APPENDIX III

GEOMORPHIC INVESTIGATION OF THE PARADISE LANE ARCHAEOLOGICAL SITE

by

James E. Pizzuto
Department of Geology
University of Delaware
Newark, DE 19716

Introduction

During November and December of 1985, the geomorphic history of the Paradise Lane Archaeological Site was studied. The goal of the study was to define the physiography of the site during possible periods of human occupation.

Location, Physiography, and Geologic Setting of the Study Area

The Paradise Lane Archaeological Site is located at the end of Paradise Lane, a residential street which extends southeast from Red Mill Road approximately 0.1 mile southeast of the intersection of Red Mill Road with 4 tracks of the AMTRAK Railroad.

The Paradise Lane Site sits on an upland surface approximately 1 mile southeast of White Clay Creek. The total relief in the immediate vicinity of the site is less than 10 feet (USGS 1:24000 Newark East Quadrangle), and probably the total relief is less than 5 feet.

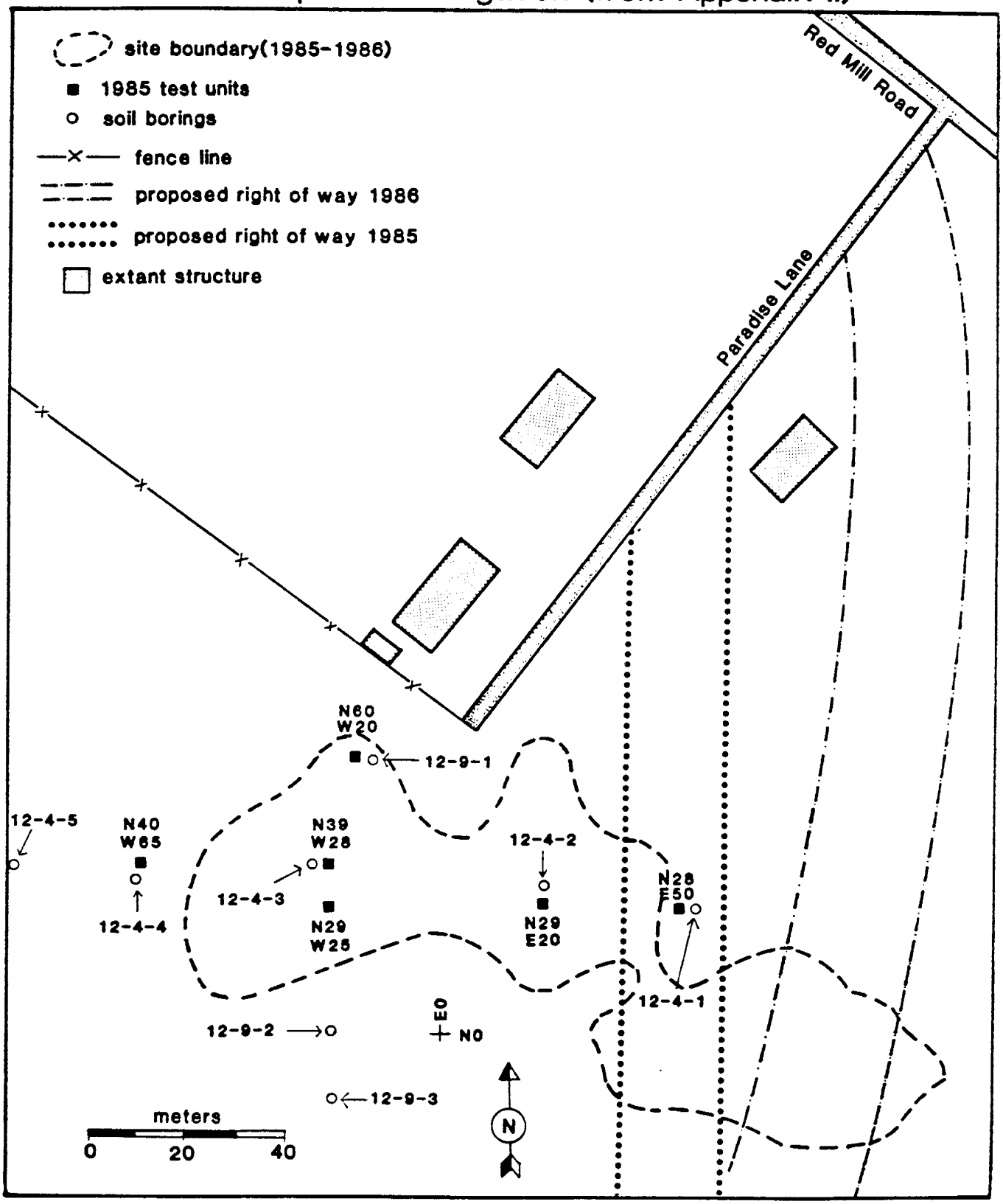
The topography at the site is developed on the Columbia Formation (Woodruff and Thompson 1972). This unit consists of sands and gravels of Pleistocene (?) Age. The Columbia Formation is about 10 feet thick at the Paradise Lane Site (Woodruff and Thompson 1972). It overlies the sands, silts, clays, and (rare) gravels of the Potomac Formation of Cretaceous Age.

Methods

Sediment samples were obtained with a 3-inch diameter bucket auger. Auger holes were placed along two transects which extend north and south across the site (Figure 70). The texture of the sediment was described using nomenclature of Folk

FIGURE 70

Paradise Lane Site, (7NC-D-125, N-10891), Geomorphic Investigation (from Appendix II)



(1968); colors were obtained from the Rock Color Chart (1980).

