THE 1952 FIELD CONFERENCE

OF

FRIENDS OF THE PLEISTOCENE

Columbus, Ohio

May 24 and 25, 1952

Conducted by

R. P. Goldthwait

GENERAL BACKGROUND

It now appears that there may be 13 distinct drift areas in Ohio. See "Drift Areas in Ohio." This trip will visit four of these starred below.*

0. Erratic boulders high on the hills south of Cincinnati and above terrace levels on the Hocking Hills (Merrill, 1950). There is no till. These might be explained as remnants of very high terraces but size and elevation suggest an early drift: Kansan? or Nebraskan?

1. Illinoian till, derived from calcareous shales and limestones weathered to gumbotil for about 4 feet and leached to 9 feet from surface. Only 5 to 20 feet thick on wide flat stratigraphic plains to the northeast and more dissected southwest. Cincinnati soils.

*2. Illinoian drift derived from sandstone and shale on hilly terrain. Till aprons and sharp gravel-till kames in valleys, sparce erratics on hilltops (White, 1939). Strong for weathering 5 feet, leached 9 feet.

3. Illinoian drift of Grand River lobe (White, 1951) called Nebraskan by Stout on drainage arguments. Generally 3 to 10 feet thick, probably leached 11 feet. Discontinuous till sheet on bedrock hills. Hanover soils.

*4. Tazewell drift of Miami lobe (Goldthwait, 1950). Deep Russell soil profile leached $4\frac{1}{2}$ feet with a silty "A" horizon (loess added?). This makes a smooth but rolling topography masking broad hills. Wells generally show 20 feet to rock.

*5. Possible Tazewell drift of Scioto lobe. Overlaps area 4 and shows more shallow leaching 3-4 feet; Xenia soils on limestone; Alexandria soils on sandstone and shale (east). Profile and depths variable. Thin on hill tops. Thick in valleys, long rounded slopes.

6. Tazewell "island" at Akron surrounded by younger drift of Grand River and Killbuck lobes (White, 1952). Sandy, weathered 4 feet, leached $6\frac{1}{2}$ feet. Derived from sandstone and shale.

*7. Questionable Tazewell or Early Cary belt of Scioto lobe drift between Xenia and Reesville Moraines. Moderately thick till plains (average near 30 feet) on Niagaran limestone bench. Deep Miami type soil leached over $3\frac{1}{2}$ feet to south, $2\frac{1}{2}$ feet north. No undrained depressions.

*8. Early Cary till plains of Miami and Scioto lobes. Miami soils, leached $2\frac{1}{2}$ feet. Thin sheet of sandy till over extensive gravel areas. Stippled on "Moraines of Southwestern Ohio". This till may bury a soil on the gravel and the gravel was highly dissected prior to this readvance. The till is clay rich where it overlies other tills and total drift thickness generally exceeds 60 feet except on the north-south limestone belt through Columbus. Studded with moraines. Some undrained depressions.

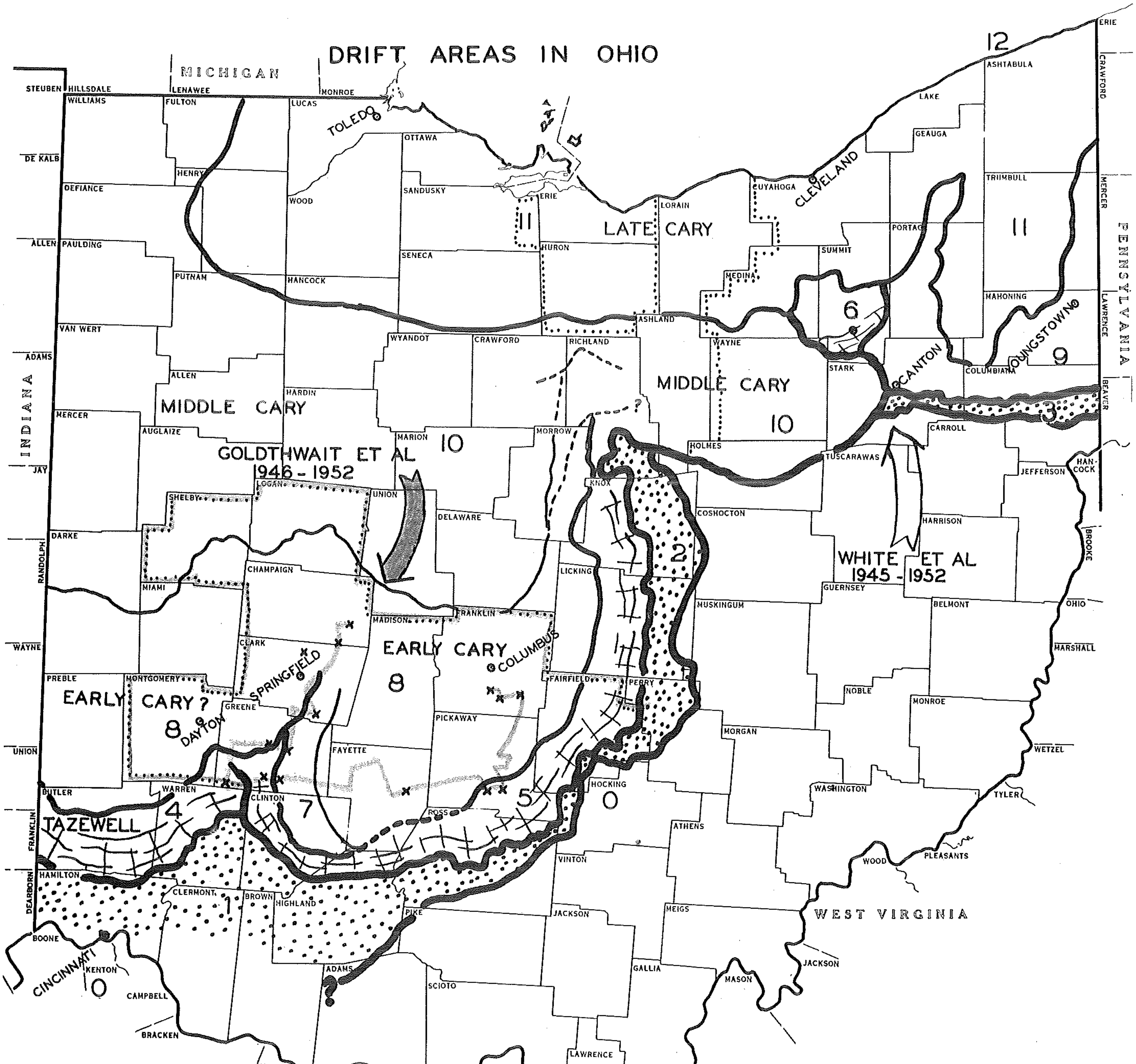
9. Middle Cary till (called "early" by White, 1952). Grand River lobe. Silty to sandy, leached 6 feet, Wooster soils.

10. Middle Cary till of Killbuck, Scioto, Miami lobes. Silty. Soils deeper east (Wooster, leached 3 feet) shallow west (Miami leached 2 feet). May over-ride area 9 and be later. No definite evidence of readvance has been worked out in west or central Ohio although the drift is festooned with moraines (White, 1939). Reconaissance of topography and stone counts suggests that later moraines (Wabash) may over-ride earlier ones (Broadway) so middle Cary boundary may be further north. Joins "Cary-Tazewell" boundary in Indiana (Wayne and Thornbury, 1951); under study in west central Ohio (Forsyth).

11. Late Cary (?) drift, clay rich from readvance over lake sediments extending to and sometimes south of Defiance Moraine (White, 1952). Long rolling hill topography. St. Clair soils leached $1\frac{1}{2}$ feet (west) to Wayne soils 3 feet (east). Further studies in north central Ohio (Campbell).

12. Possible younger Cary or Mankato drift on lake border moraines. (MacClintock and Apfel, 1944). To be studied.

DRIFT AREAS IN OHIO



STOP 1 - STARTING POINT - Hartman Farms, Route 23. Leave 8:00 a.m. E.S.T.

