

A RECYCLED LANDSCAPE

by
Richard H. Durrell
Department of Geology
University of Cincinnati

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Sandra K. Oldfield

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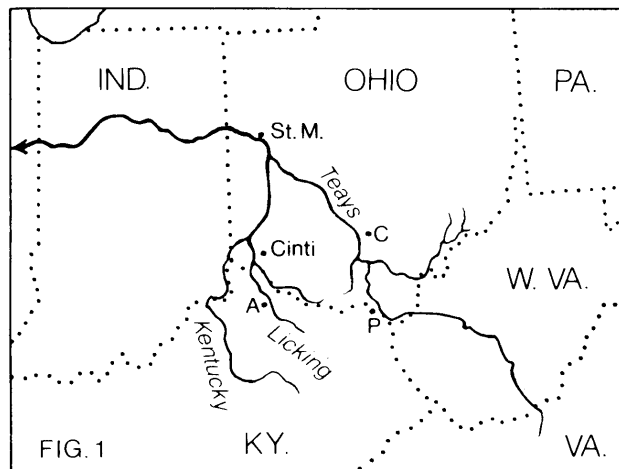
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A recycled landscape

"Recycling" is the word of the day. Modern Man reuses materials, remodels buildings, resurfaces roads, and relocates highways. In much the same way, Nature recycles even the very hills and valleys beneath our feet. But, as usual, Nature was there first -She's been recycling for millions of millenia.

The rolling uplands of the Greater Cincinnati area, its hills and valleys, its rivers and streams, all give evidence that the landforms of the region have been recycled not once, but several times in the last couple million years.

We're talking about that chapter of the Earth's history called the Pleistocene Epoch-the so-called Ice Age. The "heavies" in the story are the glaciers, those great masses of ice (as much as two miles thick) which invaded what is now the midwestern and eastern United States at least four times during the Pleistocene, beginning some 2,000,000 years BP (Before Present). At least three of these major invasions reached southwestern Ohio: The Kansan (about 1,200,000 BP), the Illinoian (about 400,000 BP), and the Wisconsinan (about 70,000 BP).



TEAYS DRAINAGE

•**THE BEGINNING.** Our story of the topography of the Cincinnati region begins over 2,000,000 years BP, before the first major ice sheet arrived in southwestern Ohio. The area was a gently rolling plain, known as the Lexington Peneplain. Flowing northwestward through Ohio was a large river system (Fig. 1). The main river, called the Teays, and its tributaries occupied lowlands which were slightly lower in elevation than modern hilltops. These valleys were only some 150 feet deep (Fig. 2), as compared to the 400 foot depth of our present drainage (Fig. 11).

