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URBANA

REPORT OF INVESTIGATIONS—NO. 106

A MAJOR BURIED VALLEY IN EAST-CENTRAL ILLINOIS AND ITS REGIONAL RELATIONSHIPS

BY
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A MAJOR BURIED VALLEY IN EAST-CENTRAL ILLINOIS AND ITS REGIONAL RELATIONSHIPS[1]

LELAND HORBERG
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ABSTRACT

A large buried valley, tributary to the well-known bedrock valley along the Illinois River, has been traced eastward across central Illinois to the Indiana state line, and continuation into Indiana and beyond is indicated by well records and outcrop data. Detailed studies are confined largely to Illinois, and the valley is herein named "Mahomet Valley" after a locality in Champaign County, Illinois. Mahomet Valley is considered preglacial, as Kansan, Aftonian, and possibly Nebraskan deposits occur within the channel. After the advance of the Kansan glacier the valley probably ceased to function as a major drainage line; and by the end of Illinoian time the valley was so completely filled with drift that the Sangamon interglacial plain continued across it without interruption.

A new working hypothesis favored by the writer is proposed, namely, that Mahomet Valley represents the lower course of Teays River, a preglacial master-stream which probably had its source near the eastern scarp of the Blue Ridge in North Carolina; flowed westward across Ohio, northern Indiana, and central Illinois; and finally discharged into the Gulf Embayment through bedrock valleys now generally occupied by the present Illinois and Mississippi rivers.

INTRODUCTION

The geological studies made by the Worthen Survey of Illinois revealed that at several points in central Illinois the bedrock occurred at elevations much lower than at adjacent localities. The distribution of these low points led F. H. Bradley[2] to postulate that a preglacial valley extended southward from Lake Michigan through Kankakee and eastern Iroquois counties into Champaign County and thence northwestward under the city of Bloomington into the Illinois Valley in southern Tazewell County. It is now known that these low points lie within independent preglacial drainage systems.

Frank Leverett[3] confirmed the presence of low bedrock elevations in east-central Illinois and suggested possible relations to the preglacial courses of the Kaskaskia, Wabash, and Illinois rivers. In a regional summary in 1910, H. M. Clem[4] suggested the presence of a "spur" connecting Illinois and Wabash bedrock valleys; and in 1931, T. E. Savage[5] definitely related the preglacial drainage of the region to the Illinois bedrock valley. Within recent years L. E. Workman and George E. Ekblaw, of the Illinois State Geological Survey, in unpublished maps and cross sections outlined the eastern margin of the valley in Champaign County and made the first subsurface interpretation of the glacial deposits within the area.

The name "Mahomet" is herein proposed for the major bedrock valley crossing the area because near the village of Mahomet in western Champaign County

[1] Published with the permission of the chief of the Illinois Geological Survey, Urbana, Illinois

[2] "Geology of Kankakee and Iroquis Counties," in *Geology and Paleontology* ("Ill. Geol. Surv.," Vol. IV [1870]), pp. 226–40; "Geology of Champaign, Edgar and Ford Counties," *ibid.*, pp. 266–75.

[3] "The Preglacial Valleys of the Mississippi and Its Tributaries," *Jour. Geol.*, Vol. III (1895), pp. 744–57; "The Illinois Glacial Lobe," *U.S. Geol. Surv. Mono.*, Vol. XXXVIII (1899), pp. 654–64, 701–7.

[4] "The Preglacial Valleys of the Upper Mississippi and Its Eastern Tributaries," *Proc. Ind. Acad. Sci., 1910* (1911), pp. 335–52.

[5] "On the Geology of Champaign County," *Trans. Ill. Acad. Sci.*, Vol. XXIII (1931), pp. 444–45.

three wells penetrate bedrock at low elevations and determine the position of the deep part of the channel.

The present study is an outgrowth of a ground-water study of Pleistocene aquifers in central Illinois (Fig. 1), in which all available well records were examined, detailed studies were made of about seventy-five sets of well cuttings, and a contour map of the bedrock surface (Fig. 2) was compiled. Data for the bedrock-surface map of western Indiana were compiled from the literature and from well records provided by Wallace W. Hagan, formerly of the Indiana Division of Geology.

The thickness of the glacial drift in the area ranges from 0, where bedrock is exposed at the surface, to over 450 feet, where moraines of Wisconsin age cross deep bedrock valleys. Few water wells reach bedrock where the drift is over 200 feet thick,[6] whereas numerous wells reach it where the drift is thin. For this reason considerable detail of relief is usually shown on the bedrock uplands, but only the general outlines of the major valleys are revealed.

