

THE GEOGRAPHY OF THE OZARKS

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LOCATION AND EXTENT.

The Ozarks, or the Ozark Ridge, is the name commonly applied to the rugged highland that extends entirely across southern Illinois from the Mississippi to the Ohio river. It is really a spur, or an eastern extension of the Ozarks of Missouri. This Illinois spur of the Ozarks is located chiefly in the counties of Union, Johnson, Pope and Hardin, but it also extends into the southern parts of Jackson, Williamson, Saline and Gallatin counties.

The crest of the Ozarks is near the northern boundary of Union, Johnson, Pope and Hardin counties. In Hardin county the crest of the Ozarks is almost exactly on the northern boundary line, but in the case of the other counties the crest is several miles farther south.

The Ozarks extend entirely across southern Illinois and have a total length of 75 miles. While the width of the Ozarks is by no means uniform, still its average is not far from 25 miles.

SURFACE.

From the standpoint of altitude above mean sea level, the so called "mounds" of Jo Davies county is the highest part of Illinois. The highest hill in this region has an elevation of 1257 feet, which is nearly 200 feet higher than the highest part of the Ozarks.

So far as now known, the highest hill in the Ozarks is William's Hill in the northeastern part of Pope county. This hill has an elevation of 1065 feet above mean sea level. Bald Knob in Union county is, however, only 40 feet lower, with an altitude of 1025 feet. There are a number of hills in the crest of the Ozarks that have an altitude from 900 to 1000 feet.¹

1. Weller and Butts: Extract from Bull. No. 41, Ill. State Geological Survey, 1920, pp. 10.

But mere altitude above sea level is, however, often misleading and gives little idea of either the appearance or the importance of a highland.

While it is true that the mounds of Jo Davies county do have an elevation almost 200 feet higher than the highest hill of the Ozarks, still the reader must keep in mind that the general level of Illinois in Jo Davies county is twice as great as that in the region of the Ozarks. For instance, the highest hills in Jo Davies county are only from 200 to 250 feet above the general level of that part of Illinois,² while the highest hills in the Ozarks are from 500 to 600 feet above the general level in the southern section of the state. The northern base of the Ozarks at Carbondale, for example, is only 415 feet above sea level, and the southern base of the Ozarks is but little over 300 feet.

It is this difference in altitude between the general level of its surroundings and the tops of the higher hills in the crest of the Ozarks, rather than mere height above sea level, that makes the Ozarks the most conspicuous highland in Illinois. This difference of 500 to 600 feet between crest and base of the Ozarks gives its streams sufficient power to carve this region into a complex of deep valleys and ravines alternating with high narrow crested ridges or steep sided, irregularly shaped hills.

As a whole the Ozarks are in the mature stage of the cycle of erosion; but there are several sections that should not be classed any later than late youth. East of Makanda, in Jackson county, there is a region of considerable size, that has a number of farms on the summit of the Ozarks that are comparatively level. Near the village of Ozark, in Johnson county, there is another region of flat topped hills where the land is comparatively level over a considerable area. There are, no doubt, other regions with similar surface features which can not be regarded as maturely dissected.

It is thus seen that the surface of this upland is by no means alike over the entire highland. The chief reasons for these differences of surface are: First, the amount,

2. Ridgeway: Natural Hist. of Ill., Vol. I, pp. 7.

or degree of stream erosion; second, the character of the rocks immediately beneath the mantle rock; third, the amount and different periods of uplift; fourth, the amount of faulting that occurred during the periods of uplift.

The greatest contrast in surface features is to be seen in the region of the Pottsville sandstones and conglomerates, compared with the section occupied by the less resistant limestones and shales of the Mississippian period. The Pottsville rocks are found in the northern part of the Ozarks while the weaker Mississippian limestones and shales are found in the southern section of the same highlands.

The Pottsville being largely sandstones and conglomerates with the cementing material in many cases iron oxide, these rocks are more resistant than many of the limestones and shales of the Mississippian outcrops in the southern part of the highlands. The Pottsville form a continuous strip of land in the southern part of Jackson, Williamson, Saline, and Gallatin counties and extend somewhat less continuously along the northern boundary of Union, Johnson, Pope, and Hardin counties.

Where the resistant Pottsville rocks are exposed, or lie immediately under the mantle rock, the stream made valleys are characteristically narrow and steep sided, but the hill tops have larger summit areas than the less resistant limestone areas farther south. Not all of the Pottsville area has these flat topped hills, but this is characteristic of much of this region.

In the southern part of the Ozarks, however, the land is maturely dissected and flat hill top farms are rare. The surface consists of a series of deep valleys with ridges or irregularly shaped hills between the valleys.

