

ARTIFACT ANALYSIS

Many archaeological studies of historic sites in the Middle Atlantic have used the techniques of pattern analysis and mean ceramic dating. The applicability of these techniques to the Whitten Road site is discussed below. Artifact pattern recognition (South 1977) has been considered a key to analyzing historic artifact assemblages. Since its inception, this model, known as the "Carolina Artifact Pattern," has been used frequently by archaeologists dealing not only with eighteenth-century British-American colonial sites, but with historic sites in general. In South's model, artifact assemblages are categorized into specific groups on the basis of both form and function. These groups include Kitchen, Architecture, Furniture, Arms, Clothing, Personal, Tobacco Pipes, and Activity Groups (South 1977). Counts of artifacts in each group are then analyzed to gauge patterned regularity and variability among the artifact classes.

The quantitative analysis of artifacts from plowzone contexts can yield very misleading data, however, because plowing of a site breaks artifacts from different groups in different ways. For example, plow damage would affect a glass bottle or a thin-walled Whieldon-like tea cup much more than it would a brick or a thick-bodied, coarse red earthenware milk pan. No controls exist in South's method for this type of variability and the problem has been discussed in other studies (Hurry and Kavanaugh 1983). The result is the superficial inflating of artifact counts, and this renders simple quantification of artifacts, the basic premise of South's model, rather impractical in a plowzone context. To simply eliminate this variability by excluding plowzone materials from the model would also be impractical because according to South, the entire collection, must be analyzed, not just selected proveniences.

Additional problems aside from those posed by a plowzone context have been identified in a critical analysis of South's artifact patterns (Warfel 1981). One of these problems is the fact that the small size of South's sample underestimated the variability of the archaeological record. South's pattern analysis also assumes that the use-breakage-discard record of artifacts on all eighteenth century British-American colonial sites is comparable. This is a very dangerous assumption because it denies the existence of varying social and environmental factors at play at different times in different places. In other words, not all ceramics, had fixed life-use spans because they are not broken and discarded at fixed rates. Furthermore, not all ceramics broke in the same way. Even if they did, the use-breakage-discard pattern would be distorted by post-occupation plowing of the site. South's assumptions have been viewed as reflective of his normative view of culture which results in oversimplification by denying that culture is multivariate (Warfel 1981).

Other problems with South's pattern analysis are concerned with the categorization of specific artifact types (Miller 1980). It has been suggested that in several cases, South has failed to place some types within the broader groups into which they best fit (Garrow 1982) producing an adverse effect on overall patterning by skewing the relative percentages of each group. An example of this problem can be seen in the buckles recovered from 7NC-D-100. South's scheme places buckles in the Clothing Group. However, 3 of the 4 specimens from this site appear to have functioned in utilitarian rather than clothing contexts. Although the effect yielded by placing all buckles in the Clothing Group would not be significant due to the small size, were this sample larger, it could dramatically alter the relative percentages of both Clothing and Activities Groups.

The analysis of the brick from this site also represents another example of the problem of quantification. Much of the brick found in the plowzone is in the form of virtual crumbs. Raw counts produce astronomical figures, and at first glance, the relatively high percentage of this material could be viewed as a result of specialized activity such as brick-making rather than in the more general context of the Architecture Group. Perhaps many of the fragments are from waster bricks not directly related to architecture at all, as brick-making is, in fact, thought to have taken place during the occupation of the site. However, the variable that eludes control is the proportion of brick that is related to de facto plow damage. Similar problems are noted for the tremendous number of small red earthenware fragments found on the site.

In sum, South's model relies on the quantification of artifacts, which in a plowzone context, yields results related as much to post-occupation plowing as to the actual occupation of the site. Although the object of the model is to identify patterned behavior by measuring the relative percentages of distinct artifact groups, it neglects the influence of the

variability inherent to the archaeological record. In the case of 7NC-D-100, the foremost variable is that imposed upon the artifact assemblage by post-occupation plowing. Therefore, use of South's analysis and detailed quantification is not necessary to reveal that the assemblage from the Whitten Road site is dominated by artifacts of the Kitchen and Architecture Groups.

An additional analytical tool developed by South and commonly employed in the dating of ceramic assemblages from historic sites is the calculation of "mean ceramic dates" (South 1977). This ceramic formula uses the median of the known date ranges of the manufacture of certain ceramic types and the frequencies of these types in the assemblage to determine an approximate mean date for the occupation of the site. The validity of this formula has been demonstrated on numerous historic sites in the Middle Atlantic (South 1977; Garrow 1982; Hurry and Kavanaugh 1983; Beidleman et al. 1986).

The nature of the ceramic assemblage from 7NC-D-100, however, makes it difficult to analyze according to South's mean ceramic formula. First of all, the vast majority of the ceramic assemblage consists of miscellaneous redwares of unknown manufacture dates for which it is difficult to assign a specific median date value for most of the ceramic sample. In addition, different median dates for imported wares of known manufacture origin are determined in part by variations in decoration and, to a lesser extent, vessel form. The majority of the imported ware sherds and ironstone from 7NC-D-100, however, are tiny, undecorated sherds not suited to this type of analysis.