Results

The soils of this site are quite uniform (detailed descriptions are located in Appendix I). Generally the upper 10-30 cm consists of moderate yellowish brown clayey silt. Occasionally, these sediments may contain pebbles or sand. Farther below the surface, the sediments become increasingly sandy and the concentration of pebbles increases. A meter or so below the surface the sediments consist almost exclusively of silty sand and gravel (granules and pebbles). There is, however, a color change in the sediments across the study area. In the northern part of the area, sediments are predominantly light or yellowish brown, while the three southernmost holes reveal very paleorange sediments. Textures, however, are fairly uniform throughout.

A large hole (approximately 5m across) at the extreme western end of the east-west (see description of "core" #PL12-4-85-5) transect was particularly enlightening. Although the sediments here are generally similar to those found elsewhere, the walls of the hole provide a long, continuous exposure which clarifies the nature of these sediments.

Two important observations were made while studying the walls of the hole. First, pebbles and granules are found at all depths, though they are more frequent at greater depths. Second, there are no discontinuities within the section which could represent buried soils or other drastic changes in the Holocene history of the area.

Discussion

The uniformity of these sediments suggests strongly that the physiography of this region has not changed significantly during the Holocene. The only important variability is a change in color from north to south across the study area. Because textures are uniform, this color change is probably a result of subtle changes inherited from the underlying Columbia Formation.

These conclusions are supported by thecontinuous section observed in the walls of the hole. Furthermore, the presence of gravel throughout the section precludes any significant deposition since the deposition of the Columbia Formation. The only possible source of additional sediments would be windblown fine sands and silts. Gravel cannot be transported by wind, and thereforethe gravel must have been derived from the Columbia Formation. Since the gravel extends throughout, the other sediments were probably also derived from the Columbia Formation (with some small input of small amounts of organics).

Conclusion

There is no evidence to suggest that the geomorphic setting of the Paradise Lane Site has changed significantly throughout the Holocene. Thus the present topography is an accurate reflection of the topography which existed during a pre-Holocene occupation of the site.

Appendix I - Core Descriptions

Core # PL12-4-85-1

Depth (cm)	Description
0-30	clayey silt (20% clay); (10YR 5/4) (mod. yellowish brown)
30-61	clayey silt (5% clay);(5YR 5/6) (light brown)
61-91	sandy silt (some coarse sand); light brown (5YR 5/6) to mod. yellowish brown (10 YR 5/4)
91-122	silty sand (sand is med., coarse and fine), some light orange and white mottles a few mm across; light brown (5YR 5/6)

Core # PL12-4-85-2

Depth (cm)	Description
0-30	sandy clayey silt (5% clay), med.-fine sand; moderate yellowish brown (10YR 5/4)
30-61	sandy clayey silt (10% clay); light brown (5YR 5/6)
61-91	sandy silt (med.-coarse sand); light brown (5YR 5/6 to mod. yellowish brown (10YR 5/4)
61-122	silty sand, rare pebbles; dark yellowish orange(10YR 6/6)

Core # PL12-4-85-3

Depth (cm)	Description
0-30	sandy (med.-coarse), clayey (10%) silt; mod. yellowish brown (10 YR 5/4)
30-61	silty clayey sand (med.-coarse); mod. yellowish brown (10 YR 5/4)
61-91	pebbly med.-coarse sand; light brown (5 YR 5/6)

91-122	pebbly med.-coarse sand; (10 YR 6/6) dark yellowish orange to (5 YR 5/6) light brown

Core # PL12-4-85-4

Depth (cm)	Description
0-30	sandy (med.), clayey (10%) silt; mod. yellowish brown (10 YR 5/4)
30-61	sandy (med.-coarse) clayey (5%) silt, some rust-colored mottles to 1 cm in diameter; grayish orange (10 YR 7/4)
61-91	pebbly med.-coarse sand; grayish orange (10 YR 7/4), numerous white and orange-colored mottles

Core # PL12-4-85-5

Depth (cm)	Description
0-0.25'	organic-rich sandy silt; (5 YR 2/1) brownish black
0.25'-0.6'	sandy (med.-coarse) clayey (5/5) silt; mod. yellowish brown (10 YR 5/4)
0.6'-1.4'	pebbly, sandy (med.-coarse) clayey (5%) silt; mod. yellowish brown
> 1.4' (exposed to ~ 3.5')	pebbly med.-coarse sand; orange mottles to several cm in diameter; grayish orange (10 YR 7/4)

Core # PL12-9-85-1

Depth (cm)	Description
0-30	clayey (10%) sandy (med.-coarse) silt, rare gravel (granules); moderate yellowish brown (10 YR 5/4)
30-61	silty med.-coarse sand, rare gravel (granules); mod. yellowish brown-dark yellowish orange (10 YR 5/4 - 10 YR 6/6)
61-122	silty med.-coarse sand; light brown (5 YR 5/6)

Core # PL12-9-85-2

Depth (cm)	Description
0-30	sandy clayey (10%) silt; very pale orange (10 YR 8/2)
30-61	silty med.-grained sand, orange (rust) mottles; very pale orange (10 YR 8/2)
61-91	silty med.-grained sand, occasional orange (rust) mottles; very pale orange (10 YR 8/2)
91-122	silty med.-grained sand; very pale orange (10 YR 8/2)

Core # PL12-9-85-3

Depth (cm)	Description
0-30	silty clayey (10%) med.-coarse sand; dark yellowish brown (10 YR 4/2)
30-61	silty med.-coarse sand, occasionally mottled; very pale orange (10 YR 8/2)
61-91	sandy (med.-coarse grained) silt, silty med.-coarse grained sand, rare gravel (granules and pebbles), occasionally mottled; very pale orange (10 YR 8/2)