large districts of the present European continent as far as the Vienna basin. Toward the end of the tertiary period, this inland sea shrank and separated into single sea basins. The Pontian basin became connected with the Mediterranean Sea later, in the latter part of the diluvial period, by means of great subsidences of recent date.

The present morphology of the Pontus is in full accord with this genesis. The northern part, as far as the line of communication between the Balkan and Yaila Mountains, is a shallow sea of a depth of less than 200 meters; the so-called bay of Odessa is barely 50 meters deep; the Sea of Azof, projecting to the northeast, barely 15 meters. But just on the southern border of the line of plicated mountains, which is broken at this point, the bottom of the Black Sea declines rapidly to greater depths (1500 meters) until, declining more gradually now, it attains the depth of 2245 meters in the center of the oval-shaped main basin of the Pontus.

The salt content of the Black Sea is much smaller than that of the ocean, or even of the Mediterranean. The Sea is comparatively small, and receives a great deal of fresh water from the many and large rivers of the region which it drains, while the influx of salt water from the Mediterranean thru the shallow straits cannot be great. The salt content is on the average 1.8%; only at great depths does it reach 2.2%. The diluted surface layer shows barely 1.5% salt content; the Sea of Azof hardly 1%. The surface water, containing little salt but a great deal of air, cannot, because of the greater density of the lower layers

of water, sink far, and this low degree of ventilation accounts for the fact that the waters of the Black Sea below a depth of 230 meters are saturated with sulphide of hydrogen, and thus preclude any possibility of organic deep-sea life.

Nevertheless, the Black Sea is notable for its beautiful blue-green color and the great transparency of its waters. A white disc, on being submerged, disappeared only at a depth of 77 meters.

The surface temperature of the Black Sea is subject to many fluctuations; from 27° C in midsummer to 5° C in winter. In severe winters the Sea is frozen over in the bay of Odessa for a short time; the Limans and the Sea of Azof regularly for from two to three months.

The Black Sea has been known since hoary antiquity as a dangerous, stormy sea. The waves, running as high as 10 meters, the short cross-waves caused by the proximity of the shores, the difficult approaches to the land, are still a great hindrance to navigation, especially in the winter time. Not without cause did the Greeks originally call it "the inhospitable sea," until the great number of flourishing Greek settlements on its shores led them to change its name to "hospitable sea." Despite this euphemistic name, however, "Pontus Euxeinos," the Black Sea has devoured many goods and lives, many Greek and Roman ships, many Turkish and Genoese galleys, many English and Russian steamers. And many a little Zaporog vessel sank in the dark waves of its native sea, "on white cliffs dashed to pieces," as is related in the old folk-epics; many a one was driven to far-off hostile Turkish shores, to the destruction of its crews.

Being a closed interior sea, the Pontus has no noticeable tides. Marked changes of level are caused by the action of the wind. In the liman of the Boh, for example, they produce 20 centimeters difference of level in a day, sometimes even 40 centimeters; in the bay of Yahórlík as

much as 46 centimeters. The Sea of Azof becomes 45 to 90 centimeters deeper when there is a west wind, up to 1 meter deeper in the case of south winds, and shallower by an equal amount when the winds are in the opposite direction. Slight changes of level are dependent also on the seasons. The Black Sea has its lowest water level in February, when the region which it drains is covered with snow; the highest in May and June, as a result of the melting of the snows and the early summer rains. These fluctuations, however, amount to only 25 cm. The currents of the Black Sea, too, are inconsiderable, because of its isolation. Outside of local currents which are caused by winds, we know of only one greater current, weak in itself, which encircles the Pontian Basin in a counter clock-wise direction and may be traced to the cyclonal motion of the air. The same conditions obtain on a smaller scale on the Sea of Azof and are reflected in the direction of the tongues of land along the coasts.

Despite the fact that the deep-sea region of the Black Sea is poisoned with sulphide of hydrogen, it possesses a rich flora and fauna in its surface layers. Enormous shoals of all kinds of fish — sturgeon, hausen, sterlet, "kephal," "bichok," "balmut," come to the coast and into the limans of the river deltas. For this reason the Pontian fishing industry has been considerable for thousands of years. The extraction of salt from the limans and salt lakes is also important. Before the age of the railroad the abundance of fish and salt of the Black Sea created a special trucking trade in the Ukraine, the so-called Chumaki, who came to the Pontian strand in whole caravans of oxcarts to take dried fish and salt in exchange for grain.