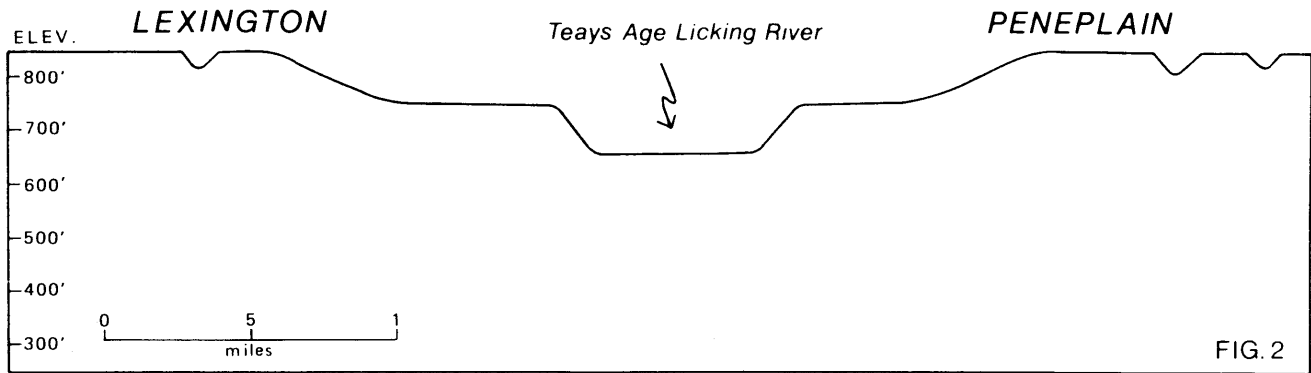


FIG. 2

LICKING RIVER IN TEAYS TIME

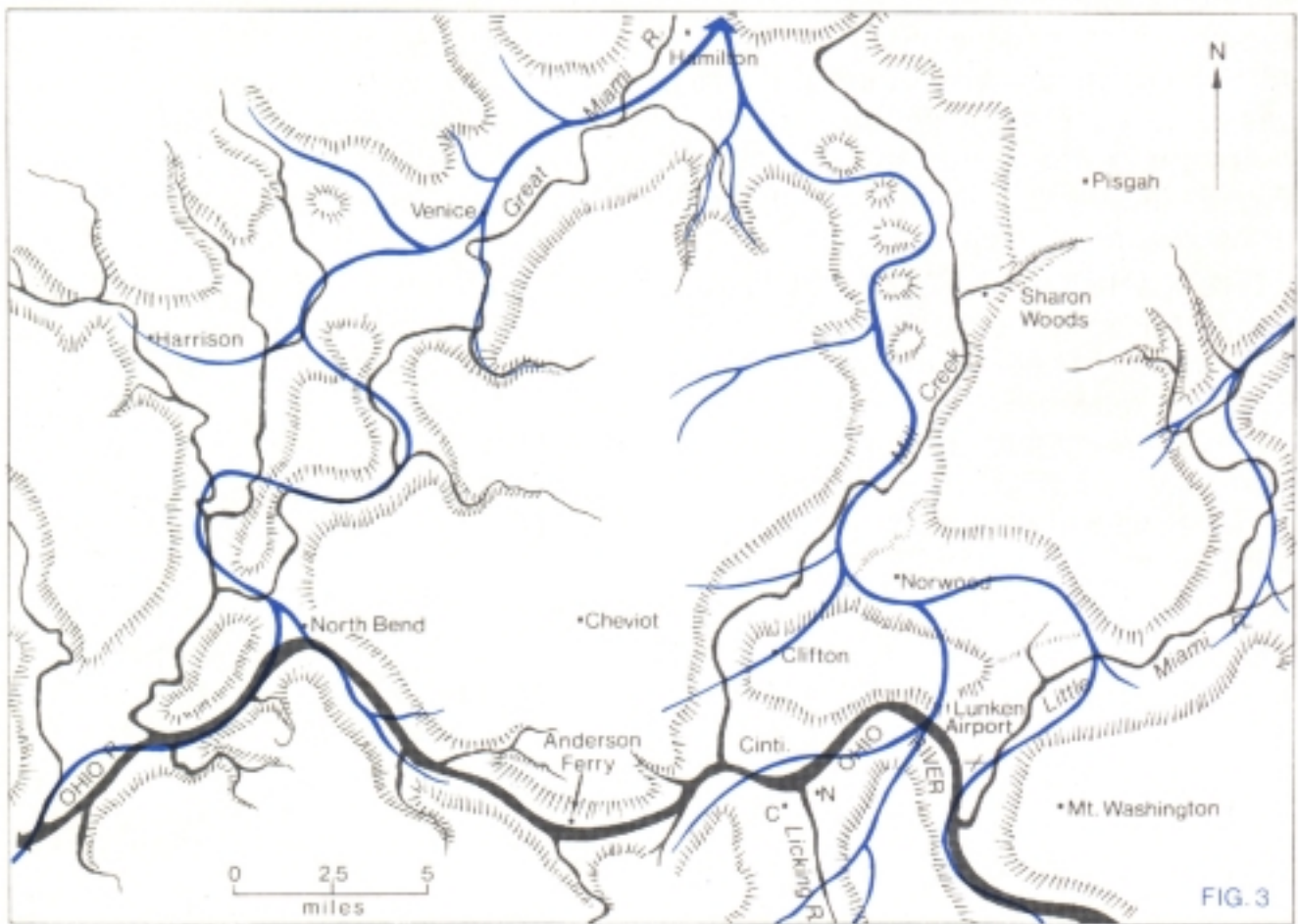
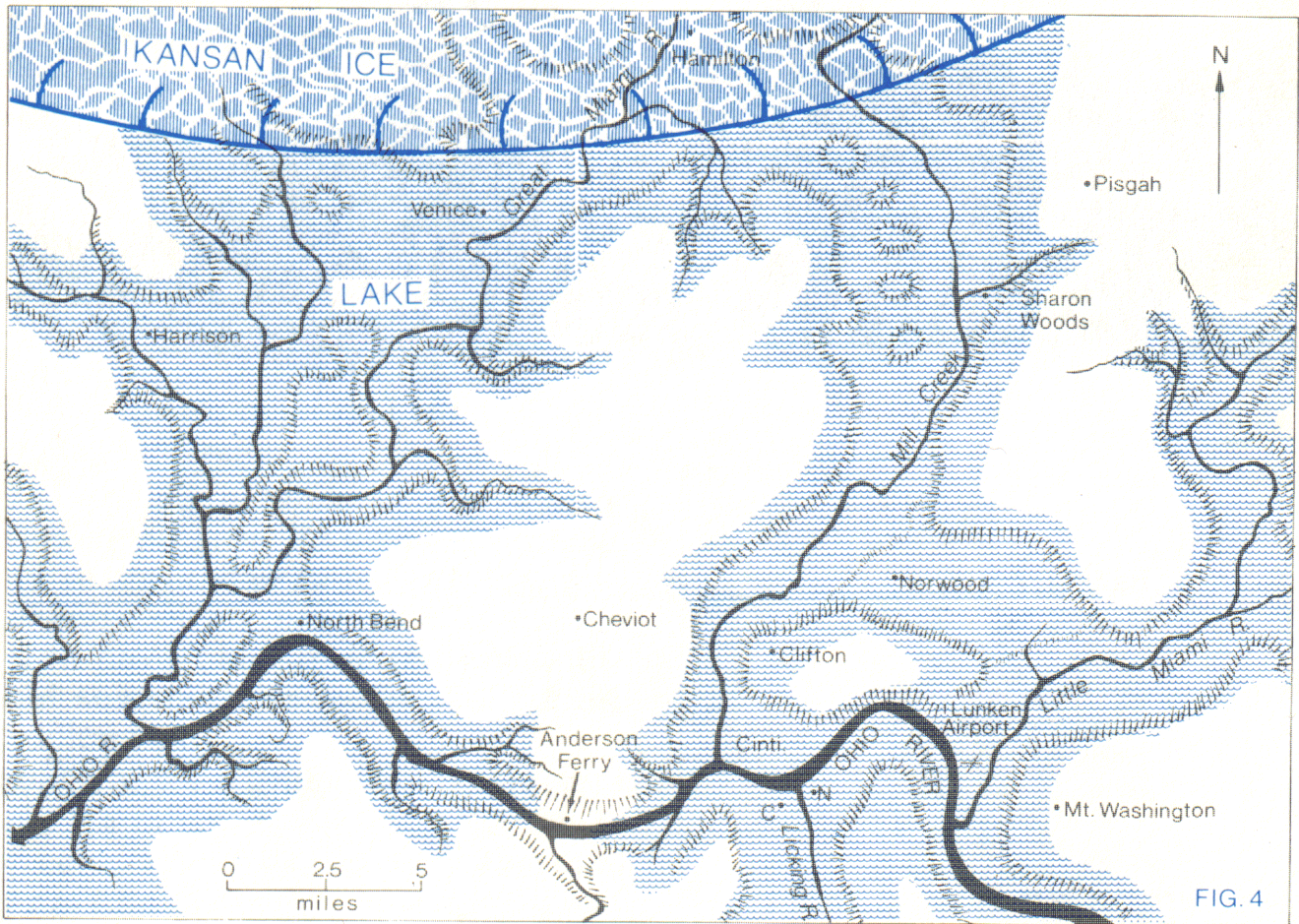