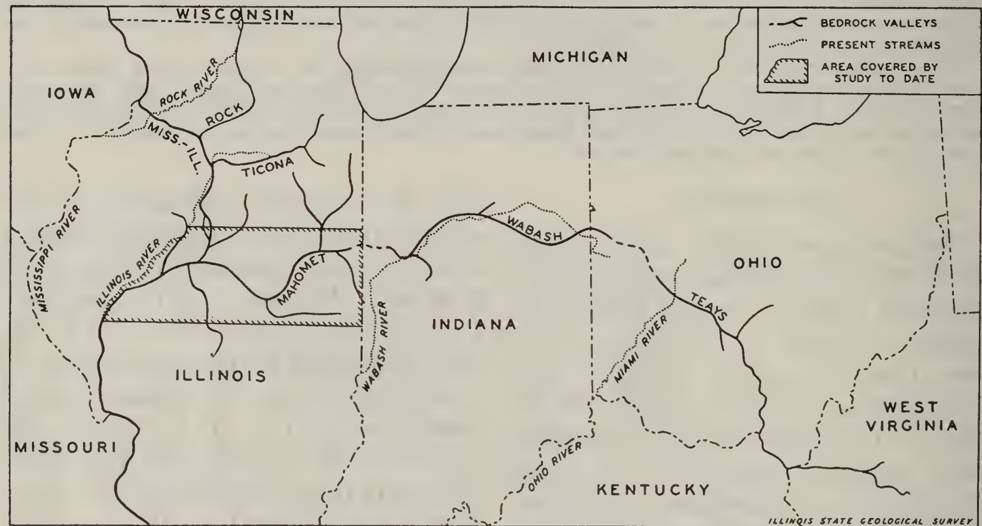


FIG. 1.—Map showing area studied in Illinois and proposed Teays drainage system. (Adapted in part after Fidlar, Tight, and Ver Steeg.)

DESCRIPTION

According to the present study, Mahomet Valley enters the state near the southeastern corner of Iroquois County and with a broad southward loop continues westward for 120 miles to enter the Illinois bedrock valley in southern Tazewell County (Fig. 2). Bedrock elevations along the valley are less than 400 feet above sea-level, or 200–300 feet lower than elevations on the adjoining bedrock uplands. The average depth of the valley appears to be about 200 feet, and in general the valley lies between the 300- and the 500-foot contours. The width of the inner portion of the valley lying below elevations of 450 feet is about 4 miles near the east state line, 5 miles in central Piatt County, and about 15 miles in DeWitt County. Although the valley-

[6] Mr. C. F. Stiegman, a water-well driller at Paxton, states that he has drilled wells along Mahomet Valley for twenty-five years without encountering bedrock in any of them.

