

NATURAL REGIONS OF THE OZARK PROVINCE

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Because of the great interest in cultural studies, there is some danger that the physical studies, which furnish much of the basic explanatory material for them, will be neglected. Before any significant advance can be made in understanding man's activities, it is necessary to analyze and describe the physical environment which is their setting.

Many important areas in the United States have not been adequately treated in published maps and descriptions. Such an area is the Ozark Province of Missouri, Arkansas, Oklahoma, and Illinois. Despite increasing interest in the Ozarks, relatively little is known of their physical features and aspects. Even the more recent maps present inaccurate ideas of their boundaries and characteristics.

For several years studies have been in progress aiming at a thorough quantitative analysis of both the physical and cultural aspects of the province. The present paper deals with some of the principal results already attained. Maps have been prepared to show the geology, local relief, angles of slope, native vegetation, and natural regions of the Ozarks, employing techniques described in an issue of the *Transactions of the St. Louis*

Academy of Science now in press. Other maps will be prepared when the analyses of the factors concerned have been completed.

One fact of especial interest to residents of Illinois is brought out by the maps. These show that most of the hill country commonly called the Illinois Ozarks is distinctly unlike the true Ozarks in the greater part of its physical characteristics.

Because of the difficulty of coordinating the data presented on different maps, generalized physical profiles have been prepared to show regional characteristics and to emphasize relationships among the various physical factors. Descriptions of some of these profiles illustrate the results obtained by regional analysis. The first example, the St. Francis Forested Knob Region, is the structural center of the Ozark dome. Ancient igneous mountains, formerly buried by sediments, have been partly uncovered by erosion. The high differential resistance of the rocks has resulted in the strong local relief of 500 to 900 feet, the resistant igneous masses standing out above the surrounding sedimentary areas. In the lowlands differential resistance is low, except

where isolated masses of cherty dolomite cap the weaker sediments and preserve them from erosion.

Each rock type of this region has characteristic soil and vegetational expressions. On the igneous knobs the mantle rock is shallow clay which has developed a poor, immature forest soil. Because of the shallow mantle rock, flooding and baking alternate. The soil conditions are reflected in a scrubby forest in which shag bark hickory, post, and red oaks constitute more than half of the timber. The sandstone areas of the lowlands have deep sandy mantle rock, poor forest soil, and low water tables. Part of the area has been cleared and the remainder supports a second growth forest in which pine, post, black and white oaks, are dominant. On the non-cherty dolomite the mantle rock is clay, the forest soil relatively fertile, and most of the land cleared for agriculture. Along the streams there are strips of timber with sugar maple, sweet gum, sycamore, and white oak predominating. The limited areas of cherty dolomite which erosion has left as caps on the higher hills have deep, pervious, siliceous mantle rock, low water tables, and poor forest soils. High percentages of pine and post oak reflect the unfavorable conditions.

The St. Francis Forested Knob Region formerly was noted for its iron mines which furnished ore for the furnaces of eastern Missouri and adjacent parts of Illinois. In the region, also, are limited deposits of disseminated galena with which is associated some nickel and cobalt. None of the metallic minerals are being worked at present.

North of the St. Francis Forested Knob Region is the St. Francis-Big River Cleared Lowland. This region differs markedly from the preceding one. Igneous rocks are exposed only in the deep-

est valleys, and dolomites, sandstones, and limestone of low resistance occur over most of the area. Because of the ease with which erosion acts on these rocks, the region has been degraded below the level of the adjacent areas of resistant strata. Among the weak rocks, however, the differential resistance is high, the dolomite forming caps for the softer sandstone. The result is rolling topography with a local relief of 200 to 300 feet and concave slopes below the cap layers. If stream cutting were not limited by the depressed character of the region, the differential resistance is adequate to give rise to high local relief and steep slopes.

The mantle rock of the region is deep and non-cherty. On the dolomite and limestone it is clay, which has a high water table and good forest soil. These areas are cultivated, except along stream margins which are timbered with sugar maple, sweet gum, sycamore and white oak. On the sandstone, however, the mantle rock is sand, the water table low, and the soil poor. Pines, post, black, and white oaks make up more than 50 per cent of the timber. The St. Francis-Big River Cleared Lowland Region includes the rich disseminated galena deposits of southeast Missouri which furnish an important part of the nation's production of lead.

The other natural regions of the Ozark Province differ from those discussed in numerous respects. Difference in rock type, structure, and amount of entrenchment of streams is expressed in variations of local relief, angles of slope, average width of hills, soils, and native vegetation. Descriptions of the eight natural regions of the Ozarks are included in an article now nearing completion, in which generalized physical profiles are used to express regional characteristics.