Nonetheless, with these limitations in mind, it is possible to generate a meaningful mean ceramic date for different components of the Whitten Road site. Although many of the non-redware sherds are small and undecorated, the type of ware (i.e., creamware versus pearlware) can still be used to generate useful mean ceramic dates. In addition, the total sample of historic ceramics associated with the three structures is large (2175 imported ware sherds and 9055 sherds including redwares). Large samples are generally held to be more accurate (South 1977, Garrow 1982, and Beidleman et al. 1986) and the Whitten Road site ceramic assemblage contains both a wide range and high absolute number of eighteenth and nineteenth century imported wares.

The mean ceramic dates computed for the features and plowzone associated with each of the three identified structures is given in Table 11. To allow for the amount of redwares, the mean ceramic date for each of the three identified structures was computed separately for all ceramics except redwares and then for all ceramics including redwares. For calculations including redwares, a conservative mean ceramic date of 1825 was used for redware. Domestic redwares were produced in the Middle Atlantic area from the early eighteenth century until well into the twentieth century (Brown 1982) and 1825 represents a conservative midpoint. Such allowances for redwares has been used successfully in mean ceramic date calculations for other late

TABLE 11

SUMMARY OF THE MEAN CERAMIC DATES

	Features N	Plowzone N	Total Struct.	N
Structure I				
without redwares	[1811.9 21]	1782.6 825	1783.3	846
with redwares*	1822.7 121	1817.7 4822	1817.1	4943
Structure II				
without redwares	[1773.4 12]	1805.4 844	1804.9	856
with redwares	1777.0 89	1819.3 2904	1818.0	2993
Structure III				
without redwares	[1800.5 2]	1805.2 448	1805.2	450
with redwares	[1823.8 42]	1818.3 1329	1818.5	1371
All Features				
[Structures I - III]				
without redwares	[1790.8 58]	--- ---	----	---
with redwares	1811.8 252	--- ---	----	---
All Plowzone				
[Structures I - III]				
without redwares	----	--- 1796.52177	----	---
with redwares	----	1818.3 9055	----	---

* Redwares values at 1825
[N < 75]

eighteenth and early nineteenth century historic sites in Delaware (Catts et al. 1986). The mean production dates for ceramic types used in these calculations is given in Appendix V.

The mean ceramic date for the features and plowzone associated with Structure I is 1783.3 excluding redwares (N=846) and 1817.1 including redwares (N=4943). Structure II yielded a date of 1804.9 without redwares (N=856) and 1818.0 with (N=2993). The results from Structure III were almost identical to those seen for Structure II--a mean ceramic date of 1805.2 without redwares (N=450) and 1818.5 with redwares (N=1371). All of these dates are consistent with the median occupation date of ca. 1795 indicated by documentary research.

The close correlation between all three structures and the known median occupation date and between Structures II and III is an indication of the applicability of mean ceramic analyses to the Whitten Road assemblage. The mean ceramic date of 1783.3 for Structure I is a reflection of this structure's probable domestic nature and the presence of a number of small sherds of relatively fragile imported wares such as tin-glazed earthenwares

and Whieldon wares and not an indication of an earlier structure. This is supported by a mean ceramic date of 1811.9 without redwares for the ceramics recovered from the structural features of Structure I (N=21).

An additional ceramic analysis is the identification of various ceramic forms and the establishment of accurate minimum vessel estimates. The nature of the sample renders both estimates of vessel numbers and the distinguishing of ceramic forms at least partially subjective because of the very fragmentary ceramic assemblage. However, the estimates presented here are conservative in nature for it is thought to be better to underestimate the assemblage rather than overestimate it (Garrow 1982).

In sum, the main objective of the analysis of the ceramic sample from 7NC-D-100 is an accurate estimation of the minimum number of vessels represented in the assemblage. The results of the minimum vessel analysis of all eighteenth and early nineteenth century ceramics are presented in Table 12. Due to the aforementioned problem posed by the quantification of artifacts in a plowzone context, the principle unit of study is the vessel rather than the sherd. The estimates of minimum vessel counts are based upon very fragmentary evidence and are generally conservative. The analysis of rim and basal sherds has been of the most use in making these estimates, particularly in the case of the red earthenwares. When possible, characteristics such as glaze, paste, and decoration have also been used as determinants in the identification of individual vessels. Another goal of this analysis was to determine ceramic form whenever possible in order to facilitate functional inferences. Artifacts shown in Plates 16 through 38 are a representative sample of the artifacts recovered.

Red Earthenware

As has been previously noted, various red earthenwares comprise the majority of the ceramic assemblage of 7NC-D-100 for both plowzone and feature contexts (Table 12). In both contexts, most of the sherds are very small. Estimates of the minimum number of vessels represented clearly indicates that redwares were the ceramic types most in use during the occupation of the site. Cost factors, coupled with availability, probably account for the majority of redwares in the ceramic assemblage from this site.