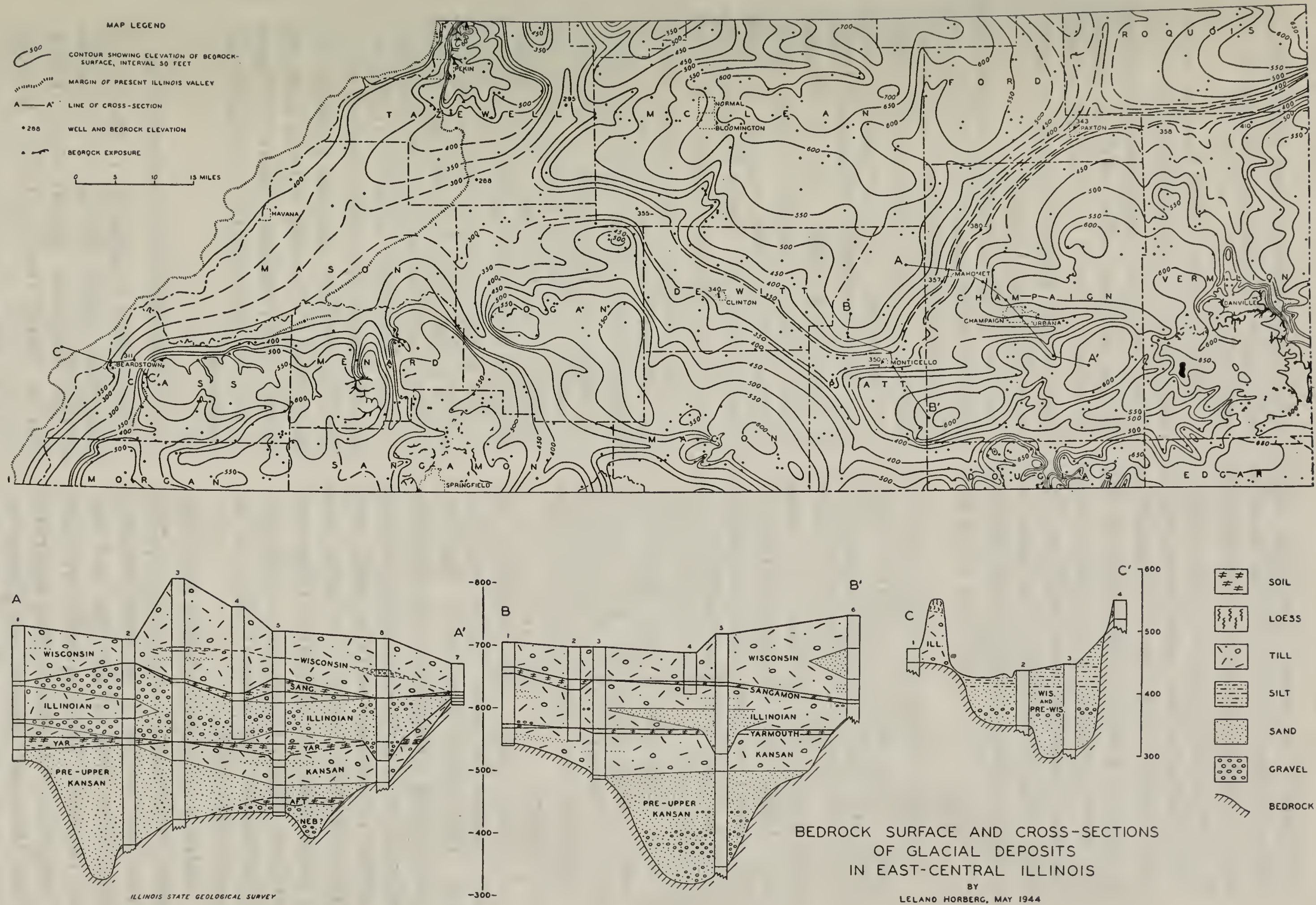

MAP LEGEND
CONTOUR SHOWING ELEVATION OF BEDROCK-SURFACE, INTERVAL 50 FEET
MARGIN OF PRESENT ILLINOIS VALLEY
LINE OF CROSS-SECTION
WELL AND BEDROCK ELEVATION
BEDROCK EXPOSURE
15 MILES
TAZEWELL
McLEAN
FORD
IROQUOIS
MASON
DE WITT
CHAMPAIGN
VERMILION
LOGAN
MENARD
CASS
MORGAN
SANGAMON
MACON
PIATT
DOUGLAS
EDGAR
PEKIN
HAVANA
NORMAL
BLOOMINGTON
PAXTON
CLINTON
MAHOMET
CHAMPAIGN
URBANA
DANVILLE
MONTICELLO
BEARDSTOWN
SPRINGFIELD
WISCONSIN
ILLINOIAN
YAR.
PRE-UPPER KANSAN
SANG.
KANSAN
AFT
NEB?
SANGAMON
YARMOUTH
WIS. AND PRE-WIS.
ILL.
SOIL
LOESS
TILL
SILT
SAND
GRAVEL
BEDROCK
BEDROCK SURFACE AND CROSS-SECTIONS
OF GLACIAL DEPOSITS
IN EAST-CENTRAL ILLINOIS
BY
LELAND HORBERG, MAY 1944
ILLINOIS STATE GEOLOGICAL SURVEY

FIG. 2

walls cannot be drawn sharply in most places because of the lack of detailed data, a notable widening is indicated for the downstream portion of the valley.

The descent of the valley floor appears to be gradual; and, when estimated on the basis of a minimum elevation of 280 feet above sea-level along Illinois bedrock valley and the elevation of 300 feet above sea-level at Oxford, Indiana,[7] an average gradient of 1.65 inches per mile is obtained. This is a descent of 20 feet in 145 miles.

A mature stage of development of the valley is indicated by its relative width and depth and by the wide distribution of low elevations in DeWitt County, which suggest the presence of a flood plain. There is also a suggestion that the valley may have been eroded during two cycles so that the inner valley is entrenched below a broad outer valley. This is evidenced by the pronounced break in slope below the 550- and the 500-foot contours and by the absence of comparable low elevations outside the inner valley.

A single major tributary from the north enters Mahomet Valley near Paxton. This valley appears to have its source along the margin of the Niagaran escarpment in northeastern Illinois. Important tributaries from the south enter Mahomet Valley north of Danville, west of Monticello, and in western Logan and northern Menard counties, which is in opposition to the general slope of the present drift plain.

Bedrock uplands bordering the valley range in elevation from 720 to 550 feet above sea-level, with the most extensive areas falling between the 550- and 600-foot contours. These uplands are parts of preglacial watersheds that separated River Mahomet from River Ticona[8] to the north, from upper Mississippi drainage to the northwest, and from Wabash and lower Mississippi drainage to the south (Fig. 1).

