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KENTUCKY RIVER GORGE.—The Kentucky River Gorge is a scenic spot of the Blue Grass region. It is crossed by four main highways—at Clay's Ferry, Camp Nelson, Brooklyn Bridge, and Tyrone—and by the Southern Railroad at High Bridge, and Young's High Bridge at Tyrone. The topography is rugged and characterized by massive limestone cliffs. Tributaries are similarly deep cliff-bound gashes in the upland and the whole immediate vicinity of the river is rugged and picturesque.

PLATE LXVI

The gorge is restricted to the outcrop of High Bridge rocks. From Boonesboro to Camp Nelson the river follows the general trend of the Kentucky River fault and in its broad meanders crosses the fault zone nine times. Where cutting in the High Bridge on the upthrow to the northwest, a gorge has been developed, where in the more easily eroded rocks of the Trenton and Cincinnati on the downthrow, the gorge gives way to more gently sloped and wooded valley sides and well developed bottom lands. Both upstream and downstream from the region of the gorge a broad open valley with extensive floodplain is developed in the younger and weaker rocks until in the vicinity of Irvine and Beattyville the outcropping Mississippian limestones and Rockcastle conglomerate again constrict the valley.

A unique feature in some of the tributary creeks is the "petrified waterfalls" The best known of these is Elk Lick Falls about 10 miles southeast

of Lexington and half a mile west of the Richmond Road. A deposit of travertine has been formed over the face of a falls 60 feet high. The falls is capped with Tyrone and is undercut in the badly jointed and more porous Oregon limestone below. The falls itself and gorge below is not easy to visualize in terms of the rather trifling stream now occupying the valley. Weathering of the limestone face behind the travertine deposit has left it partly suspended and it now shows evidence of progressive



FIG. 1. High Bridge, Kentucky (Fairchild Aerial Surveys). The River cliffs are carved out of the High Bridge limestone and the rock quarry to the right of center is the Tyrone. One of the best developments of the bentonite layer of the upper Tyrone is in this vicinity. The mouth of Dix River is shown. A few miles upstream is Dix Dam.



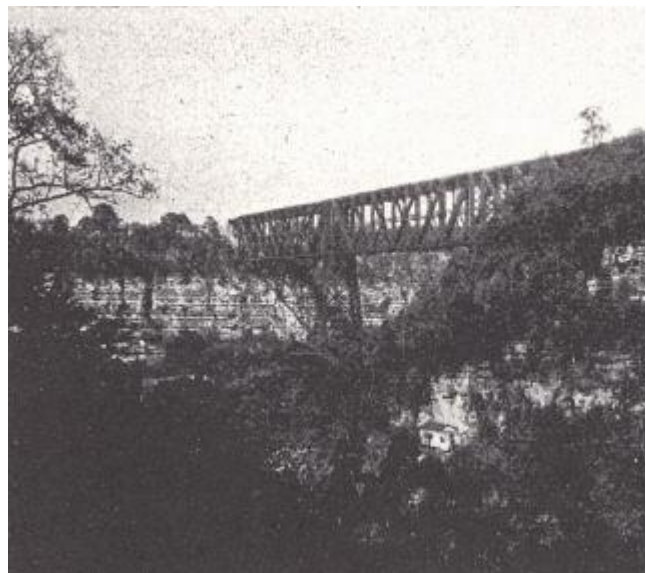
FIG. 2. Dix Dam and Lake Herrington, Mercer and Garrard counties (Aero-Graphic Corporation).

destruction. The cause of original precipitation of calcium carbonate has been variously ascribed to loss of carbon dioxide, either by agitation of the water or by the effect of mosses and lichens over which the water trickles, and by evaporation, possibly involving an earlier drier climate. If the latter be given some credence it should be associated with the earlier suggestion of a still earlier and more humid climate necessary for the forming of the falls and gorge. Other smaller examples are known in the creeks of the same vicinity.

