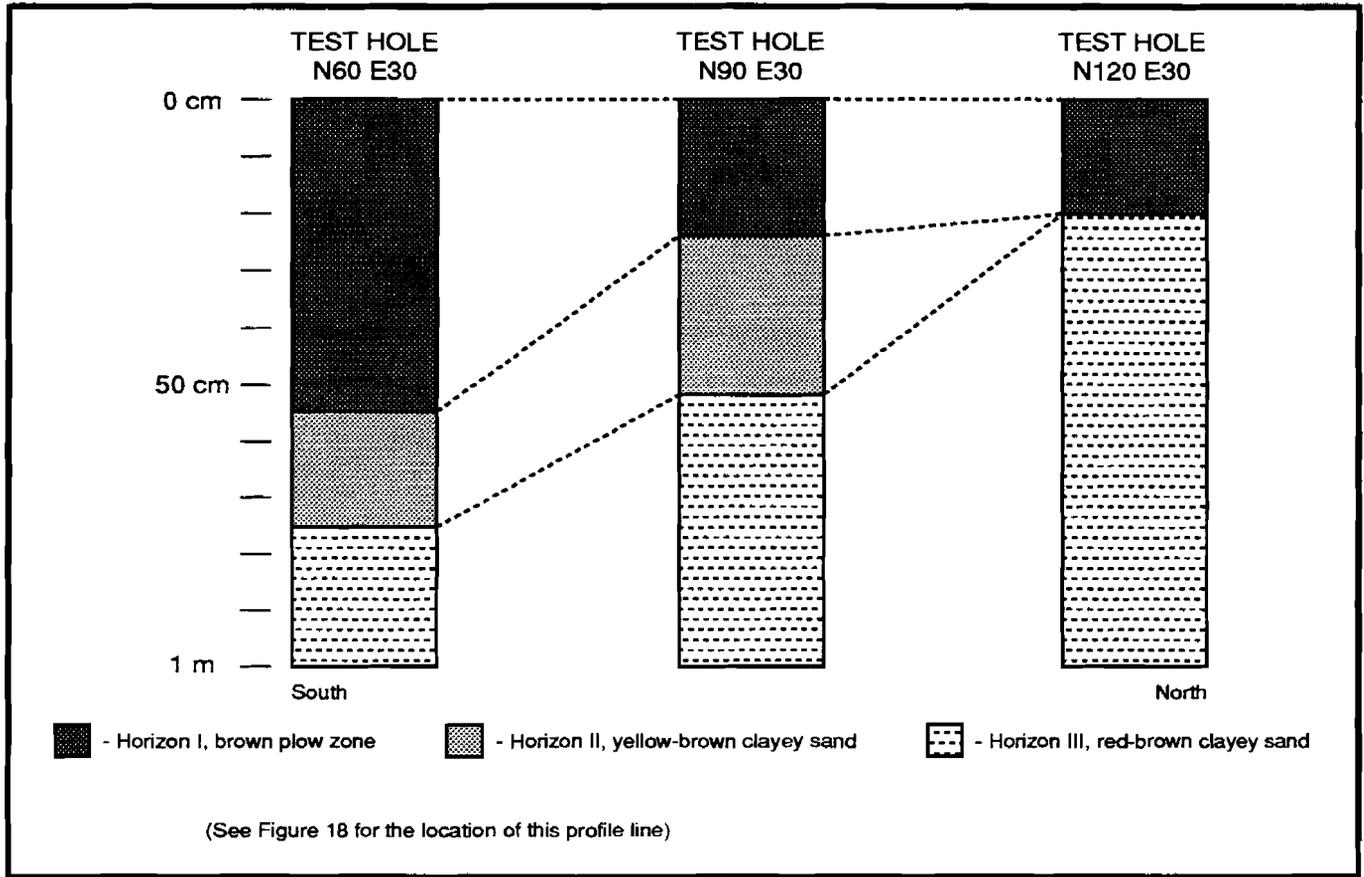


FIGURE 19  
Representative Stratigraphic Profile



## EXCAVATION RESULTS

### Stratigraphy

The stratigraphy of the Leipsic Site consists of three main soil horizons (Figure 19). Horizon I consists of a medium brown sandy plow zone overlaying the entire site. This horizon varies in thickness from 20 cm to 50 cm across the site, and both historic and prehistoric artifacts were recovered from it. Horizon II was located directly below the plow zone in the southernmost portion of the site closest to the Leipsic River and averaged approximately 20 cm deep in this part of the site. Horizon II consists of dark yellow-brown clayey sand and is not continuous across the site. This horizon was present at shallower depths, approximately 10 cm deep, in the central portion of the site, and was absent from profiles in the northernmost portion of the site. Both historic and prehistoric artifacts, including Woodland I stemmed points and Woodland II ceramic sherds, are present in this horizon, suggesting that it had been disturbed.

**TABLE 3**  
**Summary Catalog of Total Lithic Artifacts**

Artifact Type	Quartzite	Quartz	Chert	Jasper	Rhyolite	Argillite	Ironstone	Chalcedony	Other	TOTAL
Flakes	851 (196)	3251 (852)	1695 (485)	5674 (2415)	305 (10)	162	63 (4)	595 (75)	22 (2)	12618 (4039)
Utilized flakes	33 (16)	209 (86)	81 (41)	206 (124)	--	2	3	46 (16)	--	580 (283)
Flake tools	17 (10)	137 (60)	56 (30)	172 (95)	2 (1)	4 (2)	3 (1)	26 (7)	1	418 (206)
Paleo-Indian points	--	--	2	4	--	--	--	--	--	6
Archaic points	--	1 (1)	--	1	--	1	--	--	--	3 (1)
Woodland I points	2	7	8 (2)	36 (13)	--	11	5 (1)	2	1	72 (16)
Woodland II points	1	--	1	--	--	--	--	--	--	2
Early stage biface rejects	6 (4)	8 (3)	8 (8)	18 (17)	--	2	--	--	--	42 (32)
Late stage biface rejects	4	14 (2)	7 (1)	19 (5)	--	3	3 (1)	--	1	51 (9)
Miscellaneous stone tools	9 (1)	12 (3)	3 (1)	7 (3)	--	2	--	3	1	37 (8)
Shatter	63 (4)	1306 (47)	65 (2)	271 (21)	--	4	5	17 (3)	1	1732 (77)
Cores	2 (1)	32 (37)	10 (9)	68 (55)	--	--	--	--	--	112 (92)
Total	988 (232)	4977 (1091)	1936 (579)	6476 (2748)	307 (11)	191 (2)	82 (7)	689 (101)	27 (2)	15673 (4963)
# - artifact count (#) - artifacts with cortex										
25 groundstone tools 1362 fire-cracked rocks (53 kg)										

The northern part of the Leipsic Site is situated on a slight rise in the landscape which gradually levels off going south toward the Leipsic River. The absence of Horizon II in the northern part of the site and its presence in increasing depth in the central and southern parts of the site suggests the possibility that soils eroded off the northern surface sometime during the Holocene, were transported by either slope wash or aeolian processes, and were deposited onto lower parts of the site where they accumulated.

Horizon III was located directly under the plow zone in the northern part of the site and under Horizon II in the remainder of the site. This horizon consists of red-brown clayey sand, probably of Pleistocene origin. No artifacts were present in soils below Horizon II except those contained in intrusive pits dug by the site's prehistoric inhabitants. No evidence of discrete depositional living surfaces, apart from subsurface features, was observed below the plow zone.

### Excavated Artifacts

The complete catalog of all artifacts recovered from the excavation of the Leipsic Site is on file at the University of Delaware Center for Archaeological Research. A summary catalog of excavated lithic artifacts is contained in Table 3. The assemblage consists of projectile points, bifaces, cores, flakes, flake tools, and utilized flakes. Analysis of these artifacts will be presented in the discussion of stone tool technologies, settlement patterns, and activity areas.

The Leipsic ceramic assemblage consists of sherds tempered with a variety of materials, including grit, crushed quartz, hematite, and shell, and steatite. Pottery types represented in this assemblage include Marcey Creek, Wolfe Neck, Mockley, Killens Ware, Wilgus Ware, Hell Island,

**TABLE 4**  
**Ceramic Inventory**

Type	Number of Sherds
Miscellaneous Experimental	15
Marcey Creek	13
Dames Quarter	4
Wolfe Neck	3
Coulbourn/Wilgus	15
Mockley	7
Hell Island	200
Clemson Island	166
Townsend	64
Minguannan/Killens	44
Unidentified	135

Clemson Island, Townsend, and Minguannan. In addition, numerous small, unidentifiable sherds are present in the assemblage. A summary catalog of excavated ceramic artifacts is provided in Table 4.

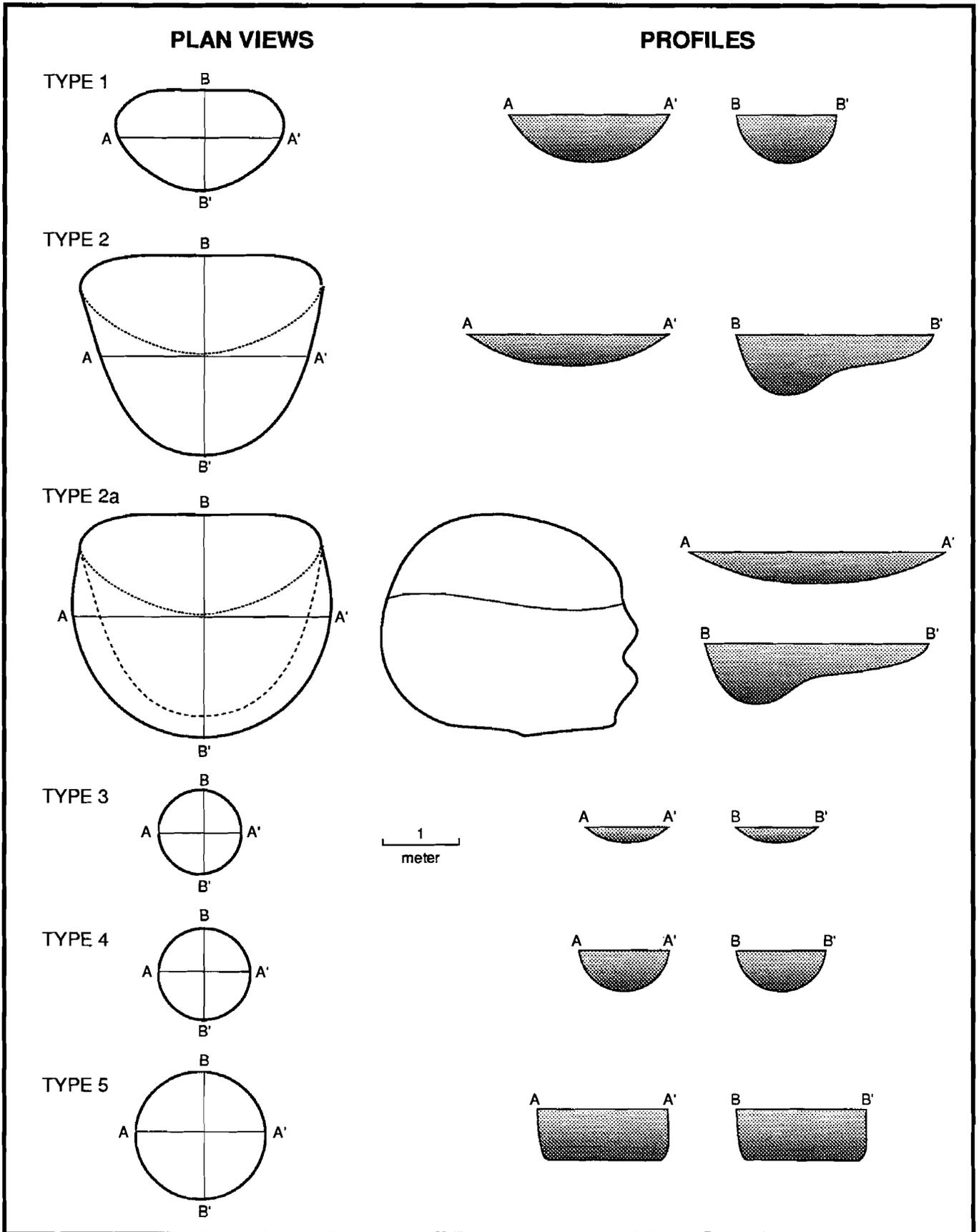
### **Features**

During Phase III data recovery at the Leipsic Site a total of 358 features were identified and excavated (Figure 20). Of the 358 features, 109 were non-cultural or historical in origin. Thus, numerical gaps appear in the final list of identified prehistoric cultural features. The non-cultural/historical features will not be discussed further. Two separate maps of features are included as attachments to this report and are intended for easy use as additional figure references for the report. Attachment I shows the features and feature clusters on the basic site map. Attachment II shows feature cluster locations superimposed on the aerial photograph of the site. Feature clusters are described later in this report.