Maximum total relief for the area is about 460 feet, with the lowest elevations, 280–290 feet above sea-level, along Illinois bedrock valley and the highest elevations, about 720 feet above sea-level, on the bedrock upland in northeastern McLean County.

In the absence of closely spaced data along the upper course of the valley two alternative interpretations may be considered: (1) a low divide near the northern boundary of Champaign County may have separated Mahomet Valley from another valley east of Paxton, which drained eastward rather than westward; (2) there may be a divide near the state line so that Mahomet Valley did not extend into Indiana. By both of these interpretations major valleys end abruptly without important headwater tributaries, thus failing to satisfy physiographic requirements. The first alternative is further discounted by the northwest trend of the tributary valley north of Danville, indicating drainage to the west, and by a record showing bedrock less than 380 feet above sea-level in the northwest part of Champaign County. The major objection to the second alternative is the low bedrock elevations in southern Benton County, Indiana (Fig. 4). In view of these facts the writer's interpretation, shown in Figure 2, will be assumed in subs quent descriptions.

RELATION TO PRESENT TOPOGRAPHY

The present topography of the area is controlled almost entirely by moraines of the Wisconsin glacial stage, which bear no direct relation to the bedrock

[7] Leverett, p. 757 of ftn. 3 (1895).

[8] H. B. Willman, "Preglacial River Ticona," *Trans. Ill. Acad. Sci.*, Vol. XXXIII (1940), pp. 172–75.

topography and cross Mahomet Valley at various angles without change in trend or elevation. These moraines belong to the Tazewell substage, and in succession northeastward from the outermost are the Shelbyville, Cerro Gordo, Champaign, Bloomington, Normal, and Chatsworth.

The western part of the area lies west of the Wisconsin drift margin (Fig. 3) and includes uplands underlain by loess-covered Illinoian drift and a broad bottom land along the present Illinois River (Fig. 2). The lowland, which is a striking feature of the middle Illinois Valley, coincides with an extensive bedrock lowland developed at the confluence of the Mahomet and Illinois bedrock valleys and four important tributary bedrock valleys.

RELATION TO BEDROCK

Mahomet Valley cuts across regional structural trends and, from east to west, crosses the western Indiana syncline, the LaSalle uplift, and the northern part of the Illinois basin. The rocks underlying this area are largely nonresistant Pennsylvanian shales, although limestone and sandstone beds locally form thin units of greater resistance to erosion.

The major feature due to differential erosion is the bedrock lowland along the Illinois River and the related narrows at Beardstown (cross section *C–C′*, Fig. 2). The narrows resulted from entrenchment in more resistant Mississippian limestones, which are exposed along the river at this point; and the lowland may be attributed to lateral planation of weaker Pottsville and Carbondale strata upstream from this local base-level. Other features of the preglacial surface which locally appear to reflect bedrock lithology are: (1) the broad ridge in western Ford County may be due to Devonian-Silurian limestones along the LaSalle uplift; (2) the small upland in southwestern Vermilion County represents an outlier of LaSalle limestone; (3) the narrow ridge in north-central Douglas County is a reflection of Devonian-Silurian limestones along the crest of the LaSalle uplift; (4) the valley-wall in northern Menard and northwestern Logan counties may be partly the result of control by Pennsylvanian limestones above No. 6 coal.

DESCRIPTION OF THE VALLEY-FILL

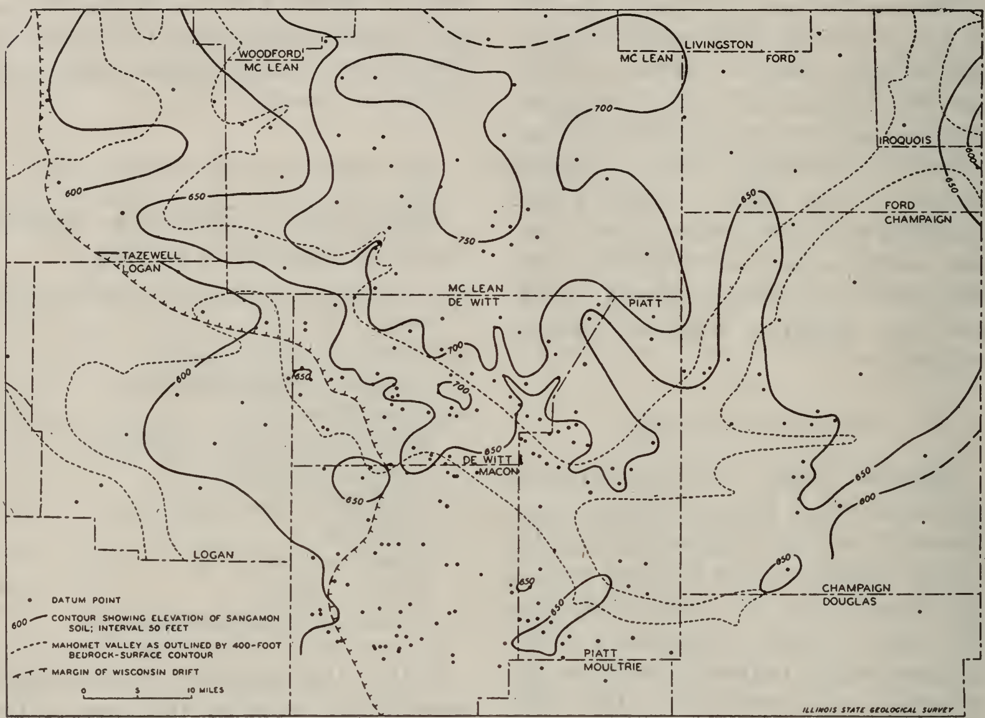
Eleven units of Pleistocene deposits have been identified in the area:

