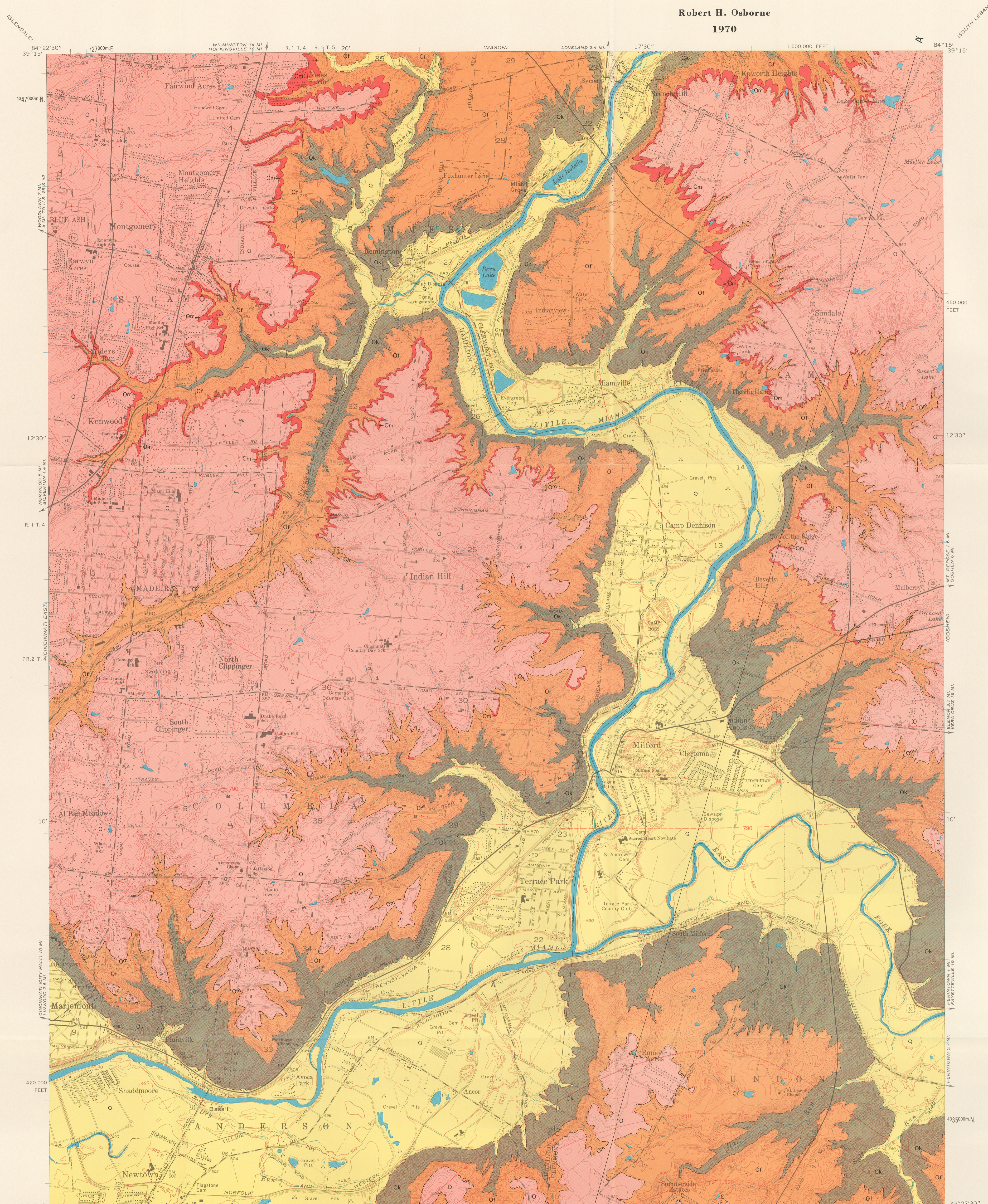
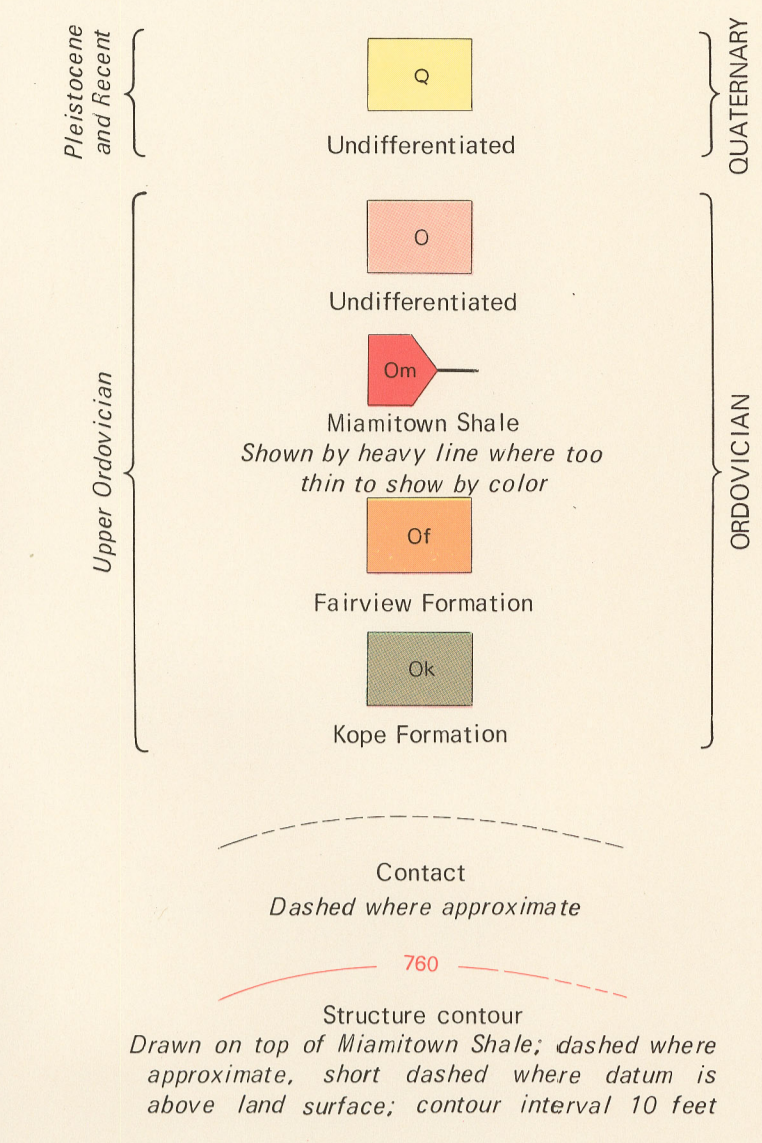