In order to standardize the discussion of the features, the cultural features at the Leipsic Site were classified into five basic categories, Type 1 through Type 5 (Figure 21), based solely on feature shape. This classification was developed specifically for the Leipsic Site and was partially based on a classification used at the Delaware Park Site (Thomas 1981). Each feature category will be described below, and representative examples will be discussed. It should be noted that Types 1, 2, and 2a are the same type of feature but their particular morphologies result from different degrees of soil deflation. Furthermore, Types 3 and 4 were determined to be similar functional types but of two different sizes. Finally, Type 5 is a feature type that has been recognized at other prehistoric base camps. A list of features, including their type designations and dimensions, appears in Appendix II. Individual descriptions of selected features are presented below along with plan view and profile maps.

FIGURE 21

Feature Type Plan Views and Profiles



## PLATE 9

### Example of a Type 1 Feature (Feature 251)



Feature Type 1. Feature Type 1 is the most common feature type found at the Leipsic Site. A total of 197 Type 1 features, 80% of the cultural features at the site, were excavated (Figure 22). The surface area of these features ranges in size from 1 to 9 square m, and the average depth is 96 cm. This feature type appears as a kidney shaped soil stain generally twice as long as it is wide and slightly asymmetrical along its long axis in plan view (Figure 21, Plate 9). The cross-section profile along the long axis of Type 1 features is symmetrical and is characterized by gently sloping sides. The short axis profile is less symmetrical, as reflected in the feature's plan view, and is characterized

by steeper sides which join off center to form a rounded bottom. Type 1 features appear to have lost a significant amount of their original volume, perhaps as much as 30 to 50 percent, due to soil deflation and erosion.

Type 1 features are found within Type 2 or 2a household structures, generally along their back walls, and probably represent the remains of cellar hole-like storage areas. A Type 1 feature indicates that at one time a dwelling stood over that place; however, the pit house walls and floor remains have subsequently been destroyed by site deflation and historic plowing. Since the remains of the cellar holes observed in Type 1, 2, and 2a features have a long axis and a short axis, the compass orientation of the dwellings may be assumed. Further discussion of potential feature functions is presented later in this report.

After the excavation of numerous Type 1 features, a decision was made to test areas adjacent to these features to determine whether deflation had completely obliterated the house floors or whether significant information about the house floors and their interface with the cellar holes was still preserved. The tests consisted of 2 m square units excavated in 2 cm levels. The test units were designated "Plan B" and were placed adjacent to the long convex side of Type 1 features. One additional test unit, designated "Plan C," was placed adjacent to the straight side of one Type 1 feature (Feature 195). Eight Plan B tests were conducted on Type 1 features (Table 5). Five of the tests recovered cultural materials and/or evidence of erosion or disturbance along the rim of the feature created by water runoff. These results indicated the likelihood that deflation had occurred and supported the inference that these Type 1 pits were at one time overlain by wider house floors. However, the information obtained from Plan B tests was not significant enough to warrant any further Plan B testing of the cellar-hole features. The Plan C test conducted adjacent to the straight side of Feature 195 did not uncover any new information and no further Plan C testing was carried out.

Feature 202 is a good example of a Type 1 feature. This feature, located in the southeastern portion of the site (Figure 22), measures 1.5 m x 3.2 m and is 95 cm deep (Figure 23). Feature fill consisted of gray-brown clayey loam soil. Artifacts recovered from the feature consisted of 284 lithic flakes and shatter, one quartz late stage biface, 21 unretouched utilized flakes and unifacial tools, two groundstone tools, 60 fire-cracked rocks (1,417 g), one crushed quartz- and grit-tempered, cord-marked ceramic sherd, and four grit-tempered ceramic sherd fragments.

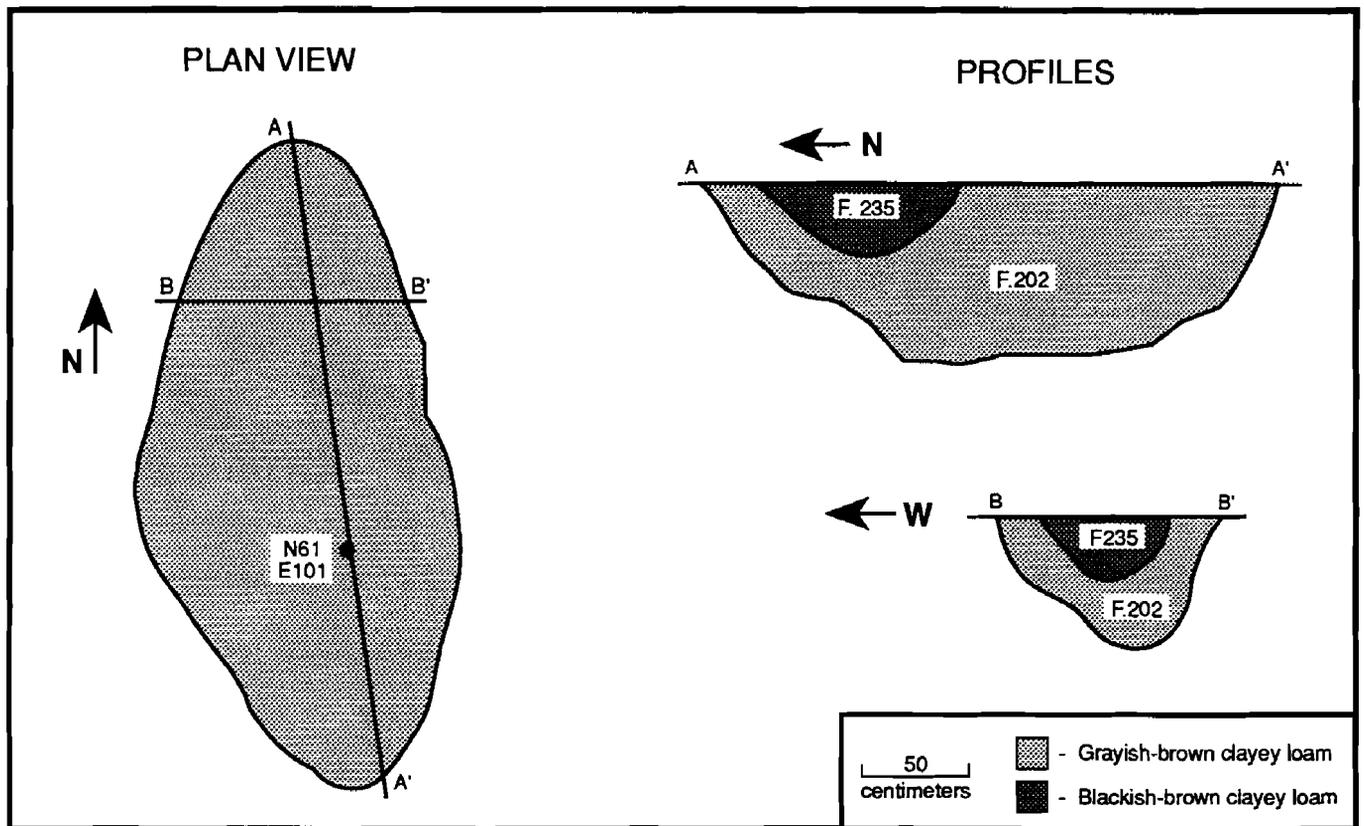
Feature 235 is a burned area located in the upper central portion of Feature 202 (Figure 23). Site deflation and mechanical plowing disturbed perhaps the uppermost 30 cm of Features 202/235, mainly affecting the upper half of Feature 235. Feature fill consisted of blackish-brown clayey loam soil. Artifacts recovered from Feature 235

**TABLE 5**  
**Type 1 and Type 2 Features**  
**Where Plan View B Tests**  
**Were Applied**

<b>Feature (Type 1)</b>	<b>Plan View B</b>	<b>Plan View C</b>
63/251	Yes	No
77/92/94	Yes	No
195	Yes	Yes
248	Yes	No
255/256	Yes	No
264	Yes	No
275	Yes	No
282	Yes	No
<b>Feature (Type 2)</b>		
9	Yes	No

FIGURE 23

Plan View and Profile of Feature 202/235 (Type 1)



consisted of 121 lithic flakes and shatter, one quartz Woodland I point, one quartz early stage biface, a quartz core, and six unifacial tools and utilized flakes.

The flotation sample from these features contained 244 small lithic flakes and 27 g of carbon in the heavy fraction. The light fraction consisted of charred seeds, including carpetweed, copperleaf, and one unidentified nut hull fragment, spores, and 2.5 g of carbon. A detailed analysis of the artifacts and ecofacts recovered from flotation samples is presented later in this report.

Feature 255/256 is another Type 1 feature located in the southeastern part of the site (Figure 22). This feature was thought to be two separate features when originally identified but was later determined to be one feature. The entire feature measured 2.8 m x 3.2 m and extended to a depth of 125 cm (Figure 24), making Feature 255/256 the largest of the Type 1 cellar-hole features.

At the surface of Level 3 in Feature 255/256 was a large (85 x 35 cm) piece of bark (labeled Artifact A), a concentration of charcoal (labeled Area B), probably from a burned tree root, a circular area of burned soil with charcoal flecks (labeled Area C) surrounding Artifact A and extending down to 90 cm below subsoil, and two additional pieces of tree bark (labeled Artifact D-1 and D-2) (Figure 24, Plate 10). Artifact A was pedestaled while excavation proceeded around it (Figure 25). Soil beneath Artifact A in Area C consisted of an upper stratum of gray-brown clay feature fill. Beneath this stratum was a thin layer of bright red, compacted, burned soil, and below this horizon was a thinner horizon of dark brown sandy silt with high organic content. Artifact A was cut into three pieces and removed for Carbon-14 dating. All of the burned soil from Area C was removed for flotation, and the remainder of Area C was excavated as Level 3. The remaining feature fill was then completely excavated to a depth of approximately 125 cm below subsoil (Figure 24).

FIGURE 24  
 Plan View and Profile of Feature 255/256 (Type 1)

