

STRATIGRAPHY AND AGE OF DEPOSITS IN AN EXCAVATION AT THE WRIGHT-PATTERSON AIR BASE, DAYTON, OHIO

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Excavation on the upland at the Wright-Patterson Air Force Base near Dayton during the winter of 1957 revealed a sequence of Pleistocene deposits, including a till containing fragments of wood. Because information provided by this excavation would be available for only a short time, the geologic section was observed; wood from the till was collected, identified, and a radiocarbon age determination made; and moss from a silt beneath the wood-bearing till was also identified. The purpose of this report is to present briefly and to evaluate all the data concerned with this excavation.

Location

The excavation was made on the upland south of old Ohio route 4 at the Wright-Patterson Air Force Base near Dayton, in the south-central part of section 12, R7T2, Beaver Creek Township, Greene County, Ohio. It was observed and sampled on February 5, 1957, by Andrew Spieker of the U.S. Geological Survey, Ground Water Branch, in Columbus, Ohio, and by myself.

Geologically, this site lies on ground moraine in the southeastern part of the Miami glacial lobe (see fig. 1), southeast of the Farmersville moraine and north of a small east-west moraine considered to be equivalent to the Camden moraine (Goldthwait, 1950). Bedrock (Ordovician upper Richmond and Silurian Brassfield) is shallow in this upland area.

Stratigraphy

The section exposed in this excavation includes six Pleistocene units underlain by Ordovician bedrock:

No.	Description	Thickness
7.	Sand and gravel, well sorted, coarse, discontinuous.	0-8 ft
6.	Till, oxidized 3-7 ft; rounded masses of silt from unit 3, 4-12 in. in diameter, are present within the base of this unit. Wood in the form of good-sized logs, branches, and smaller fragments occurs in the basal few feet of this till. Wood sample taken from this till was identified as <i>Picea</i> (spruce) by Dr. G. W. Burns and dated at 21,600±400 (W-648) radiocarbon years.	6-11 ft
5.	Clay, gray.	0-6 in.
4.	Peat.	1/8-1/4 in.
3.	Silt, with occasional gastropod shells, wood fragments, and moss identified as <i>Drepanocladus apiculatus</i> Steere by Dr. Margaret Fulford. Source of rounded masses in base of unit 6.	4-14 in.
2.	Sand with lenses of pea- or coarser-sized gravel, very dirty and poorly sorted; locally contains a thin zone of what appears to be sandy till.	3-6 ft
1.	Ordovician Richmond shale.	

