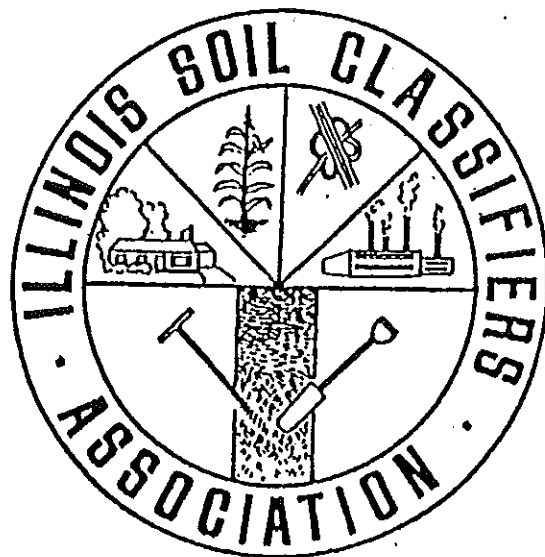


SOILS--GEOLOGY TOUR

PRINCETON, ILLINOIS

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Sponsored by

Bureau and Putnam County Soil
Survey Staff and Leon R. Follmer
Illinois State Geological Survey

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Introduction

The field trip emphasizes both soils and geology and will provide participants with the opportunity to exchange ideas on the latest concepts. We will examine six soil profiles on the terrace system of East Bureau Creek, a major tributary of the Illinois Rivers (fig. 1). A block diagram (fig. 2) and a list of soils (Table 1) found in the vicinity of the Malden South Section are presented in this guidebook and will be discussed on the trip. Figure 3 is a soil map of the area. In the east bank of the creek about 300 feet north of county road 1700 N, we will examine a reference section of the Malden Till.

Geology

The type section of the Malden Till is in the road cuts along the road east of the bridge but the exposures are now largely covered over. All of the geologic units described by Willman and Frye (1970, ISGS Bull. 94, Malden South Section) are all exposed in the stream cut (fig. 4).

At the top of the exposure is the Modern Soil, which is part of the continuum of present day soils at land surface and is treated as a stratigraphic unit by geologists. The Modern Soil is Fayette silt loam in most places and has developed in about 6 feet of Richland Loess. The loess overlies a thin mixed zone of pebbly loam which could be a glacial debris flow diamicton, but is not known for sure. Under the diamicton is a clean sand with some gravel and has the character of normal or "good" outwash, i.e., stratified. The sand becomes thicker to the south and eventually merges with an underlying outwash near the middle of the exposure.

The Malden Till appears in the north part of the exposure under the (upper) sand and pinches out to the south permitting the two outwash bodies to merge. The upper part of the Malden is oxidized brown and the texture is loam but seems to vary. The lower part is more gray, finer textured (Sic1) and more uniform. The lower part is probably a till diamicton, deposited directly

from the ice, and the upper part may be a glacial debris flow diamicton. The undulating shape of the pinch out suggests flowage.

Under the Malden is about 10 feet of stratified sand and gravel with a few silt layers near the top. This is a fining-upwards sequence that is typical of outwash in a channel. This channel could have been several hundred feet wide and appears to indicate a flow direction of north to south based on the near horizontal bedding that slopes to the south.

A coarse gravel at the base of the outwash lies on top of the Tiskilwa Till, which indicates an erosion surface. Most of the 13 feet of Tiskilwa exposed here is good till and exhibits the normal range in colors from gray to dark brown or reddish brown. At the base of the Tiskilwa is a gray to greenish zone that Willman and Frye called Lee Center Till. Recent studies (ISGS Guidebooks 16 and 19) indicate that this zone should be included with the Tiskilwa as a basal deformation zone within the Wedron Formation area. The portion of the Lee Center beyond the Shelbyville Morainic System has been found to underlie a paleosol (Sangamon Soil) and is now considered to be equivalent to the Radnor Till.

About 6 feet of Morton Loess underlies the Tiskilwa. It is a proglacial deposit that represents the earliest Woodfordian deposit at this site. Loess was being deposited for about 5000 years before the glacier reached this point. The medium-silt-rich texture and the presence of land snails are the principle reasons for interpreting this silt deposit as a loess.

From the Morton on down to stream level, the outcrop is covered by talus. Under the Morton is an organic-rich zone with coniferous wood. One piece of wood near the top was carbon dated to be $27,300 \pm 540$ years old (ISGS-614). This organic-rich soil is called the Farmdale Soil and its parent material is classified as the Robein Silt. About a half mile south the Robein overlies the Roxana Silt and the Sangamon Soil developed in Illinoian till.

Directions from City County Park to Malden Site. From the park, get on IL 26 South to I-80 East. Go east approximately 5 miles to I-180 South. Travel South for 2 miles and exit to U.S. 6 East. Travel East .4 of a mile, exit to gravel County Road 2500 E. Shortly after exiting, turn left onto County Road 2500 E. North on 2500 E to 1700 N. East on 1700 N. for 0.8 mile to Malden Site.



