Title: Valley Sand and Gravel Pit

Location: Sec. 5, 6, T. 6 N., R. 20 E., Hales Corners 15' Quadrangle, Waukesha County Permission is needed to enter this pit. It can be obtained from Valley Sand and Gravel.

Author: David M. Mickelson (after Whittecar, 1976).

Description: This pit is in the core and flanks of a drumlin formed by ice of the Lake Michigan Lobe during mid-Woodfordian time. The southern part of the pit is in the south flank of the drumlin and exposes numerous deformation features (Whittecar, 1977; Whittecar and Mickelson, 1977). Gravels underlie till throughout much of the core, demonstrating that this drumlin form is primarily an erosional feature. A large clastic dike or diapir of fine sand has warped gravels upward about 40 feet from their originally flat lying position. Were the gravels frozen at the time of deformation? The answer to this question is not known, but one can hypothesize that ice advanced over a thin permafrost layer (gravels saturated and frozen) and underlying saturated but unfrozen sands were forced upward by differential pressures.

The till above the gravels is typical of the mid-Woodfordian advance of the Lake Michigan Lobe. Note that some of the till (especially its lower contact with the gravels) is deformed with the folding. A very similar till above seems to truncate this structure and follow the drumlin form. The relationships in the pit have led Whittecar and Mickelson (1977) to suggest the following sequence of events.

1. Deposition of outwash gravels previous to and during the advance of mid-Woodfordian ice (see Waukesha Gravel Pit).

2. Ice advance over the gravels and deposition of basal till on a zone near the ice margin. Much of this till is conformable (doesn't cross-cut) the gravels.

3. Further ice advance and thickening of ice over the area. Partial erosion of the tills and gravels producing the drumlin form and deformation of the gravels.

4. Retreat of ice and deposition of a basal till layer over the drumlin form. This till cross-cuts the structure of the gravels.

Significance: Exposure is one of best for illustrating cross-cutting relationships of tills deposited during advance and retreat. The southern part of the pit usually illustrates this best. This type of drumlin, cored with gravel, proves that in some drumlins the form is due to subglacial erosion of preexisting material.

References: Alden, 1905; 1918