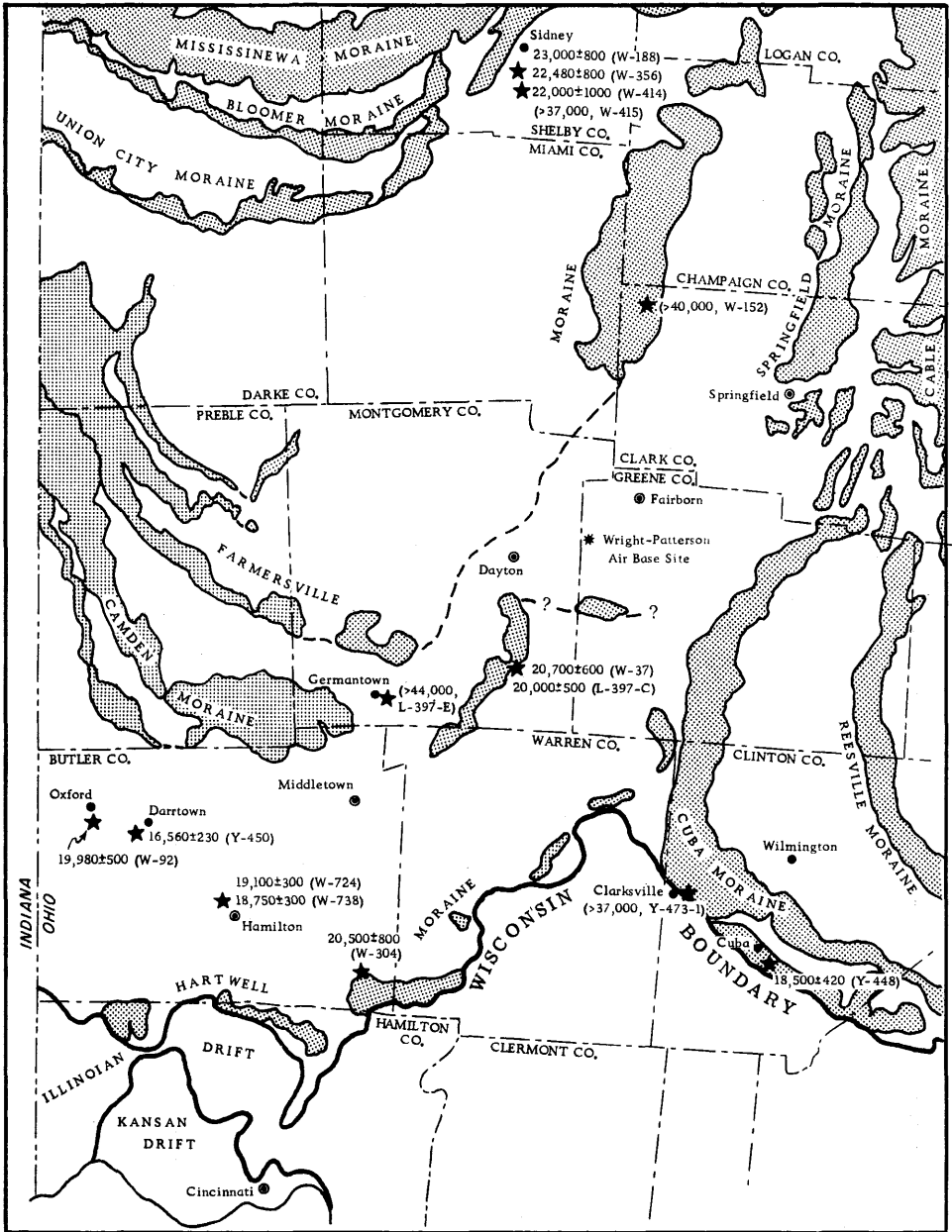


FIGURE 1. Map showing general location of site with respect to glacial boundaries, Wisconsin end moraines, and other localities from which have come wood that has been dated.

Discussion

The till containing the wood is part of the extensive till deposit which blankets much of southwestern Ohio and was left by the last major advance of the Wisconsin glacier. Radiocarbon dates from wood embedded near the base of this surface till have been obtained from many localities in central and western Ohio (see fig. 1; see also Goldthwait and Burns, 1958). Thus, a series of stages in the advance of this glacial front can be traced: from the edge of Lake Erie near Cleveland (24,600±800, W-71) south to Columbus 23,000±850, Y-449) and Sidney (23,000±800, W-188), on to Chillicothe (18,050±400, W-91), Hamilton (19,100±300, W-724), and Oxford (19,980±500, W-92) (Flint, 1955a, 1955b; Goldthwait and Burns, 1958; Forsyth, 1961). The retreat of this glacier is not recorded; a retreating glacier does not override trees.

The deposition of the till in this exposure, from which the wood was recovered, began, therefore, with the last advance of the Wisconsin glacier into this area about 21,000 years ago. The deposition continued while the glacier advanced on southward to its terminal position near Sharonville (north of Cincinnati) and then began its retreat. This retreat started in the southwest about 17,000 years ago and continued to about 13,000 years ago, when the margin had retreated out of northern Ohio. As a result, the wood-bearing till in this excavation probably represents glacial deposition of from about 21,000 to about 16,000 years ago.

Earlier advances of the ice doubtless covered this area; a thin zone of what may be sandy till is recorded in unit 2. However, possibly because the bedrock surface stood so high in this area, no significant deposits of the earlier glacial advances were left at this site. The lower stratigraphic units (nos. 2(?), 3, 4, 5) seem to be mainly proglacial deposits relating to the advancing glacier that later left the till (unit 6). The presence of the moss *Drepanocladus apiculatus* Steere, which is common in swampy places in Canada and northern United States, indicates a climate at that time that was cool and moist, suggestive of the presence of an advancing glacier.

The overlying sand and gravel (unit 7) probably represents some local outwash deposited by the retreating glacier.

REFERENCES CITED

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