0.0 Pull in on the east side of the road heading north past the fruit stand. We start in Drift Area 8. These hills are the most northerly and highest member of a discontinuous series of kame groups and esker ridges stretching from Columbus down the Scioto Valley to the Wisconsin (Tazewell) boundary at Kingston. Parts of this Circleville esker chain are covered by thin till, but sharp constructional form is intact.

0.1 Turn R east off Hy. 23, on Rathmell Rd., between farm buildings, go 1.2 mi.
1.1 In 1 mile road crosses glacial channel which heads at Rt. 23, $1\frac{1}{2}$ mi. NW.
1.2 Turn R, south, on Parsons Rd. for 2.0 mi.
CWG 1A Till over gravel (old pit) on this corner is the west edge of over 100 square miles of till-over-gravel-over-till. See Projected Profiles of Scioto Valley. Road follows channel to the south.
2.7 After 1.5 miles drop 10 feet onto floodplain of Big Walnut Creek.
3.2 Stop sign. Turn L, east, on Route 665 across bridge for 0.6 mi.
3.6 Climb off floodplain around curve 0.2 mi.
3.8 Turn sharp right onto new gravel road into gravel pit.
3.9 Park at top of gravel pit.

STOP 2 - Gravel Pit near Lockbourne, just off 665. 8:20 - 8:50 a.m.
A thin till (Cary?) 2 to 5 feet thick has been stripped back. It lies on about 15 feet of gravel (Tazewell?) and is typical of areas to the south (also north to O. S. U.) where a gravel terrace is exposed westward from under a till blanket. Second Projected Profile of Scioto Valley. Is all of this gravel of one generation? Why did not the ice cover it all with till? The soil is unusually red for a till due to excessive underdrainage. Note concentration of reddish clay (B2) in the top of the gravel: At many similar places this can not be ascribed clearly to a pre-till soil profile. In the bottom of the pit one can dig or auger through a 3-inch olive-yellow zone into blue-gray till (Tazewell?). Stone counts on river bluff near here and 14 miles away (Stop 18) show that this lower till has more sandstones and shales from the north but less dolomite from the west than the overlying till.

0.0 Return north 0.1 mile to the blacktop road.
0.1 Turn R, east, on Hy. 665 following it for 5.1 miles.
0.7 In 0.6 mi. jog L at Lockbourne Rd., then R (still 665).
1.6 Cross railroad overpass with view of plains.
2.4 Pass Lockbourne (jet) Air Base. In this area well logs show 32 to 44 feet of till over more than 14 feet of gravel.
4.5 At 2 miles beyond the Airbase turn L, north, with Rt. 665 on Pontius Rd.
5.2 Continue straight north on Saltzgaber Rd., leaving Hy. 665 after 0.7 mi.
5.9 Another 0.7 mi. north climb hill past pit and turn into pasture just north of windmill. Park.

STOP 3 - Gravel Pit on Saltzgaber Rd., Groveport. 9:05 - 9:50 a.m.
This is interpreted as a buried esker. It extends for $1\frac{1}{2}$ miles north as a subdued ridge. Half buried kames are exposed north of it. 4 water wells

reveal 6 - 25 feet of till over at least 30-80 feet of gravel. Here 3 to 9 feet of till (Cary?) with reddish excessively-drained soil profile and a calcareous zone 3 where thick, lies on 20 feet of cross-bedded sand and gravel (Tazewell?). Where the till is thin, typical Fox gravel soil pendants (root channels?) of red-brown clay (B3) penetrate 4 to 6 feet into the gravel. The critical question is, then, where there is thick calcareous till is the discontinuous red-brown, non-calcareous clay layer under the till a relic of an interstadial soil? or could it be generated through the red clay-filled joints in the till after till deposition? Nearly two dozen similar cases are known in Ohio and Indiana.

0.0 Return south on Saltzgaber Rd. 0.7 mi. to rejoin Hy. 665. All of this route to Circleville is over Devonian (Ohio) shales.

1.5 In another 0.8 mi. continue south on Pontius Rd. 14.6 miles, leaving Hy. 665. Pontius Road follows Walnut Creek at first and passes pit in gravel exposed from under till in 3.7 mi. The whole area has till/gravel in well logs and this road follows the buried bedrock valley far east of the present Scioto.

6.1 Cross Walnut Creek, climb and note Appalachian low escarpment rising to the east. You are crossing the third Projected Profile here. See buried valley on "Map Showing Bedrock Contours."

9.2 Stop sign 3.1 miles farther: continue south across Hy. 752. This is the area of the bottom Projected Profile #4.

10.4 Swing left over covered bridge in another 1.2 mi. and cross north end of long glacial channel. In another mile the escarpment to the east is closer and more prominent. The till is thin and the gravel pinches out underneath it all along this escarpment.

14.7 A little over 4 miles from the covered bridge where the road heads southwest note the skyline of an esker a mile or two away R. This is the same esker chain of Stop 1. It is extensively quarried and has thin till cover here. Did the readvance (Cary?) come all this way and leave till on most but not all of the outwash, kames, esker?

16.1 Stop sign: end this road. Turn L, south, on Hy. 23 for 1.6 mi. into Circleville on Court St. passing 2 traffic lights.

17.7 Turn L, 3rd light, on Watt St. and follow it east 0.8 mi.

18.5 Turn diagonally left at stop sign onto Rt. 22, across Hargus Creek.

CWG 2A Cary end moraine. This takes you along the north edge of the hummocky Marcy moraine for 2.1 mi. Till is over 40 feet thick here. At 1.8 mi. the moraine rises sharply toward the escarpment.

20.6 Turn R, south, off Hy. 22 onto dirt road for 1.9 mi. near but not on the escarpment, and through the moraine.

21.3 After 0.7 mi. cross blacktop road and railroad. Note till cuts L.

22.5 0.6 mi. from railroad leave moraine, cross creek, swing R on blacktop for 0.3 mi.

22.8 Stop sign. Turn acute angle L, southeast, onto Hy. 56 and climb escarpment for 1.5 mi. on thin Tazewell drift. This is drift area 5.

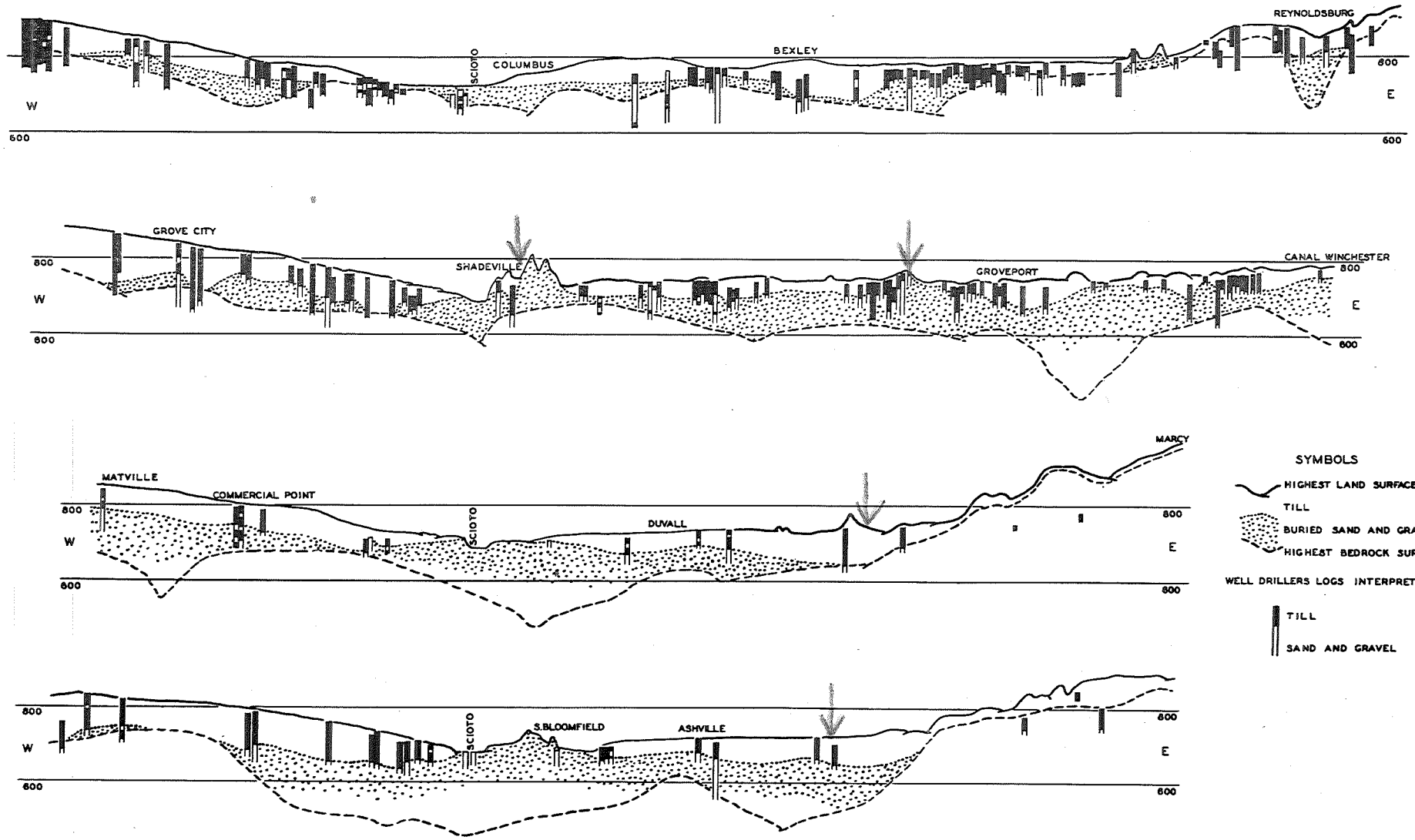
23.3 Note shallow till on Mississippian shale after 0.5 mi.