At least 234 different redware vessels are evident in the assemblage from both plowzone and undisturbed contexts; however, the vast majority of redware vessels are derived from the plowzone (Plate 16). Fifty-two of the redware vessels are coarse, thick-bodied utilitarian-like hollow forms such as crocks, basins, or bowls based on the analysis of rim sherds. Body thickness, paste, and glaze were used as determinants to a lesser extent. Most of these redware vessels are characterized by brown glaze on the interior surface only, although 2 vessels were

TABLE 12

Summary of Minimum Vessel Estimates

	teacup	cup or mug	mug or tankard	cup or small bowl	small bowl	tea pot	chamber pot	butter pot	jug, ewer, pitcher or bowl	footed jar, dish or bowl	lid	plate	saucer	plate or saucer	indeterminate flatware form	indeterminate hollow form	indeterminate form	total
Rhenish stoneware		1																1
tin-glazed earthenware			1										1			2		4
buff paste earthenware	4																	4
Jackfield															3			3
Buckley						1										1		2
plain white salt-glazed stoneware	7			2					2	2	2	1						16
painted white salt-glazed stoneware	1																	1
"scratch blue" white salt-glazed stoneware	2									1								3
red engine-turned stoneware		1		3														4
Whieldon-type ware exterior decoration	1			1												1		3
Whieldon-type interior decoration																1		1
Whieldon-type ware interior/exterior decoration	1																	1
Whieldon type ware Wedgewood-Whieldon variety																2		2

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TABLE 12

(con't.)

Summary of Minimum Vessel Estimates

	tea cup	cup or mug	mug or tankard	cup or small bowl	small bowl	tea pot	butter pot	chamber pot	jug, ewer, pitcher	footed jar, dish, bowl	lid	plate	saucer	plate or saucer	indeterminant flatware form	indeterminant hollow form	indeterminant form	total
deep cream-colored ware	1	1			1									2		1		6
light cream-colored ware	2								1	1	14			4	6	1		29
pearlware, blue shell edged													3					3
pearlware, blue impressed edge													4					4
pearlware, green impressed edge													1					1
pearlware, blue painted edge													3					3
pearlware, green painted edge													1					1
pearlware, blue handpainted underglaze			10							1								11
pearlware, polychrome hand painted underglaze															9			9
pearlware, annularware															1			1
pearlware, finger painted annularware															4			4
pearlware, finger painted annularware, "mocha" variety															1			1
pearlware, polychromed stenciled															1			1

TABLE 12
(con't.)

Summary of Minimum Vessel Estimates

	tea cup	cup, mug, or tankard	cup or small bowl	small bowl	tea pot	flask/flask neck	chamber pot	pastry or milk pan	butter pot	jug, ewer, pitcher	footed jar, dish, basin	pot	plate	saucer	dish	plate or saucer	indeterminate flatware form	indeterminate hollow form	indeterminate utilitarian form	indeterminate form	total
pearlware transfer print																	1				1
porcelain, English	2		7	3																	12
porcelain, Chinese export	2																				2
grey stoneware								1									1		3		5
yellow ware																			1		1
whiteware, undecorated		1															1		3		5
whiteware, transfer printed																			4		4
coarse red earthenware																	32	52			84
coarse red earthenware, slip decorated		1		13										16		57	3				90
refined red earthenware		5		21		9											16				51
refined red earthenware slip decorated																			9		9
brown stoneware		1																			1

