OHIO GEOLOGICAL SURVEY Contour interval 20 feet Datum is mean sea level Cartographic drafting by James A. Brown hummocky constructional topography. 82°45' Creek; these are indicated on the map by the symbol-Wtr. REPORT OF INVESTIGATIONS NO. 59 GLACIAL MAP LOCATION OF LICKING COUNTY, OHIO BASE COMPILED FROM THE FOLLOWING U. S. GEOLOGICAL SURVEY TOPOGRAPHIC MAPS

LICKING COUNTY, OHIO

JANE L. FORSYTH

EAST COLUMBUS

FREDERICKTOWN

ZANESVILLE

FRAZEYSBURG

GAMBIER

GRANVILLE

MARENGO

NEWARK

THORNVILLE

THURSTON WESTERVILLE

STATE OF OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF GEOLOGICAL SURVEY Ralph J. Bernhagen, Chief

Forsyth, J. L., 1961, Pleistocene geology, in Root, S. I., Rodriquez, Joaquin, and Forsyth, J. L., Geology of Knox County: Ohio Geol. Survey Bull. 59, p. 107-138.

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EXPLANATION

Stream alluvium

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REPORT OF INVESTIGATION NO. 59 GLACIAL MAP OF LICKING COUNTY, OHIO

Outwash terraces Wog-Granville Terrace Woh - Vanatta Terrace (high terrace)
Wol - Utica Terrace (low terrace) Woc-low-level cut terrace Wt-undifferentiated Wisconsin terrace

Wtr-terrace cut into rock

End moraines

Ground moraine

ILLINOIAN

Lake deposits Io - outwash terrace Iokt - local kame terrace It - undifferentiated Illinoian terrace

End moraines Ground moraine

Unglaciated areas Crestlines of end moraines Line marking boundary of Wisconsin

area of Wisconsin deposits

or Illinoian deposits

Position of pre-Wisconsin or pre-Illinoian divide

Contours drawn on bedrock surface. Contour interval 100 feet

Gravel pit

GLACIAL GEOLOGY

Licking County is located in central Ohio, just east of Columbus. Newark is the county seat. The county is drained by the Newark River and its tributaries, which flow eastward into the Muskingum drainage. Glacial deposits are present throughout most of the county. These deposits are of both Wisconsin and Illinoian age and were formed along the east edge of the Scioto Lobe of the glacier. As a result, both glacial boundaries are oriented north-south, with the unglaciated portion of the county to the east. Deposits of sand and gravel form kame hills (fillings of glacial crevasses) and flat-topped outwash terraces (gravel washed out beyond the glacial margin). Local silt deposits, representing lacustrine or slack-water accumulations, are present. Glacial till composes broad, smooth-surfaced ground moraine and hummocky belts of end moraine, each belt identifying a separate retreatal position of the glacial margin. Because of the high bedrock hills of central and eastern Licking County, end moraines there are strongly arcuate and the glacial cover is generally quite thin. In such areas, the distinction between end moraine and bedrock hills is commonly difficult to make; the most useful basis for separation was found to be the presence of

The distinction between the Wisconsin and Illinoian Wisconsin and Illinoian glaciers created drainage tills is based on their distribution and the nature of the diversions. Striking diversions made by the Illinoian ice soils developed in them. Wisconsin till soils generally occur in the valleys of Wakatomika Creek, in eastern belong to the Alexandria group of soils and are 2 to 5 Perry Township and in northern Fallsbury Township. In feet deep; Illinoian till soils are generally in the Falls-addition, major Illinoian diversions took place in the burg group and are 6 to 7 feet deep. In the southern part valleys of Rocky Fork just south of Hickman and of of Licking Township, just northeast of Buckeye Lake, Wilkins Run in southeastern Newton Township. Jonathan there are some soils which, though they are 6 to 7 feet Creek, located along the Fairfield-Perry County line, deep, look much more like deeper, more weathered Alex- was believed by Flint (1951, p. 6) to have been affected andria soils. It is possible that the till in which these soils were developed is "early." Wisconsin and might

Five main diversions were created by the Wisconsin correlate with the Knox Lake Till of Knox County ice. Diversions in the valleys of the unnamed southwest (Forsyth, 1961), but because no soils break was observed tributary of Rocky Fork, 3 miles northeast of St. Louiseast of this area and because all previous workers ville, and of Lost Run, 3 miles east of St. Louisville, (White, 1939; Nicholas Holowaychuk, oral communication, were both caused by the same thick deposit of end mor-1964; and Ralph Meeker, oral communication, 1964) have aine and kames in southeastern Washington Township. called this till Illinoian, it is so designated on the map. The deep narrow valley of Claylick Creek, 3 miles south-All other Wisconsin deposits in Licking County are of east of Newark, was created when ice blocked a west-"late" Wisconsin age.