24.3 Turn obliquely R, south, off Hy. 56, at hilltop by "Morris Church" sign.

24.4 Park with right wheels on grass 0.1 mi. further.

PROJECTED PROFILES ACROSS THE SCIOTO VALLEY, OHIO

FROM WEST TO EAST AT FOUR CROSSINGS EACH THREE MILES WIDE (NORTH - SOUTH) BETWEEN COLUMBUS AND CIRCLEVILLE, OHIO : VERTICAL EXAGGERATION 26 TIMES



STOP 4 - View near Thatcher Corners. 10:45 - 11:00 a. m.
This is "Tazewell type" topography: long rolling hills, thinly clad with till and with sharp, deep major valleys. To what extent is it due to bedrock relief on the escarpment? Similar undulation is found over the broad buried valley 6 mi. south. The prominent escarpment of Pennsylvanian sandstones at the edge of the Appalachian plateaus forms the rough skyline. Wisconsin (Tazewell) terminal moraine comprises thick drift hills along its base. See "Map of Moraines." Former west-flowing valleys are reversed southward (See Salt Creek, Laurelville Quad.).

0.0 Continue south for 0.2 miles.
0.2 Jog R, west, then L, south. See broad high outwash of Scioto Valley, far right. Continue 1.5 mi.
1.7 Jog L, east, and R, south, 0.6 mi. more. Don't miss view of "terminal" moraine and escarpment ahead.
2.3 Turn R, west, at "T" intersection, go 2.1 mi.
4.4 Jog L. 0.2 mi. at Hayesville and R, west, across railroad 0.5 mi.
5.1 Jog L, south, 0.3 mile and R, west, for 1.4 mi. over a high outwash plain.
6.0 In 0.6 mi. approach north end of a 2-mile long esker segment which may be part of Circleville esker chain (Stop 1).
6.8 Stop sign, Route 23, Turn R, into pit, to park.

STOP 5 - High Pickaway Outwash. Scippo Creek at Hy. 23. 11:20 - 11:35 a. m.
This graded high outwash level occurs only in the lower Scioto Valley from the kame-and-kettle area near Marcy moraine southward. No till covers this outwash. Thus, it seems to stem from the long (Cary?) readvance. A typical Fox soil profile with fine "root" pendants at the base of the "B" is seen. The lower outwash at the creek level, west, heads at Columbus (Stop 1). Since it seemed to be buried by till, in part, further north it raises a problem. Is it younger since it is inset into the higher level gravel? If so, it must be younger than buried gravels north of Circleville, although contiguous with them.

0.0 Pull onto Hy. 23 heading north. Go 5.0 miles on Rt. 23.
0.8 Rising onto graded outwash plain in 0.8 mi.
2.3 Pass kettle holes 1.5 to 1.9 mi.
3.7 Kames at the head of the outwash in another 1.0 mi. Return into drift area 8.
4.4 Enter Circleville again, on Court St., and cross railroad, for 0.6 mi.
5.0 Turn L, west, on Mound St. just south of the courthouse for 0.3 mi.
5.3 Stop sign at underpass. Swing L, west, on Rt. 22 for 19.7 miles, across Scioto River and floodplain for first 1.1 mi.
6.4 Low outwash terrace edge as you pass Spunkeytown. You cross this channelled and graded surface by the airport for 1.4 mi. This is the low gravel which is contiguous with till-covered gravel further north.
7.8 Rise onto kame moraine area, part of Marcy moraine (outer Cary?).
CWG 5A There are high kame knobs left, but to the south, on Rt. 104 (0.3 mi.) most knobs are till or till over gravel. This Marcy moraine swings far south to Ross County and is very weak.

9.1 Follow Hy. 22 west, rising further onto original constructional slope of till plain which determined post-glacial drainage.

14.7 Williamsport, at 9.4 miles from Circleville.

22.8 New Holland, 8.1 miles farther. Here a diminutive moraine attaching to the Marcy is recurving northwestward —— the first of a whole series on the southwest nose of Scioto lobe.

23.2 Enter Fayette County. As you go 1.8 mi. note low Marcy (?) moraine to north.

25.0 Jog R, north, across railroad, then for 1.5 mi. rise onto Bloomingburg moraine where Marcy joins it.

26.5 At "Roadside Park" signs and Compton Creek turn left with caution into parking space.

STOP 6 - LUNCH , Johnson (Roadside Park), Route 22. 12:15 to 1:00 p.m. You have gone 67.5 miles thus far.

This stream, Compton Creek, is one which parallels a moraine for many miles. Obviously its course was determined by the Bloomingburg moraine which might be next to last moraine system of Early Cary time (last good "crest" is London moraine). See "Map of Moraines." After lunch we will cross 3 successive moraine belts mapped by Leverett (1902). Here these are puny frayed out low belts of hummocks. To the northwest 30 miles, they join as one high, rough, multi-crested moraine belt (Stop 16).

0.0 Continue L, west, on Hy. 22 for 6.3 mi. crossing Cary till plain. This is the preglacial bedrock divide area between drainage into the very deep valley to the north under Madison County, and that southward.

3.6 Pass over very low subsidiary end moraine crest, south from the Bloomingburg moraine.

5.3 Enter Washington Court House, for 0.8 mi.

6.1 Swing L at "stop" on Rts. 3 and 62 for 0.2 mi.

6.3 Turn R, northwest, on Route 70 for 13.2 mi.

9.8 Straight ahead at Eber, 3.5 mi. from Washington C. H., swing L, west, in 0.8 mi. (on Rt. 70).

10.6 Cross Paint Creek onto the next moraine: Esboro. Swing R, north, along it in 1.2 mi.

11.8 Follow just east of moraine crest, for 4.7 mi.

16.5 Turn L, west (on Hy. 70) at junction with 734, leaving Esboro moraine and passing light at center of Jeffersonville in 0.6 mi.

17.3 Leaving Jeffersonville in 0.2 mi. to cross Sugar Creek, an inter-moraine stream separating the Esboro and Glendon crests. The pattern of crests on the "Map of Moraines" suggests that the Esboro is a readvance over the southeastward extension of some Glendon crestlines.