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PLATE 16

Reconstructed Utilitarian Redware Vessel
Recovered from Plowzone Context

161

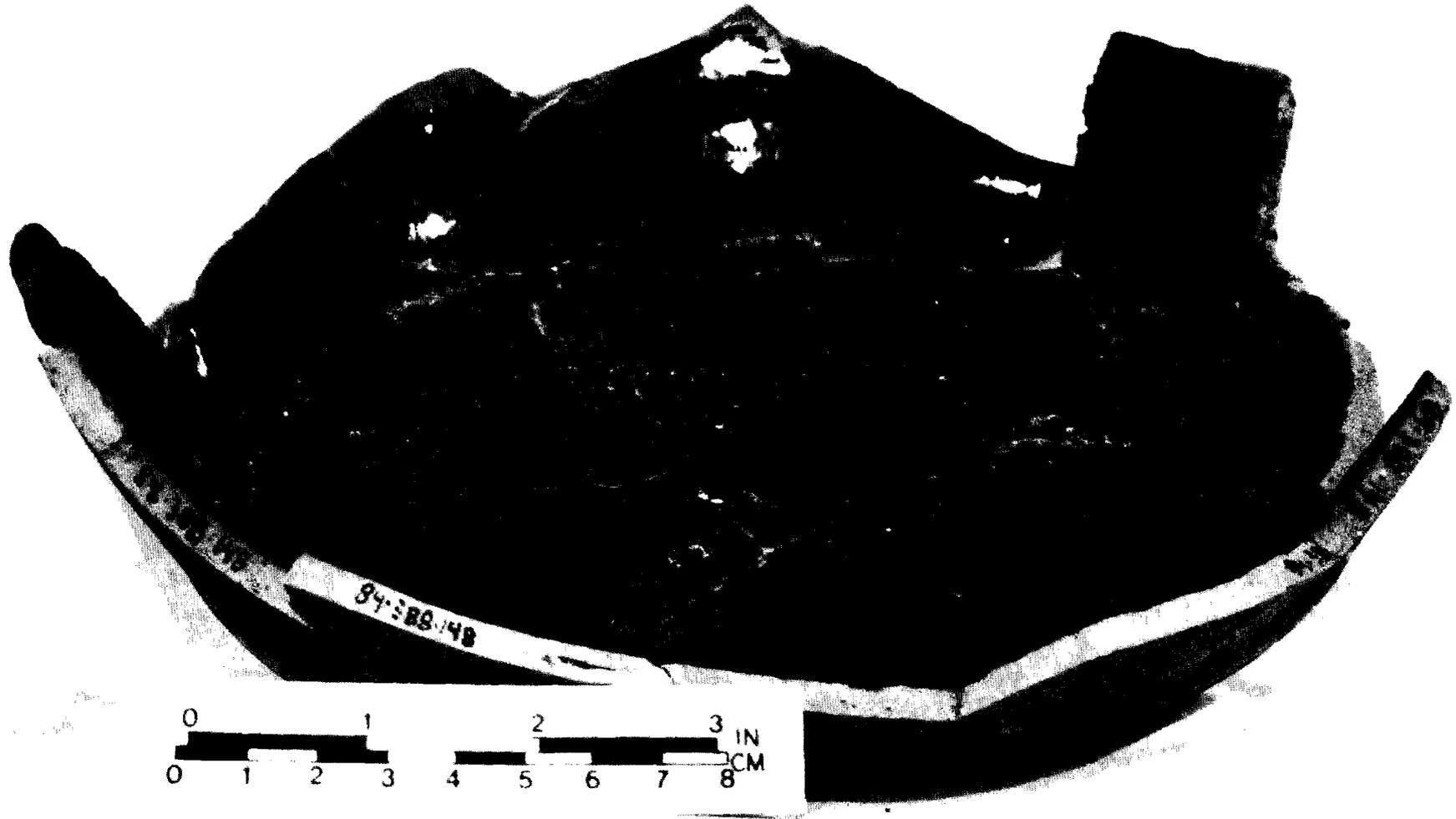


PLATE 17

Feature 65 Reconstructed Utilitarian Redware Vessel

