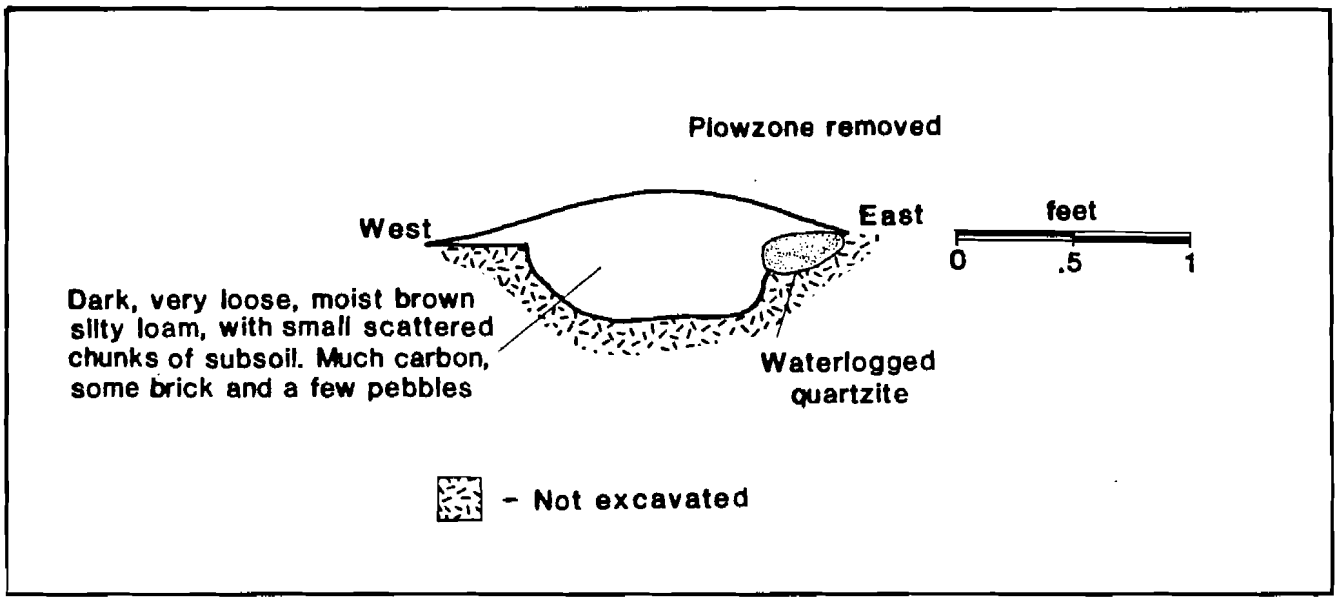
FIGURE 47

# Profile of Feature 126




possibility that the feature may be the result of non-cultural activity. Finally, Feature 126 appears to be a small trash midden similar in definition shape and contents to Features 8 and 12 (Figure 47).

## SOIL ANALYSIS

The chemical analysis of soils at the Whitten Road site was employed because the patterning of concentrations of certain soils trace elements can be correlated with the occurrence of particular activities (Custer and Cunningham 1986). In this regard, soils analysis can be used to help delineate specific activity areas in addition to providing a more generalized understanding of the utilization of space on the site. Analysis of soils consisted of determining the relative frequencies of phosphates, calcium, potassium, and magnesium and soil pH across the site. Chemical analyses were conducted by the Soils Laboratory of the University of Delaware College of Agriculture. Soils analysis on a previously excavated historic site in northern Delaware has confirmed the locations of activity areas within the site indicated by detailed historic documentation (Coleman et al. 1985). In contrast, chemical analysis of soils at the Whitten Road site can be seen to confirm the delineation of various activity areas indicated by both the arrangement of features and plowzone artifact distributions. Chemical analysis of soils has also been used on numerous historic sites in southern Maryland in order to provide additional data on site

structure (Marks 1979) and these data have been gleaned through the chemical analysis of plowzone soil samples.

At the Whitten Road site, sets of soil samples were taken from both plowzone and subsoil at 10 foot intervals in the core area of the site and also from all out lying 5 feet squares excavated during the random sampling procedure. Sampling of both plowzone and subsoil contexts was done in an attempt to determine the degree to which the chemical patterning resulting from the occupation of the site had been altered by subsequent agricultural fertilization. It was assumed that the subsoil sample would be less-subject to chemical contamination related to post-occupation agricultural practices than the plowzone sample.

As was predicted this dualized soil-collecting technique yielded two very different sets of data when frequency distribution maps of the presence of trace elements particularly phosphates and calcium, were computer-generated (Figures 48-52). Concentrations of phosphates were found to correlate well with activity areas identified during intensive excavations. Chemical analysis of the plowzone sample revealed that the highest concentration of phosphates occurred in distinct pockets at both the northeast and northwest corners of the two-bay domestic structure (Figure 49). With the exception of these two concentrations, the distribution of phosphates in the plowzone was fairly uniform across the site.