Figure 1. Topographic map of tour site.

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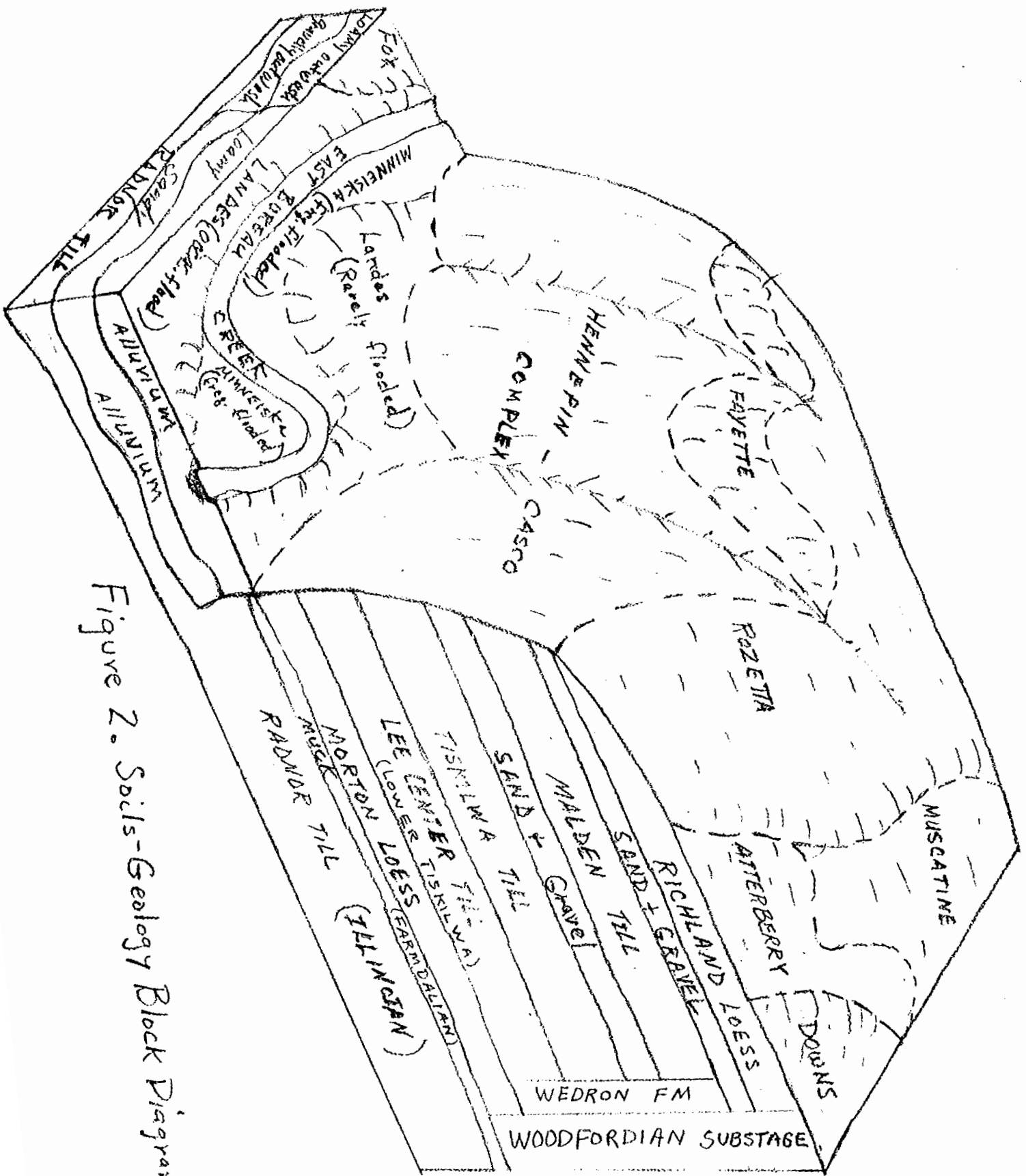


Figure 2. Soils-Geology Block Diagram.

Table 1. SOILS LEGEND

	<u>Parent material</u>	<u>Classification</u>
I.	Deep loess	
	(19) Sylvan	fine-silty, mixed, mesic Typic Hapludalfs
	(41) Muscatine	fine-silty, mixed, mesic Aquic Hapludalfs
	(61) Atterberry	fine-silty, mixed, mesic Udollic Ochraqualfs
	(279) Rozetta	fine-silty, mixed, mesic Typic Halpudalfs
	(280) Fayette	fine-silty, mixed, mesic Typic Hapludalfs
	(386) Downs	fine-silty, mixed, mesic Mollic Hapludalfs
II.	Glacial till	
	(25) Hennepin	fine-loamy, mixed, mesic Typic Eutrochrepts
III.	Stratified outwash	
	(820) Casco (samples w/Hennepin)	fine-loamy/sandy or sandy skeletal, mixed, mesic Typic Hapludalfs
	(125) Selma	fine-loamy, mixed, mesic Typic Haplaquolls
IV.	Alluvium	
	(73) Ross	fine-loamy, mixed, mesic Cumulic Hapludolls
	(3179) Minneiska, frequent flood	coarse-loamy, mixed, (calcareous) mesic Mollic Unifluvents
	(7304) Landes, Rave flood	coarse-loamy, mixed, mesic Fluventic Hapludolls
	(8304) Landes, occasional flood	coarse-loamy, mixed, mesic Fluventic Hapludolls
V.	Miscellaneous	
	(802) Orthents loamy	loamy, mixed, nonacid, mesic Udorthents