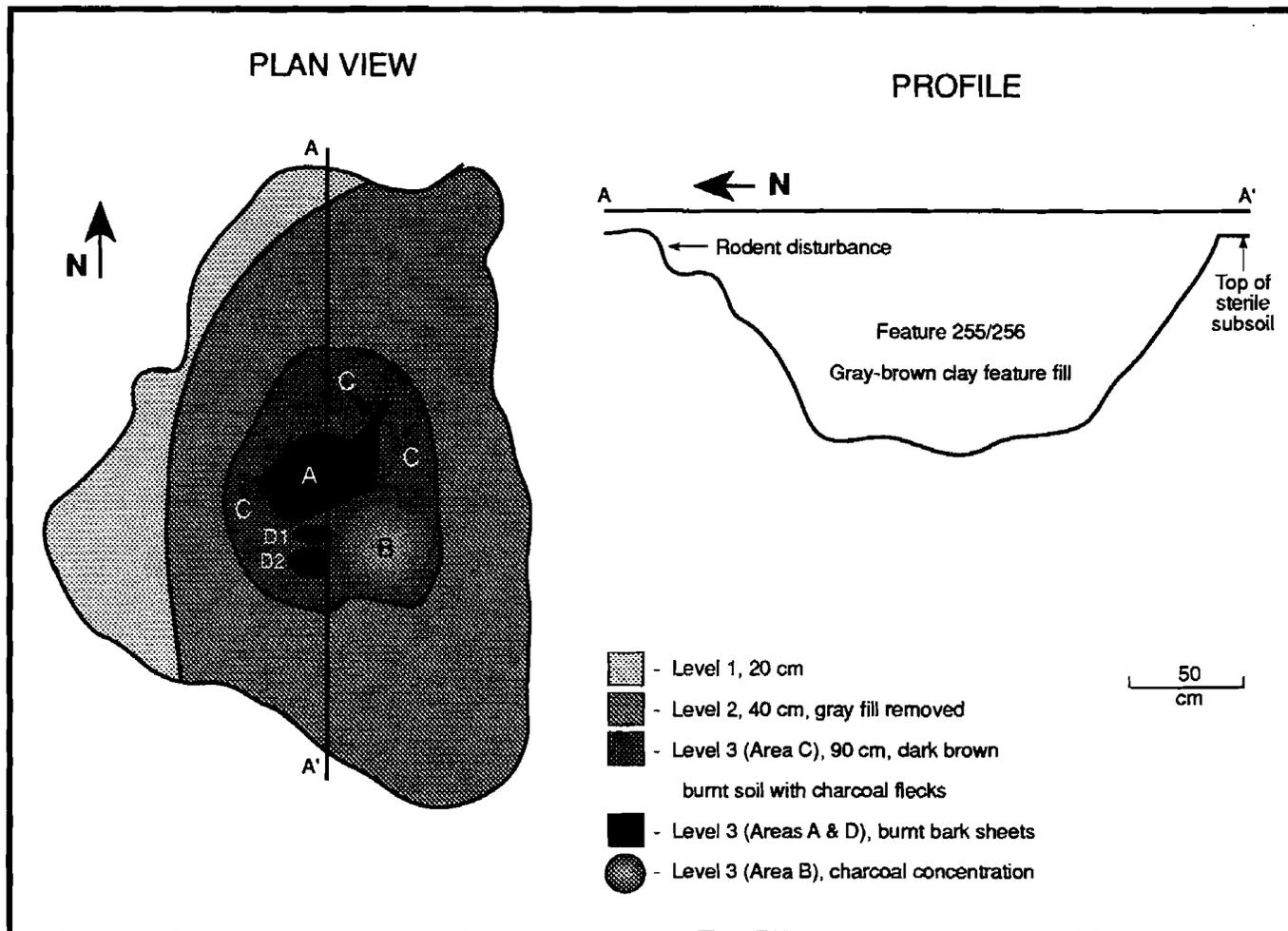


FIGURE 25  
 Profile of Feature 255/256, Area C (Type 1)

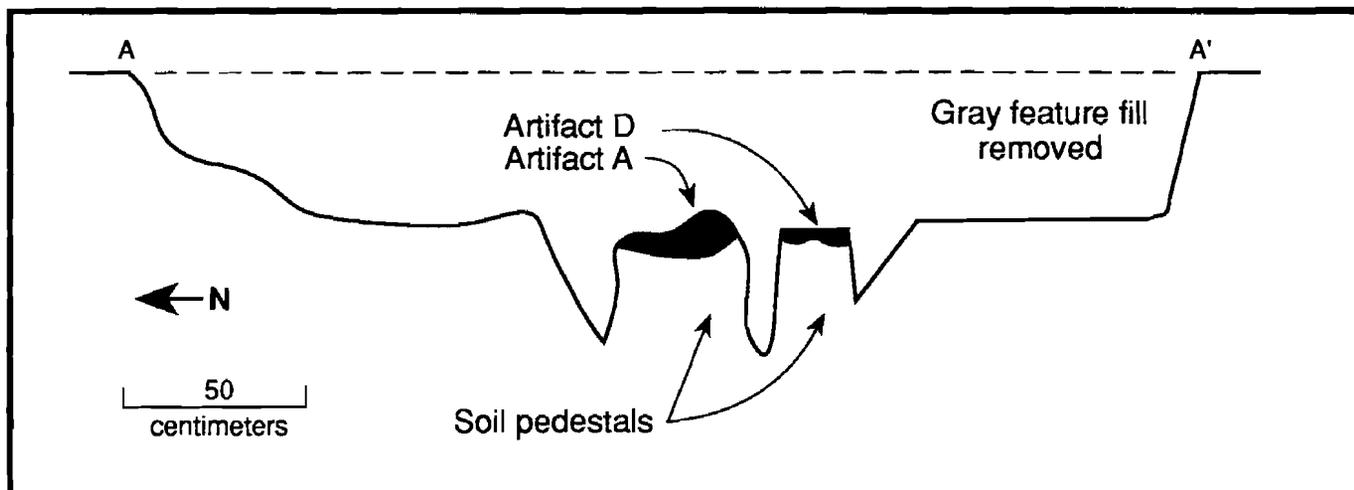


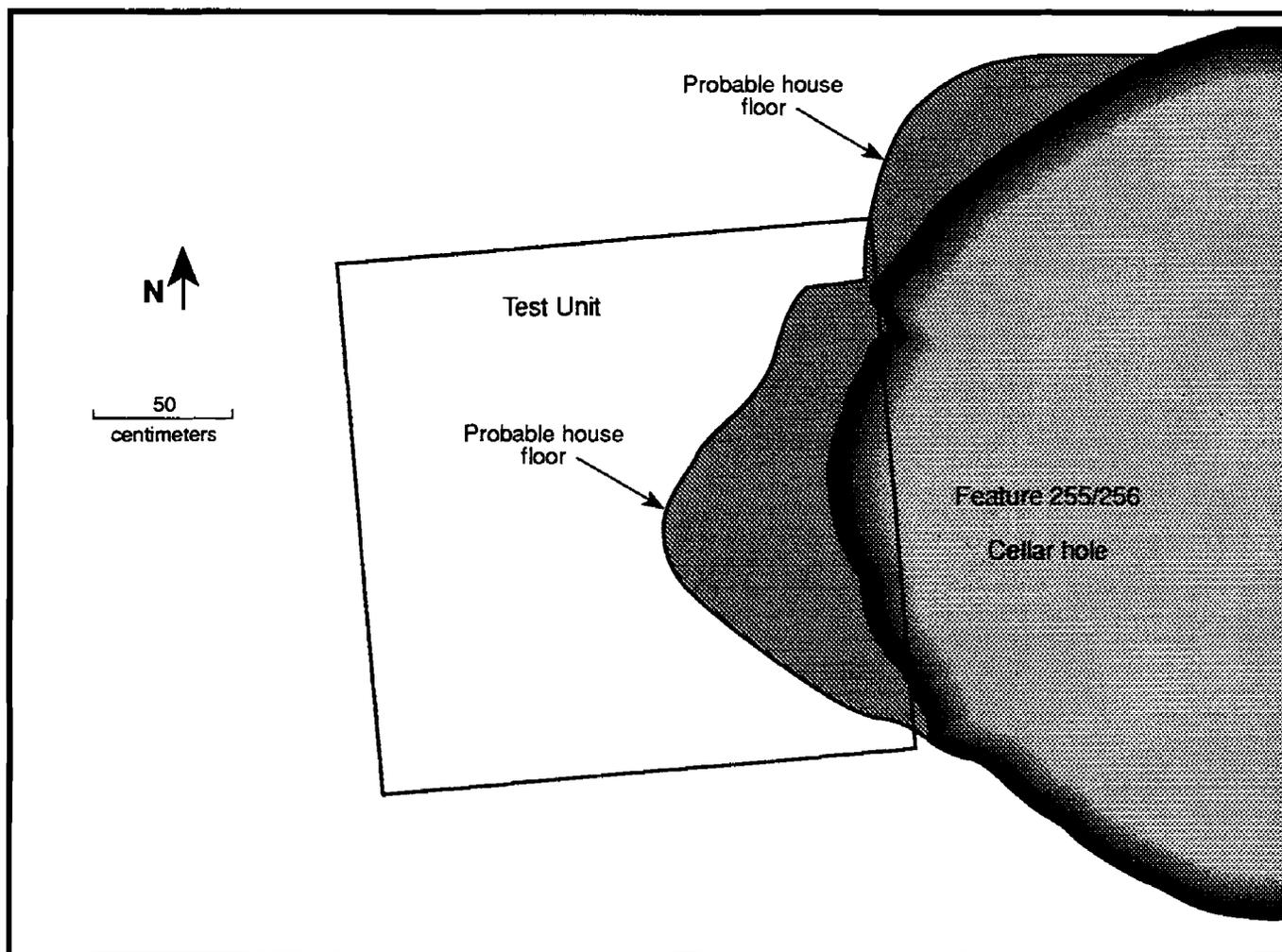
PLATE 10  
Bark Sheets from Feature 255/256 (Type 1)



A sample of Artifact A bark provided an uncorrected radiocarbon date of 1080 +/- 130 years before present (Beta-42881) with a calibrated date range of A.D. 778-1148 and a mid-point of A.D. 981 (Stuiver and Becker 1986). A sample of Artifact D bark provided an uncorrected date of 770 +/- 170 years before present (Beta-42882) with a calibrated date range of A.D. 1040-1390 and a mid-point of A.D. 1261 (Stuiver and Becker 1986).

FIGURE 26

Plan B Test Unit Adjacent to Western Edge of Feature 255/256

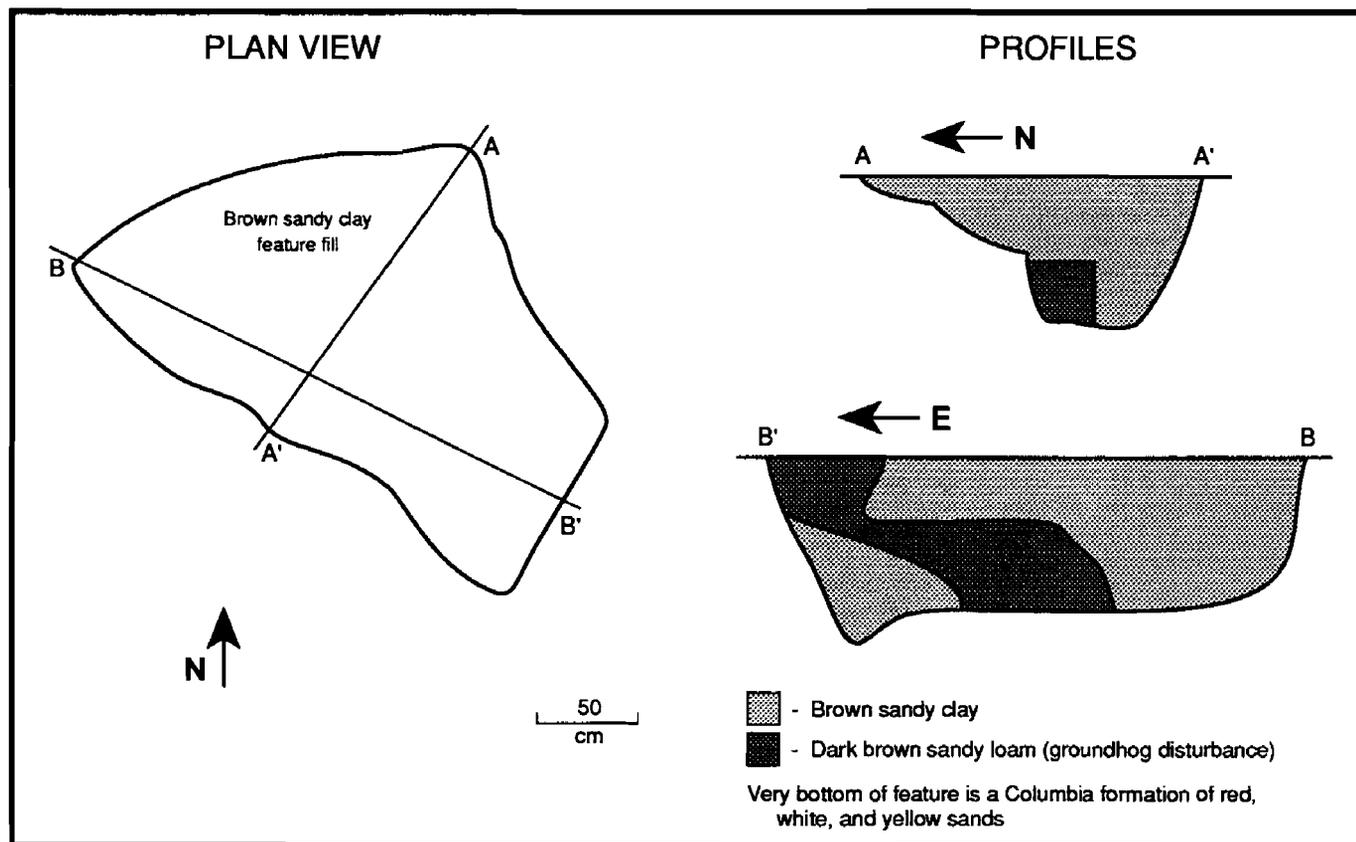


Artifacts recovered from feature fill included lithic debitage, unretouched utilized flakes and flake tools, one quartz late stage biface, one quartzite early stage biface, one jasper core, 23 fire-cracked rocks (1,630 g), eight crushed shell and grit-tempered or crushed shell and hematite-tempered Killens ware ceramic sherds, and four crushed shell-tempered ceramic fragments. The flotation sample from the feature contained 10 lithic flakes and 11.3 g of carbon in the heavy fraction. The light fraction consisted of charred edible seeds, including Amaranth, Chenopodium, Chokeberry, Solomonseal, and nut hull fragments, and non-edible seeds such as Primrose and Tuliptree among others. A detailed analysis of the artifacts and ecofacts recovered from flotation samples is presented later in this report.

