GEOFACTS from the Kansas Geological Survey

Cherokee Lowlands: Rocks and Minerals

Occupying roughly 1,000 square miles in Bourbon, Crawford, Cherokee, and Labette counties, the Cherokee Lowlands is a gently rolling plain that developed on easily eroded shales and sandstones of the Cherokee Group. Next to the Mississippian outcrops in the Ozark Plateau, the rocks of the Cherokee Group are the oldest rocks occurring at the surface in Kansas. They were deposited during the early part of the Pennsylvanian Period, approximately 300 million years ago.

The gently sloping landscape is traversed by shallow stream valleys. Isolated sandstone hills offer occasional topographic relief. One of these, Blue Mound, is located just east of Kansas Highway 69 in southern Cherokee County, a half mile north of the Oklahoma border.

The region is characterized by deep, fertile soils, which have eroded from the soft rocks of the Cherokee Group. These soils and the relatively flat and well-drained topography make the region good for farming, except where the surface has been disturbed by mining. Generally trees grow only on the slopes of hills, banks of larger streams, and in abandoned mining areas.

Rocks and Minerals

Coal.—Like much of the Pennsylvanian strata around the world, the rocks of the Cherokee Group are rich in coal, making the Cherokee Lowlands the largest area of coal mining in Kansas. Coal is a general name used for black deposits consisting chiefly of carbon compounds derived from plants and plant debris that have been compacted into firm, brittle rocks.

Coal is most likely to form from deposits in swampy areas with heavy vegetation. Coal takes millions of years to form.

Coal has either a dull or shiny luster and is divided into three main grades: anthracite (hard coal), bituminous (soft coal), and lignite. Most coal in Kansas originated during the Pennsylvanian Period, sometimes called the "Great Coal Age." During the Pennsylvanian, the eastern part of Kansas stayed nearly at sea level. Great swamps covered the low-lying areas along the coasts, and primitive plants, including ferns as tall as trees, grew densely. After the plants died and fell into the marsh, they were covered by water and mud and sand. As layers of sediment accumulated above the decaying plant material it was compacted, eventually producing the sedimentary rock, coal.

Geologists estimate that it took about 10 feet of leaves, tree trunks, and other organic matter to produce a one-foot layer of coal. The first stage in the transformation of decaying plant material into coal is the development of peat. Following long intervals of time, peat is transformed into lignite (brown coal) and eventually into bituminous coal. Had Kansas coal undergone even more heat and pressure, it might have become anthracite.

Anthracite is a dense, brittle coal with either a shiny or dull luster and a shell-like (conchoidal) fracture. It burns with a pale-blue, smokeless flame. Anthracite has never been found in Kansas.

Bituminous coal, though soft, does not not crumble on exposure to air. It breaks into irregularly shaped blocks, has a luster varying from dull to fairly bright, and burns with a yellow flame. Most coal in Kansas is bituminous and in found in the eastern third of the state.

Lignite contains well-preserved plant structures (such as ferns, horsetails, and club mosses), showing that it

Bituminous coal from southeastern Kansas.

originated in swamps. It is intermediate in quality between peat and bituminous coal. As much as 40 percent water, lignite dries out when exposed to air and crumbles. In Kansas, small quantities of lignite occur in Cretaceous rocks from the Dakota Formation.

Coal mining has played an important role in the region's economy. The outcrops of coals from the Cherokee Group extend from Columbus, Kansas, northeasterly into Missouri and Iowa and southward into Oklahoma.

Mulky coal bed from the Cabaniss Formation in Bourbon County.

Places to Visit

Crawford County Historical Museum.—This museum has exhibits featuring coal mining in the region. Located in Pittsburg, between Atkinson Road and 20th Street on Kansas Highway 69, the hours of the Crawford County Historical Museum vary throughout the year. Please call for information (316) 231-1440 or (316) 231-3794.

Mined Land Wildlife Areas.—A good place to see the effects of strip mining on the landscape is in the Mined Land Wildlife Areas in Cherokee, Crawford, and Labette counties. This land was donated to the Kansas Department of Wildlife and Parks by the Pittsburg and Midway Mining Company of Pittsburg, Kansas. Abandoned strips pits have filled with water and a nature trail is located in one of the areas.

Big Brutus, Cherokee County.

Big Brutus.—A relic from an earlier period in coal mining, Big Brutus was the world's second largest electric mining shovel. It stood 160 feet high and could scoop up to 150 tons (30,000 pounds) of rock and soil in a single scoop. Big Brutus was used to remove the overburden—soil and rocks covering the coal seam—which was sometimes as thick as 69 feet. Smaller shovels were then used to remove the coal. A combination of economic and environmental factors led to its abandonment in the mid-1970's. In 1985 it was converted to a museum "dedicated to the rich coal mining history in southeast Kansas." Big Brutus is located one mile southwest of the town of West Mineral in Cherokee County (316) 827-6177.

Sources

Buchanan, Rex C., and McCauley, James R., 1987, Roadside Kansas—A Traveler's Guide to Its Geology and Landmarks: Lawrence, Kansas, University Press of Kansas, 365 p.

Evans, Catherine S., 1988, From Sea to Prairie—A Primer of Kansas Geology: Kansas Geological Survey, Educational Series 6, 60 p.

Schoewe, Walter H., 1949, The Geography of Kansas: Transactions of the Kansas Academy of Science, v. 52, no. 3, p. 261-333.

Wilson, Frank W., 1978, Kansas Landscapes—A Geologic Diary: Kansas Geological Survey, Educational Series 5, 50 p.

This fact sheet was compiled by Kansas Geological Survey staff (April 1999). More information is available on the World Wide Web:
http//:www.kgs.ku.edu/Extension/