The Kentucky and its main tributaries follow wide meanders trenched in the upland level of the Lexington plain (800 to 1000 feet). The intermediate valley (terrace), a couple of hundred feet lower with its alluvial deposits of the Irvine formation, has been described on p. 125. The meanders are entrenched and inherited from the cycle which terminated in the forming of the Lexington peneplain, though the slip-off slope on the inside of many of these curves shows their progressive development as the valley was trenched; thus both inherited and ingrown (Rich, 1914). Some of these loops have almost closed on themselves as in the case of Frying Pan Bend on Dix River and the loop just east of Handy's Bend on the Kentucky River (Harrodsburg quadrangle).

The gorge of the Dix River has been developed for power purposes with the building of the Dix Dam 3 miles above its mouth. This was the largest rock-filled dam east of the Mississippi River—1030 feet long, 275 feet high, and 750 feet thick at the base. Lake Herrington formed behind it has an extent of about 3000 acres and the lake level commonly ranges from 680 to 750 feet above sea level. The power plant has a generating capacity of 30,000 horsepower.

PLATE LXVII



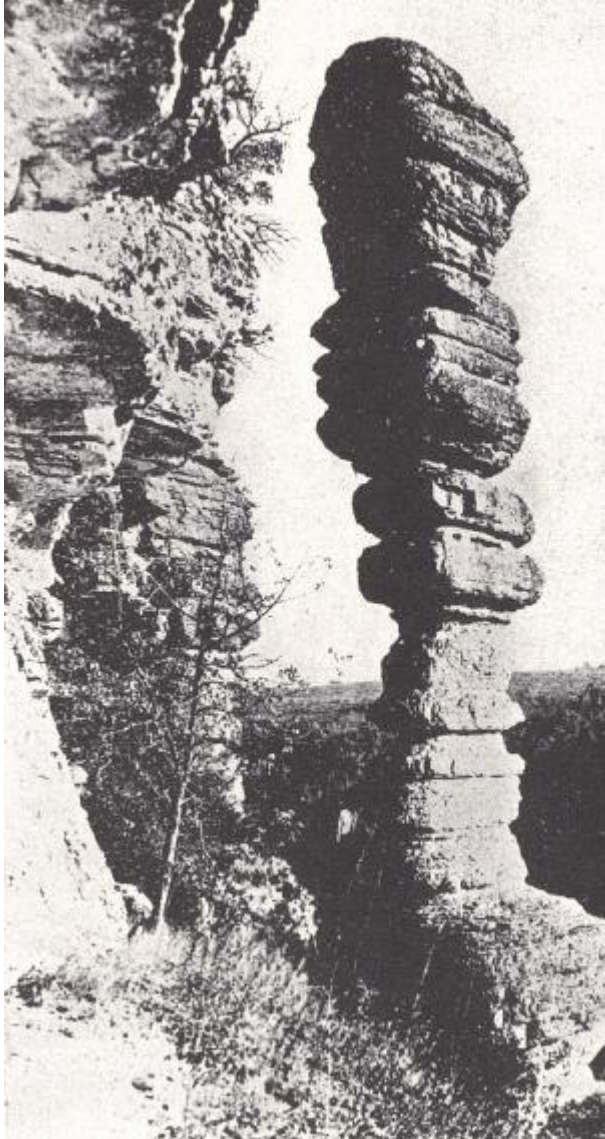


FIG. 1. Chimney (Candle Stick) rock, Kentucky River cliffs, 2 miles below Camp Nelson (Caufield and Shook).

FIG. 2. High Bridge, Kentucky. View from Shakertown-High Bridge road, showing the rugged river country in the region of High Bridge outcrop.