Figure 3. Soil Map of Area Surrounding the Malden Site



Bureau County, Illinois
Sections 5 and 8.

T. 16 N., R. 10 E.

Location of Malden Site is:

S.E. 160, S.E. 40, S.W. 10, N.W. 2 1/2,
of Section 5. ⊗

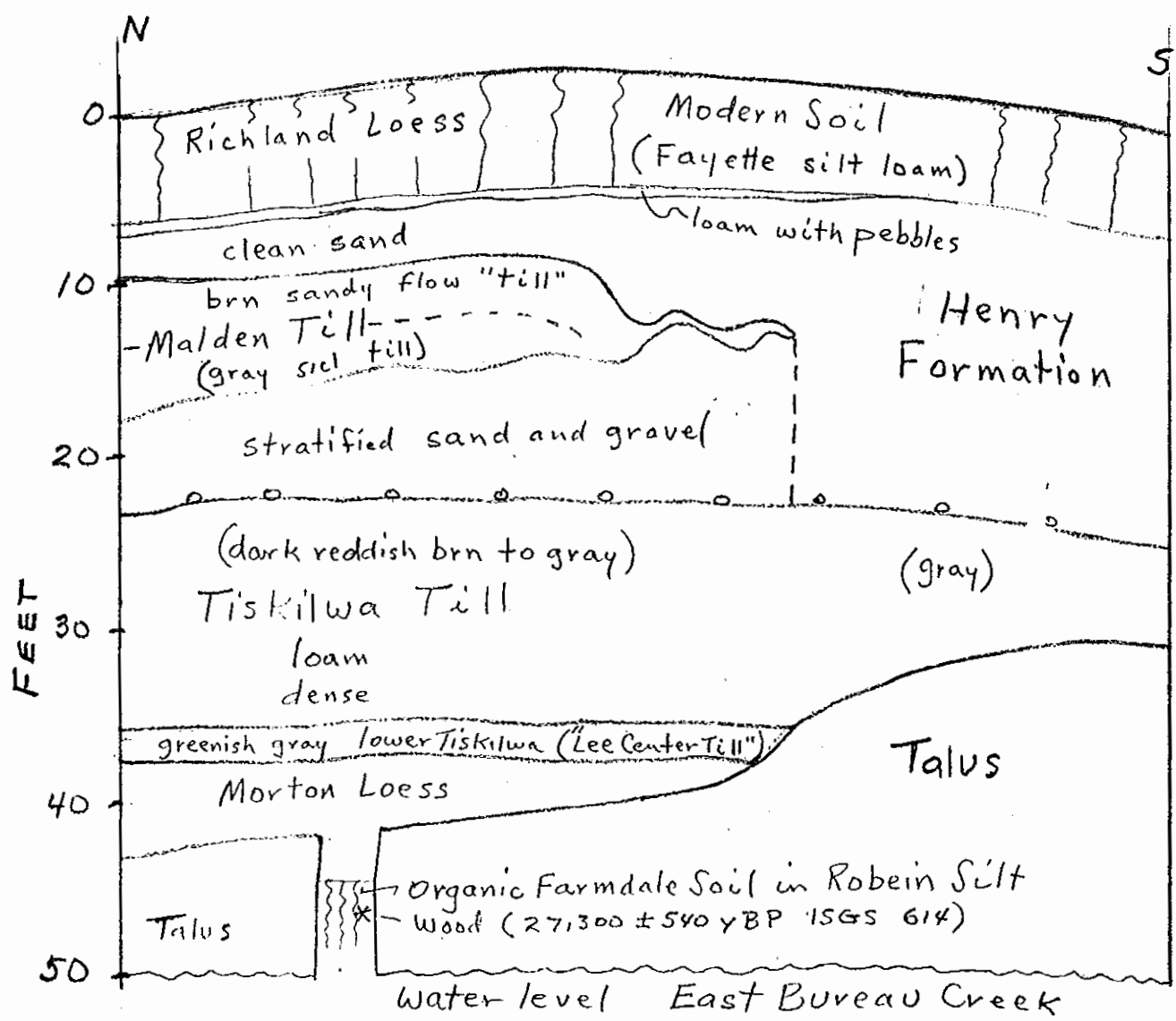


Figure 4. Sketch of stream cut. Malden Till reference section, 300 feet north of Type Section along road.