Trip B-8

Two Till Sequence at Dugway Road Exposure Southwest of Clinton, New York

D.B. Krall
Department of Earth and Planetary Environ., Kean College, Union, N.J.

INTRODUCTION

During the waning stages of the Wisconsinan ice sheet, the southwestward ice movement across the Adirondacks changed to a strong flow around both sides of the Adirondack Mountains. The Ontario lobe moved southwestward up the St. Lawrence Valley and spread southward across the Ontario Lowlands, whereas the ice east of the Adirondacks moved southward along the Champlain-Lake George trough and expanded southward down the Hudson Valley and westward up the Mohawk Valley. Chamberlin (1883), Fairchild (1912) and Brigham (1931) suggested that these two lobes were contemporaneous in the area south and west of Utica, N.Y. To fit his meltwater chronology, Fairchild (1932) proposed that the Mohawk lobe wasted away prior to the Ontario lobe, allowing free drainage down the Mohawk Valley while the Ontario ice receded from the Syracuse-Utica area. Krall (1977) supports the latter view based on drumlin realignment, morainal orientations, and the superposition of tills at the Dugway Road exposure, 6 km southwest of Clinton, N.Y.

THE DUGWAY ROAD SECTION

The Dugway Road exposure consists of a dark gray till, with some interspersed yellow-brown layers, overlain by weak red till (Figure 1). Between the two tills is a single boulder layer underlain by a yellow-brown material somewhat sandier than either of the two tills. The top of the exposure consists of finely laminated (varved?) clays.

Ice movements can be inferred by till fabric and till color. A fabric taken in the red till shows a N 31°W trend, whereas a fabric taken 2 m below the boulder layer shows a trend of N 22°E. Two other till fabrics were taken, one just below the contact of the two tills (N 2°W) and the other 1.3 m below the contact (N 52° E). The dark gray color of the lower till can be attributed to southwestward movement of the Mohawk lobe across the Utica Shale, Frankfort Shale, Clinton Formation and the Lockport Formation, all of which have black or dark gray to blue-gray components (Dale, 1953). See inset map on Figure 1. The upper till was deposited by the Ontario lobe moving southeastward, a direction that would have taken the ice over red Vernon Shale for nearly 7 km before reaching the Dugway Road position. This evidence implies Mohawk retreat prior to advance of the Ontario lobe.