11. Post-Shelbyville (Wisconsin) till and outwash
10. Shelbyville (Wisconsin) till
9. Sangamon soil and alluvium
8. Upper Illinoian till
7. Middle Illinoian sand and gravel
6. Lower Illinoian till
5. Yarmouth soil and alluvium
4. Kansan till
3. Kansan sand and gravel
2. Aftonian alluvium
1. Nebraskan (?) sand and gravel

Within this sequence significant unconformities occur at the base of the Kansan sand and at the bases of the Yarmouth and the Sangamon interglacial deposits. These unconformities are responsible for major variations in the succession below the Sangamon soil zone; the Wisconsin tills form a relatively regular unit, in which Shelbyville and post-Shelbyville divisions are usually recognizable. An outstanding feature of the pre-Wisconsin deposits is the dominance of water-laid silts, sands, and gravels within Mahomet Valley in contrast to glacial till, which is the dominant material along the margins of the valley and under the adjoining uplands (cross sections, *A–A′* and *B–B′*, Fig. 2).

RELATIONS OF THE SANGAMON AND THE YARMOUTH SOIL ZONES

The Sangamon plain below Wisconsin drift has been reconstructed for a part of the area on the basis of about 200 well records in which buried soil was either logged by the driller or was determined from sample cuttings (Fig. 3). Considering the minor errors possible in logging and in determining the location and elevation of wells, the close agreement of data-points for any given part of the map is noteworthy. The plain slopes gently away from the bedrock upland in McLean County and crosses Mahomet Valley without significant change in gradient. In Macon, Piatt, and western Champaign counties most of the elevations fall between 620 and 640 feet above sea-level. The surface has an average gradient of about 5 feet per mile and varies in elevation from 760 to 590 feet above sea-level. In northwest Champaign County a shallow sag in the plain lies approximately over Mahomet Valley, but elsewhere there is no coincidence with the bedrock surface. Upon this plain were spread the Wisconsin drift sheets and their moraines.



SANGAMON PLAIN BELOW WISCONSIN DRIFT
IN CENTRAL ILLINOIS
BY
LELAND HORBERG, 1944

FIG. 3

The Yarmouth surface is not so well known as the Sangamon, but it appears to cross Mahomet Valley at fairly uniform elevations (cross sections *A–A′* and *B–B′*, Fig. 2). About 60 wells in the area covered by Figure 3 encounter the horizon and indicate that the undissected plain was generally parallel with the Sangamon surface. Highest elevations occur over the bedrock upland in McLean County, and from that area the Yarmouth surface slopes outward in all directions. Elevations range from 670 to 514 feet above sea-level, most of them falling between 550 and 600 feet.

INTERPRETATION OF LOCAL DRAINAGE HISTORY

The oldest feature of the bedrock surface is represented by the upland surface, which crosses the structures of the area and slopes southwestward from elevations of about 600–500 feet above sea-level. The most extensive parts of this surface appear to lie between the 550- and the 600-foot contours. In the northern part of the area in McLean and eastern Iroquois counties higher portions of the upland rise to a uniform level of about 650 feet and have restricted summits at elevations over 700 feet. In northwestern Illinois a summit erosion surface, called the "Dodgeville peneplain,"[9] has been recognized. This surface slopes southward from an elevation of about 900 feet in the Driftless Area to an elevation of about 600 feet in the Starved Rock region in LaSalle County.[10] Bedrock valleys, eroded 200–300 feet below this upland, are pre-Kansan and probably preglacial in age. The elevation, slope, and dissection of the bedrock uplands in east-central Illinois suggest their correlation with the Dodgeville surface.