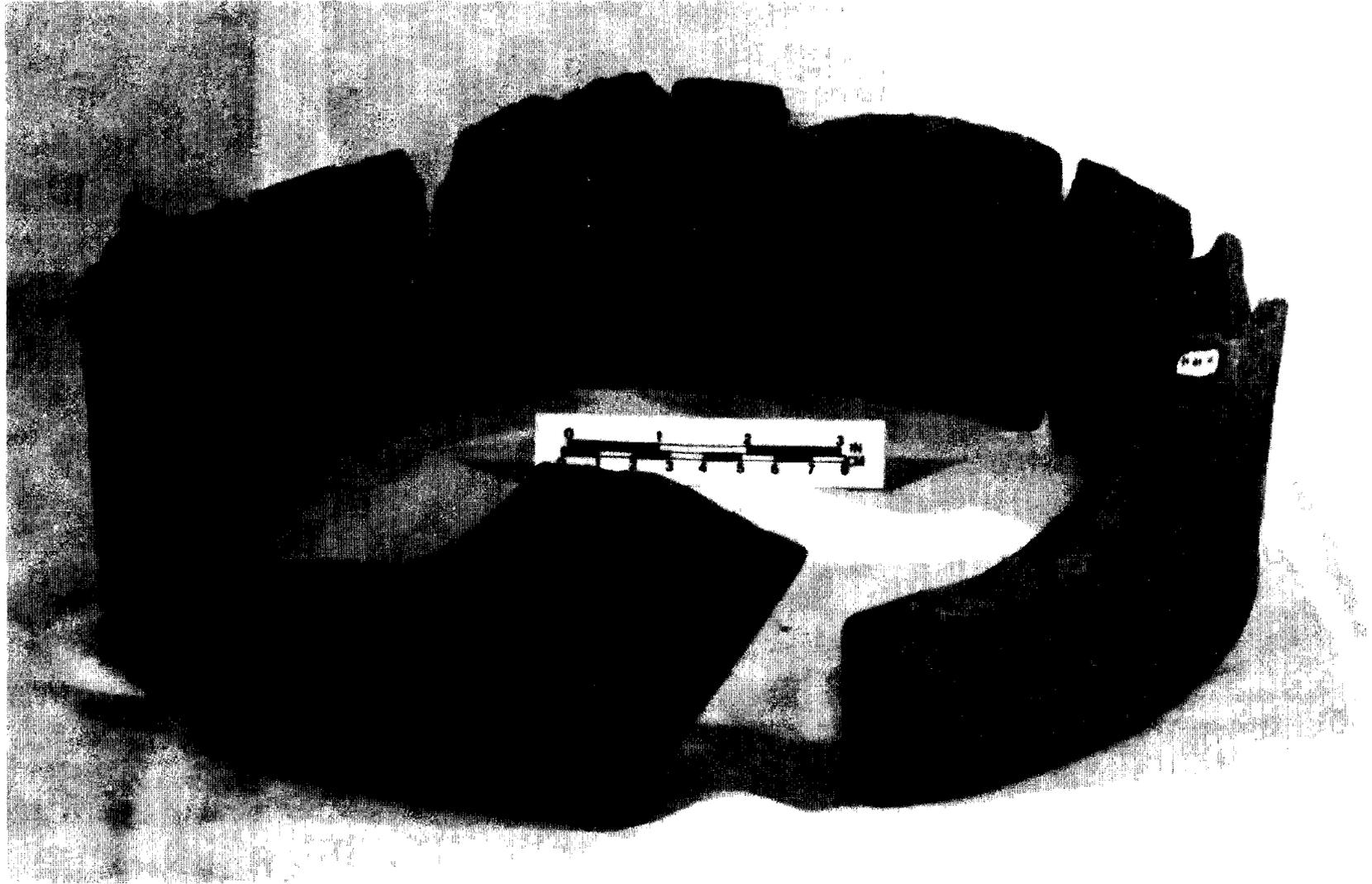


PLATE 18

Redware Vessels Recovered from Phase III Excavations

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PLATE 19
Rhenish Stoneware

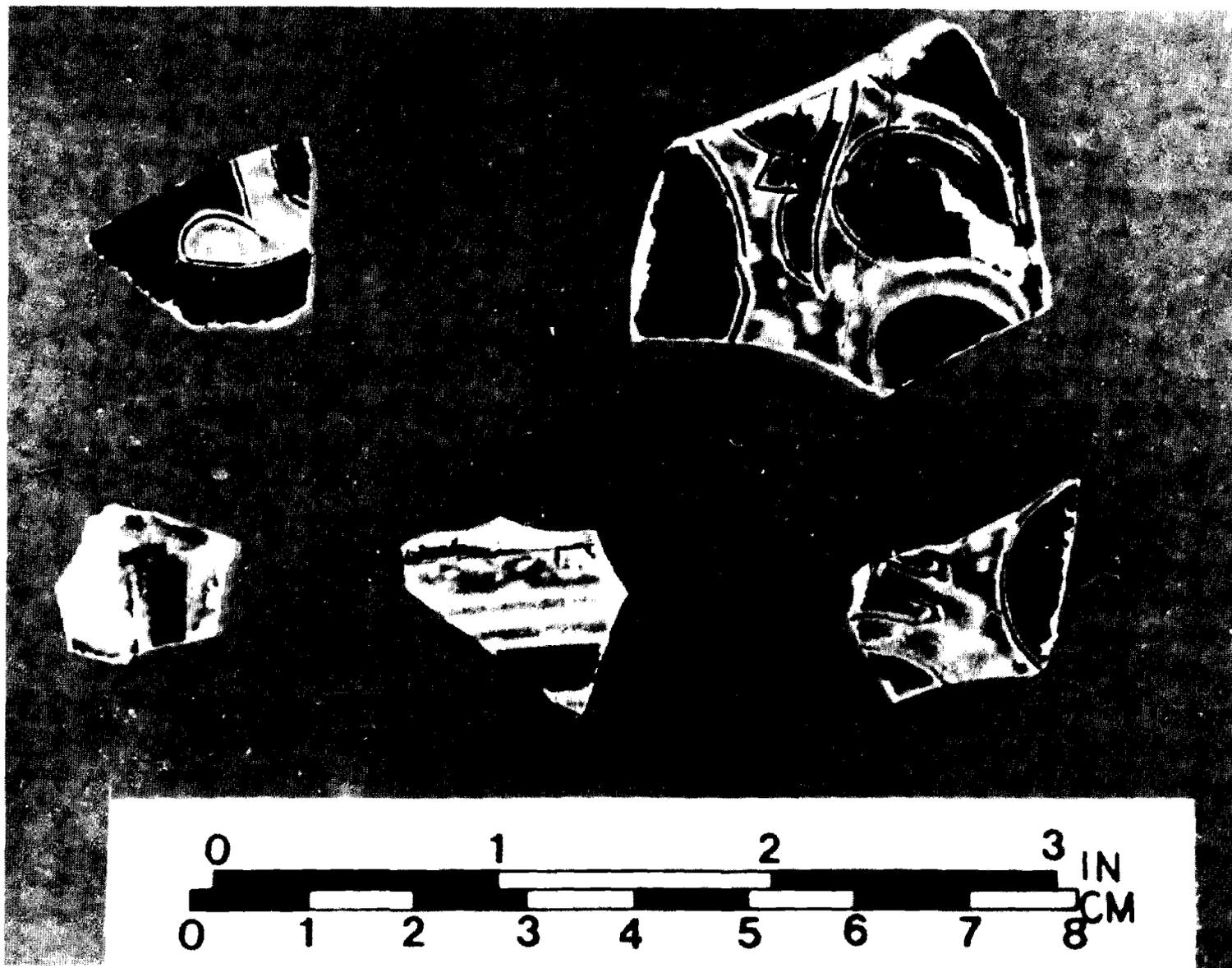


PLATE 20

Tin-glazed Earthenware