18.6 Rise onto first of 3 weak Glendon moraine crests in 1.3 mi., and in 0.9 mi.

19.5 Bear L, west, leaving Hy. 70 and dropping off sharp moraine edge for 0.4 mi.

19.9 Turn L, south, on W. Lancaster Rd. along weak western crest of Glendon moraine. Continue south 3.2 mi. Note that the mapping of moraine crestlines — definite though weak——tell us more than a map of morainal topography alone.

23.1 West Lancaster. Stop sign. Turn R, west, on Rt. 35 for 3.5 mi. leaving moraine, crossing Rattlesnake Creek which flanks Glendon moraine for 25 miles!

26.3 Enter Greene County and after 0.3 mi. faint depressions in plowed fields are dark (Brookston soil). Contrast this with area 5 later.

26.6 Turn L, south, at old church and "Rosemoor" signs, going south on Rosemoor Rd. across flat till plain. Here till is over 40 feet deep and leached 31 inches. Swing R across railroad in 0.6 mi. continue 1.3 mi.

28.5 Join Jasper Rd., cross creek and begin gradual climb 2.2 mi. on subdued side of Reesville moraine.

30.7 Slow over east crest of moraine at U.S.A.F. radar tower. Continue

CWG 6A 0.5 mi.

31.2 Stop sign, turn R, north, on Hy. 72 for 0.2 mi. only.

31.4 Turn left at first white farm: park in barnyard.

STOP 7 - Franklin Farm. Shallow Soil Profile. Rt. 72 Jamestown. 2:00 to 2:20 p.m. This Reesville moraine has heavy clay drift continuing north into Clark Co. (recent soil study by Petro). The Miami profile is unusually thin, averaging 21" depth leaching. Since the till plain just crossed averages 30" and is inside the curvature of the moraine, the difference must be one of (1) texture, (2) topography. It contrasts sharply with variable depths to carbonate (30" to 39") on the till to the west, and greater depths to 48" south (Area 7). This change and the implications of outwash lines in Clark County, north, (on Map of Moraines) suggest that this is the outer Cary moraine. Possibly irregular thin Cary drift extends west in places, explaining some fresh soils. The connection to Marcy Moraine around the curve of moraines southeast and northeast is not clear, nor is there extensive over-ridden gravel. Note the sharp western moraine front.

0.0 Return south on Hy 72, 0.2 mi. to crossroad.

0.2 Turn R, west, on Jasper Rd. for 2.2 miles across till plain which is generally only 10 to 30 feet thick over Niagaran limestone. This is area 7.

2.4 Cross creek, turn L, southwest, on Waynesville-Jasper Road. This road follows the course of a buried valley from its head. It once fed to Miami River. Straight across next intersections at 1.3, 2.3, 3.6, 3.9, 5.5 mi.

4.7 Note till cuts along S. Branch. The valleys get broad and the dissection of till plain is great, but interfluves are flat since till covers the tough Niagaran limestone surface. Gradually enter rough "Tazewell" dissected topography.

9.0 Join Hussy Road. Stop sign at Rt. 68. Cross it onto dirt road for 1.2 mi.

10.2 Stop sign. Turn L, south, on Winchester Rd. for 1.3 miles along the east edge of the much-dissected Xenia moraine. To the north and south this lies at the topographic break (lower west) to the Ordovician (Richmond) shaly limestones.

11.5 Stop sign. Turn R, west, 2.2 mi. on Spring Valley Rd. Cross the moraine and a poor crest in 1.1 mi.

13.7 Slow down by woods right.

CWG 7A Roadcut, showing young soil in Xenia moraine, Spring Valley Rd. Here is a relatively young soil profile (leached 26") in the Xenia moraine although the average profile was leached 37" and it is highly dissected. Could this be Cary? Moraine topography hardly rises above the till plain to the east although the drop to the west, off of the Niagaran, is steeper, Its continuity is not too satisfactory at either county boundary. Continue west 2.6 mi. on Spring Valley Rd. crossing Rt. 380 in 0.4 mi. and Caesar Creek 1.1 mi.

15.0 Jog L. Here you enter Area 5, Tazewell leaving Xenia moraine R. Note crest of older Tazewell moraine curving L. and light soil color even in depressions.

16.0 Turn R. on drive behind brick high school, park on grass.

STOP 8 - Old Soil. Spring Valley High School. 3:10 - 3:30 p. m.
This contrasts with the last stops as a deeper more rotted (Xenia or Russell) soil. Carbonates are leached more than 40 inches. This might be explained in part by gravel beneath, 6 to 30 feet down wells nearby.

0.0 Continue around west side of school and R, west, into Spring Valley 0.4 mi.

0.4 Stop sign. Turn L, south, on Hy. 42 for 2.0 mi. through Spring Valley across floodplain and Little Miami River in 0.6 mi.

1.4 Onto low valley train of Little Miami drainage graded from the Alpha channel due north. Note high outwash $\frac{1}{2}$ mile west which seems to be part of a Tazewell system (Stop 10).

2.4 Just beyond diner on rise, turn R, west, on Old Stage Rd. leave Hy. 42 climbing onto till plain for 0.6 mi.

3.0 Bear R, west, on Sears Rd. for 1.0 mi.

4.0 Park at Sears-Pennewit intersection with right wheels on grass, but beware of ditch.

STOP 9 - Tazewell Section. Creek cut. 3:40 - 4:15 p. m.
This is perhaps typical deep Russell soil. It is leached to 50" and has a thick yellow silty "A" zone. Is this loess? Outwash sources are nearby and silts often characterize the older areas. The till contains sand lenses and it is sandy itself. Wells show variable depths of till, 0 to 97 feet.

0.0 Continue west on Sears Rd. 1.0 mile. Note the broad rolling topography and pale topsoil in depressions.

1.0 Turn R, north, on Waynesville Rd. for 4.7 mi. At 0.6 mi. the sharp hilltop has Ordovician outcrops at the surface.

2.0 Stop sign. Straight ahead. Bedrock is seen in creek 1.2 mi. past sign.

3.7 Descend sharply into valley and note high kame knoll far L. Cross covered bridge for 0.3 mi.

4.0 Rise on low terrace of valley train, enter Bellbrook, continue straight at light in 0.3 mi.

5.7 Climb Tazewell topography 1.4 mi. from light. Jog R, east, 0.1 mi. and L, north, again on Alpha-Bellbrook Rd. for 1.5 mi.

7.4 Jog R. then L. again for 0.5 mi.

7.9 Turn R. on dirt road for 1.0 mi.

8.9 Stop sign. Turn R, east, on Indian Ripple Rd. over hill 0.8 mi. Note
CWG 9A section of discontinuous Springfield-Camden moraine, outer Cary of Miami lobe, against hillside far L. and broad Alpha valley train of Little Miami R. obliquely L. Descend by outcrops of Ordovician shaly limestone.

9.7 Into gorge. Turn L, north, on Factory Rd. before crossing covered bridge.
CWG 9B Note narrow gorge of Little Miami here and wide valley ahead, north. The Little Miami was diverted from the broad site of the preglacial valley when ice blocked the Dayton area 10 miles northwest. It may not have carried the high (Tazewell?) outwash drainage from 3 counties north for that passes to the east higher up; it did carry the valley train drainage (Cary) but it seems unlikely that this cut the whole gorge.

10.3 Kames of moraine on L. after 0.6 mi. and climb onto valley train for 0.3 mi. Here you are directly over the deep buried valley which was former head of the Miami drainage system.
11.0 Stop sign. Continue across bridge and railroad for 0.5 mi.
11.5 Alpha. Stop sign. Turn R, east, on Hy. 35 for 2.3 mi. rising onto low portion of Camden-Springfield moraine in 0.6 mi. Ahead on the left this moraine is high, hummocky, and complicated by till-and-gravel "sandwiches."
13.8 Trebein. Turn R. on Hy. 35 across bridge and railroad on valley train.
15.0 At 1.2 mi. east of Trebein rise onto wall of valley where gravel is exposed and go 0.8 mi. farther.
15.8 Turn sharp L, north, on dirt lane opposite Children's Home and bear R. 0.2 mi.
16.0 Park in large pit floor.