FIG. 3

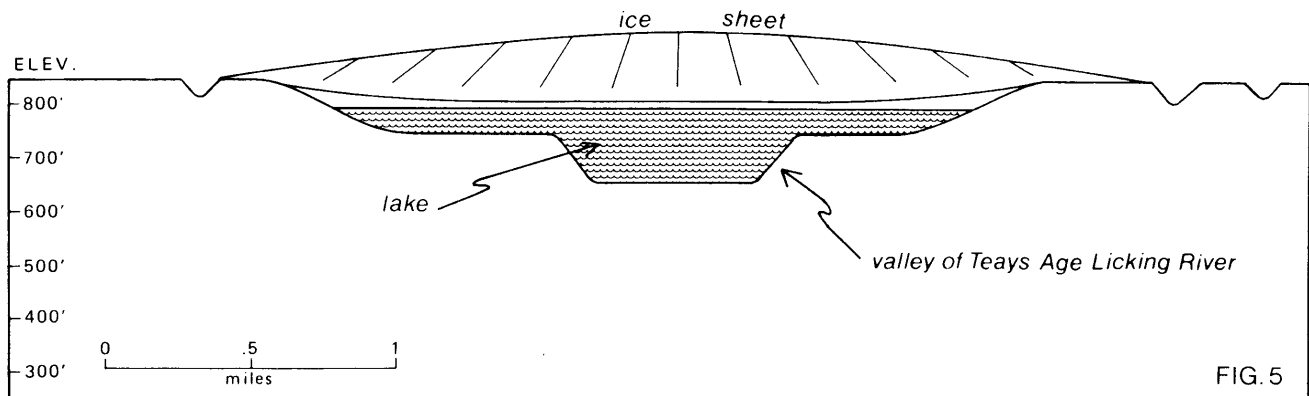
Several segments of a major tributary of the preglacial drainage can be traced in northern Kentucky. For about three miles south of Alexandria US27 follows an abandoned segment of the Teays Age Licking valley. Nearer to Cincinnati smaller tributaries of this Teays Age Licking explain, for example, the lower hilltops and modern north-flowing streams in Clifton (Fig. 3). Instead of flowing south to the modern Ohio these recycled tributaries flow away from it.