Feature 255/256 was deflated enough to be designated a Type 1 feature; however, a remnant of the house pit floor was observed. A Plan B test unit was excavated adjacent to the feature and showed a floorplan starting at the outer edge of the cellar-hole becoming successively deeper toward the center (Figure 26). Very little evidence of erosion or natural backfilling was observed. One Killens ceramic sherd was recovered from the deepest portion of the Plan B test unit.

Feature Type 2. Type 2 features are not as numerous as Type 1 features at the Leipsic Site and represent only 4% of the cultural features. Ten Type 2 features were identified (Figure 27) at the Leipsic Site. In general, these features appear triangular in plan view (Figure 21) with surface areas ranging in size

FIGURE 28  
Plan View and Profile of Feature 142 (Type 2)

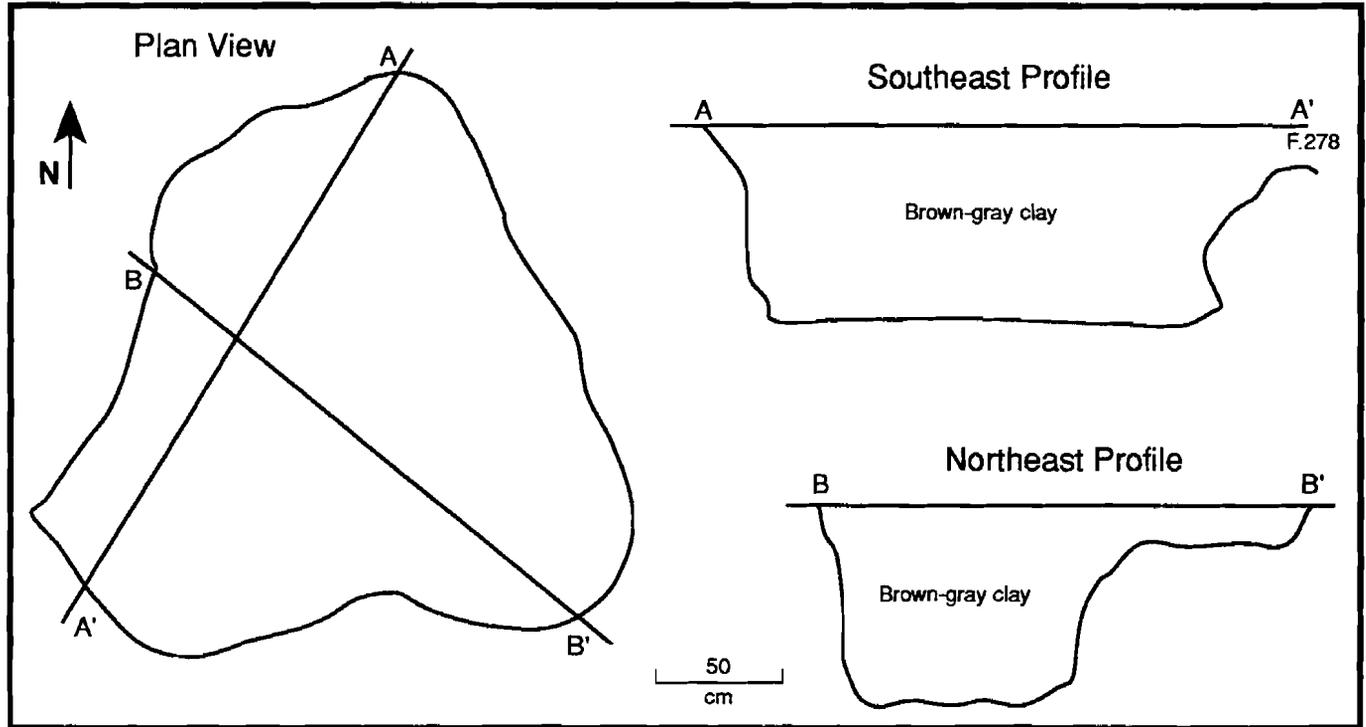


from 2 to 16 square m. Type 2 depressions have gently sloping walls and the floors slope downward to join an internal cellar hole (Type 1 pit feature) at one end of the Type 2 feature area (Figure 21). The average depth of Type 2 features is 81 cm.

Feature 142 is a good example of a Type 2 feature. This feature, located in the central portion of the site (Figure 27), measures 2.2 m x 2.85 m and is 95 cm deep (Figure 28). Feature fill consisted of brown sandy clay subsoil, with a rodent disturbed area in the center of the feature extending from approximately 45 cm to 75 cm below the surface of subsoil (Figure 28). The majority of artifacts were recovered from the upper half of the feature fill. Lithic artifacts included lithic debitage and unretouched utilized flakes and flake tools, and eight fire-cracked rocks (612 g). Two crushed shell-tempered ceramic sherds and 11 unidentifiable ceramic sherds were also recovered from feature fill. The flotation sample from the feature contained two flakes and 0.6 g of carbon in the heavy fraction. The light fraction consisted of seeds, spores, nut hull fragments, and 0.3 g of carbon. More detailed discussions of the flotation analysis will be presented later in the report. The triangular shape of the feature's plan view indicates that a portion of the house pit floor has been preserved, and that the feature did not experience as much deflation as a Type 1 cellar hole.

Feature 277 is also a Type 2 feature and is located in the southwestern portion of the site (Figure 27). The feature measures 3 m x 2.9 m, is 95 cm deep (Figure 29), and consists of a central core that extends to a depth of 95 cm below surface. A portion of the house pit floor is present in the upper 20

FIGURE 29  
Plan View and Profile of Feature 277 (Type 2)



cm of the feature (Figure 29). Lithic artifacts recovered from the feature include debitage, four unretouched utilized flakes, 35 fire-cracked rocks (819 g), one quartzite early stage biface reject, one jasper early stage biface reject, and one chalcedony biface fragment. Three crushed quartz and grit-tempered ceramic sherds were also recovered from feature fill. The flotation sample from Feature 277 contained 65 flakes and 44.2 g of carbon in the heavy fraction. The light fraction consisted of one charred edible seed (Ground Cherry) and one nut fragment, 30 seeds of non-edible plant species, 168 spores, and 4.8 g of carbon.

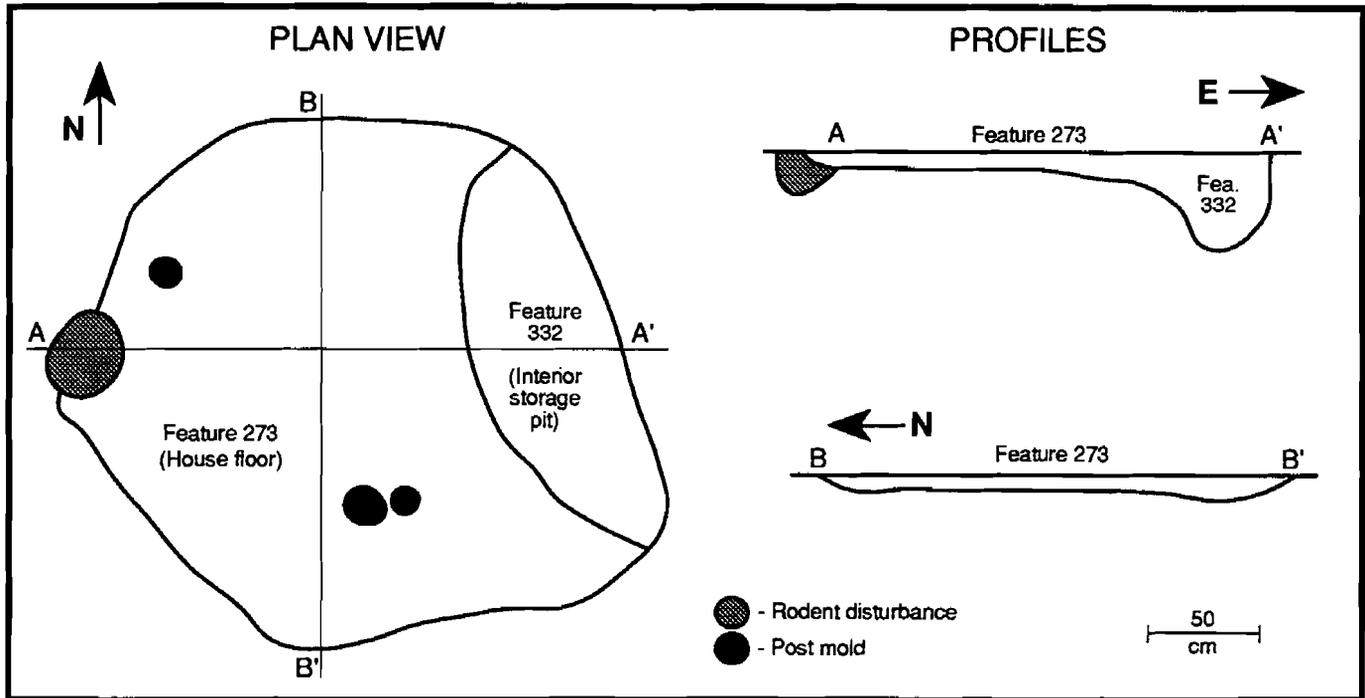
Feature Type 2a. Only two Type 2a features were found at the Leipsic Site (Figure 27). Type 2a features appear roughly circular in shape and, in general, are shallow in profile with gently sloping walls (Figure 21). For the most part, Type 2a features are versions of Type 1 and Type 2 features that have not yet been as badly truncated by erosion.

Feature 273/332 is a good example of a Type 2a house pit feature with associated cellar hole. The feature is located in the southwestern corner of the site (Figure 27), roughly circular in shape, and measures 3.6 m by 3.6 m (Figure 30). Feature 273 appeared on the surface of subsoil as a yellow-brown stain within a red sandy subsoil matrix. At the east end of Feature 273 was an elongated area of darker soil with a small concentration of fire-cracked rocks on the surface. The area of darker soil was designated Feature 332 (Figure 30).

A 50 cm wide trench was excavated in an east/west direction across Features 273 and 332 along the N53 E32 grid line. The trench excavation showed that Feature 273 extended a uniform 15 cm in depth to a reddish clayey sand house pit floor; however, it became obvious that Feature 332 soil went

FIGURE 30

Plan View and Profile of Feature 273/332 (Type 2a)



much deeper. Feature 273 was then completely excavated and the feature fill consisted of yellow-brown sand. Artifacts recovered from Feature 273 consisted of 51 pieces of lithic debitage, one jasper flake tool, and one quartzite late stage biface. A small area of rodent disturbance was observed on the west side of Feature 273 near grid coordinate N54 E30 (Figure 30). In the floor of Feature 273, at 15 cm below surface of subsoil, were three circular stains approximately 20-30 cm in diameter (Figure 30). Excavation showed these stains to be shallow depressions, approximately 7-10 cm deep (Figure 30). No artifacts were recovered from the holes and their shallow depths suggest that they were not associated with structural posts. It is possible that these depressions were associated with internal partitions or furnishings of the structure.

Feature 332 extended to a depth of 70 cm below the surface of subsoil and feature fill consisted of moist gray clay (Figure 30). Artifacts recovered from feature fill consisted of 78 pieces of lithic debitage, one jasper flake tool, nine fire-cracked rocks (644 g), five unidentifiable ceramic sherds, one crushed shell-tempered rim sherd, and one hematite-tempered body sherd. Feature 332 probably represents a Type 1 storage cellar located along the east wall of the house pit floor (Feature 273). The flotation sample from Feature 273/332 contained 23 flakes and 1.9 g of carbon in the heavy fraction. The light fraction consisted of 1.1 g of carbon, edible seeds such as Pokeweed and non-edible varieties, including Bristlegrass, Copperleaf, and Panicum.