STOP 10 - Greene County Pit. Till on eroded outwash. 4:50 - 5:30 p.m. In the nearest exposures 2 to 6 feet of (Cary?) till lie on the northward sloping eroded side of a valley carved across (Tazewell?) gravel. On the north side of the valley the till veneer rises again to an older pit and is up to 8 feet thick. Here an abnormally red (well drained) soil profile on top is separated from the gravel by calcareous till. Parts of clay rich B-2-type pendants have been found in the upper gravel. Are these part of a buried soil? This belt of the Miami lobe containing discontinuous, thin till on clay enriched gravel surface and the widespread underlying gravel together with a kame-studded outer moraine (Springfield Moraine across valley above Trebein) all suggest origin and date similar to Scioto lobe stops 1 and 2 and the Marcy moraine. Here Miami lobe Cary ice pushed nearly up to the older Xenia moraine.

0.0 Turn around. Return 0.2 mi. to Rt. 35. Continue L, east, 1.4 mi. crossing exposed outwash after 0.5 mi. (derrick of a pit far to south) to enter Xenia on Dayton Ave.
1.0 Continue 0.4 mi. into town, down-grade, turn L, east, off of Hy. 35 onto W. Market St. across railroad for 0.4 mi. past blinker to second traffic light.
1.4 Unload here. Xenia Hotel L, Sohio Station R, Courthouse ahead.

STOP 11 - OVERNIGHT. Xenia Hotel. "Free Parking" overnight is afforded 2 short blocks (0.2 mi.) east, just north of Market St. You have travelled 136.3 miles today.

0.0 Assemble in front of Xenia Hotel headed north at 8:00 a.m.
0.1 Turn R, east, at first light onto Church St. Climb west side of Xenia moraine 0.3 mi. to 3rd light.
0.4 Bear L, northeast, on Rt. 42 out of town on Columbus Ave. following west side of moraine 2.5 mi. 2.0 mi. out note thinness of moraine here, bedrock in creek.
2.9 Turn L, northwest, at red brick house on Clifton Rd., passing Wilberforce U. in 0.5 mi.
3.4 Continue on winding road into valley by (Cary) till over (Tazewell?) gravel cut in 0.4 mi. and up onto high outwash for 0.9 mi.

4.7 Another change in slope, climb onto Xenia moraine travelling obliquely across it 3.3 mi. to a small bedrock gorge (at bridge) comprising undercut below Cedarville dolomite. Travel over 5' - 10' thick ground moriane for 2.1 mi. farther.

10.1 Stop sign. Cross Clifton Rd., ahead to bridge 0.1 mi. This is the head of
CWG 11A Clifton Gorge, 3 mi. long and up to 120 feet deep. Its spectacular sharpness results from the stratigraphy but some of its length results from greatly enlarged glacial waters. This is the terminal point for the vast Kennard outwash of 2 counties to the north. Great potholes in ledges either side of the gorge seem to demonstrate former increased flow (Larsen, 1951 Study at Antioch).

10.2 Turn R, east, just across bridge opposite store in Clifton for 0.1 mi. to stop sign. Turn R, south, across second bridge on Route 72 for 0.2 mi.

10.5 Turn L, east, just across bridge onto S. River Rd. for 2.6 mi. This crosses thin outwash on limestone 0.5 mi. and climbs back onto the Xenia moriane in 1.9 mi.

13.1 Oblique intersection of dirt roads. Swing R, east, on Courtsville Rd. over moraine hummocks and crests in 0.9 and 2.2 miles.

15.3 Here join Battin-Howell Rd., continue 1.1 mi. up onto high knot of moraine.

16.4 Stop sign. Courtsville. Turn L, west, on Selma Pike 0.9 mi. over knoll to weatherbeaten farm R. (mailbox "Hall")

17.4 Park in barn yard through gate. Climb to hill 500 ft. south.

STOP 12 - Tindall Farm. View. 8:40 to 9:10 a.m.

To the southwest are the NE-SW crests of Xenia moraine. Heading due north is a cross-element or ridge which truncates Xenia moraine at this knot. One problem is: did Cary Scioto lobe push forward here truncating earlier Cary or Tazewell Xenia moraine? Or are the moraine crests seen northwest (through Thorp and Pitchin) produced by Cary ice of Miami lobe riding up against Xenia moraine to the south and Springfield moraine north? Stone counts favor the former view (D. M. Brown, 1950) but outwashes favor the latter.

0.0 Return through farmyard to Selma Pike. Continue R, west, for 6.1 mi. across narrow belt of thin outwash which seems to have drained in a semicircle southeast and south to Massie Creek. This argues for Miami lobe damming waters on the west. In 0.5 mi. cross Throp crest of moraine complex and ground moraine for 1.9 mi. west of it.

2.4 Rise onto Pitchin moraine element with crest in the village after 0.6 mi. Drop off the moraine and swing L over bridge 0.7 mi.

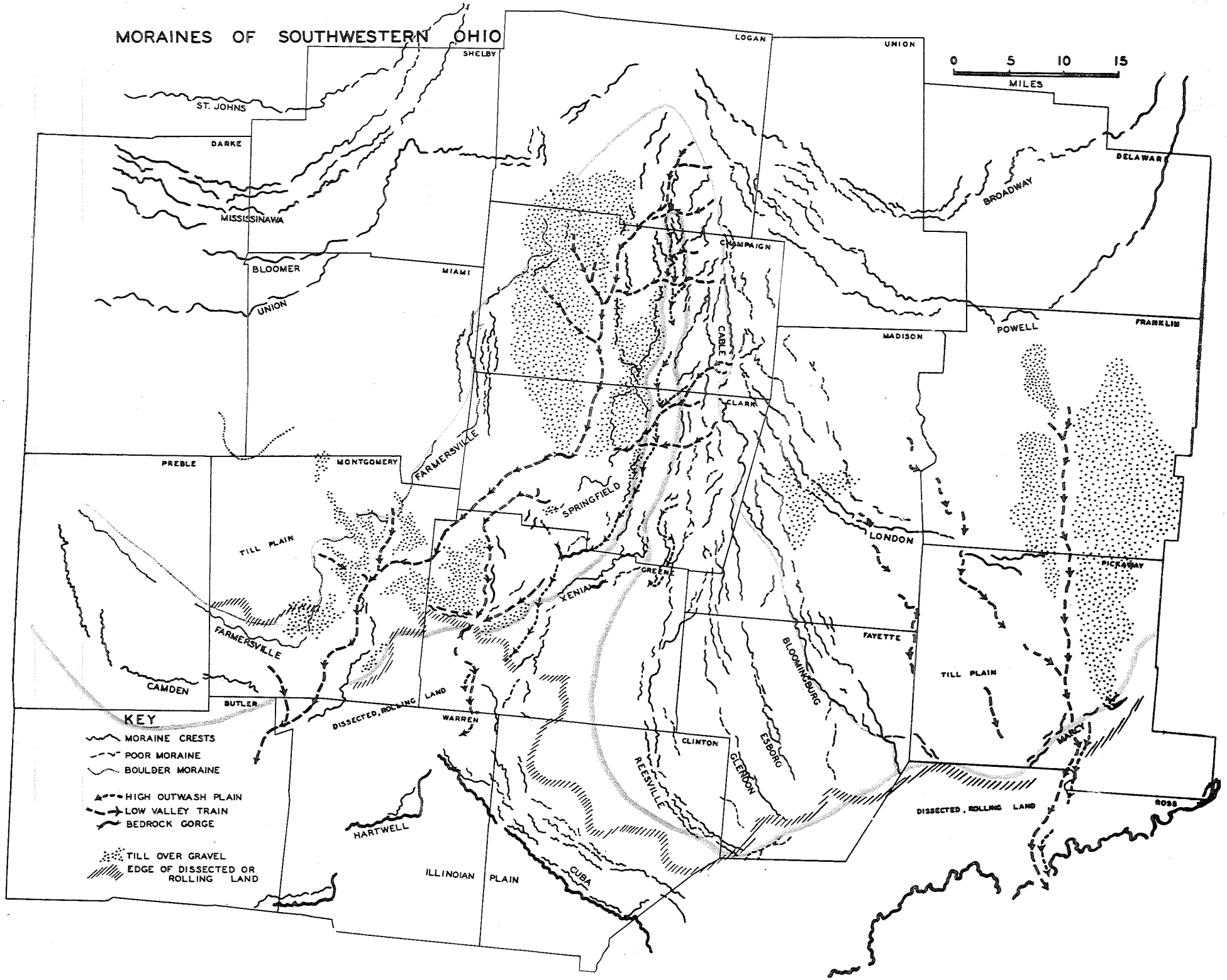
3.7 Continue across high Kennard outwash, here 35 feet above the falls seen at Clifton. Rise onto ground moraine in 1.1 mi.; continue 1.3 mi.