A heavy line representing a subordinate soils bound- just east of Jacksontown, was diverted from its original ary is shown cutting north-south across the middle of the westward flow by the outermost Wisconsin end moraine. area of ''late'' Wisconsin till. The difference in the soils Three miles north of Granville, Dry Run, which once on either side of this line is nowhere great. The variation flowed to the southwest, up the valley of Griffin Run, along a single side of the line is commonly greater than now drains eastward through the bedrock hills into the that across the line. However, since the contrast in soils Licking River. at any one place along the line is everywhere reasonably sharp, this line is taken to represent the terminal position reached by a major readvance of the Wisconsin glacier during its retreat. Locally this readvance proonly by a change in soils and a subtle topographic contrast. This relationship is seen even where the younger drift overlaps the western edge of the older Johnstown Moraine. Because this line of soils change correlates with the Centerburg Mt. Liberty soils break to the south of the Teays, the Groveport River, flowed south from Utica to Buckeye Lake. At Newark, the Contract of the product of th with the Centerburg-Mt. Liberty soils break to the north in Knox County (Forsyth, 1961), the younger till is here port River was joined by a major tributary from the east,

called Centerburg and the older Mt. Liberty. This soils the Cambridge River. A third tributary, less clearly line also appears to correlate with the Miami 6A-Miami 60 defined by the contour lines, flowed south from Johnssoils line of southwestern Ohio (Forsyth, 1965).

TERRACES Gravel outwash terraces of both Wisconsin and Illiand which seem to have flowed toward the east. These noian age are present in the county. Terraces along the are interpreted to represent the first valleys resulting valleys of the Licking River and its main tributaries. from diversions created by the initial glacial advance; were studied by Jones (1959), whose mapping, with minor the deeper cutting of these valleys would be explained modifications, appears on this map. Illinoian outwash, in by the abundant meltwater provided by the glacier. Since the valleys of the Licking River, Brushy Fork in Perry surficial evidence does not seem to support the existence Township, and Wilkins Run in Mary Ann Township, forms of a pre-Illinoian glacier in this part of Ohio, these diverflat extensive plains of sand and gravel, whose eastern sions were probably produced by the Illinoian ice. edges slope steeply down into the valleys. Illinoian outwash also forms the higher level on the north side of the able depth by glacial materials. Maximum depths now Licking valley between Newark and Hanover. Because recorded are in the main Groveport River valley east and this outwash is not present on the south side of the south of Newark, where more than 400 feet of drift are valley, it is likely that it actually represents a kame measured in some places. terrace, formed while a tongue of ice occupied much of the Licking valley. This interpretation is supported by the somewhat irregular surface on this deposit and the presence, locally, of significant amounts of till. Two levels of Wisconsin constructional terrace are recognized, a higher Vanatta Terrace and a lower Utica glacial materials of Licking County is sand and gravel. Terrace (Jones, 1959). In addition, lower, cut terraces

bedrock, since removed by erosion, in the valley of Rac-Louisville. coon Creek about a mile east of Granville. Terraces in "undifferentiated Wisconsin terrace." These terraces (Dove, 1960). Also significant among the county's natucommonly contain more silt and colluvium than gravel. ral resources are the richly productive soils developed Terrace levels cut into sandstone are locally present in the glacial tills of western Licking County. the northeast corner of the county along Wakatomika

There are more than a dozen active or recently active are present in most places. Contrary to Jones' original gravel pits in the county. Almost all of these pits are in mapping, the Vanatta Terrace is now recognized along the Vanatta Terrace which, despite a silt cap of 2 to 3 the Licking valley in the St. Louisville area and along feet, appears to contain a better quality of gravel than is Raccoon Creek three miles southeast of Johnstown, just found in the lower terraces. The gravel that occurs in west of Hazelton Corners. At this latter location, the this terrace east of Granville is generally of poorer terrace is locally capped by Centerburg Till. Around quality than that to the west, apparently because of the Granville, there are matched constructional terraces, larger amounts of deleterious shale and friable sandstone not reported by Jones (1959), which stand approximately present in it, presumably derived from the adjacent bed-20 feet above the level of the Vanatta Terrace and are here called the Granville Terrace. The existence of this terrace is best explained by the presence of resistant

Wisconsin lacustrine deposits 2 miles northeast of St. Ground water occurs in relatively abundant amounts areas so separated from the Licking drainage that dependable correlation was not possible are mapped as minor amounts throughout the glaciated part of the county

MINERAL RESOURCES

The most important mineral resource among the

DRAINAGE DIVERSONS

flowing stream in the valley at Fleatown. Quarry Run,

BEDROCK SURFACE

town to Pataskala and joined the Groveport River south

of Hebron. Smaller tributaries were present in the valleys of Wilkins Run, Wakatomika Creek, and Lake Fork. In places, there appears to be evidence for a few

streams that were incised more deeply than the others

The contour lines drawn on the buried bedrock sur-

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