Feature 17, a second Type 2a feature, was located in the southwestern portion of the site (Figure 27). The feature is roughly circular in shape and measures 4 m by 4.1 m (Figure 31). Feature 17 was first identified during Phase II excavations of Test Unit 42 (N60 E42) at 58 cm below ground surface (Figure 32). During these excavations, the north wall of the feature was located and partially excavated (Riley, Bachman et al. 1994). Complete excavation occurred in Phase III.

FIGURE 31  
Plan View of Feature 17 (Type 2a)

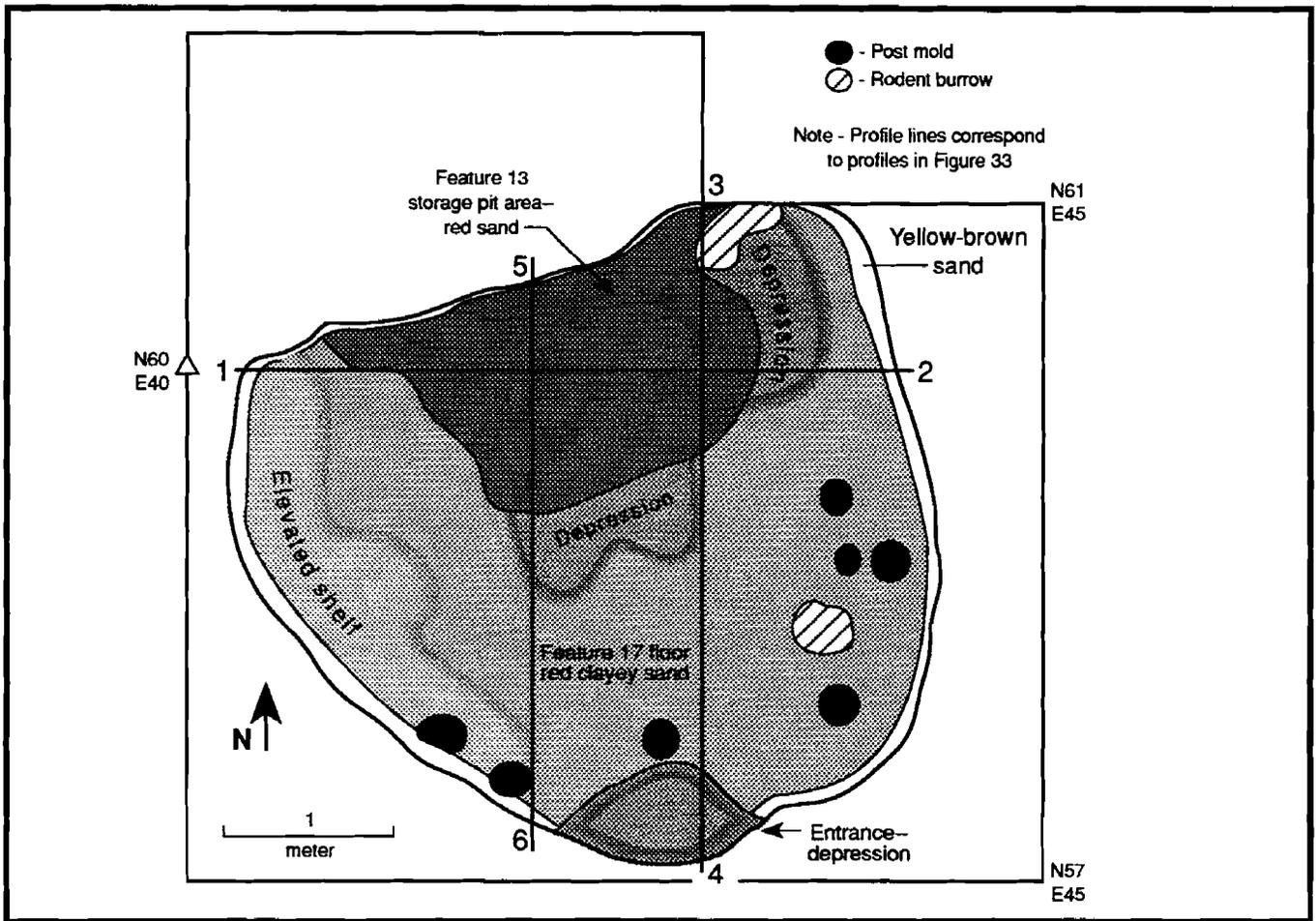


FIGURE 32  
Location of Feature 17 (Type 2a)  
in Phase II Test Units 40, 41, and 42

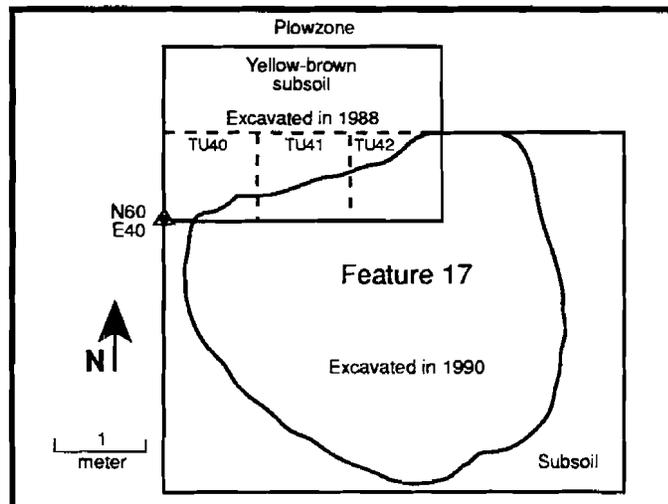
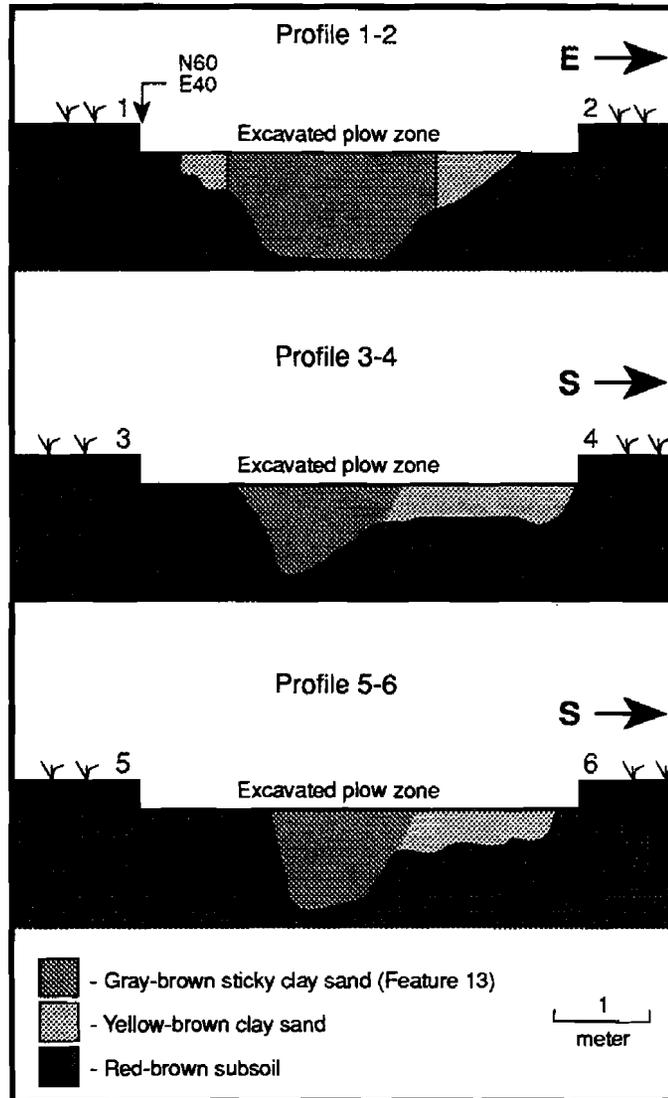
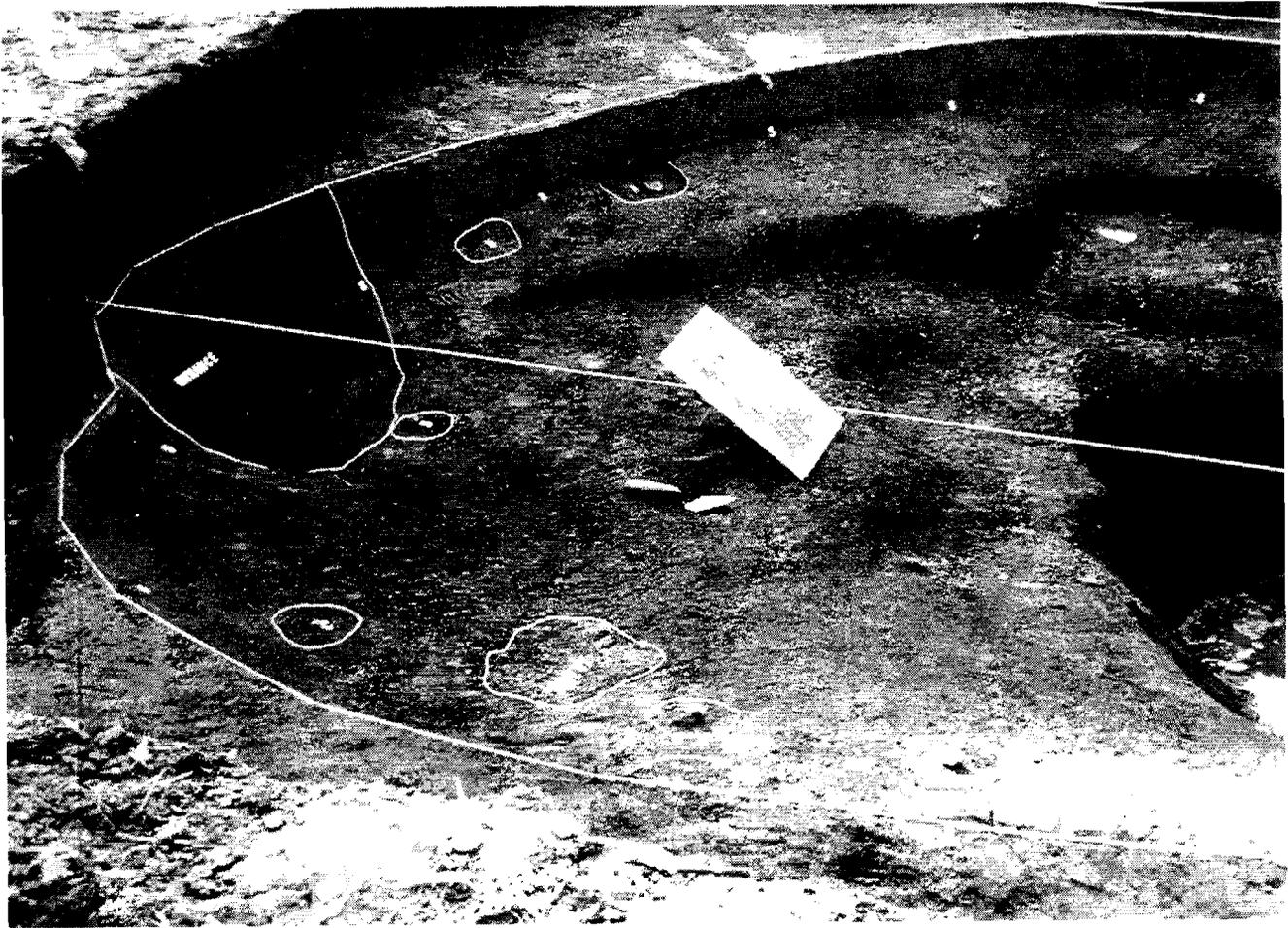


FIGURE 33  
 East/West and North/South  
 Profiles of Feature 17 (Type 2a)



In general, the roughly circular house pit floor extended approximately 30 cm below the surface of subsoil. However, a much deeper area (Feature 13 extending 115 cm below subsoil), probably a Type 1 storage cellar, was observed at the north end of Feature 17 (Figures 31 and 33). Feature fill consisted of gray-brown sticky clay sand in the deepest part of the pit and a yellow-brown clay sand in the shallower area (Figure 33). Artifacts recovered from feature fill included 454 pieces of lithic debitage, 31 unretouched utilized flakes and flake tools, two jasper stemmed Woodland I points, one weathered argillite stemmed point, one chert stemmed point, one quartz biface fragment, one jasper core, 63 (2,256 g) fire-cracked rocks, seven steatite-tempered ceramic sherds, and two Hell Island sherds. Similar artifact types were recovered from Phase II excavation of Feature 17. The fire-cracked rocks were randomly distributed throughout the feature fill and were not concentrated on the house pit floor. Therefore, no definable hearth was present in the feature.