6.1 Jog R, east, at houses on Crabill Rd. and L, north, along west edge Springfield Moraine for 1.1 mi.

7.2 Stop sign. Turn R, east, 2.1 mi. On the way, at 0.9 mi., cross railroad onto Springfield moraine. Bear L 0.6 mi. farther through areas of wells showing 12-40 feet of till over gravel.

9.3 Slow down at Turkey Farm.

CWG 12A Note Kennard Outwash with black prairie soil, below to the east.


MORAINES OF SOUTHWESTERN OHIO
0 5 10 15
MILES
SHELBY
LOGAN
UNION
ST. JOHNS
DARKE
DELAWARE
BROADWAY
MISSISSINAWA
CHAMPAIGN
BLOOMER
MIAMI
UNION
CABLE
MADISON
POWELL
FRANKLIN
CLARK
PREBLE
MONTGOMERY
FARMERSVILLE
SPRINGFIELD
LONDON
TILL PLAIN
GREENE
PICKAWAY
XENIA
FAYETTE
FARMERSVILLE
BLOOMINGBURG
TILL PLAIN
CAMDEN
BUTLER
DISSECTED, ROLLING LAND
WARREN
CLINTON
REESVILLE
GLENDON
ESBORO
MARCY
ROSS
DISSECTED, ROLLING LAND
HARTWELL
ILLINOIAN PLAIN
CUBA
KEY
MORAINE CRESTS
POOR MORAINE
BOULDER MORAINE
HIGH OUTWASH PLAIN
LOW VALLEY TRAIN
BEDROCK GORGE
TILL OVER GRAVEL
EDGE OF DISSECTED OR ROLLING LAND

9.4 Proceed straight north (over railroad) for 3.6 mi. Cross Hy. 70 at stop sign in 0.6 mi. and Hy. 40, 0.8 mi. farther. CAUTION. Descend off the Springfield moraine 0.9 mi. and cross creek 0.3 mi.

12.0 Stop sign. Cross Old Columbus Rd. continuing north on Buck Creek Lane for 1.0 mi. across gently sloping top of high outwash. Note gravel pit right, Cable Moraine on horizon east, Springfield moraine on horizon west.

13.0 Park on descending slope with right wheels on grass.

STOP 13 - Kennard Outwash Pit. Buck Creek Lane. 9:35 - 9:55 a.m.
Although the top of this outwash shows gravel all the way along, here at the west edge is overlapping till of Miami ice over-riding from the west, as in the Springfield moraine. Here, as at many places near Dayton (south) or Urbana (north) the till sheet extends over outwash far beyond (east of) the moraine. This is almost over the very deep valley on the "Map of Bedrock Contours". It drained southeast (Deep Stage).

0.0 Proceed north for 2.2 miles descending old channel on Mad River Valley train level in 0.1 mile, back onto an intermediate (cut?) outwash level in 1.0 mile and in 0.2 mi. swing L, west onto valley train, railroad, and bridge for 1.1 mi. None of the valley train has till on it; it postdates the last (Cary) ice maximum here.

2.3 Stop sign. Turn R, north, onto Hy. 4 for 1.0 mi. along east edge of Springfield moraine. In 0.6 mi. bear R. on Hy. 4 into New Moorefield and onto an intermediate outwash level. Swing left again 0.6 mi. to edge of town.

4.3 Turn sharp L, west, off Hy. 4 onto Prairie Rd. which turns north across intermediate outwash level. This was probably cut out of Kennard outwash in Cary time, or, reconstructed in Cary time. Note the Kennard outwash 40 feet higher as a horizon on left and right.

5.9 At 1.6 miles up Prairie Rd. climb high outwash and enter Champaign County. Pass through kettle holes 0.2 and 0.5 mi. farther and note Springfield moraine rising slightly to west.

7.9 Stop sign. Straight across Dolly Varden Rd. up Hy. 54 for 1.0 mi. rising at 0.3 mi. onto till over the gravel outwash.

8.9 Turn R, east, leaving Hy. 54 at T-shape intersection. Park by hedge with right wheels in grass in 0.1 mi. Walk carefully through wheat to gate by tree 1,000 feet north.

STOP 14 - Hilliard Farm Pond. Till over gravel. 10:15 - 10:55 a.m.
One of few exposures showing very thin (5') Miami lobe till on gravel which is probably Kennard outwash. Every one of dozens of well logs in this till area shows gravel below. Here there are patches of reddish brown clay-enriched leached gravel at the contact with the calcareous till above. If these are truncated soils this makes Kennard outwash much older (Tazewell?) and makes the western part of Cable moraine older, but soils on the moraine do not confirm this (leached 22 to 39").

0.0 Continue east on Pisgah Rd. for 1.5 mi. Note the high moulin kame ½ mi. L, north, which is surrounded by outwash and seems to predate it. Probably it formed as (Tazewell) ice thinned between the once-joined lobes. The road drops off of till, crosses a creek in 0.7 mi., and goes 0.7 mi. across kettled outwash surface.

1.4 Jog R, south, 200 feet and L. up onto a western spur of cable moraine. Uphill 0.1 mi. bear R, southeast, on Ludlow Rd. for 1.4 mi. If crestlines in this composite moraine do signify successive ice edge positions, and if stone counts correctly indicate a Scioto lobe origin, these spurs represent earliest westward extension of the ice, and the southwestward extensions of the moraine must be buried by Kennard outwash. The older westward striae of crisscrossing sets in northeastern Greene Co. confirm this hypothesis.

CWG 14A Descend onto an arm of Kennard outwash in 0.2 mi. from corner and back onto second moraine spur in 1.0 mi.

2.9 Turn R, south, on Mutual-Catawba Rd. Go down the moraine 0.5 mi., jog L. over the crest, and in 0.6 mi. descend onto the high Kennard outwash, which wraps and buries moraine end.

4.5 Stop sign. Continue ahead on Hy. 54 past coarse gravel L, 0.2 mi. to another stop sign. Turn L. again, north, up Hy. 4, 1.9 mi. along Mad River valley train. Note section of high outwash east behind white silo across valley. Rise onto kame terrace across railroad in 1.6 mi. for 0.3 mi.

6.6 Turn R. on Casey Rd. 0.1 mi. to gravel pit L, east. Park in field on the left.

STOP 15 - Gravel Pit. Kame Terrace. 11:10 to 11:30 a.m.
There are two lower narrow terrace levels and a rolling kamic topography above ending in a long kettle hole against the cable moraine to the south. This is at the head of Kennard outwash up the tributary valley of Buck Creek cut into the moraine. The valley must have been cut by meltwaters from the east; it widens southwestward. These kames rise slightly higher than the outwash plain and may well represent contemporaneous deposition in ragged thin ice. Similar kame groups head another arm of this outwash at Cable on Kings Creek. Thus it is concluded that Scioto lobe ice edge stood from here southward along Reesville moraine, and Miami lobe ice stood somewhere in and over the Mad River and Miami Valleys simultaneously to force waters at high level southward to Clifton Gorge.

