**DESCRIPTION OF THE PIKEVILLE SHEET.**

**GEOGRAPHY.**

General relations.—The Pikeville atlas sheet comprises an area bounded by the parallels 35° 30' and 39° and the meridians 85° and 87° 30'. The region mapped embraces a section of a square of the earth's surface. Its dimensions are 54.5 miles from north to south and 38 miles from west to east, and it contains nearly 900 square miles. The adjacent atlas sheets are Standing Stone on the north, Kingston on the east, Chatta­nom on the south, and McMinnville on the west. The area lies wholly within the State of Tennessee and contains portions of White, Cumberland, Van Buren, Grundy, Sequatchie, Branson, and Elizabethton counties.

In the geologic and geologic relations this area forms a part of the Appalachian province, which extends from the Atlantic coastal plain on the east to the Mississippi lowlands on the west and from the Ohio River to the Alabama line. All parts of the region thus defined have a common history, recorded in its rocks, a geologic structure and topography very similar. Only a part of this history can be read from an area so small as that covered by a single atlas sheet; hence it is necessary to consider the sheet in its relations to the entire province.

Subdivision of the Appalachian province.—The Appalachian province is divided into three main regions: the eastern or plateaus of Georgia and Alabama; the Central Plateau of Tennessee, Kentucky, and Ohio; and the Appalachian Folded Belt of the northwestern part of the province. These three regions are separated from each other by broad breaks of faulting, and are sharply defined on the western margin of the province. The eastern or plateau division comprises an area bounded by the parallels 35° and 39° and the meridians 85° and 87° 30'. The region mapped embraces a section of a square of the earth's surface. Its dimensions are 54.5 miles from north to south and 38 miles from west to east, and it contains nearly 900 square miles. The adjacent atlas sheets are Standing Stone on the north, Kingston on the east, Chattanooga on the south, and McMinnville on the west. The area lies wholly within the State of Tennessee and contains portions of White, Cumberland, Van Buren, Grundy, Sequatchie, Branson, and Elizabethton counties.

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neatly spaced, and the level summits of the mountain district faults and folds are prominent. The planes of the faults are steeply dipping, and the rocks dip on either side. Some faults are found forming a series of arches and troughs.
to the trend of the folds and cleavage planes. In the Sequatchie Valley, the strata are nearly parallel with the axis of the Sequatchie Valley, but not so nearly parallel as to sustain the map indications, within narrow limits, the area within which the coal beds are 4 feet thick will be found to be an area of about 3 or 4 miles square. West of Sequatchie Valley and south of Bee Cove, this formation is continuous over a large area of the plateau, within which red fossil iron ore may occur. This fossil or "Clinton" ore is associated with the Bon Air coal, which occurs above the Lookout conglomerate. The area in which the coal is exposed is about 500 square miles. The coal has been worked in a small way at various places on the northwestern side of the anticline. As already stated, there has a thickness of 5 feet. It is also worked on the strip which crosses the southeastern corner of the area of the sheet a few miles on either side, but the bed is here probably too thin for profitable working at present.

The supply of limestone within the Pickeville district suitable for blast-furnace fuel and for lime is abundant and convenient of access. At Dayton, just off the southeastern corner of the area, the Bangor limestones are used both for flux and lime. It contains a small percentage of quartz and clay.

Some adapted to architectural purposes occurs in nearly every formation in the region mapped. Rocks of the Bangor and Chickamauga limestones are easily quarried in large, regular slabs from two inches to a foot in thickness. It is excellently suited for building purposes, and is used for the trimmings of large buildings. A similar sandstone is quarried near Dayton, just beyond the southern edge of the area of the sheet.

The hard, blue Bangor and Chickamauga limestones furnish an abundant supply of macadam material, which would require but little transportation to make excellent roads in all the valley and at the head of Rocky River, near Olio. At all of these widely separated points the coal appears to be 4 or 5 feet in thickness, so that there can be but little doubt that the workable seam extends continuously over that part of the plateau indicated on the economic sheet. Two seams have been worked by the Dayton Coal and Iron Company on the eastern side of the Walden Plateau. It is here about 4 or 5 feet in thickness. It is also worked at the head of Rocky River, near Olio. At all of these widely separated points the coal appears to be 4 or 5 feet in thickness, so that there can be but little doubt that the workable seam extends continuously over that part of the plateau indicated on the economic sheet. Two seams have been worked by the Dayton Coal and Iron Company on the eastern side of the Walden Plateau. It is here about 4 or 5 feet in thickness. It is also worked at the head of Rocky River, near Olio. At all of these widely separated points the coal appears to be 4 or 5 feet in thickness, so that there can be but little doubt that the workable seam extends continuously over that part of the plateau indicated on the economic sheet.
Sandy soils.—The Cumberland Plateau is formed of sandstones and sandy shales, and its soil is a sandy loam. At the surface it is gray, while the subsoil is generally light-yellow, but varies to deep-red. In some places it consists largely of sand, but in others it contains sufficient clay to give the subsoil considerable coherency, so that a cut bank will remain vertical for some years. The depth of soil on the plateau varies from a few inches to ten feet or more, diminishing in proximity to streams, where erosion is most active. A large part of the plateau retains its original forest growth, chiefly of oak, chestnut, and hickory, while pines clothe the steep sides of the stream channels. The practice of burning off the leaves each fall prevents the accumulation of vegetable mold and has delayed a just appreciation of the agricultural possibilities of this region. It has been found well adapted to fruit-raising, particularly for grapes and apples.

Cherty soils.—The Sequatchie Valley is underlain by the Knox dolomite; (4) alluvial soils, deposited by the larger streams on their flood-plains.

Since the sandstones of this region occupy the highest land, the overplaced soils, or those washed down to lower levels, are mostly sandy. They are especially abundant at the foot of the escarpment surrounding the plateau, where the Bangor limestone and its clay soil are often wholly concealed. The delta deposits formed by streams emerging from gorges cut in the plateau also give considerable areas of sandy soil, overlying rocks which would themselves produce clay or cherty soils.

Clay soils.—These are derived chiefly from the Bangor and Chickamauga limestones, and their distribution coincides with the outcrops of these formations, as shown on the geologic map. They sometimes have a deep-red color, but where the mantle of residual material covering the rock is thin it is often dark bluish-gray. The rocks generally weather more rapidly where they have a steep dip than where they are nearly horizontal. Hence the soil is deeper and more highly colored in some places only occasional fragments occur, while in others the residual material is made up almost wholly of chert. Where the clay predominates the soil is deep-red, but becomes lighter with the increase in amount of chert, and in extreme cases is light-gray or white. Even when the proportion of chert is very large this is a strong, productive soil, especially adapted to fruit-raising. The soil derived from the Fort Payne chert is similar to that from the Knox dolomite, but the areas of the Fort Payne are much smaller and are usually on steep slopes, so that its soil is relatively unimportant.

Alluvial soils.—The Sequatchie River is bordered by narrow strips of bottom-land covered with a rich alluvial soil derived from the limestones of the valley and the surrounding sandstones. All the other streams in the district are at present cutting their channels deeper, so that they have no flood-plains, and hence deposit no alluvial soils.

Charles Willard Hayes, Geologist.

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