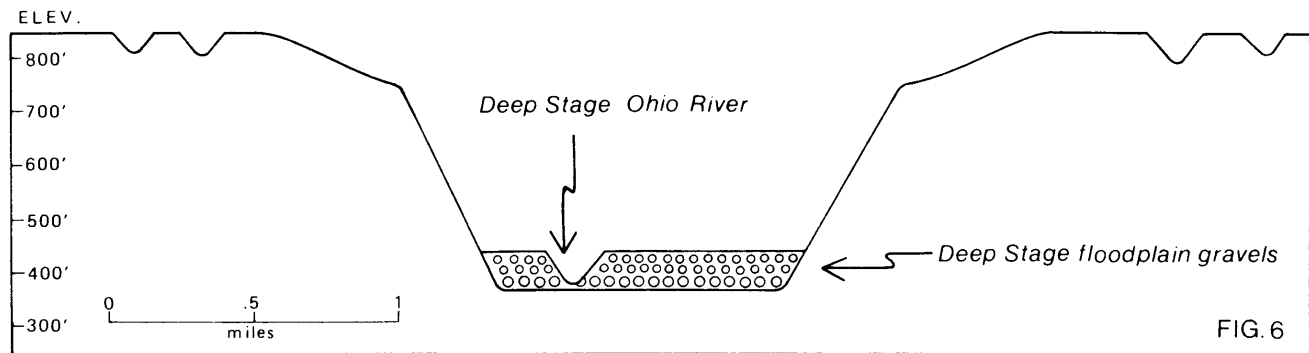


A KANSAN INSTANT

• **THE KANSAN GLACIATION (1,200,000 BP).** When the Kansan ice sheet advanced from the north over the Cincinnati area, the north-flowing Teays Age Licking River was dammed by the snout of the glacier (Fig. 4). Deposits of lake clay partially filled the ponded Teays Age Licking valley in southwestern Ohio and northern Kentucky (Fig. 5). (In Campbell County, Kentucky, south of Alexandria, extensive deposits can be seen.) In time, the lake waters rose sufficiently to overflow a divide near Madison, Indiana, to the west.

As the Kansan ice sheet melted, water continued to follow the new drainage system westward from near Hamilton and southwest toward Venice (Ross), Harrison, Lawrenceburg, and on to Louisville, Kentucky (Fig. 7). Augmented by a large volume of melt water and accompanying higher velocity, this new river recycled former valleys, eroding a deep, wide channel called the Deep Stage Ohio (Fig. 6). This drainage system, as the name suggests, was deep; it cut its valley to a level 100 feet lower than today's Ohio, Little Miami and Great Miami Rivers.