In certain sections, particularly in Hardin county, faulting has been responsible for certain surface features. Fault lines often represent places of weakness, where streams can more easily develop their valleys. In Hardin county several stream courses are thus determined by fault lines.

There are certain easily dissolved limestones that have caused the characteristic sink hole and underground drain-

age surface. There are two such areas in Hardin county, one in the vicinity of Cave in Rock and the other near Rosiclare. There are other similar areas in Johnson and Pope counties.

Some idea of the ruggedness of the Ozarks can be gained by a more detailed statement of the steepness of the slopes in various parts of this highland region. On the Mobile and Ohio railroad from Pomona to Alto Pass, in a distance of four miles, the altitude changes from 403 to 748 feet, while in the next four miles there is a drop from 748 to 449 feet. Again at Ozark on the Paducah branch of the Illinois Central railroad there is a descent from 668 feet, at Ozark, to 384 feet at Simpson, in a distance of five miles. It should be noted that these are railroad grades and are about the easiest grades that can be found which cross the crest of the Ozarks. Most of the side slopes of the valleys are very much steeper. Slopes of 600 and 700 feet per mile are numerous and in not a few cases slopes of 800 to 1000 feet³ per mile are to be found in all regions of strong relief. Much steeper slopes than these are found in restricted areas. In fact one of the characteristic features in many parts of the Ozarks is the bluff or almost perpendicular cliff. In many cases these perpendicular cliffs form the most striking feature of the surface. High bluffs are particularly noticeable in Big Hill at Leo Rock and Fountain Bluff, along the lower course of the Big Muddy, bordering the Mississippi flood plain in the chert hill regions in western Union and northwestern Alexander counties. Other bluff regions, perhaps a little less noticeable, are to be seen along the Cache-Big Bay bottom lands that form the southern boundary of the Ozarks. Bluffs are also found along the Ohio river. There are various other situations where bluffs are to be seen bordering even some of the smaller streams in the interior of the Ozark region. Most of these bluffs are due to undercutting of streams, but faulting and weak rock layers underlying stronger rocks are also important causes.

Perhaps no better idea of the ruggedness of the Ozarks can be gained than from some quotations from geologists

3. Salisbury: Extract from Bull. No. 41, Ill. State Geological Survey, 1920, page 43.

who visited this region and left us their impressions of it. Dr. Salisbury, speaking of Hardin county alone, says, "In almost every direction from almost any point, hills and ridges alternate with valleys. Most of the valleys are 100 to 200 feet deep, but some of them are as much as 300 feet deep. Such relief alone, of course, does not make a mountainous country, but the slopes of many mountain regions are no steeper than many of the slopes of this country."⁴

Sixty-nine years ago Worthen, in a more picturesque way, gives us his impressions of the Ozarks: "In the spring of 1851, I undertook to make a reconnaissance of this ridge from the Big Muddy to the Ohio, through what was then an almost unbroken wilderness, and on foot and alone, with hammer in hand, I traversed this wild and picturesque region, reaching the Ohio in eight days after leaving the Big Muddy. The only signs of civilization to be met with then, in this region, was a log cabin now and then, occupied by some squatter family from east Tennessee or North Carolina, who imagined themselves entirely secure in this wilderness from the encroachments of a higher civilization."⁵ Worthen's characterization of this region as "wild and picturesque" is not altogether out of place today when it is seen from the highest and most rugged parts of the Ozarks.

THE SOILS.

The soils of the Ozarks are by no means alike in all parts of this highland. The chief differences are largely due to these two causes: First, the ruggedness of the region and the character of the underlying rocks. To the types of soils here given there are many local exceptions. In the western part of the Ozarks, underlaid by the Devonian rocks, the soils often have a large chert content and the surface is one of the most rugged in the entire highland. Here the soils are generally sterile, so much so that certain areas of very steep slopes were almost entirely destitute of timber even in the period of early settlement. The "Pine Hills" in western Union county is an example of this type of soil.

4. Salisbury: Extract from Bull. No. 41, Ill. State Geological Survey, 1920, page 39.

5. Worthen: Geological Sur. of Ill., Vol. III, page 56.

The second region occupies the northern part of the Ozarks. This is the section where the resistant sandstones and conglomerates are immediately beneath the mantle rock. The soils are mainly a yellowish clay with a considerable intermixture of sand. The soils are light, warm, and well drained, but often of low fertility, and are particularly lacking in vegetable matter. In parts of this section the timber growth was never heavy. In the flat hill top parts of this section the soils are deeper and of higher fertility.