The Ukrainian coast of the Black Sea begins at the delta of the Danube and ends at the western spurs of the Caucasus. The greater part is flat coast, the smaller, steep coast.

At the northern Kilian arm of the Danube delta, where now the descendants of the Zaporog Cossacks gain a scanty living thru fishing, begins the coast of the Ukraine. The steppe approaches the sea with a steep declivity, which is bordered by a narrow strand of sand and pebbles. The coast runs evenly as far as the Dnieper delta, without any indentations. Even the famous port of Odessa is an artificial harbor.

Only at a point where a river, a streamlet, even a *balka* (step-glen, ravine) opens into the sea, is the steep incline of the steppe-plateau broken. We then see before us an enormous pond as it were, at the upper end of which the water-course enters and the lower end of which is locked from the sea side by a land-tongue or bar (Kossa, Peresip) as by a flat dam. This sea-water lake is called liman in Ukrainian.

Wherever a stream of great volume empties into a liman, the bar is severed at one or more places. These liman deltas are called, in Ukrainian, *hirló*. Limans which have such connections with the sea are broken. Of such a kind are the limans of the Kunduk, Dniester, Boh and Dnieper. Where a little streamlet discharges which has not a sufficient volume of water to cover the loss from evaporation of the liman surface and still retain an excess for keeping open the outlet, then the bar of the liman is without an opening and the water contains a great deal of salt. Of this kind are, above all, the limans of Kuyalnik and Khadshibó near Odessa, the large, deep Tilihul and many smaller ones. The water and the mud of such limans possess healing powers, and every summer thousands of patients travel to the hot shores of the limans to regain their health.

The limans are simply submerged eroded valleys of steppe rivers which are now being filled in by alluvial deposits. Therefore, the limans of all larger rivers are too shallow to serve as good harbors for the larger sea-going

vessels. The liman of the Dniester allows entrance only to small ships drawing two meters of water; the gigantic Dnieper liman is only 6 m. deep, and only the Boh liman is accessible to larger sea-going ships. Systematic dredging, however, could, without a doubt, bring relief, and would change a number of the limans into profitable harbors.

Beginning at the liman of the Dnieper, the coast is strongly indented as far as the bay of Karkinit, but these indentations (Yahorlik, Tendra, Kharilgach) are closed off by long tongues of land and the undersea extension of the bar of Bakalsk. The west coast of Crimea is also a uniform liman coast, increasing constantly in height, however, toward the south. At the Alma delta the coast becomes steep and has two excellent harbors, Sevastopol and Balaklava, which are submerged deep valleys. The southeast coast of the Crimean peninsula is a strongly marked acclivitous shore. The steep descent of the Yaila Mountains has been transformed here, thru the abrasive action of the sea, into a beautiful coastline. Eruptive rock, capable of offering great resistance, is found here in places, forming picturesque capes, jetties and crags, between which lie pretty little bays and coves. The agreeable climate, the clear sky, the good sea-baths and the beautiful country annually lure to this Ukrainian Riviera thousands of consumptives and health-seekers. There are rows and rows of cottage-colonies and mansions.

Beginning at the crescent-shaped bay of Feodosia, the coast again becomes lower and also has a number of salty lagoons and bars. Of the same description are the coasts of the Strait of Kerch, leading into the Sea of Azof, which is 35,000 sq. km. in area. This extremely flat sea is often compared to a liman. Numerous tongues of land (Biriucha, Obitochna, Berdianska, Kossa, etc.) jut out here into the sea, showing very clearly in their direction the effect of the cyclonal motion of the air. The low coast has an enormous number of limans and lagoons, e. g., Utluk, Mius, Molochni,

Yeski, Akhtirski, Tamanski, Kisiltash, etc. The most remarkable part of the Sea of Azof, however, is the Sivash. A bar 111 km. in length shuts the Sivash off from the Sea of Azof, leaving only a connecting passage of 150 m., near Henichesk. The curiously ragged banks of red-clay, the salt swamps, lagoons and islands, the bracken, ill-smelling water, which is salty in summer, and in a few spots at other times as well, have given the Sivash the name of Foul Sea (Hnile More).