PLATE 11  
Post Molds in Feature 17 (Type 2a)



After the excavation had fully exposed the feature floor, several small, round pockets of loosely textured soil were observed. These areas were labeled A through G and excavated (Figure 31, Plate 11). The holes range from 15-20 cm in diameter and from 5-15 cm in depth and soil in the holes is consistent with that in the rest of the feature. No artifacts were recovered from these holes. The holes do not seem to be substantial enough to have served as structural supports, but may be associated with interior partitions. A shallow area of feature fill (extending down 8 cm from the house pit floor) was also observed along the south wall of Feature 17 which extended both inside and outside the wall (Figure 31). No signs of rodent disturbance are present, and this depression may represent a pass-through entrance to the house structure.

The flotation sample from Feature 17 contained 82 flakes and 9.8 g of carbon in the heavy fraction. The light fraction consisted of 2.2 g of carbon, nut hull fragments, and charred edible seeds such as *Chenopodium*, *Purslane*, and *Primrose* and non-edible seeds such as *Copperleaf*, *Germander*, *Panicum*, *Bristlegrass*, and *Carpetweed*.

Feature Type 3. Feature Type 3 is generally characterized as a shallow saucer-shaped pit feature that is relatively symmetrical in cross-section (Figure 21). The average surface area of these features is 1.3 square m, and the average depth is 20 cm. Seven Type 3 features were identified at the Leipsic Site (Figure 34). Type 3 features probably served as storage or refuse areas.

FIGURE 35

Plan View and Profile of Feature 326 (Type 3)

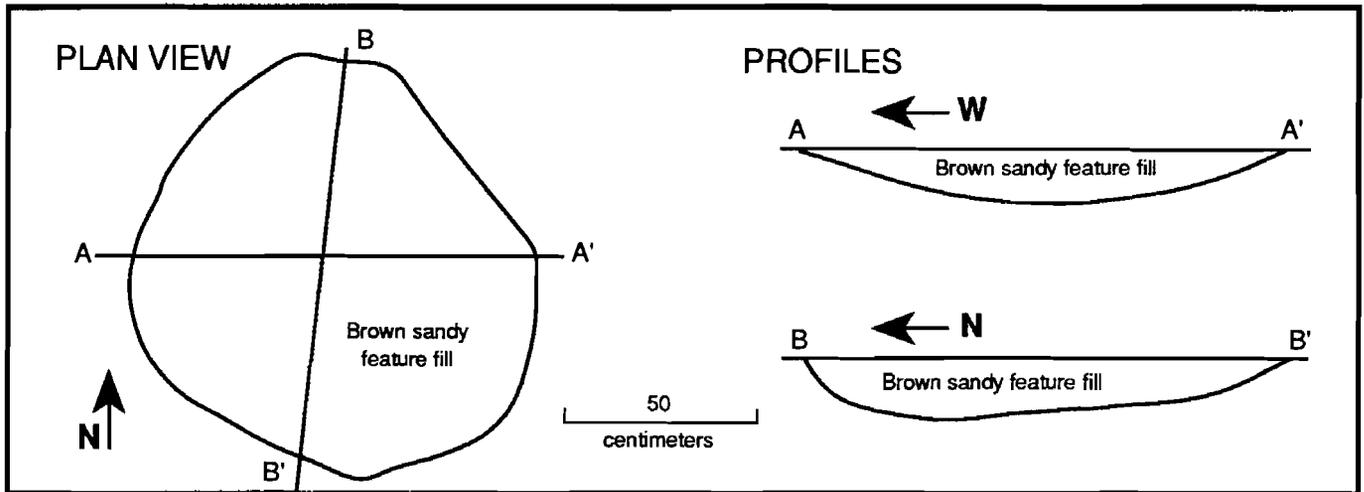
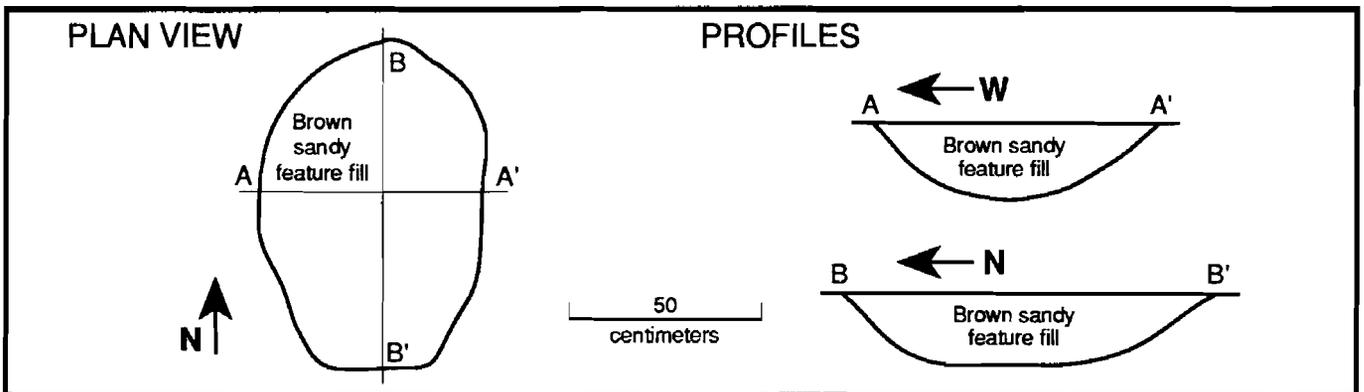


FIGURE 36

Plan View and Profile of Feature 327 (Type 3)



Features 326 and 327 are good examples of Type 3 features. Both features are located in the eastern portion of the site (Figure 34). Feature 326 appeared as a circular stain on the surface of subsoil and measured approximately 1 m by 1 m (Figure 35). Feature fill consisted of gray-brown sand, and the feature's depth was 15 cm (Figure 35). Artifacts recovered from feature fill consisted of 1 quartz flake. The flotation sample from this feature contained 0.1 g of carbon in the heavy fraction. The only charred seed remains in the light fraction consisted of Copperleaf.

Feature 327 appeared on the surface of subsoil as a circular stain that measured approximately 80 cm x 48 cm (Figure 36). Feature fill consisted of gray-brown sandy loam, and the feature's depth was 16 cm (Figure 36). No artifacts were recovered from feature fill, however, 0.6 g of carbon were recovered in the heavy fraction of the flotation sample. Charred Copperleaf seeds, spores, and 0.4 g of carbon were recovered in the light fraction.

**Feature Type 4.** In general, Type 4 features are characterized as bowl-shaped pit features that are similar to Type 3 features, but deeper (Figure 21). The average surface area of Type 4 features is 1.5 square m and the average depth is 50 cm. Sixteen Type 4 features (6% of the total features) were identified at the Leipsic Site (Figure 37). The greater depth of Type 4 features may indicate that they are a unique

FIGURE 38

Plan View and Profile of Feature 101 (Type 4)

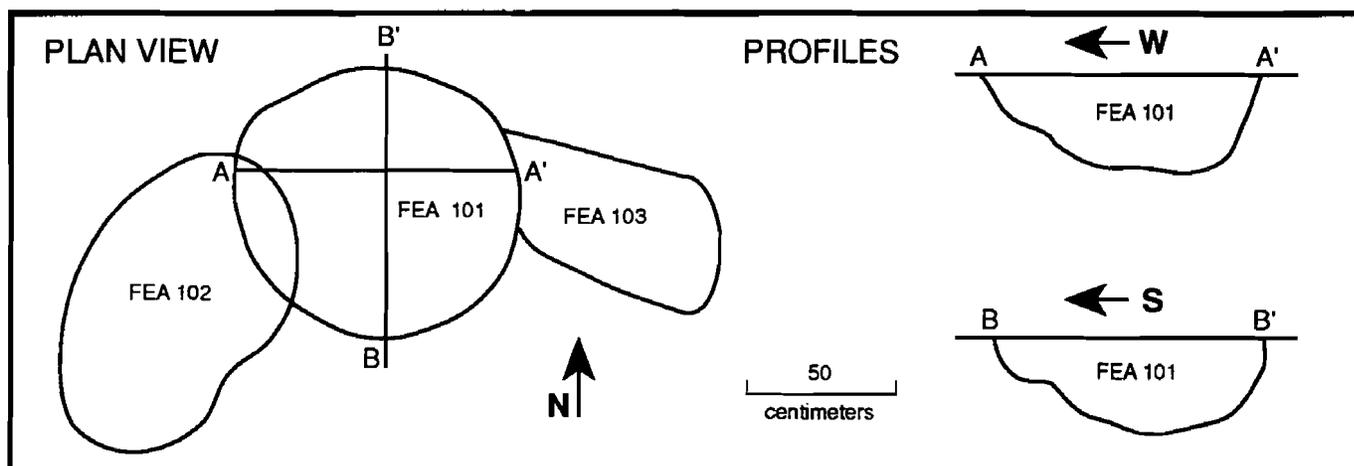
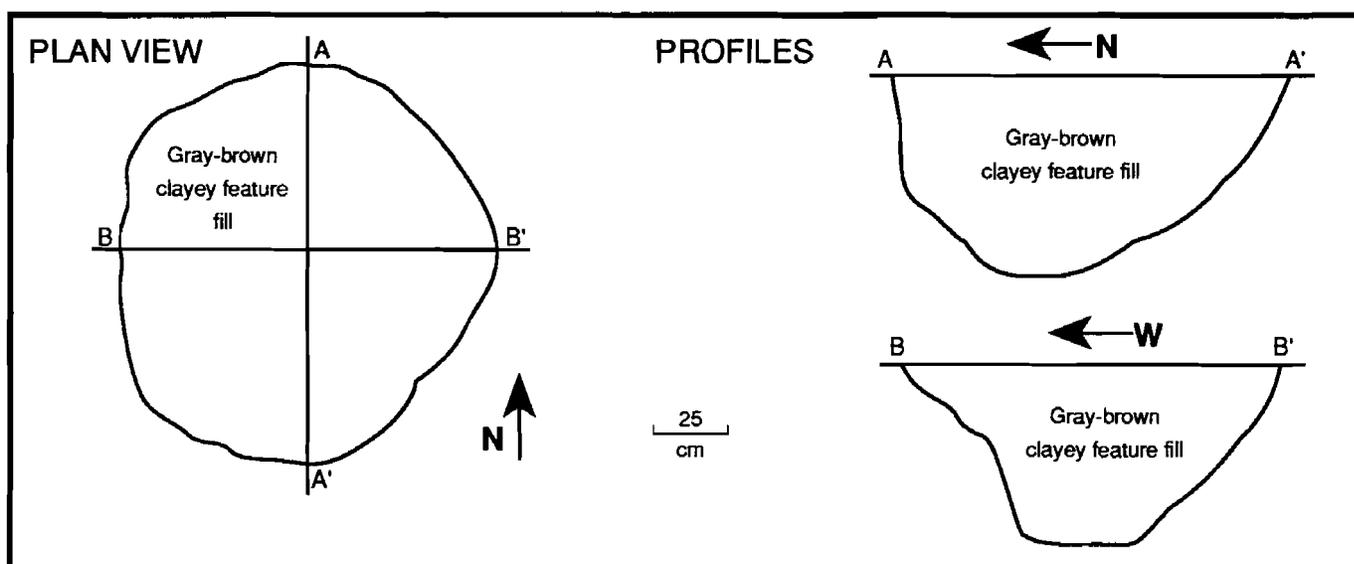


FIGURE 39

Plan View and Profile of Feature 200 (Type 4)