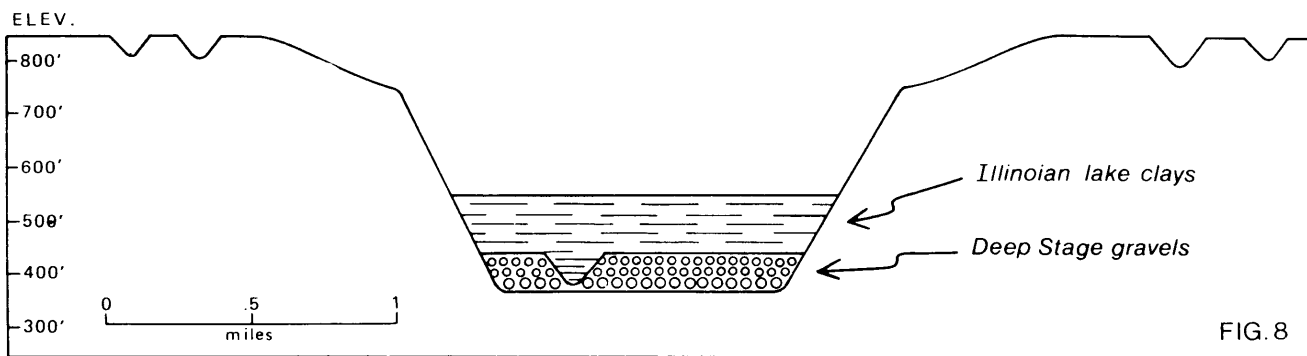
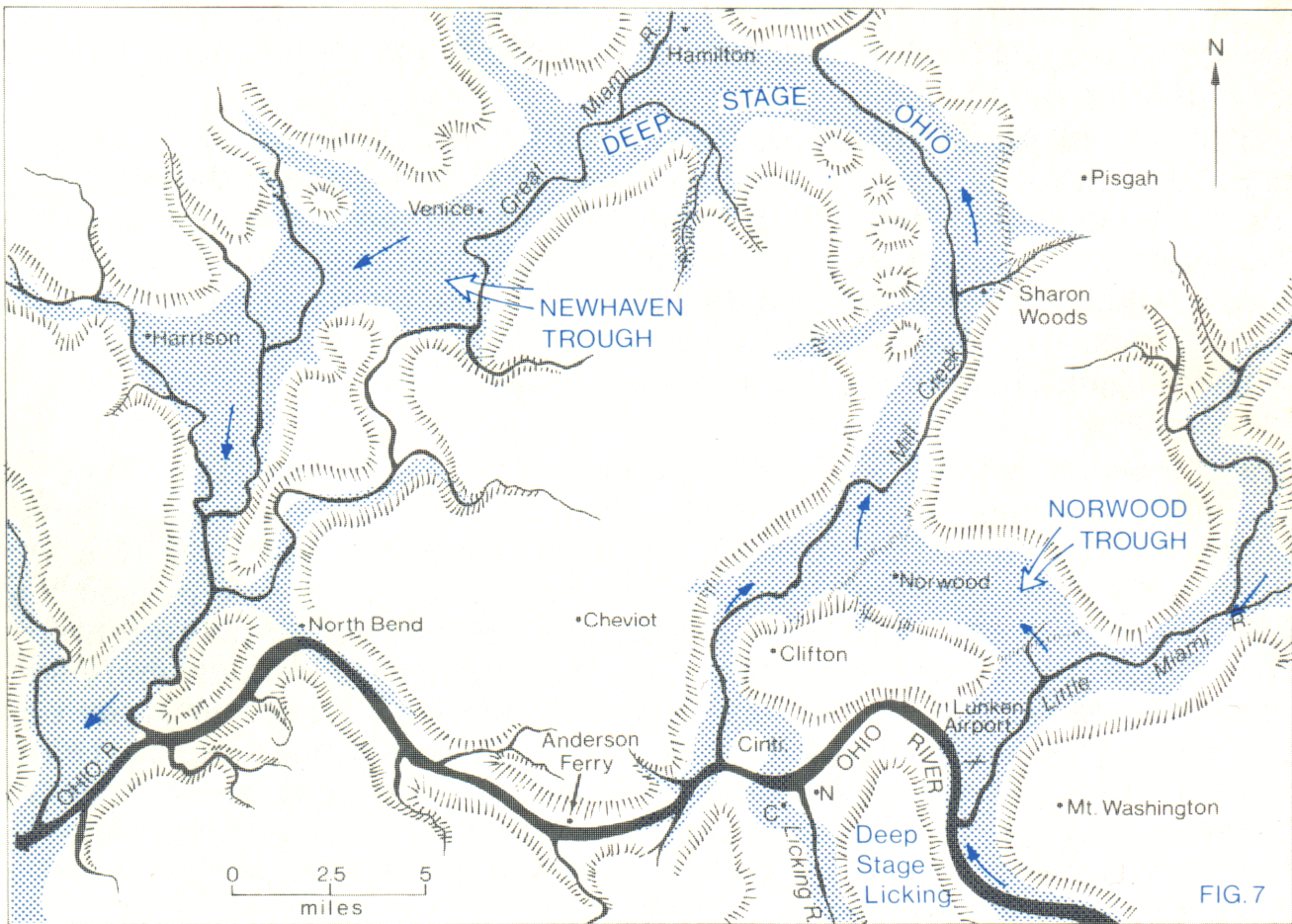
DEEP STAGE RIVER -ANCESTRAL OHIO

Had a steamboat drifted down the Deep Stage Ohio River, it would have passed the sites of Mariemont, Bond Hill, Evendale, Sharonville, Sharon Woods, Hamilton, Venice, Harrison, Elizabethtown, and Lawrenceburg. Cincinnati at this time would have been a southern city.

In what is now northern Kentucky the Teays Age Licking River abandoned its former course and shifted westward, cutting its Deep Stage valley where the present day Licking River now flows. However, in Deep Stage time, the Licking did not terminate at its present day mouth, instead it continued northward across the basin of downtown Cincinnati and up what is now the valley of Mill Creek to join the Deep Stage Ohio near Norwood. Many tributaries of the old Teays Age Licking became tributaries of the Deep Stage Licking. (Today's small, south-flowing Mill Creek is an underfit stream - much too small to have carved the valley in which it lies. It is, in fact, using the recycled valley originally cut by the much larger, north-flowing river of Deep Stage time.)