Chemical analysis of the subsoil sample revealed a smaller, more ephemeral concentration of phosphates associated with the north end of the probable domestic structure (Figure 49). However, a more concentrated accumulation of phosphates was located in the area of the site between the south end of the probable domestic structure (Structure I) and the farm-related structure (Structure II) in the subsoil. Evidence of an enclosure in this area was found in the distribution of the remains of fence posts. Concentrations of phosphates, known to be derived from accumulations of organic wastes, and the location of greatest phosphate density within this enclosure substantiates the contention that animals were contained within the enclosure and probably quartered in the adjacent three-bay barn or other farm-related structure (Structure III). As is noted below, the plowzone sample of the portion of the enclosed area adjacent to the domestic structure also yielded the greatest concentration of artifacts on the site, and this correlates well with the prediction of phosphate concentrations as indicative of refuse disposal. It is most likely that this accumulation of phosphates is due to organic wastes resulting from livestock and household-generated refuse in the form of food remains.

It is significant that the high levels of phosphates were discerned through chemical analysis of the subsoil in this activity area. Although the analysis of the plowzone soil samples revealed the highest levels of phosphates located at the north end of the Structure I, this accumulation was also revealed through analysis of the subsoil (Figure 49). The fact that these

subsoil phosphate concentrations were present is interesting in light of the fact that no privies were found anywhere on the site. The occurrence of these concentrations of phosphates, in the plowzone, adjacent to the north end of the domestic structure may be indicative of a more direct deposition of organic wastes by the human occupants of the site than that proposed above for the subsoil areas of the barnyard adjacent to the extension or replacement of the domestic structure located some distance to the south. In sum, the distribution of phosphates correlates well with two activity areas discerned throughout the arrangement of archaeological deposits in the subsoil and the distribution of artifacts in the plowzone.

The distribution of calcium, like that of phosphates was found to be quite different between plowzone and subsoil samples. However, unlike phosphates, whose occurrence in concentrations are reflective of the deposition of organic material, calcium concentration can be traced to a number of sources including agricultural liming, deposition of oyster shell, and presence of architecture-related material such as mortar. The frequency map of calcium in the plowzone displays the greatest concentration in direct correlation with the concentration of plowzone phosphates at the northeast corner of the domestic structure (Figure 50). However, like the phosphates, the distribution of calcium in the subsoil reveals a greater concentration not evident in the plowzone (Figure 50). This accumulation occurs north of the domestic structure and in the area where there was evidence of an enclosure. The enclosed area and the accompanying calcium concentration may mark the location of a garden where oyster shell was deliberately applied to promote fertility. This calcium concentration seems to be related to differential deposition of oyster shell because calcium concentrations are conspicuously absent from the area of the barnyard enclosure known to be the location of the greatest accumulation of household refuse. Although the accumulation of plowzone calcium may also be related to the existence of mortar in the soils adjacent to the structure, the greater concentration in the enclosure to the north makes the inference involving the use of oyster shell as a fertilizing agent more likely.

Soils were also tested for the presence of potassium which results from concentrations of wood ash (Coleman et al. 1985) and in much the same manner as the phosphates and calcium, this element was found to occur in varying locations and concentrations among the plowzone and subsoil samples. The plowzone sample shows the potassium to be concentrated around the domestic structure and this seems to indicate that hearth cleanings were deposited around the part of the domestic structure containing the hearth (Figure 51). This concentration was not apparent in the area of the greatest density of household debris, but neither was a hearth feature. The subsoil sample reveals a much more uniform distribution of potassium across the site, although a slight concentration was located adjacent to the farm-related structure (Figure 51). This occurrence is likely to be related to a small area of scorched subsoil observed during

excavation to be intruded by one of the structure-related postholes. Because of the intrusive nature of the posthole, this burned subsoil and the accompanying potassium concentration in the subsoil may be prehistoric in origin.

In contrast to the variability exhibited among the plowzone and subsoil samples for concentrations of phosphates, calcium, and potassium, frequency distribution maps of magnesium display very little variation between the two sets of soil data (Figure 52). Concentrations of this element in the plowzone occur in correlation with the Structure I and may represent evidence of the deposition of architectural-related material like mortar. However, the greatest accumulation was found north and west of the domestic structure in an area generally lacking in both subsurface features and plowzone artifacts. A very similar pattern of magnesium distribution is apparent from the subsoil samples. Magnesium concentrations can perhaps be most adequately explained by post-occupation agricultural liming with dolomitic limestone, and the uniformity of the patterning of this element among both plowzone and subsoil samples may be more a reflection of this agricultural activity than anything else.