[9] A. C. Trowbridge, "The Erosional History of the Driftless Area," *Iowa Univ. Studies*, 1st ser., No. 40 ("Studies in Nat. Hist.," Vol. IX, No. 3 [1921]), pp. 1–127; R. E. Bates, "Geomorphic History of the Kickapoo Region, Wisconsin," *Bull. Geol. Soc. Amer.*, Vol. L (1939), pp. 819–80.

[10] H. B. Willman and J. N. Payne, "Geology and Mineral Resources of the Marseilles, Ottawa, and Streator Quadrangles," *Ill. Geol. Surv., Bull. 66* (1942), pp. 204–5.

Mahomet Valley and its tributaries were eroded below the upland surface in pre-Aftonian time, as Aftonian and possibly Nebraskan deposits have been identified within the valley in cuttings from wells at Urbana, Champaign County (Fig. 2, cross section *A–A′*, well No. 5), and in southwestern McLean County. In both localities three soils are recognizable, the lowermost or Aftonian being underlain by sand and gravel. The age of the basal sand and gravel is uncertain, and it is considered Nebraskan rather than Aftonian largely because of the absence of humus, the pronounced break at the top of the deposit, and its general similarity to known glacial, rather than interglacial, deposits. Valley cutting thus appears to have been completed by preglacial Pleistocene time. Later modifications of the bedrock surface in the area were probably brought about largely by drainage diversions and only to a minor degree by true glacial corrasion. Glacial erosion by Wisconsin ice was certainly negligible, as there are few instances where the surface drift is not underlain by older glacial deposits.

The dominant glaciofluvial character of the pre-Wisconsin deposits within Mahomet Valley indicates that the valley remained an active drainage line until late Illinoian time. During the early Pleistocene the channel was probably open and cleared of fill, as the pre-upper Kansan sand and gravel in several places rests directly on bedrock (cross sections *A–A′* and *B–B′*, Fig. 2). However, after the deposition of this material, the valley was progressively filled with glacial and interglacial deposits so that by Sangamon time (possibly even by Yarmouth time) it had ceased to function as an important drainage-way and the Sangamon plain crossed it without interruption.

The available evidence indicates that the initial drainage diversion leading to the abandonment of the valley was caused by the advance of the Kansan glacier and that the valley continued only as a minor channel-way during Yarmouth and Illinoian time. The possibility of diversion in pre-Kansan time is opposed by the occurrence of Aftonian and older deposits at elevations between 450 and 500 feet above sea-level within the valley and by the stratified character of all the deposits within the valley that lie below the upper Kansan till. The alternative of diversion by the Illinoian glacier finds some support in the widespread occurrence of middle Illinoian sand along the valley. However, the base of this sand has an elevation of about 550 feet above sea-level, which is 250 feet above the valley-floor and close to the level of much of the upland. This relation, together with the uniform elevation of the Yarmouth soil, suggests that the valley in Illinoian time was a broad sag which followed the general course of Mahomet Valley and received Illinoian outwash but was not an important through-valley. This view is further attested by the fact that the Yarmouth and Sangamon deposits consist largely of peaty soil and alluvial silt and fine sand, most of which probably represents wash from adjacent gentle till slopes.

With the advance of the Wisconsin glacier across the Sangamon plain, all vestiges of the old valley were obliterated, and there is nothing in the present landscape to suggest its existence.

RELATION TO REGIONAL PRE-GLACIAL DRAINAGE

Numerous well records in southern Benton County, Indiana, suggest that Mahomet Valley continues eastward to join the bedrock valley along the present Wabash River near LaFayette. This interpretation (Fig. 4) is based on well records and bedrock-exposure data compiled largely from the literature and is thus subject to important revisions, although the amount of published data and their agreement are notable.

Low bedrock elevations in southern Benton County were first noted by S. S. Gorby[11] in 1866 and were subsequently verified by Leverett.[12] Three interpretations of these low bedrock elevations have been proposed: (1) the preglacial valley at LaFayette continues west past Oxford (Fig. 4) and thence south to the preglacial valley near Covington;[13] (2) a possible "spur" connects Wabash and Illinois drainage;[14] and (3) the bedrock valley near LaFayette continues south through Fountain County, and the valley in Benton County represents an important western tributary.[15] Concerning the main valley at LaFayette, Fidlar further postulated[16] that this valley continued eastward into Ohio, where it joined the ancient Teays Valley[17] in the central part of the state near Chillicothe (Fig. 1). The course of the valley from LaFayette eastward across northern Indiana to the Indiana-Ohio state line in Adams County is based on numerous well records and in part follows the

[11] "Geology of Tippecanoe County," *Ind. Dept. Geol. and Nat. Res., 15th Ann. Rept.*,(1886), p. 76.