The third section includes the southern slopes of the Ozarks. In the limestone sections of this region the soils are the best of any part of the Ozark highland. These soils are of a reddish brown color and where the surface is not too rugged make fine fruit and truck lands.

While the soils of the Ozarks are generally poorer than the surrounding low-lands, still it must not be understood that they are not adapted to certain products, particularly when carefully tilled and under proper application of fertilizers. Many of these lands are the best fruit lands to be found anywhere in the state. Certain truck crops also do well in these same soils.

CLIMATE.

Since practically all of the higher hills of the Ozarks have an altitude of less than 1000 feet above mean sea level, their climate is practically the same as that of Carbondale, or any other towns near the base of these highlands. So the climatic data here given are from the records I have made as cooperative observer at the Carbondale station of the United States weather bureau. These data extend over a period of ten years and can be taken as giving a fair notion of the climate of this region.

From the Carbondale records it is clear that this southern section of Illinois is subject to great annual extremes of temperature. In a period of ten years, there were only two years that the temperature did not reach 100 degrees, or above; and in these two years only lacking one and two degrees respectively of reaching the hundred mark. The average for the ten years is almost exactly 100. There

were four years that the temperatures did not get as low as zero and with an average of almost exactly zero for coldest days. In 1912 and 1918 the temperature reached 24 degrees and 18 degrees below zero. These great extremes of temperature are due to the inland position of this section and to the fact that the low Central Plain of North America affords no obstruction to either the cold waves from the north or the hot winds from the south. The seriousness of these extremes is seen in the cold waves of 1912 and 1918 when the peach and other tender fruit trees of the Ozark region were seriously "winter killed."

The average mean July temperature for the last ten years is 80.04 degrees; the mean average for January temperature for the same period is 34.3 degrees. The average date of the first killing frost in the fall is October 25, and the average date of the last killing frost in the spring is April 9. This gives the average period free from frosts, six months and sixteen days. These are very important factors in determining the time of year that both fruits and vegetables can be placed on the city markets. But few summer apples reach the northern markets earlier than those from the Ozarks. The temperatures that the fruit and vegetable grower notices most, however, is the suddenness of temperature changes, particularly in the spring. A few warm days in March, or early April, often cause the fruit buds to burst into bloom; then comes a sudden cold wave which in one night will change a promising fruit crop to almost a failure. These spring freezes are the temperature changes that the fruit grower dreads most of all. Complete failures of the fruit crops are rare however, particularly of the hardier apples and small fruits. This is especially true in the higher parts of the Ozarks where the frost drainage is best and where the fruit industry is extensively and scientifically carried on. Even this spring of 1921 there is some fruit in the higher parts of the Ozarks, notwithstanding the fact that on March 24 and April 11 the temperatures were 24 degrees and 26 degrees. Some growers report from 20% to 75% of a crop for the hardier apples, and almost everywhere from 50% to 75% of a berry crop. The strawberries are about 50% and blackberries 75%.

The rainfall of the Ozark region is the heaviest in the state and ranges from 44 to 45 inches per year, for a period of ten years. For Carbondale the average has been nearly 44 inches. In some of the higher parts of the Ozarks it is a little higher, reaching 45 inches. The average distribution of the rainfall by months for a period of ten years is quite uniform, with a slight maximum in March, June, and November, and a little more pronounced minimum in August, September, and October. These figures refer to averages for a period of ten years. Individual years and months show quite different results. For instance in 1914 only .92 inches of rain fell in June and .35 inches fell in July, making in all, for a period of two critical months, only 1.27 inches. This rain was largely in slight showers and soon evaporated. The mean monthly temperature for July of that year was 83 degrees, or three degrees above the normal. Again in the year 1916, the rainfall was only .21 of an inch for July. Again this rain fell in slight showers and was soon evaporated because the mean July temperature of that year was 82 degrees, or two degrees above the normal. In both these years there was serious drouth in the two critical months of July and August, that did serious damage to all crops, particularly summer vegetables. Small fruits and even the apples and peaches were small, although the quality was otherwise good.

Thus the surface, soils, climate, and the composition of the rocks, particularly adapts the Ozarks to the production of fruits and vegetables, where railroad transportation is good. In the other sections stock raising and the production of timber should be the leading industries, while in certain restricted areas the mining of spar, kaolin, and silica have assumed considerable importance. But perhaps one of the newest and most needed mineral industries is limestone crushing. The limestone crushing industry has already assumed some importance in Union and Johnson counties. Union, Johnson, Pope and Hardin counties have abundant supplies of limestone, although their cherty composition is a discouraging feature in many localities.