0.0 Return to the main road, Hy. 4, turn R, east, for 1.9 mi. Descend on valley train again in 0.7 mi. and after crossing Hy. 56, pass side of large kame with cemented gravel, L.

1.9 Turn L, north, on Hawk Rd. (dirt) around kame. In 0.3 mi. zig zag across head of Mad River valley train in Buck Creek arm. This suggests that the Scioto lobe at the time of Mad River valley train stood in numerous kames near Mechanicsburg, 1 mi. east. Similar evidence shows it stood east of Cable and Mingo to the north and along the Bloomingburg moraine to the south. West of Mad River Valley the same graded surface traces northwest far up Nettle Creek. This ends in kames along Farmersville

boulder moraine suggesting that the Farmersville was simultaneous with Bloomingburg. Numerous boulders on the Bloomingburg crest help confirm this relation. Keep R, and climb moraine for 1.2 mi. This is real end moraine.

3.4 CWG 15A Stop sign. Turn L, west, on Hy. 29 for 0.4 mi. only, then R, north, on Yankee Hill Drive at WLWC relay tower. This is the highest crest of the Cable moraine, 200 ft. above the head of the valley train and 300 ft. above the till plain to the east. Only one well near here reaches bedrock at nearly 300 feet. Continue 0.7 mi.

4.6 Stop sign. Turn R, east, on Hy. 161, recrossing highest crest in 0.3 mi., a parallel stream 1.2 mi. further and next crest east in 0.5 mi. Note kettle holes R. for 0.9 mi.

7.6 Park along roadside at knoll with old windmill. Third moraine crest.

STOP 16 - Moraine crest. 11:45 to 12 Noon.
In the roadcut there is till over gravel. On the knolls sand lies on the till. This third crest is largely kame moraine and represents probable extension of London moraine.

TRIP ENDS

You have travelled 53.6 miles today. It is 38 miles back to Ohio State U., 228 miles in all, round trip.

Those who go west will find it easy to reach Route 36 or 29 by going back west on Hy. 161.

Those who go north can reach Hy. 4 or 36 straight ahead.

Official cars will return east to Ohio State U. Some will pause briefly at the Orleton Farms mastodon site (Goldthwait, 1952) along Rt. 29, if requested. To reach this optional stop:

0.0 Continue 0.8 mi. east to 5 corner intersection. Turn R. on Hy. 559 entering Mechanicsburg and climbing easternmost Cable moraine crest in 1.7 mi.

3.0 Pass school, turn L, east, on Hy. 29 (Main St.) through town, leaving moraine in 0.6 mi. at railroad. In the next few miles cross high submorainic topography which forms a weak crest parallel to the London-Cable moraine.

6.4 Enter Madison Co. and climb slightly over second submoraine for 1.3 mi.

10.1 Turn L, into lane, beyond white farm in trees. Park after 0.2 mi. at lane end. Depression ahead, slightly left, is mastodon site. OPTIONAL STOP 17.

TO COLUMBUS (OHIO STATE UNIV.)

0.0 Continue southeast on Hy. 29 for 9.5 mi. Turn L, east, on Hy. 40 through W. Jefferson in 2 mi. and Alton in 7 mi. Go 1.5 mi. east of Alton.

18.1 Turn L. off Hy. 40 on Hilliards Road just past Deere Implement Shop entering New Rome. North 2.1 mi. across railroad.

24.2 Turn R, east, on Trabue Rd. for 4.0 mi. across 2 railroads to first traffic light. Turn L. on Hy. 33, 0.4 mi. and right at light on Lane Ave. for 3.9 mi.

28.0 Turn R. at Neil Ave. to Ohio State Univ.

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FRIENDS OF THE PLEISTOCENE

35) 40 mi
12
10 A.M.
10 P.M.

March 5, 1952

GREETINGS:

This is a cordial and sincere invitation to you to attend the annual gathering of the "clan" on May 24-25 1952 at Columbus, Ohio. Realising that the distance to Columbus involves both time and money we are preparing:
a. a program which you can't afford to miss, and
b. a minimum of expendes while you are here.

Listen to this:
1. We will meet any plane,, train, or bus at Columbus
2. Open house at the Goldthwaits for any early arrivals
   Buffet free from 6 to 12 PM Friday
3. Free housing the night before (Friday) for any early arrivals. Many geologists here and they all want you.
4. Free guide for the conference, compliments of Ohio Geological Survey.
5. An up-to-the-minute map is in preparation by the Ohio Water Division.
6. Free transportation throughout the tour in comfortable State sedans and station wagons with "geological" drivers. Suggest you leave your car in Columbus (free parking) but do as you wish.
7. No city driving. Leave the outskirts of Columbus at 8:30 Saturday morning.
8. Completely described geology along the route with a few liesurely stops.
9. Box lunch Saturday at a "Roadside Park" absolutely free.
10. Arrive at overnight quarters Saturday (Dayton or Springfield) shortly after 5 PM. Expect to have plain comfortable accomodations at $2.00 (reservations later) and regular hotel rooms at $3.50 up.
11. Dining facilities - probably private - and in no case costly. About $1.25
12. Maps charts, slides available for evening discussion.
13. Cafeteria breakfast at 50¢ and up.
14. Described terrain and about three stops returning to Columbus by noon on Sunday.
15. For those who leave later (planes and trains go in evening) there is choice of addendum Sunday afternoon
    a. Multiple Wisconsin tills just east of Columbus
    b. Illinoian drift and drainage changes 40 miles east.
16. Free supper in Columbus for any who depart in the evening.

NOW, how do you get to Columbus?
If you DRIVE it is
  540 miles from New York (Skyway-Turnpike) not over 15 hours round trip $16.50 each (4 in car @ 6¢/mi.)
  785 miles from Boston (Parkway-Skyway-Turnpike) may be 23 hours, round trip $23.50 each.
  474 miles from Syracuse; 416 miles from Washington
If you FLY to save time these are predicted E.S.T. schedules
  Leave New York 6:30 PM Friday direct to Columbus (TWA) 8:40 PM (return 6 to 8 PM Sunday) round trip $66.59 incl. tax

leave Boston about 4 PM, reach Columbus 10 PM (return 6 to 12 PM Sunday, round trip $86.48 incl.tax

If you compromise on RAIL

leave New York about 4 PM (NYC) or 6:15 or 7:35 PM (Pennsy) arrive Columbus 5:45,6:43,or 8 AM; return times similar, round trip coach $41.75

leave Boston 1 1:30 AM Friday, Columbus 5:45 AM Saturday return 6:45 PM to 12:10 Noon,round trip coach $56.67

If you economize on BUS

leave New York before 5 PM Friday, arrive Columbus 15 hours later, round trip $27.94 incl.tax

leave Boston before 6 AM Friday, arrive Columbus 26 hours later, round trip $34.10

That's the story. HOW ABOUT IT ? Can we look forward to seeing you ? There'll be chance to ask for specific reservations later. Right NOW we'd like to have you indicate your intentions. PLEASE return the enclosed card soon (Deadline April first).

With best regards

Dick Goldthwait

Richard P. Goldthwait
Department of Geology
The Ohio State University
Columbus 10, Ohio

)PLAINS,
LY RECENT

OSTLY CARY

, GRAVEL IN SOME PLACES
TILL - MOSTLY TAZEWELL

GRAVEL IN SOME PLACES
TILL - MOSTLY TAZEWELL

TILL PLAIN LYING ON
CES - MOSTLY CARY

WITH SOME GRAVEL
RY

RAINE,
ILDERS - CARY

SCALE IN MILES
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C H A M P A I G N

C L A R K

M A D I S O N

F R A N K L I N

M E R Y

G R E E N E

P I C K A W A Y

1 3 4 5 7 8 9 11 13 14 15 16

INDEX MAP
OHIO

N

SHOWING SURFICIAL DEPOSITS
N WEST-CENTRAL OHIO.