[12] "Wells of Northern Indiana," *U.S. Geol. Surv. Water-Supply and Irrigation Paper 21* (1899), pp. 61–66.

[13] Leverett, p. 744 of ftn. 3. (1895).

[14] Clem, ftn. 4 (1911).

[15] M. M. Fidlar, "The Preglacial Teays Valley in Indiana," *Jour. Geol.*, Vol. LI (1943), p. 417.

[16] *Ibid.*, pp. 411–18.

[17] W. G. Tight, "Drainage Modifications in Southeastern Ohio and Adjacent Parts of West Virginia and Kentucky," *U.S. Geol. Surv. Prof. Paper 13* (1903), pp. 1–111.

course of a buried channel previously described by S. R. Capps.[18]

Near the Indiana-Ohio state line the channel coincides with preglacial channels discovered by J. A. Bownocker,[19] and the course southeastward to Chillicothe is based upon the work of Karl Ver Steeg.[20]

west boundary of Tippecanoe County and flows essentially on bedrock to a point about 3 miles south of Covington, where it again enters a buried bedrock valley. In this area Fidlar indicated that the preglacial valley followed a buried channel through Fountain County some distance east of the Wabash River and

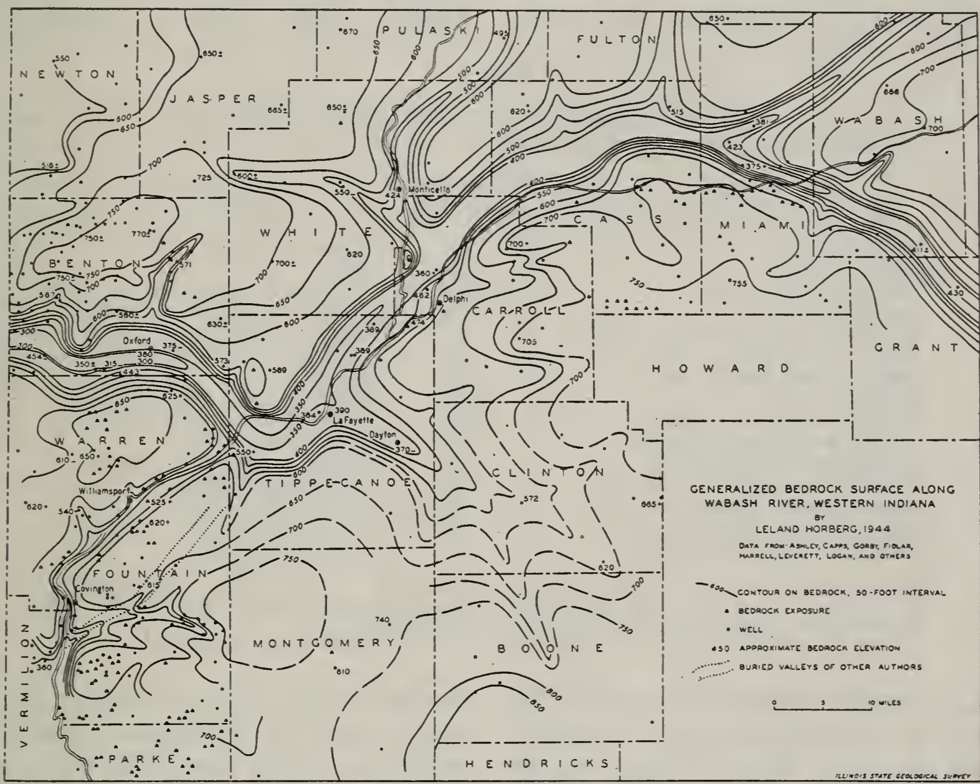


FIG. 4

The course of the ancient bedrock valley south of LaFayette does not follow the present Wabash River, as that stream enters a narrow valley near the joined the present valley south of Covington (Fig. 4). As an alternative hypothesis it is proposed that the main valley turned west near LaFayette, through southern Benton County into Illinois and, as Mahomet Valley, continued west to join the bedrock valley along the Illinois River. The following considerations are offered in support of this interpretation: (1) the valley in southern Benton County appears to be comparable in

[18] "Underground Waters of North-central Indiana," *U.S. Geol. Surv. Water-Supply Paper 254* (1910), p. 26.

[19] "A Deep Preglacial Channel in Western Ohio and Eastern Indiana," *Amer. Geol.*, Vol. XXIII (1899), pp. 178–82.