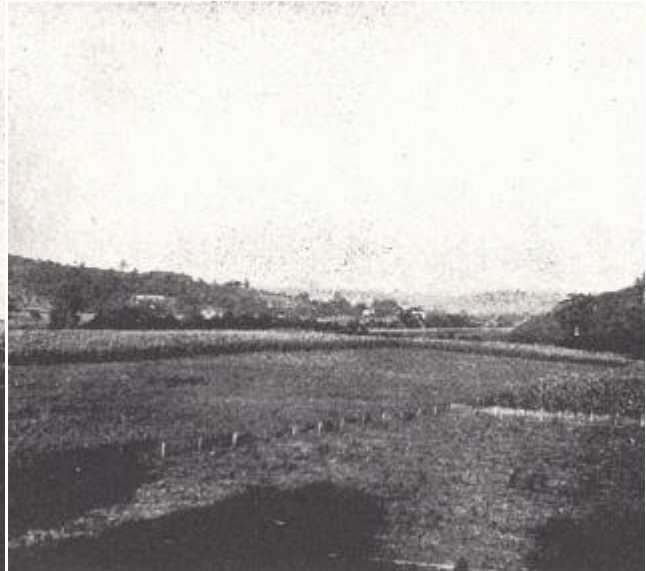


FIG. 3. Kentucky River valley near Drowning Creek Ferry in northern Madison County. The broad bottoms were carved in the thin limestones and shales of the Maysville and Richmond and contrast with the Kentucky River gorge downstream.



FIG. 1. Lake Herrington just above Dix Dam.

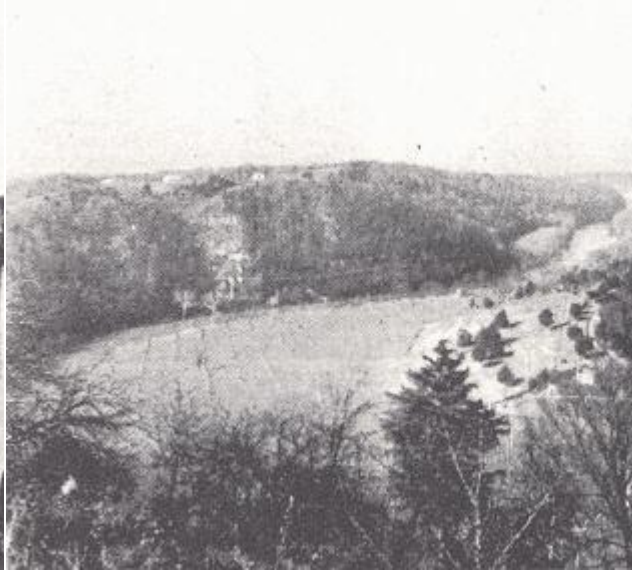


FIG. 2. Kentucky River gorge at Clay's Ferry, northern Madison and southern Fayette counties, showing the Kentucky River fault where the limestone cliff terminates to the left of the center of the picture. U. S. Highway 25 (right) crosses the fault three times in the immediate vicinity.



FIG. 3. Elk Lick Falls, "Petrified Water Falls" west of U. S. Highway 25 near the Kentucky River and about 10 miles southeast of Lexington. The travertine has formed over a 60-foot falls capped by Tyrone limestone and undercut in the Oregon. Cause of deposition is conjectural involving possibly



FIG. 4. Chimney Rock of Camp Nelson limestone, Lake Herrington, about 1 mile below Kennedy's Bridge.



FIG. 5. A water falls in the Camp Nelson limestone. Tributary of Boone's Creek, southeastern Fayette County.

agitation, evaporation, and use of
carbon dioxide by submerged
lichens, moss, etc.

A preliminary study was made by Foerste (1912b) not only of the annual available water supply but also of the problem of probable leakage. He found structural conditions favorable for a minimum loss of water by underground drainage. While several small fault displacements were observed, these did not seem important. With the lake available it has been possible to observe the limestone cliffs more carefully, and two grabens of considerable size and extent have been found. One of these is well exposed about a mile below Kennedy's Bridge in Spillman's Branch. The downfaulted block is not more than 100 yards wide and has a displacement of about 150 feet. It is shown again on Cane Run. The other cuts across a meander at the upper end of the "mile stretch" 4 to 5 miles above Kennedy's Bridge. Apparently though, they do not seem to be an important cause of leakage. Some difficulty was encountered with leakage around and below the dam through the limestone. The problem was successfully handled by closely spaced drill holes into which liquid asphalt was forced.