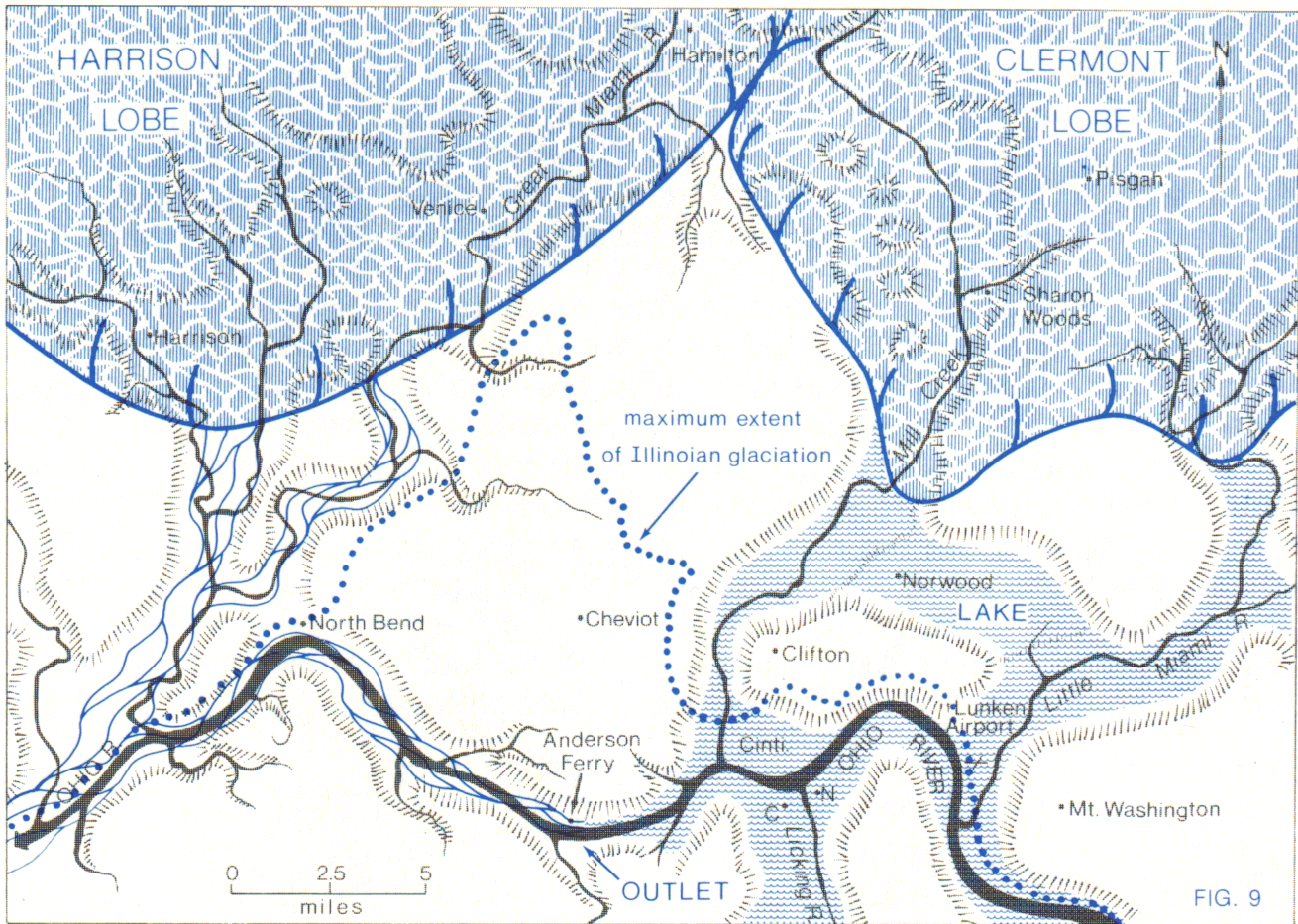
- **THE ILLINOIAN GLACIATION (400,000 BP).** The next to last ice sheet, the Illinoian, advanced from the northeast (out of Ontario) and covered almost all of southwestern Ohio. There were two lobes of ice in the area (Fig. 9). The eastern lobe advanced southward down the lowland of the Scioto River toward Chillicothe and then southwestward to Cincinnati. At the same time a more westerly lobe pushed down along the Indiana-Ohio border into western Hamilton County. The area west of Mill Creek lay between the two ice tongues.

The Illinoian ice sheet eventually dammed the Deep Stage Ohio. Thus, a second lake formed, extending back up the Deep Stage Ohio toward Portsmouth to the east and along the Deep Stage Licking to the south (Fig. 9). In this lake were deposited Illinoian lake clays (Fig. 8). As time passed the lake rose higher and higher; in due course it spilled over directly westward from Cincinnati cutting a new, narrow gorge extending through Anderson Ferry, Saylor Park, and on to North Bend. (Tributaries along this stretch of the modern Ohio are recycled. Those near Cincinnati still drain eastward from the relict divide at Anderson Ferry; they join the present Ohio as barbed tributaries, that is, they each meet the Ohio in an acute angle pointing upstream - showing that the main stream once flowed in the opposite direction. The tributaries to the west of the divide continue in their original westerly courses.)