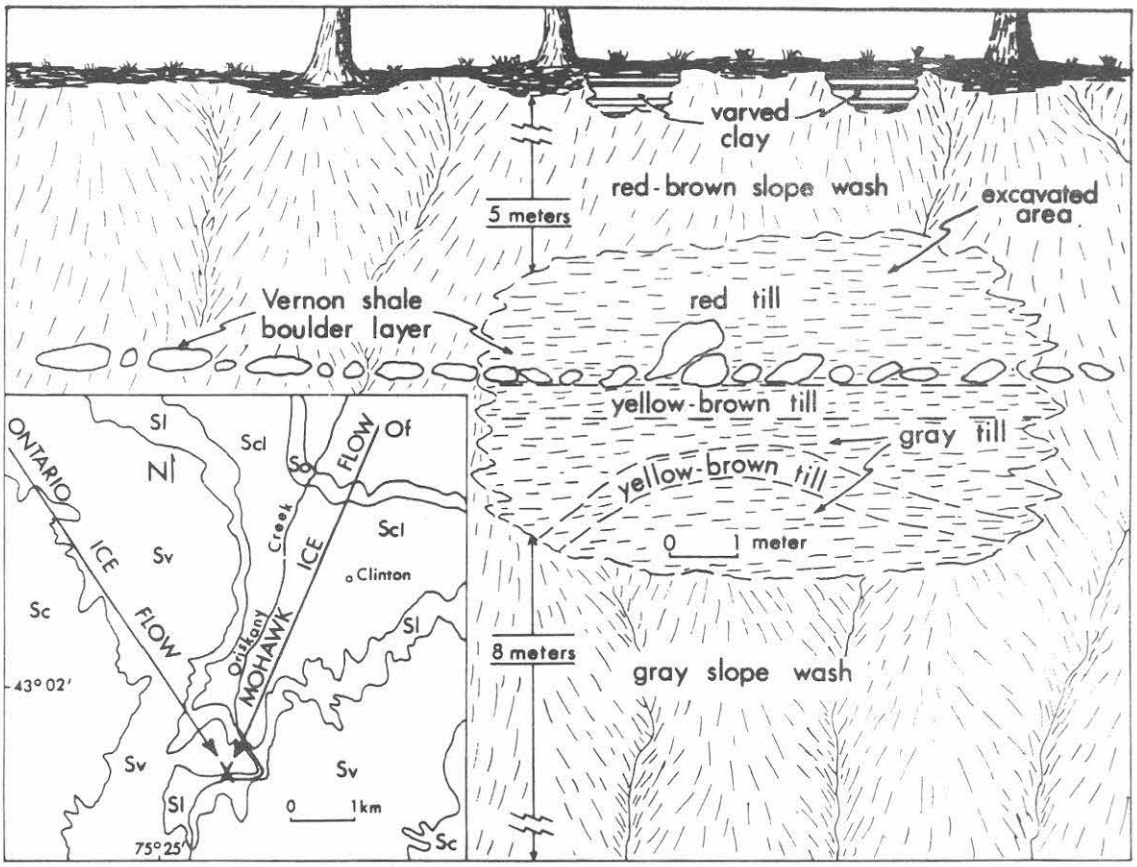

Figure 1. Sketch of the Dugway Road exposure. Inset map shows location. Geology is after Dale (1953). Of = Frankfort Shale; So = Oneida Conglomerate; Scl = Clinton Formation; Sl = Lockport Formation; Sv = Vernon Shale; Sc = Camillus Shale. Assumed ice-flow directions based on till-fabric orientations at exposure. Adapted from Krall (1977).

QUESTIONS

1. Does the boulder layer and the yellow-brown sandy material represent an ablation till deposited by the Mohawk lobe, a weathered zone of the lower till, or a deposit by the later Ontario lobe?

2. Is there a "significant" time interval between the deposition of the two tills?

3. Does the Mohawk till correlate with the West Canada Till or the Hawthorn Till of Muller, et.al. (1983) and Ridge and Franzi (field trip C-10 of this publication)?

4. What is the cause of the lower yellow-brown layer in the Mohawk till?

5. The Dugway Road exposure owes its existance to stream divergence of Oriskany Creek, which leaves the broad Oriskany Valley to the west, flows due east for more than a kilometer and then cuts northward through a narrow bedrock gorge (Figure 2). What caused this divergence?

SCALE 1:24000

1 MILE

0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

FIGURE 2

ROAD CLASSIFICATION

Heavy duty — Light duty

Medium duty — Unimproved dirt

U. S. Route — State Route

NEW YORK

QUADRANGLE LOCATION

CLINTON, N. Y.
SW/4 ROME 15' QUADRANGLE
N4300—7522.5/7.5

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C. 20242

REFERENCES CITED

Brigham, A.P., 1931, Glacial problems in central New York: Assoc. Am. Geographers Annals, v. 21, p. 179-206.

Chamberlin, T.C., 1883, Terminal moraine of the Second Glacial Epoc: U.S. Geol. Survey 3rd Ann. Rept., p. 291-402.

Dale, N.C., 1953, Geology and mineral resources of the Oriskany (Rome) quadrangle: New York State Mus. Bull. 345, 196 p.

Fairchild, H.L., 1912, The glacial waters in the Black and Mohawk Valleys: New York State Mus. Bull. 160, 47 p.

_____1932, New York moraines: Geol. Soc. America Bull., v. 43, p. 627-662.

Krall, D.B., 1977, Late Wisconsinan ice recession in east-central New York: Geological Society of America Bull., v. 88, p. 1697-1710.

Muller, E.H., Franzi, D.A., and Ridge, J.C., 1983, Pleistocene stratigraphy of the western Mohawk Valley, New York: Geol. Soc. America Abst. with Programs, v. 15, no. 3, p. 134.