BEDROCK GEOLOGY OF THE MADEIRA QUADRANGLE,
 HAMILTON AND CLERMONT COUNTIES, OHIO

by
 Robert H. Osborne
 1970



EXPLANATION



SYSTEM	FORMATION	LITHOLOGY	THICKNESS (IN FEET)	DESCRIPTION
QUATERNARY	Undifferentiated	[Symbol]	0-150	Recent alluvial silt, sand, and gravel, generally less than 10 feet thick. Pleistocene fluvial gravel, sand, silt, and clay, comprising dissected terraces and abandoned river channels; laminated silt and clay of probable fluvio-lacustrine origin along many valleys; one or more intercalated till units in places.
	Undifferentiated (Bellevue Limestone and overlying rocks)	[Symbol]	0-100+	The description provided is for the Bellevue Limestone. Top of the Bellevue is not exposed in the map area and other valid but unexposed lithic units probably overlie it.
CRETACEOUS	Miamtown Shale	[Symbol]	0-12	Interbedded shale and limestone. Shale, medium- to dark-gray, calcareous, fissile; present as partings and sets up to 3 feet thick; calcareous light- to medium-gray mudstone and siltstone present as partings within some of the shale units. Limestone 10-20 percent, light- to medium-gray, very fine- to coarse-grained, moderately well-sorted, argillaceous, biogenic; in lenticular or irregular beds from 1 to as much as 8 inches thick, locally fine- to coarse-grained, moderately sorted, in even beds. Mudstone, medium- to medium-dark-gray, calcareous; present as thin partings and as sets up to 4 inches thick between limestone beds. Formation fossiliferous throughout; <i>Platystrophia ponderosa</i> one of the most conspicuous faunal elements; formation weathering to produce a distinctive rubble or slabby float.
	Fairview Formation	[Symbol]	70-115	Interbedded shale and limestone. Shale, medium- to dark-gray, calcareous, fissile; present as thin partings and sets up to 1 foot thick; calcareous light- to medium-gray mudstone and siltstone present as partings in the shale units. Limestone 20-40 percent, light- to medium-gray, fine- to very coarse-grained, moderately well-sorted, argillaceous, biogenic, generally in even to slightly irregular beds from 1 to 4 inches thick, ripple marked in many places. Fairview Formation thin bedded and fossiliferous throughout; several argillaceous limestone beds composed largely of <i>Rafinesquina</i> valves present in upper third of unit; upper contact placed to separate the thin-bedded shale and limestone sequence of the Fairview from the medium-bedded shale and limestone sequence of the Miamtown Shale.
	Kope Formation	[Symbol]	64-208	Interbedded shale and limestone. Shale, medium- to dark-gray, calcareous, fissile; present between limestone beds as thin partings and sets up to 3 feet thick; mudstone and siltstone present as partings within some of the shale units. Limestone 20-30 percent, light- to medium-gray, very fine- to coarse-grained, moderately well-sorted, argillaceous, biogenic; generally in beds from 1 to 4 inches thick; ripple marked in many places. Formation fossiliferous throughout, although shales less fossiliferous than limestones; upper contact gradational and placed to separate the medium-bedded units of the Kope Formation from the thin-bedded sequence of limestone and shale of the Fairview Formation.