165

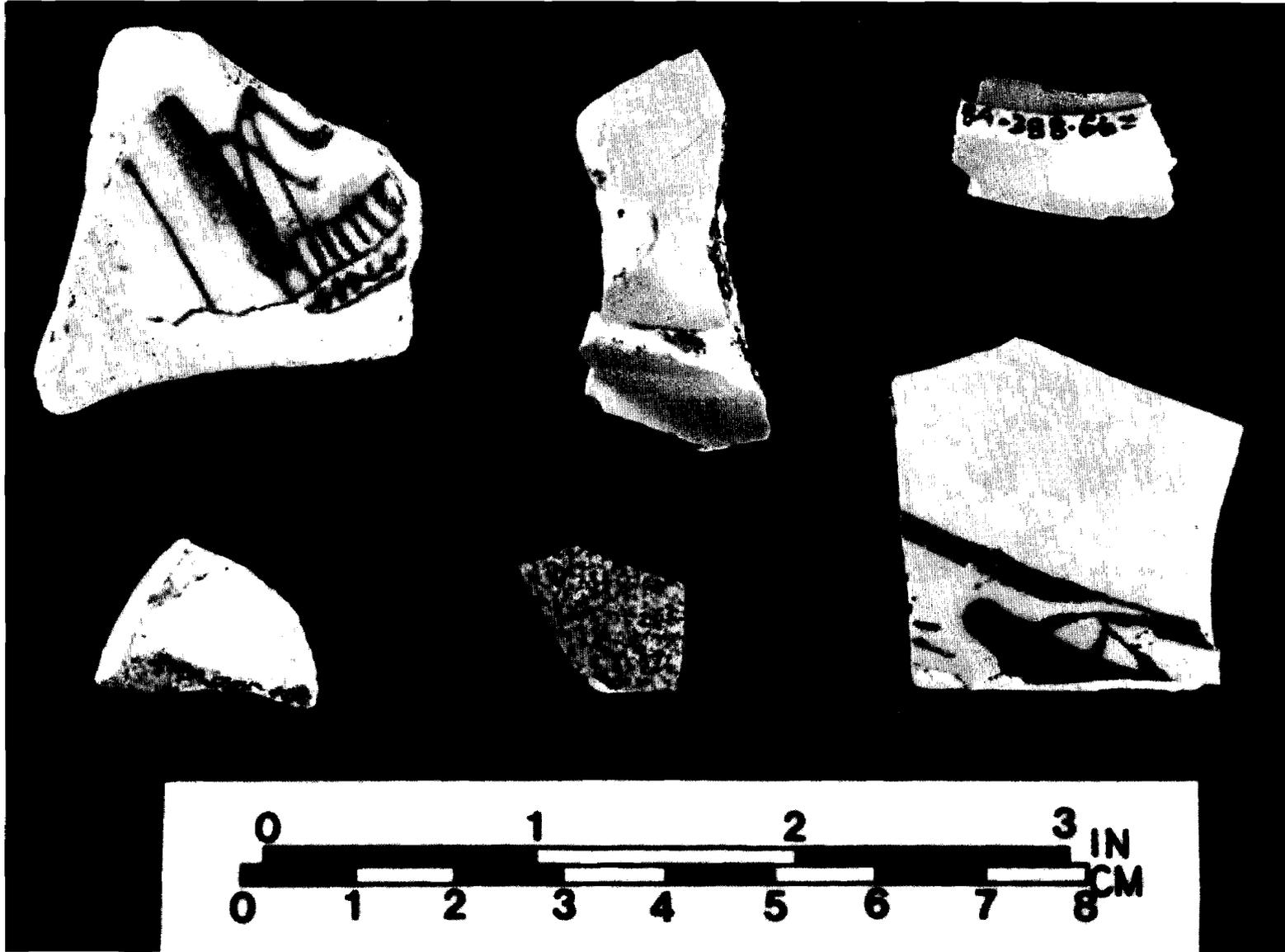


PLATE 21

Buff-paste Earthenwares

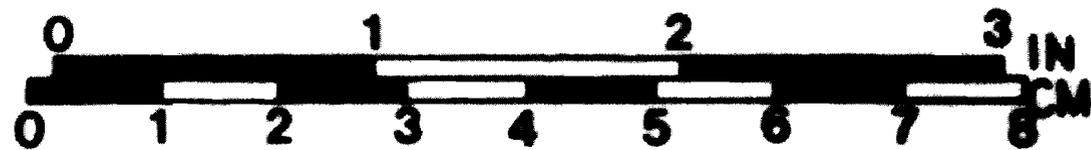


PLATE 22
Jackfield Wares



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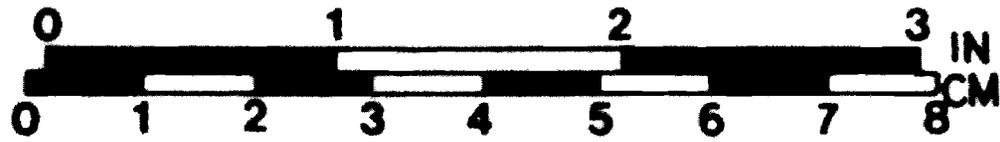