In summary, soils analysis substantiates the locations and functional aspects of three distinct activity areas identified through artifact distribution analysis. A combination barnyard and domestic refuse dump located in an enclosure between the south end of the Structure I and Structure II contains elevated concentrations of phosphates derived from a possible combination of organic wastes produced by livestock and refuse in the form of food remains. This suggests that Structure I was the site of domestic activity and Structure II was associated with a barn or other agricultural outbuilding. Indications of high concentrations of organic waste at Structure III suggests that it was a stable or other agricultural outbuilding associated with a number of large animals.

Smaller accumulations of phosphates adjacent to the north end of Structure I may mark the locations where human occupants of the site relieved themselves of organic waste material. Concentrations of phosphates adjacent to doorways have been observed at the St. John's Site in St. Mary's County, Maryland and have been attributed to human waste disposal (Marks 1979). Due to the lack of a brick foundation at the Whitten Road Site, the exact location of the doorway(s) of Structure I at 7NC-D-100 cannot be ascertained. However, it is suggested that the concentration of phosphates near the north end of the structure may indicate that an entrance or window was located in this vicinity of Structure I and that the occupants commonly deposited bodily wastes in this area. Potassium concentrations in this area may be derived from the deposition of woodash during the cleaning of a hearth. In addition, concentrations of calcium in an enclosed area to the north of Structure I may be resultant of the deposition of oyster shell as a fertilizing agent in a garden within this enclosure. Inferences such as these are largely derived from the chemical analysis of subsoil samples which may

be less contaminated by recent agricultural liming than has been the plowzone. Soils analysis has successfully provided an additional dimension to the study of the structure of the site originally delineated by the patterning of intact features and the accompanying distributions of plowzone artifacts.

## DISTRIBUTION OF PLOWZONE ARTIFACTS

The excavation of contiguous 5' X 5' squares in the site's core area and as part of the stratified, aligned, random sampling strategy allows the analysis of distributions of varied artifact classes across the site. Indeed, some of these distributions have been noted in the discussion of the structure-related features. Figure 53 shows the distribution of historic artifacts within the building complex area and the concentration of artifacts in the central area among the three structures is apparent. Figure 54 shows the distribution of total ceramics between the three buildings and also shows that the main artifact concentration west of Structure II consists primarily of ceramics and probably represents domestic refuse disposal in this area.

There were sufficient data to generate meaningful distribution maps of a number of temporally significant ceramic types including brown stoneware (Figure 55), creamware (Figure 56), and whiteware (Figure 57). A distribution map of general 19th century ceramics was also produced (Figure 58). A detailed map of general ceramic distributions between Structures I and II was also produced (Figure 59). The earliest ceramics, brown stonewares (Figure 55), are found adjacent to Structure I and between Structures I and II. Creamwares, which had their highest incidence of use prior to 1800 are found in the general disposal area among the three structures (Figure 56). Whiteware (Figure 57) and general 19th century ceramics (Figure 58) are found between Structures I and II somewhat to the west of the brown stoneware concentration (Figure 55).

A detailed map of ceramics between Structures I and II (Figure 59) shows two major ceramic concentrations, suggesting that at least one of the structures was the site of domestic activity. Comparison of Figures 55-59 indicates that the easternmost ceramic concentration (Figure 59 - Concentration #1) consists of older ceramics than those found in the western concentration (Figure 59 - Concentration #2). Concentration #1 is associated with what is thought to be the older section of Structure I. Therefore, the relative age of the two ceramic concentrations roughly corroborates the proposed sequence of rebuilding and/or expansion of Structure I.

In general, the examination of distributions of dated ceramics shows little change in refuse disposal patterns during the site's occupation. The general refuse disposal area between Structures II and III is used for almost all ceramic types, especially creamwares. The slight shift in refuse disposal patterns near Structure I is probably related only to alterations

of Structure I, not a change in general refuse disposal patterns.

Figure 60 shows the distribution of the architecture group of artifacts including bricks, nails, window glass, and iron fragments. The concentrations fall within the general refuse disposal area and adjacent to the south central side of Structure I west of the ceramic disposal areas shown in Figure 59. Figures 61 and 62 show that the artifact concentration associated with the south central wall of Structure I consists primarily of brick. As was noted earlier, this brick concentration is most likely associated with a hearth. Figure 63 shows that iron fragments are also associated with the hearth feature area.

In sum, the analysis of artifact distributions shows little change in artifact disposal patterns through time, except for small-scale changes related to alterations of the domestic structures. The consistency of disposal patterns argues for the relative contemporanity of the structures.