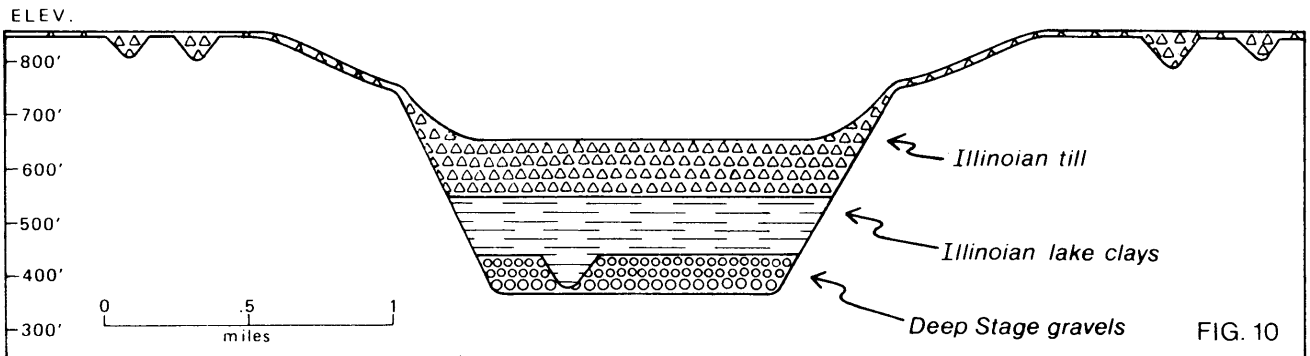


Not content merely to flood the area, the Illinoian ice sheet continued to creep inexorably southwestward. In due course, upon the Illinoian lake clays, as well as on the high-lands overlooking the valleys, there was deposited a blanket of till - unsorted, unstratified, ice-laid material (Fig. 10). For upwards of 300,000 years following the retreat of the Illinoian glacier from Ohio, weathering and erosion attacked the glacial deposits. The streams carved new valleys in the partially filled former valleys. Remnants of these former fillings, consisting of lake clays buried by glacial till, remain as terraces (Fig. 11). (Illinoian materials form the terraces along Mill Creek in Spring Grove Cemetery and the surface under Bond Hill, Norwood, and Mariemont.)

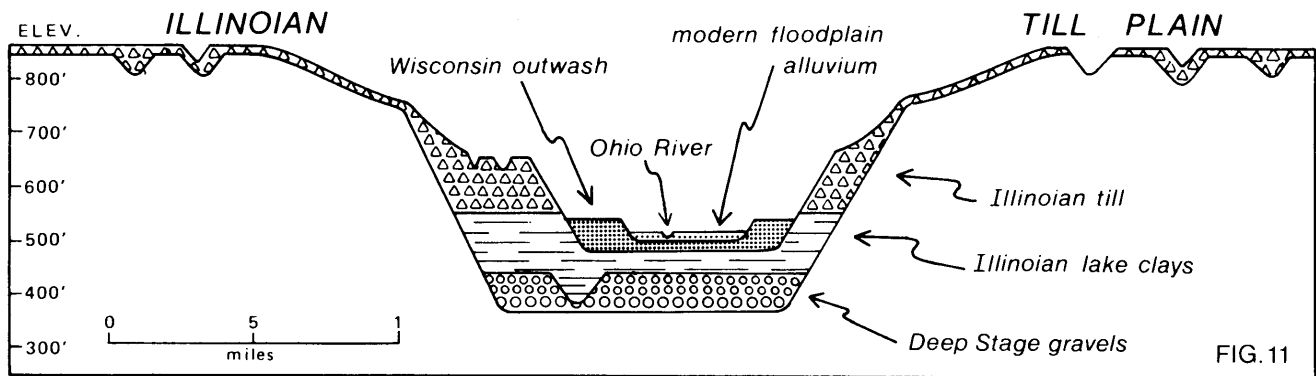
• **THE WISCONSINAN GLACIATION (70,000 BP).** The last continental glacier (in former years almost universally called the Wisconsin Glacier) advanced into southwestern Ohio about 70,000 years ago. After a slight retreat it readvanced into northern Hamilton County 19,000-18,000 years BP (as discovered in Carbon-14 studies of trees knocked over and buried just north of Sharon Woods, Ohio). The glacier stood at its maximum extent for a few