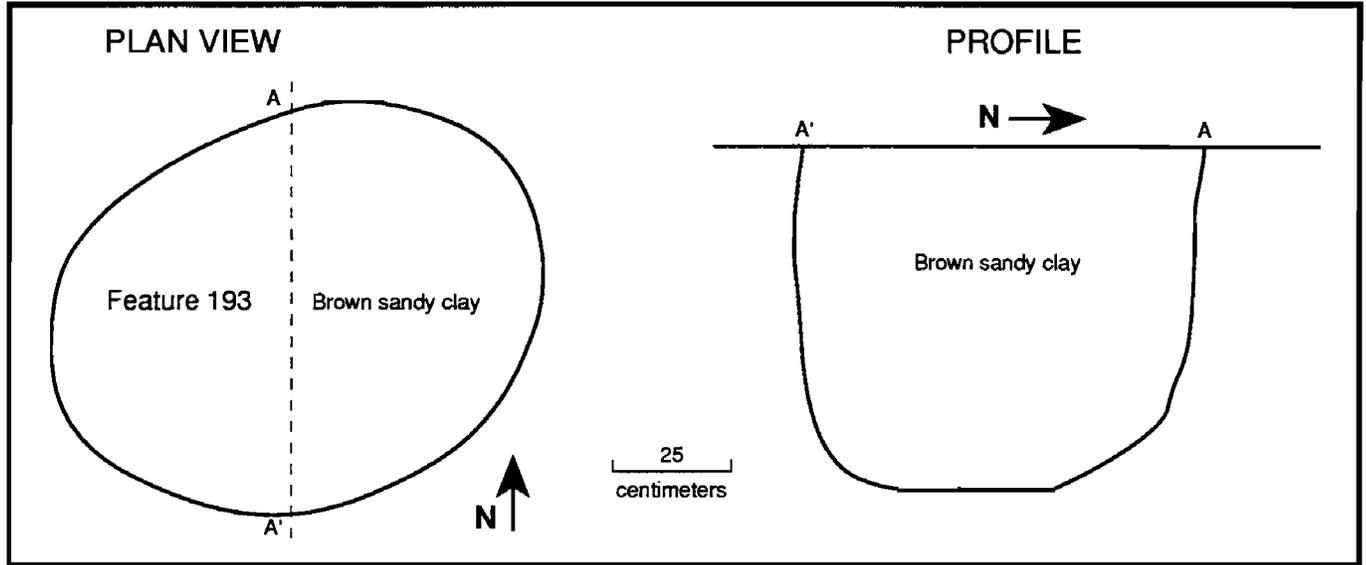


feature type and served a unique function, or they may simply be a less deflated version of Type 3 pit features. Both Type 3 and Type 4 pit features contained relatively few artifacts.

Features 101 and 200 are good examples of Type 4 features. Feature 101 is located in the center of the site and Feature 200 is in the southeastern portion (Figure 37). Feature 101 measures 70 cm x 70 cm and is 30 cm deep (Figure 38). The feature first appeared as a dark circular stain on the surface of subsoil 35 cm below ground surface just north of grid coordinate N82 E71. This feature intersects with Feature 102 to the west and Feature 103 to the east (Figure 38). Feature 101 fill consisted of pasty medium red-brown clayey sand. Artifacts recovered from fill consisted of 13 pieces of lithic debitage. The flotation sample from Feature 101 contained seven flakes and 2.2 g of carbon in the heavy fraction, and charred Copperleaf seeds and 0.2 g of carbon in the light fraction.

Feature 200 measures approximately 1 m by 1 m and is 55 cm deep (Figure 39). The feature was first identified on the surface of subsoil as a dark circular stain with charcoal surrounding grid point N61 E96. Feature fill consisted of gray-brown clay with charcoal flecks. Artifacts recovered from feature fill

FIGURE 41  
Plan View and Profile of Feature 193 (Type 5)



included five pieces of lithic debitage, one quartz unretouched utilized flake, and one quartz flake tool. The flotation sample from Feature 200 contained one flake and 1.2 g of carbon in the heavy fraction and 0.3 g of carbon in the light fraction. No charred seeds or nut hulls were recovered from this feature.

**Feature Type 5.** Type 5 features, like Type 3 and 4, are circular in plan view (Figure 21). The average surface area of Type 5 features is 1.3 square m. Type 5 features differ from Type 3 and 4, however, in profile (Figure 21). On average, Type 5 features are deeper and have straight walls that are nearly perpendicular to a flat pit floor. The average depth of Type 5 features is 70 cm. Eleven Type 5 features were identified at the Leipsic Site (Figure 40). These features probably functioned as storage or refuse pits.

Features 193 and 219, located in the east central and southeastern portions of the site (Figure 40), are good examples of Type 5 features. Feature 193 measures 1.05 m by 0.90 m and is 75 cm deep (Figure 41). This feature was first identified on the surface of subsoil as a dark circular stain surrounding grid point N75 E81. Feature fill consisted of brown sandy clay. Artifacts recovered in feature fill consisted of nine lithic flakes, one quartzite Woodland I stemmed point, and two fire-cracked rocks (208 g). All of the artifacts were recovered from the feature's upper half. The flotation sample from Feature 193 contained 1.8 g of carbon in the heavy fraction; no lithic artifacts were present in heavy fraction. The light fraction consisted of charred Copperleaf seeds and 0.3 g of carbon.

Feature 219 measures 1 m by 0.90 m and is 80 cm deep (Figure 42, Plate 12). The feature first appeared as a dark circular stain at grid point N47 E90. Feature fill consisted of brown sandy clay. Artifacts recovered from feature fill included 40 pieces of lithic debitage, an ironstone Lehigh/Koens-Crispin broadspear (Figure 45C), one groundstone tool, and eight (352 g) fire-cracked rocks. The flotation sample from Feature 219 contained 27 flakes and 27.1 g of carbon in the heavy fraction. The light fraction consisted of charred seeds, including Purslane, Wild Millet, Pigweed, Carpetweed, Copperleaf, Panicum, and Tuliptree, and 2.9 g of carbon. Over 2,000 spores were also recovered in the light fraction.

PLATE 12  
Feature 219 (Type 5)

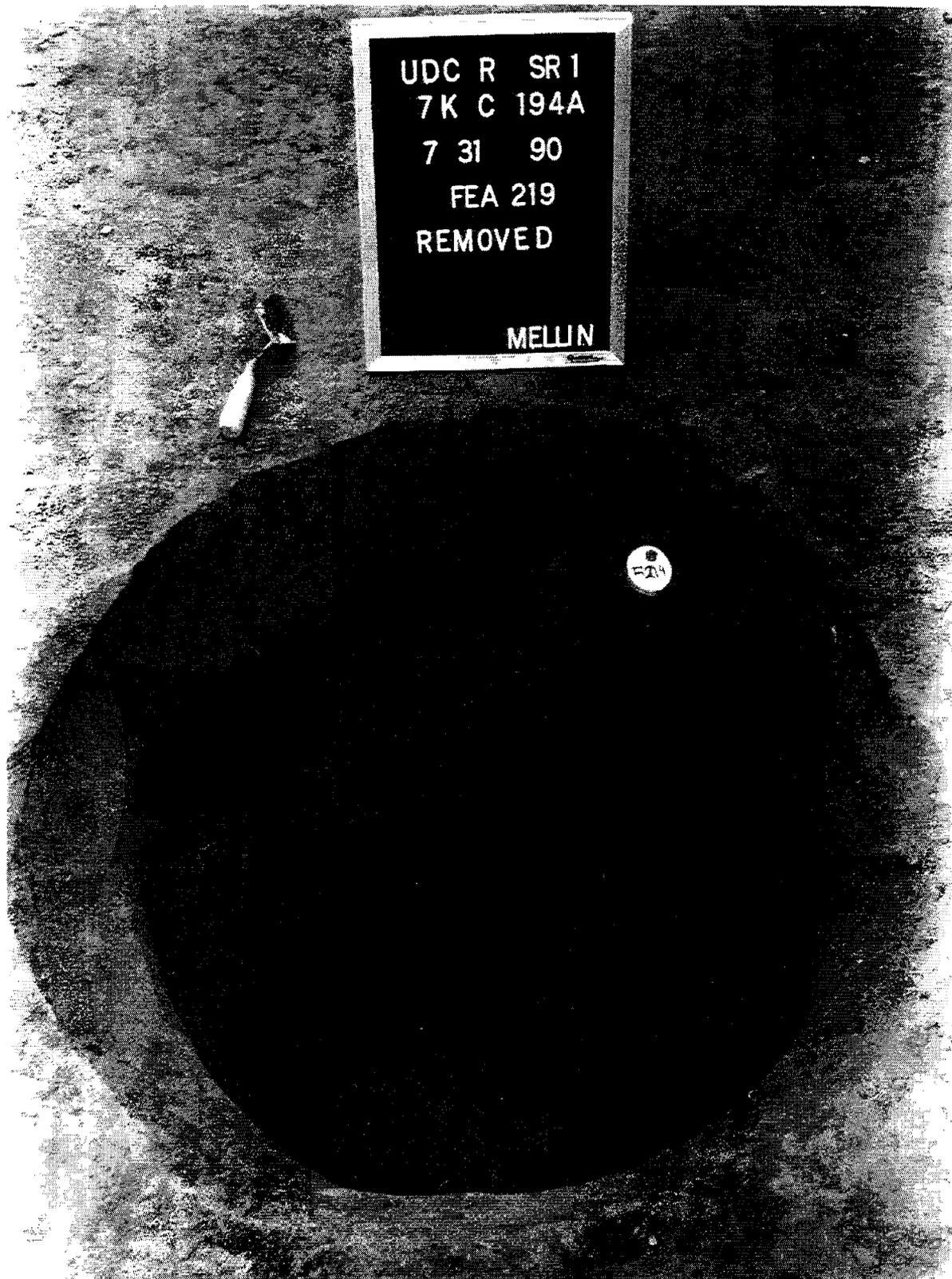
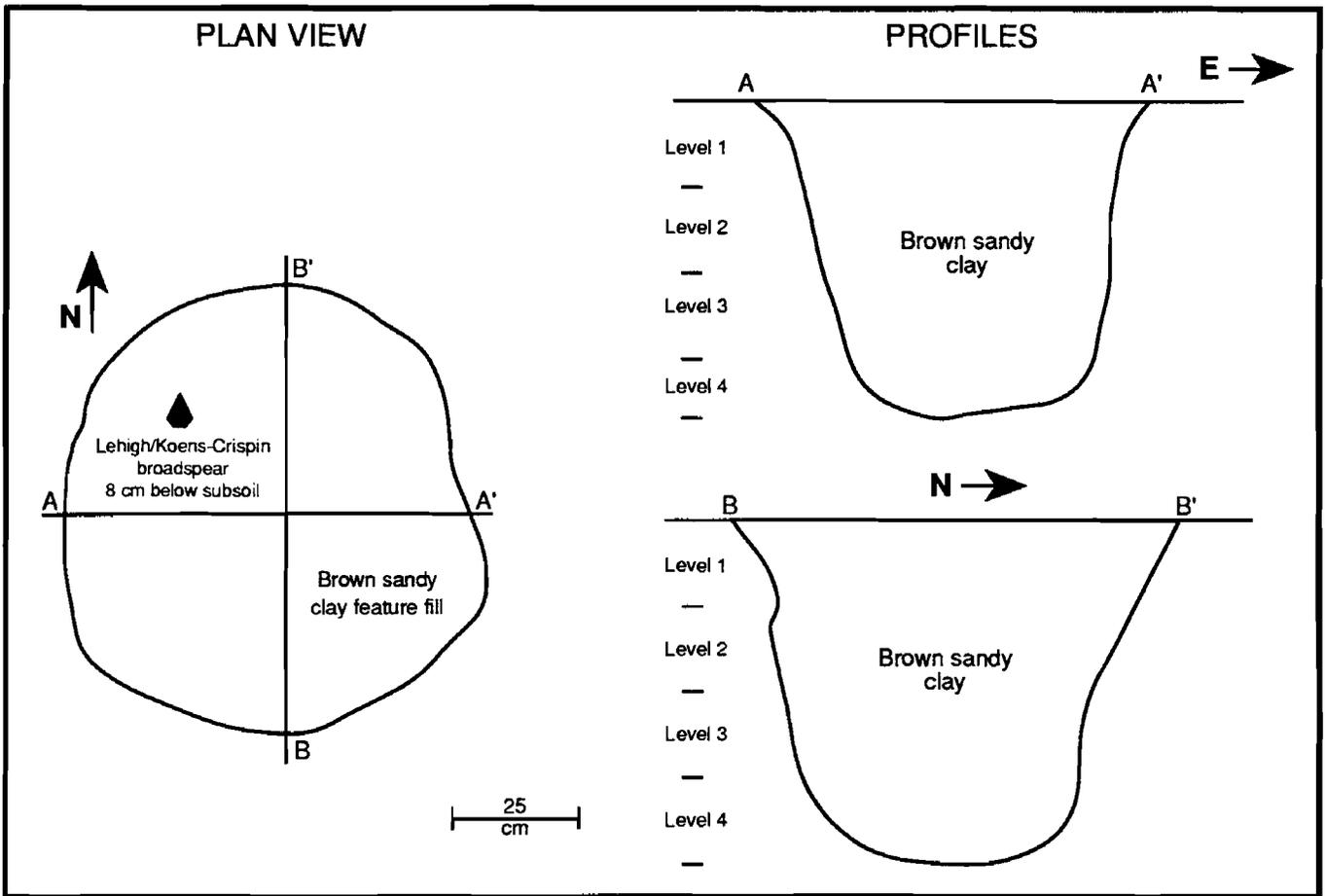


FIGURE 42

Plan View and Profile of Feature 219 (Type 5)



**Floated Artifacts and Ecofacts**

Flotation samples, each consisting of a minimum of 15 l of soil, were taken from features excavated at the Leipsic Site. After the soil samples were processed, a light fraction and a heavy fraction of material were recovered. Lithic micro-debitage and wood charcoal were collected in the heavy fraction, and additional wood charcoal as well as charred and uncharred seeds were collected in the light fraction. Both European and native seed varieties were contained in the flotation assemblage. A list of the most common varieties and the number of charred versus uncharred seeds is included in Table 6. Type 1 features contained the most artifacts and ecofacts from flotation, and this was also true of artifacts collected in 1/4-in. screen.