[20] "The Buried Topography of Western Ohio," *Jour. Geol.*, Vol. XLIV (1936), pp. 918–39.

size to the valley above LaFayette, whereas any buried valley in Fountain County must necessarily be restricted in width; (2) bedrock elevations to the west are lower and more closely spaced than they are to the south, where there is an interval of about 90 miles before comparable low elevations are shown by Fidlar;[21] (3) this interval is an area of high bedrock indicated by well records and numerous bedrock exposures[22] (Fig. 4); (4) the published evidence supporting the buried valley through Fountain County is inconclusive,[23] and it is significant that Leverett[24] in a later discussion of the wells of Fountain County makes no reference to an important buried valley within the county.

No satisfactory interpretation of drainage changes in the area south of LaFayette can be made until further information becomes available. It is questionable whether the diversion from Mahomet Valley into the lower Wabash bedrock valley was directly into the present valley above Covington or through a buried valley to the east. Subsurface studies of the deposits filling the valleys are needed to establish the times of important erosion; and until this is done, interpretations will remain uncertain.

Although the details of drainage history in the LaFayette region are not entirely clear, the existing evidence strongly indicates that the main preglacial valley continued into Illinois as Mahomet Valley. If this is true and if the course of the ancient Teays east of LaFayette outlined by previous writers is confirmed, Mahomet Valley represents the course

TABLE 1

BEDROCK ELEVATIONS ALONG PROPOSED TEAYS VALLEY

Locality	Feet above Sea-Level	Reference
Seary, W.Va.	670	Stout and Lamb*
Chillicothe, Ohio	630	*Ibid.*
Madison County, Ohio	Less than 538	Ver Steeg, p. 925 of ftn. 20 (1936)
Jay County, Ind.	463	Fidlar, p. 416 of ftn. 15 (1943)
La Fontaine, Wabash County, Ind.	411±	Capps, p. 226 of ftn. 18 (1910)
Miami County, Ind.	423	Fidlar, p. 416 of ftn. 15 (1943)
Delphi, Carroll County, Ind.	360±	Logan†
LaFayette, Ind.	384	Fidlar, p. 416 of ftn. 15 (1943)
Oxford, Benton County, Ind.	300	Leverett, p. 757 of ftn. 3 (1895)
Rankin, Vermilion County, Ill.	358	Files, Ill. Geol. Surv.
Paxton, Ford County, Ill.	343	Savage, p. 444 of ftn. 5 (1931)
Mahomet, Champaign County, Ill.	357	Files, Ill. Geol. Surv.
Clinton, DeWitt County, Ill.	Less than 340	Files, Ill. Geol. Surv.
Delavan, Tazewell County, Ill.	288	Savage, p. 444 of ftn. 5 (1931)
Beardstown, Cass County, Ill.	311	Files, Ill. Geol. Surv.

* Wilber Stout and G. F. Lamb, "Physiographic Features of Southeastern Ohio," *Ohio Jour. Sci.*, Vol. XXXVIII (1938), also in *Geol. Surv. Ohio* ("Reprint Ser.," No. 1 [1939]), p. 14.

† W. N. Logan, "The Sub-surface strata of Indiana," *Ind. Div. Geol. Pub. No. 108* (1931), p. 47.

[21] Fig. 1, p. 412 of ftn. 15 (1943).

[22] Leverett, "Wells of Southern Indiana," *U.S. Geol. Surv. Water-Supply and Irrigation Paper 21* (1899), pp. 19–20.

[23] The evidence consists of a map and statement by R. T. Brown, published in 1881 without supporting data, in "Fountain County," *Ind. Rept. Geol. and Nat. Res. 11th Ann. Rept.* (1881), p. 92, map facing p. 89.

[24] P. 20 of ftn. 22 (1899).

of the lower Teays River.[25] By this hypothesis Mahomet Valley was eroded by a preglacial master-stream which probably had its source near the eastern scarp of the Blue Ridge in North Carolina;[26] flowed westward across Ohio, northern Indiana, and central Illinois; and finally discharged into the Gulf Embayment through bedrock valleys along the present Illinois and Mississippi rivers. Bedrock elevations (Table 1) along this valley indicate an average gradient of about 7 inches per mile for that portion of it above Beardstown, Illinois.

[25] In this case the name "Mahomet" should be dropped and the valley referred to as the "lower Teays."

[26] Wilbur Stout and Downs Schaaf, "Minford Silts of Southern Ohio," *Bull. Geol. Soc. Amer.*, Vol. XLII (1931), pp. 663–72.

Acknowledgments.—This paper is an outgrowth of bedrock-surface and ground-water studies made at the Illinois State Geological Survey under the supervision of L. E. Workman, head of the Subsurface Division, and Dr. George E. Ekblaw, head of the Areal and Engineering Division. The early studies of Pleistocene stratigraphy in the area made by these two men assisted progress of the work, and the manuscript has benefited by their criticism. The aid and suggestions of other members of the Survey staff are also acknowledged.

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