The eastern part of the Ukraine's Black Sea coast is a mountainous cliff-coast again. The plications of the western Caucasus, which approach the sea obliquely, are here so quickly destroyed by the powerful abrasive action of the surf, that the erosive action of the rivers and mountain streams cannot keep pace. Therefore, the coast is difficult of access and only the two harbors of Novorossiysk and Gelendzhik offer shelter for ships along this part of the coast. But even this shelter is doubtful, because of the bora-like winds.

As we perceive from this description of the Ukrainian coast, it is not one which would promote navigation among the inhabitants. Lack of harbors, isolation, remoteness from the main lines of the world's traffic, never could have an encouraging effect upon the development of navigation among the Ukrainians. Despite all this, however, they developed very high seafaring qualities in the time of the old Kingdom of Kiev and later on in the Cossack period, and the present age, too, has brought a revival of the nautical skill of the Ukrainian coast population.

General Survey of the Physical Geography of Ukraine

The Ukrainian Mountain Country

Glancing at the map of the Ukraine, we perceive at once that in this country we should seek in vain for such a variety of surface configuration as is peculiar to Central or Western Europe. In Germany or France there appear in a comparatively small space the most varied landscape — chains of high mountains, central chains of mountains, terrace and hill country, plateaus and plains.

It is different here in our wide Ukraine. One can travel hundreds of miles in any direction without seeing a change in the character of the scenery. The uniformity which is typical for Eastern Europe is peculiar also to the Ukraine. But not to the extent that it is to Great Russia, where the endlessness of the flat country wearies the eye of the traveler. For there are in the Ukraine landscapes of high and central chains of mountains, picturesque hill districts and richly cut plateaus, marshy plains and steppes strewn with barrows. There is, then, in the Ukraine, a variety of surface configuration, but on a large scale, not as in Western or Central Europe, confined in a small space.

The morphological nucleus of the Ukraine is the closed group of plateaus, which extends from the country at the foot of the Carpathians and the Polish part of the Vistula region to the Sea of Azof. Pontian Plateau or Avratinian Ridge are the commonly used but incorrect names of this plateau group. The first designation might do, but the second transfers the name of a little destitute hamlet at the

source of the Sbruch to a territory of hundreds of thousands of square miles. We shall, therefore, select for this plateau group the name Ukrainian Plateau Group.

It forms a compact whole between the Carpathians and the Dnieper and is divided into the following individual sections: The Rostoch, between the San and Buh Rivers; Volin, between the Boh and the Teterev; Podolia, between the Dniester and the Boh; the Pocutian — Bessarabian Plateau, between the Dniester and the Prut; the Dnieper Plateau, between the Boh and the Dnieper. The plateau character continues at the rapids section of this river on the left bank, where, at some distance, the last member of the Ukrainian Plateau Group lies — the Donets Plateau.

The plateau group of the Ukraine is bordered on the north and south by two plain districts. The northern district consists of adjoining lowlands — Pidlassye, Polissye, and the Dnieper plain — and their extensions along the Donets; the southern district is made up of the long stretch of the Pontian steppe-plain, which, in the country at the foot of the Caucasus, merges into the Caspian desert-steppe.

Beyond the northern plain district, Ukrainian territory does not extend, except in the Don region, where it embraces the southern spurs of the Central Russian Plateau.

Besides these plateau and plain regions the Ukraine takes in also parts of three mountain systems of the European continent. The Ukraine is the only country of Eastern Europe which extends over into the region of the European mountains of plication. Parts of the Carpathians, the little Yaila chain of Crimea, and the western parts of the Caucasus lie, together with their environs, in Ukrainian territory.

From this general survey of the surface configuration of the Ukraine, we can easily see that more than nine tenths of the surface of this land is taken up by plains and plateaus. Nine-tenths of the Ukrainians have certainly

never seen a mountain and do not even know what one looks like. Expressive of this circumstance is the fact that in the wide plateau and plain region of the Ukraine the most insignificant hills bear the high-sounding name of "mountain." But, despite this, the Ukraine also has its share in the three mountain systems of Europe — the Carpathians, the Yaila, and the Caucasus. All three were formed thru plication of the rock-layers.

The vast plication-formed mountain range of the Caucasus, even in the small part belonging to Ukrainian territory, attains an alpine height; the scenery of the Yaila along the Crimean Riviera is wonderful, but the Carpathians, although not as lofty as the Caucasus and not of such scenic beauty as the Yaila, are the dearest to the heart of the Ukrainian. For the Ukrainian nation expanded in the Caucasus only a century ago and has but just reached the Yaila. And the Eastern Carpathians have for more than a thousand years been a Ukrainian mountain range.