Lithic Artifacts. A majority of flotation samples (212 of 254) contained lithic micro-debitage. An average of five pieces of micro-debitage was recovered in each 15 l sample. However, heavy fraction samples from seven features contained 25 or more pieces of debitage, and the most abundant sample (162 pieces) came from Feature 319.

The predominant raw material represented by flakes and shatter in the flotation was jasper (35%), followed by quartz (26%), chalcedony (17%), chert (15%), and quartzite (2%). Rhyolite, argillite, and ironstone were each represented in less than 1% of the flotation lithic assemblage. In general, these

TABLE 6  
Plant Seed Varieties Collected in Flotation Samples  
and Their Suggested Uses

EUROPEAN SEED VARIETIES	TOTAL CHARRED	TOTAL UNCHARRED	PURPOSE	REFERENCE
Bristlegrass ( <i>Setaria</i> sp.)	1	301	Unknown	—
Carpetweed ( <i>Mollugo verticillata</i> )	4	297	Unknown	—
Copperleaf ( <i>Acalypha</i> sp.)	54	5,049	Unknown	—
Crabgrass ( <i>Digitaria</i> sp.)	3	534	Unknown	—
Grass ( <i>Gramineae</i> sp.)	4	9	Unknown	—
Wheatgrass ( <i>Panicum</i> sp.)	4	588	Unknown	—
Wheat ( <i>Triticum aestivum</i> )	2	4	Food	Fernald (1950)
Sage ( <i>Salvia</i> sp.)	1	1	Unknown	—
Spurge ( <i>Euphorbia</i> sp.)	2	54	Unknown	—
Purslane ( <i>Portulaca oleracea</i> )	2	63	Food	Hall (1976: 86-89)
<b>NATIVE SEED VARIETIES</b>				
Lambsquarter ( <i>Chenopodium</i> sp.)	18	215	Food	Tantaquidgeon (1972: 128), Kindscher (1987: 81-83)
Pigweed ( <i>Amaranthus retroflexus</i> )	1	102	Food	Hall (1976: 82-83)
Butterflypea ( <i>Clitoria</i> sp.)	1	0	Unknown	—
Chokeberry ( <i>Pyrus</i> sp.)	1	0	Unknown	—
Evening Primrose ( <i>Oenothera</i> sp.)	6	8	Food	Hall (1976: 156-157)
Flowering Dogwood ( <i>Cornus florida</i> )	18	0	Medicine	Petrides (1972: 76)
Grape ( <i>Vitis</i> sp.)	2	8	Food/medicine	Tantaquidgeon (1972: 31, 80), Niethammer (1974: 68-69)
Greenbriers ( <i>Smilax</i> sp.)	1	2	Food	Hall (1976: 56-57), Coon (1980: 161)
Pinweed ( <i>Lechea</i> sp.)	1	0	Unknown	—
Raspberry ( <i>Rubus occidentalis</i> )	1	1	Food/medicine	Erichsen-Brown (1979: 473), Tantaquidgeon (1972: 78)
Sea Purslane ( <i>Trianthema</i> sp.)	3	2	Unknown	—
Sheep Sorrel ( <i>Rumex acetosella</i> )	2	4	Food/medicine	Tantaquidgeon (1972: 75, 120, 132), Erichsen-Brown (1979: 419,420)
Solomon's Seal ( <i>Polygonatum</i> sp.)	1	2	Food/medicine	—
Tuliptree ( <i>Liriodendron tulipifera</i> )	3	6	Medicine	Erichsen-Brown (1979: 106-108)
Spores	6,439	91,439	—	—
Unidentified	211	0	—	—

percentages conform to those represented in the lithic assemblage from features collected in 1/4-in. screen, except that the screen assemblage contains a slightly higher percentage of quartz (37%) than jasper (35%). More frequent resharpening of jasper tools, which would have had more brittle edges, may account for a slightly higher frequency of small jasper flakes in the flotation assemblage.

Seeds. Numerous charred (347) and uncharred (7,250) seeds were contained in the Leipsic Site flotation samples. In addition to seeds, 97,878 spores were recovered in flotation, of which 6,439 were charred (Table 6). Edible native seed varieties in the charred assemblage included (in order of descending frequency) evening primrose (*Oenothera* sp.), grape (*Vitis* sp.), sheep sorrel (*Rumex acetosella*), greenbriers (*Smilax* sp.), raspberry (*Rubus occidentalis*), Solomon's seal (*Polygonatum* sp.), and pigweed (*Amaranthus* sp.). In addition to edible varieties, some species represented in the flotation samples are believed to have medicinal qualities and could have been used for curing purposes (Table 6).

Flotation samples from six features contained charred native seeds exclusively and samples from three features contained a mixture of charred native and charred European seeds (Table 7). In addition, samples from 34 features contained a mixture of charred and uncharred native seeds (Table 7). Finally, samples from six features contained a mixture of charred and uncharred native and European

TABLE 7  
Summary Catalog of Features Containing Seeds

Charred Native Seeds	Charred Native & Charred European Seeds	Charred & Uncharred Native Seeds	Charred & Uncharred Native & European Seeds	Charred & Uncharred European Seeds
202	172	1	229	192
219	220	17	230	224
222	255/256	52	235	230
255/256		148	236	253
292		152	254	255/256
296		159	256	265
		160	260	266
		168	264	
		175	266	
		191	267	
		195	269	
		197	274	
		203	286	
		205	296	
		210	303	
		219	331	
		226	354	

Note: Some feature numbers appear in more than one column because separate flotation samples yielded seeds that fit various categories. The numbers represent feature numbers.

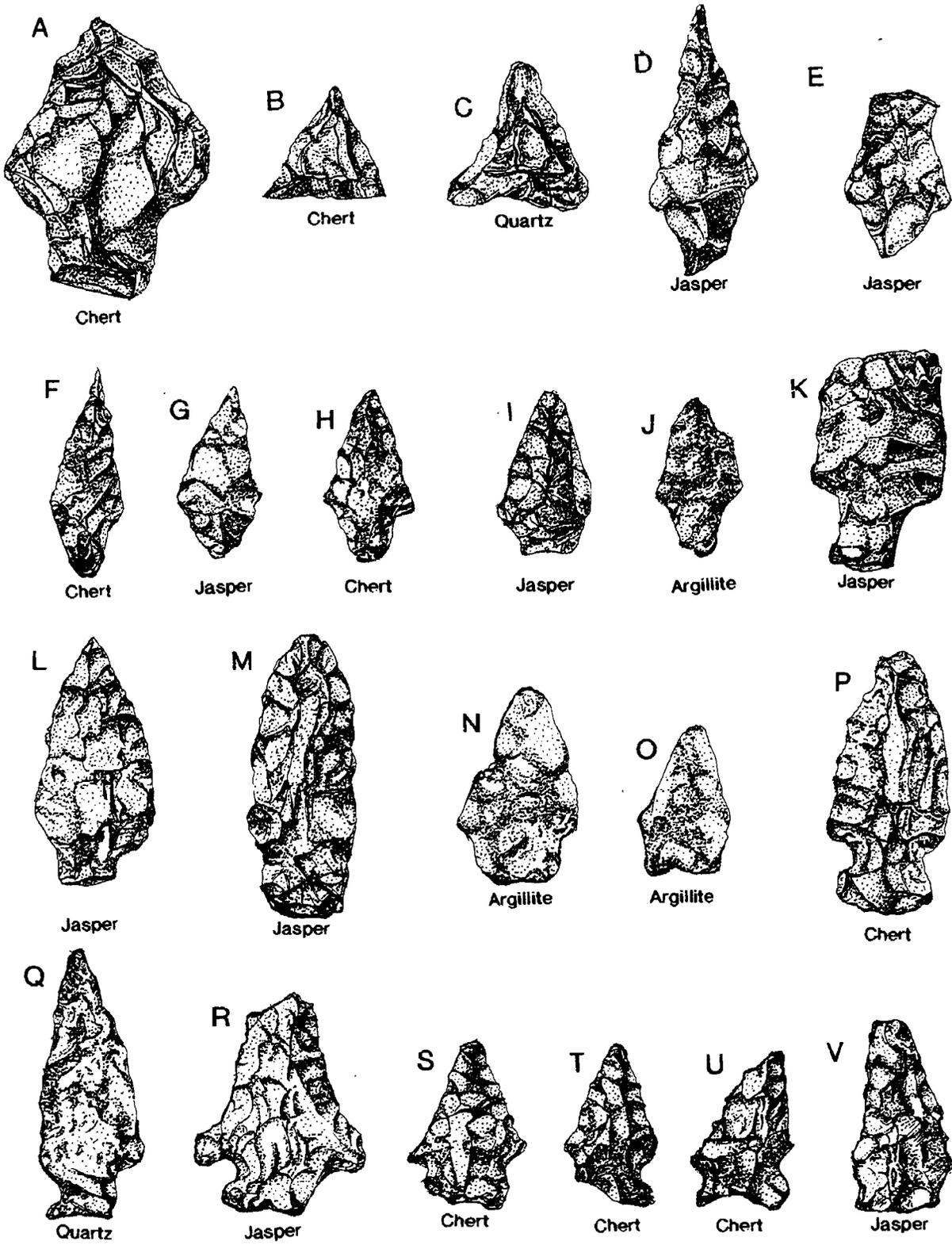
seeds, and samples from eight features contained charred and uncharred European seeds (Table 7). In general, feature flotation samples did not contain abundant seeds but did contain a fairly wide variety of plant seed species.

In addition to seeds, occasional nut hull fragments were also recovered in flotation samples. Nut hulls from Phase III flotation samples were too fragmentary for identification as to species; however, analysis of flotation samples during Phase II investigations identified hickory nut hulls, (*Carya sp.*) at the Leipsic Site (Riley, Bachman et al. 1994).

**Wood Charcoal.** Wood charcoal was one of the most common materials recovered from flotation. Wood charcoal was recovered in light fraction and heavy fraction flotation from 152 features. Analysis of wood charcoal conducted during Phase II investigations showed that several varieties of oak (*Quercus sp.*, oak, *Erythrobalanus* group) were present in the samples (Riley, Bachman et al. 1994:Appendix III). These varieties include northern red oak, pin oak, shumard oak, and scarlet oak. No conifers were present in any of the samples. Abundant carbon was found mainly in Type 1 features, with the largest amount occurring in Feature 255/256. However, detailed identification of charcoal from Phase III excavations was not undertaken due to its highly fragmented nature.

One final ecofact of interest was one large piece (85 x 35 cm) and two smaller pieces of oak bark recovered from Feature 255/256 (Plate 4). A sample of the large piece of bark provided an uncorrected radiocarbon date of 1080 +/- 130 years before present (Beta-42881) with a calibrated date range of A.D. 778-1148 and an intercept value of A.D. 981 (Stuiver and Becker 1986). A sample of the smaller bark provided an uncorrected date of 770 +/- 170 years before present (Beta-42882) with a calibrated date range of A.D. 1040-1390 and a mid-point of A.D. 1261 (Stuiver and Becker 1986). It is possible that the bark served as a covering for a structure framed with saplings that provided shelter over the pit feature. Similar examples are noted by Kraft (1986:79, 111, 122-127).

FIGURE 43  
Points from Plow Zone



Note: Projectile point types are described in the text.