PLATE 23

Brown Stoneware

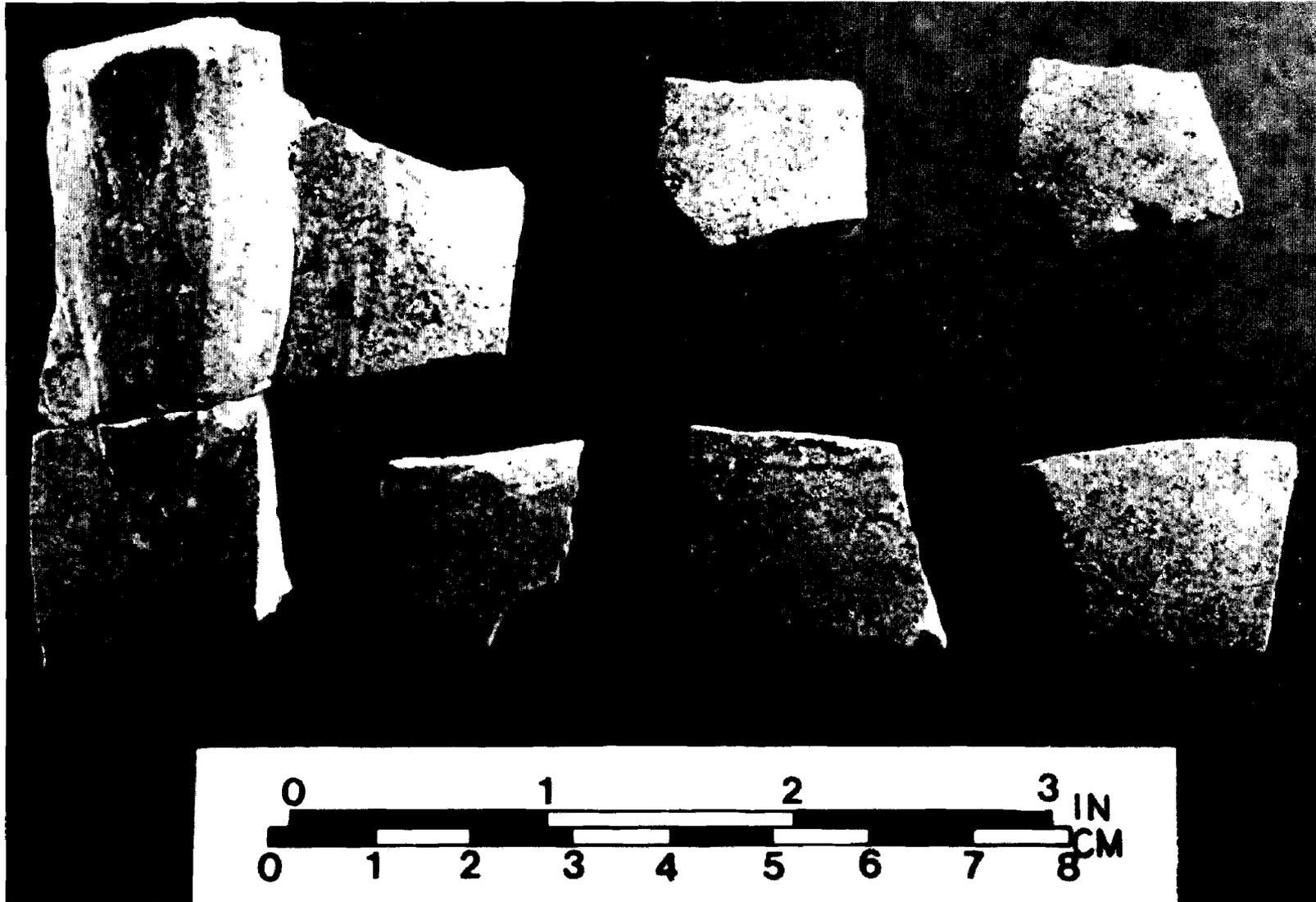


PLATE 24

White Salt-glazed Stoneware