MINERAL RESOURCES

Ground water.—Logs from wells in the major valleys of the Cincinnati area indicate up to 150 feet of sand, sand with pebbles, and gravel, which in many cases may be largely of Illinoian age (Durrell, 1961, p. 57). These deposits are a very important source of ground water in the industrialized areas of Cincinnati. Water supplies from bedrock in this area vary greatly in quantity and quality, but are generally ample only for domestic use.

Sand and gravel.—Glacial deposits (largely outwash) of both Illinoian and Wisconsin ages and Recent alluvium supply large amounts of sand and gravel in the area. The greatest resource of sand and gravel is found in the terrace remnants of valley trains of Wisconsin age.

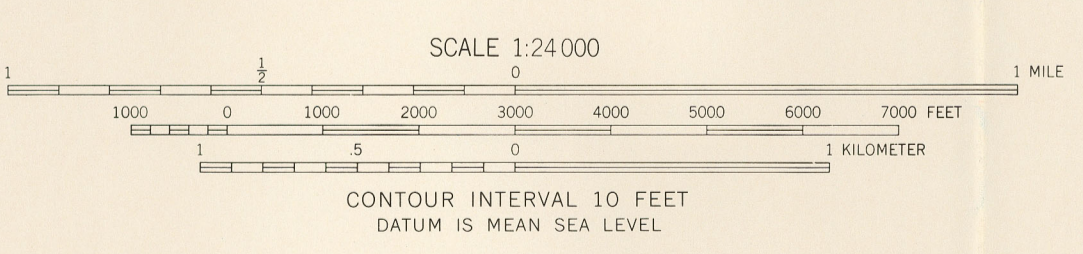
Limestone.—No operating quarries were observed in the map area, but Fenneman (1916, p. 177-178) reported that the upper portion of the Fairview Formation was once quarried for building stone. In adjacent areas the Fairview Formation is quarried for crushed stone for use as concrete aggregate, road metal, railroad ballast, and sewage filter beds.

Shale.—The shale of the Kope Formation was once used for making brick (Fenneman, 1916, p. 179); however, there are no operating quarries in the area at the present time.

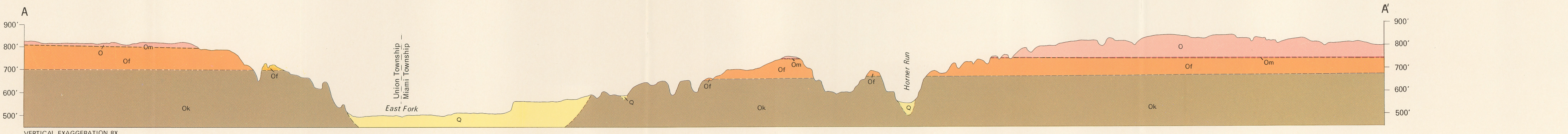
REFERENCES CITED

Durrell, R. H., 1961, The Pleistocene geology of the Cincinnati area, in Goldthwait, R. P., and others, Guidebook for field trips, Cincinnati meeting, 1961, New York, Geol. Soc. America, p. 47-57.
 Fenneman, N. M., 1916, Geology of Cincinnati and vicinity, Ohio Geol. Survey Bull. 19, 207 p.

BASE BY U.S. GEOLOGICAL SURVEY, 1961
 10,000-foot grid based on Ohio coordinate system, south zone
 1000-meter Universal Transverse Mercator grid ticks,
 some 1/4 shown in blue



TRUE NORTH
 MAGNETIC NORTH
 APPROXIMATE MEAN
 DECLINATION, 1961



VERTICAL EXAGGERATION 8X