Still, hardly one-third of the 1300 km. curve of the Carpathians belongs to Ukrainian national territory. Toward the west the Carpathians are inhabited by Poles and Slovaks; in the east and south by the Romanians.

The boundary-posts of the Ukrainian territory extend in the west beyond the famous defile of Poprad. From the rounded peaks of the mountain country where the last Ukrainian villages lie, one sees rising at a very short distance the imposing range of the Tatra; still nearer lie the cliffs of the Pienini, famous geologically as well as for their scenery. In the eastern part of the Carpathian chain, Ukrainian territory reaches the Prislop pass, which connects the valleys of the Golden Bistritz and the Visheva (Visso). To the Ukraine, then, belongs the sandstone district of the Carpathians at that point where it is highest and most developed. It is called simply the "wooded Carpathians."

The western part of the sandstone Carpathians which lies within Ukrainian territory is called the Low Beskid. It is also known as Lemkivski Beskid because it is inhabited by the Ukrainian mountain tribe of the Lemkes. The Low Beskyd extends from the defile of Poprad to the valleys of the Strviash River, the Oslava (Lupkiv pass), and the Laboretz. It is a broad-backed but not a high mountain country. In long chains, gently undulating mountain ridges stretch from west to east and southeast. Their slopes are gentle; one can easily walk or even ride up, and numerous wagon-roads and highways lead straight over the crest or even along the edge of the crest. The peaks are rounded and of uniform height, except where an occasional gently vaulted mountain top rises above the low-hill country. Between gently sloping ranges there extend, in a longitudinal direction, valleys with watersheds and communicating passes. Broad, well-developed defiles separate the range into different sections. The Galician-Hungarian dividing-ridge has only slight gorges of genuine mountain passes.

The peaks and high passes of the Lower Beskid are insignificant. Only in the extreme west, on the Poprad and the Torissa, do the peaks reach a height of 1000 and 1100 m.; further toward the east hardly 700 to 800 m. The important Dukla Pass is hardly 500 m. above sea-level. In the middle of the Beskid mountain country we even see a great longish strip of lower country ("the Sianok Lowlands") whose low hills are less than 300 m. high.

There is a connection between the insignificant height and soft landscape forms of the Low Beskid and the geological construction and evolution of the mountain range. This mountain country, like the whole sandstone-region of the Carpathians, is built up of strongly plicate and compressed Flysch — a series of sandstones slates, conglomerates, clays, etc., of the Cretaceous and tertiary ages. All these species of rock occur in this region in thin

layers and have little power of resistance; everywhere the basic mountain ridge is covered with a thick coat of weathering loam; rock piles are found very seldom. There is added the fact that all the sandstone Carpathians of the Ukrainian territory have been evened out by the destructive action of water and air into a more or less perfect plain. Not until the quaternary was the "obliterated" range raised anew and transformed into a mountain district by the action of the rivers which were cutting in again.

The Low Beskid was once covered with great, mixed forests. Now the once splendid virgin forests are completely thinned and all the ill effects of forest destruction have visited the poor mountain country. The fertile soil was washed away on the mountain-sides and heaped up with rubble and mud in the valley bottoms. The tribe of the Lemkos is therefore, perhaps, the poorest of all the Ukrainians and is compelled to seek an existence in distant lands.

In the southern part of the Low Beskid the boundaries of the Ukrainian nation in Hungary reach the northern part of the Hegyalia-Sovari Ridge, which, at this point, is 1100 m. high, and is composed of extinct trachyte volcanoes.

To the east of the Lupkiv Pass begins the second section of the Ukrainian Carpathians — the High Beskid. It stretches to the southeast as far as the valleys of the Stri, Opir and Latoritza Rivers (Pass of Verezki).

The High Beskid like the Low is composed of a number of parallel, weakly joined mountain ranges, which run northwest and southeast. The type of the Rost Mountains is, therefore, even more clearly marked in this part of the sandstone Carpathians than in the preceding. The mountain crests are gently sloped, the edge of the crests slightly curled, the height of the peaks constant, the passes only walled passes. Toward the southeast, though, the ridge steadily increases in height. The highest peaks are Halich