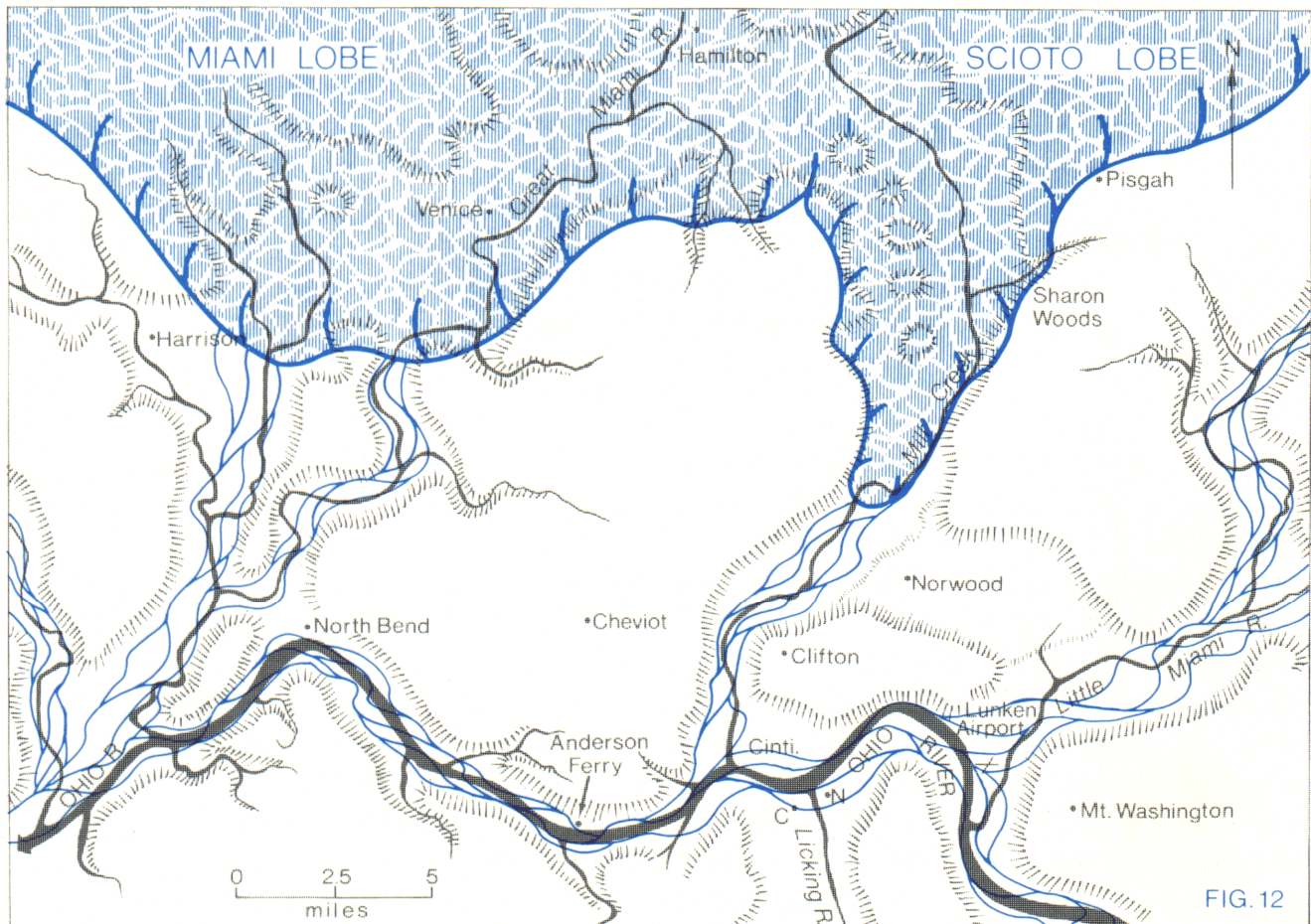
TWO ILLINOIAN INSTANTS



hundreds of years and, when it retreated, left a rolling belt of till marking the terminus of glacial movement (Fig. 12). (A segment of this terminal moraine, called the Hartwell Moraine, extends westward from just east of Pisgah, Ohio, to Sharon Woods, then south along the sides of the former Deep Stage valley as a giant loop to Hartwell, and back north to Winton Woods and Greenhills. It then wanders westward south of Venice to the Indiana line, just north of Harrison.) As the glacier melted, great, braided streams of meltwater carried large quantities of sand and gravel, including many foreign pebbles from as far away as Ontario. Many of the valleys became partially filled with water-laid, stratified deposits of the material. Since the Wisconsinian, stream erosion has cut into these deposits of outwash and has left terraces along many of the valleys (Fig. 11). Downtown Cincinnati, north of Fourth Street, is constructed on a terrace of this Wisconsinian outwash. (Indeed, Cincinnati owes its prominence to the fact that, in 1789, the U.S. Army decided to locate Ft. Washington on this terrace -above flood level. The other two local log cabin villages, North Bend and Columbia, failed to become important centers, because they were located on the modern Ohio floodplain, with no fort to provide protection from Indian raids.)



WISCONSINAN AND BEYOND



• **CINCINNATI, THIS WAS YOUR LIFE!** The Pleistocene geomorphic "life" of the Greater Cincinnati area has been one of recycling. The northward flowing preglacial drainage was disrupted by the Kansan Glaciation, but many of the old valleys were reused by the westward flowing Deep Stage Ohio and its tributaries. The Illinoian Glacier, in turn, disrupted the drainage pattern it encountered; once again many of the old valleys were reused, this time by the modern Ohio River and its tributaries.

Meanwhile, the Greater Cincinnati area was home for a multitude of animal life. Excavations in Wisconsin outwash deposits, for example, from time to time uncover the bones and teeth of many extinct animals which roamed the glacial and interglacial countryside. There were two elephant relatives -the mammoths and the mastodons. In addition there were giant ground sloths, wild horses, giant beavers, peccaries (a pig relative), tapirs, giant bison, and others. These animals of the Pleistocene Epoch, unbeknownst to themselves, were witnesses to the recycling of the land surfaces and of the streams which gave us the local landscape we know so well.

Further reading:

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