APRIL 1952

EXPLANATION

BROAD RIVER FLOODPLAINS,
SILT ON SAND - MOSTLY RECENT

VALLEY TRAIN,
SAND AND GRAVEL - MOSTLY CARY

OUTWASH TERRACES, GRAVEL IN SOME PLACES
THINLY COVERED WITH TILL - MOSTLY TAZEWELL

KAMES AND ESKERS, GRAVEL IN SOME PLACES
THINLY COVERED WITH TILL - MOSTLY TAZEWELL

GROUND MORAINE, TILL PLAIN LYING ON
GRAVEL IN MANY PLACES - MOSTLY CARY

END MORAINE, TILL WITH SOME GRAVEL
KAMES - MOSTLY CARY

BOULDER BELT MORAINE,
TILL WITH MANY BOULDERS - CARY

SCALE IN MILES
0 5 10

CHAMPAIGN
CLARK
MADISON
FRAN
MONTGOMERY
GREENE
PICKA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

INDEX MAP
OHIO

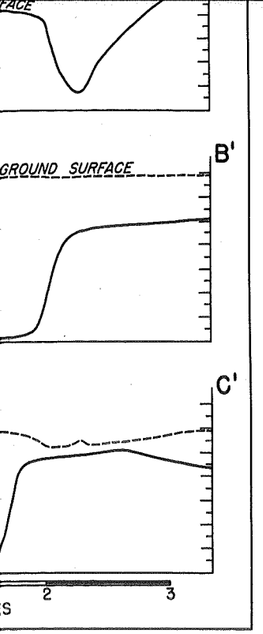
N

MAP SHOWING SURFICIAL DEPOSITS IN WEST-CENTRAL OHIO.

CONTOUR INTERVAL 100 FEET

SCALE IN MILES

0 5 10 15



C H A M P A I G N

C L A R K

M A D I S O N

F R A N K L I N

M E R Y

G R E E N E

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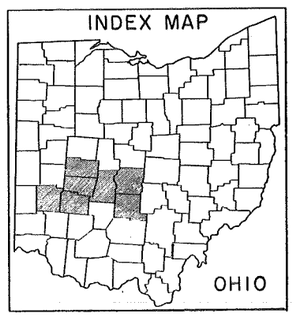


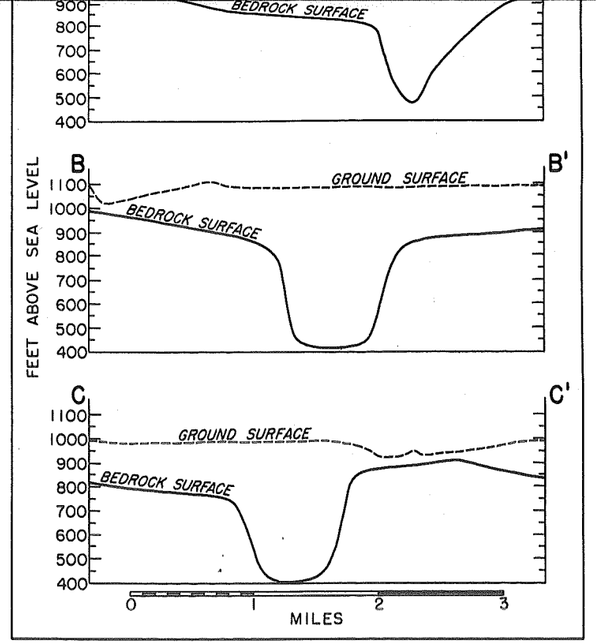
SHOWING CONTOURS ON THE SURFACE IN WEST-CENTRAL OHIO.

APRIL 1951

CONTOUR INTERVAL 100 FEET

SCALE IN MILES

0 5 10



C H A M P A I G N

C L A R K

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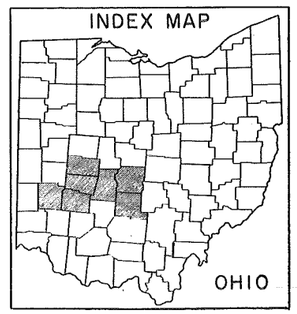
F R A N

M O N T G O M E R Y

G R E E N E

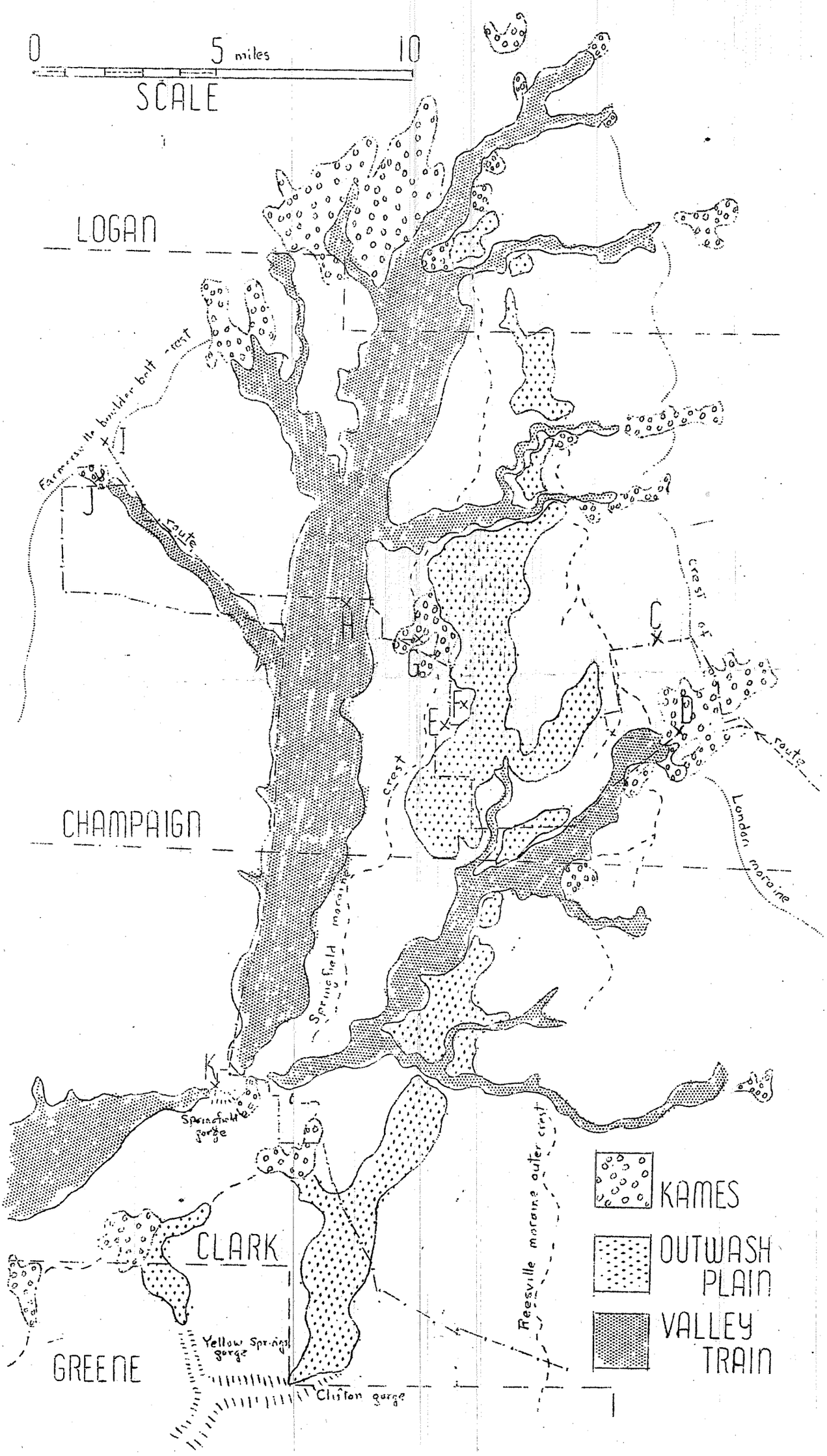
P I C K A



MAP SHOWING CONTOURS ON THE BEDROCK SURFACE IN WEST-CENTRAL OHIO.

APRIL 1951

WASHED DEPOSITS



SKETCHED SECTIONS