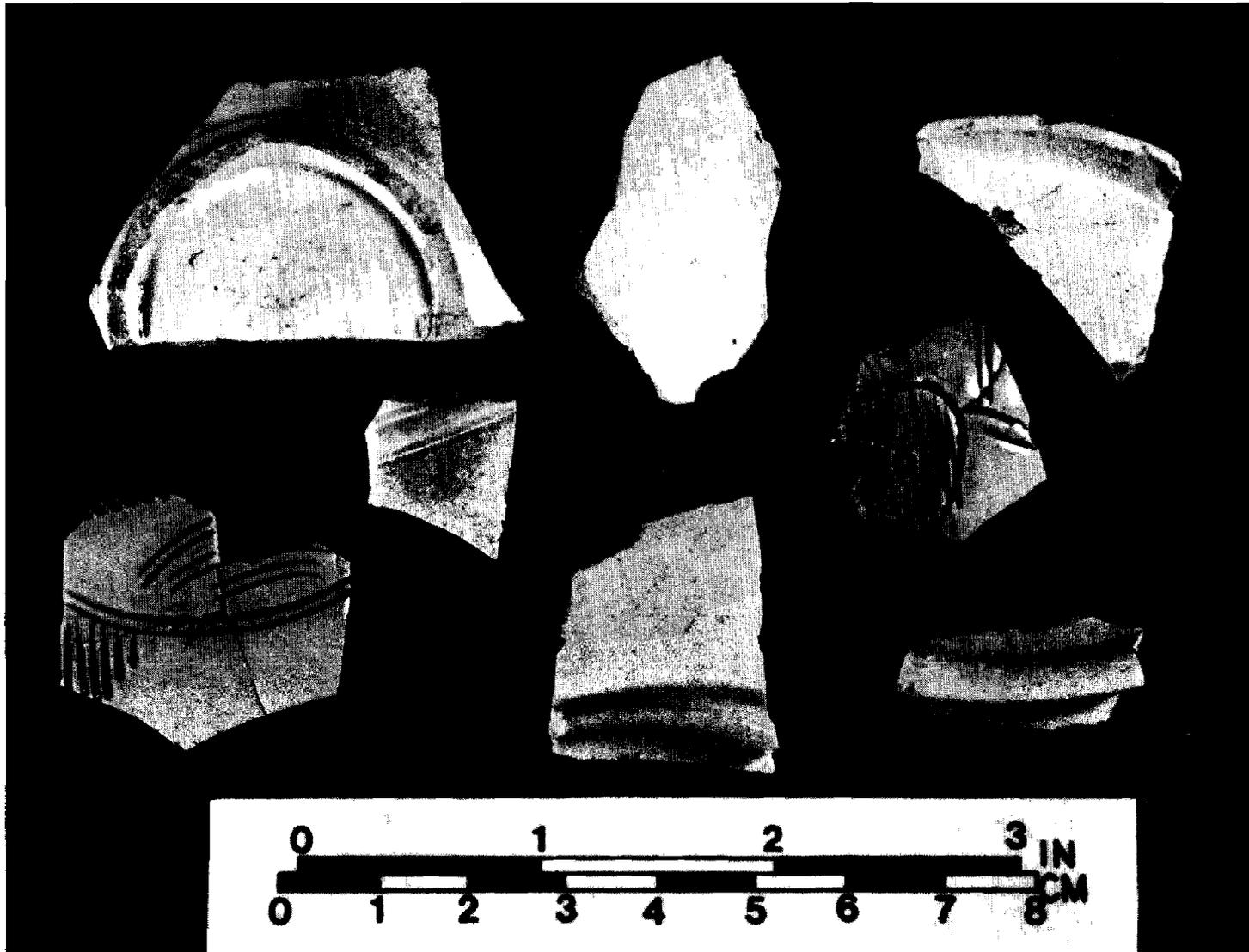


PLATE 25

Red Stoneware, Engine-turned

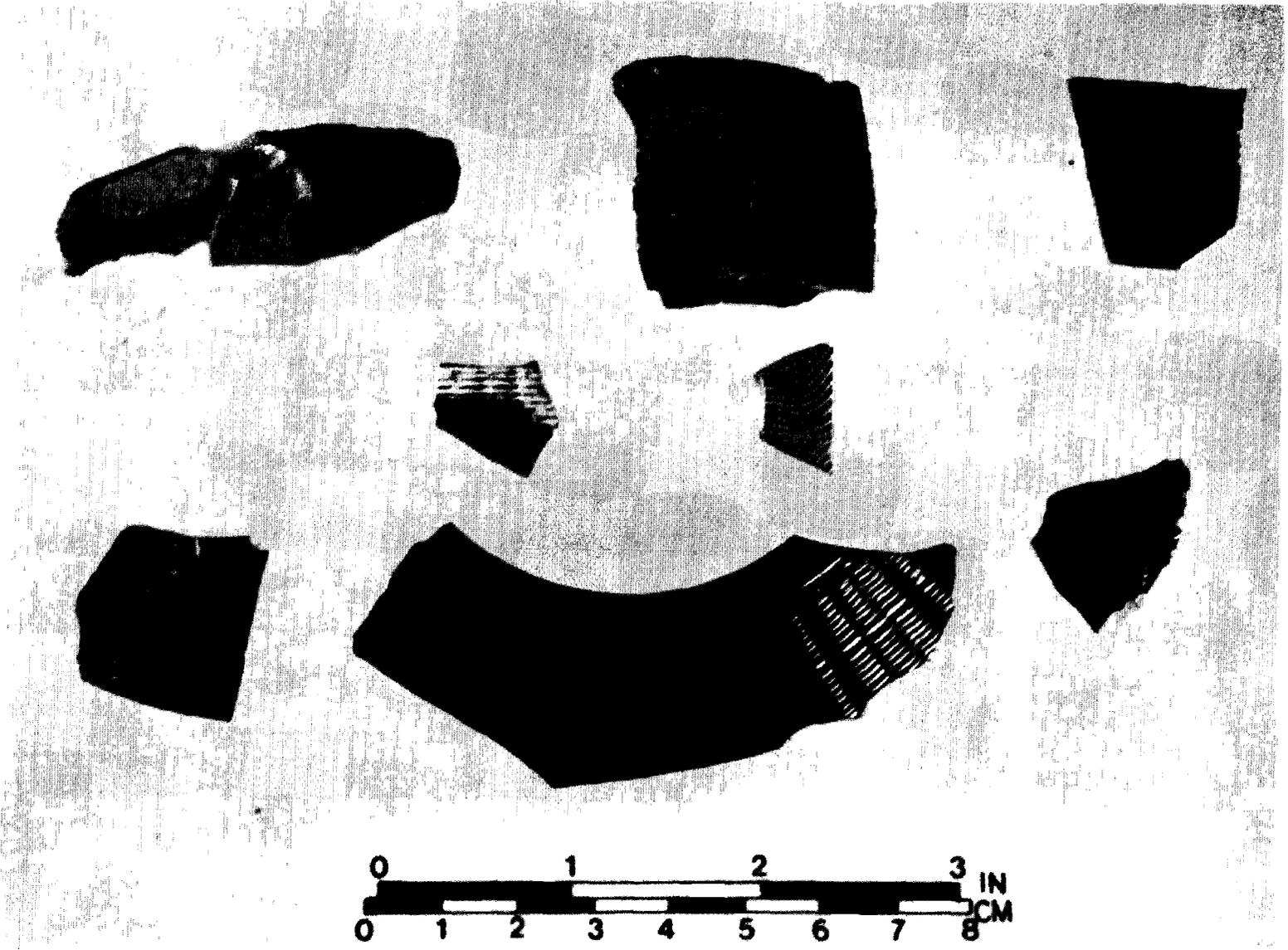
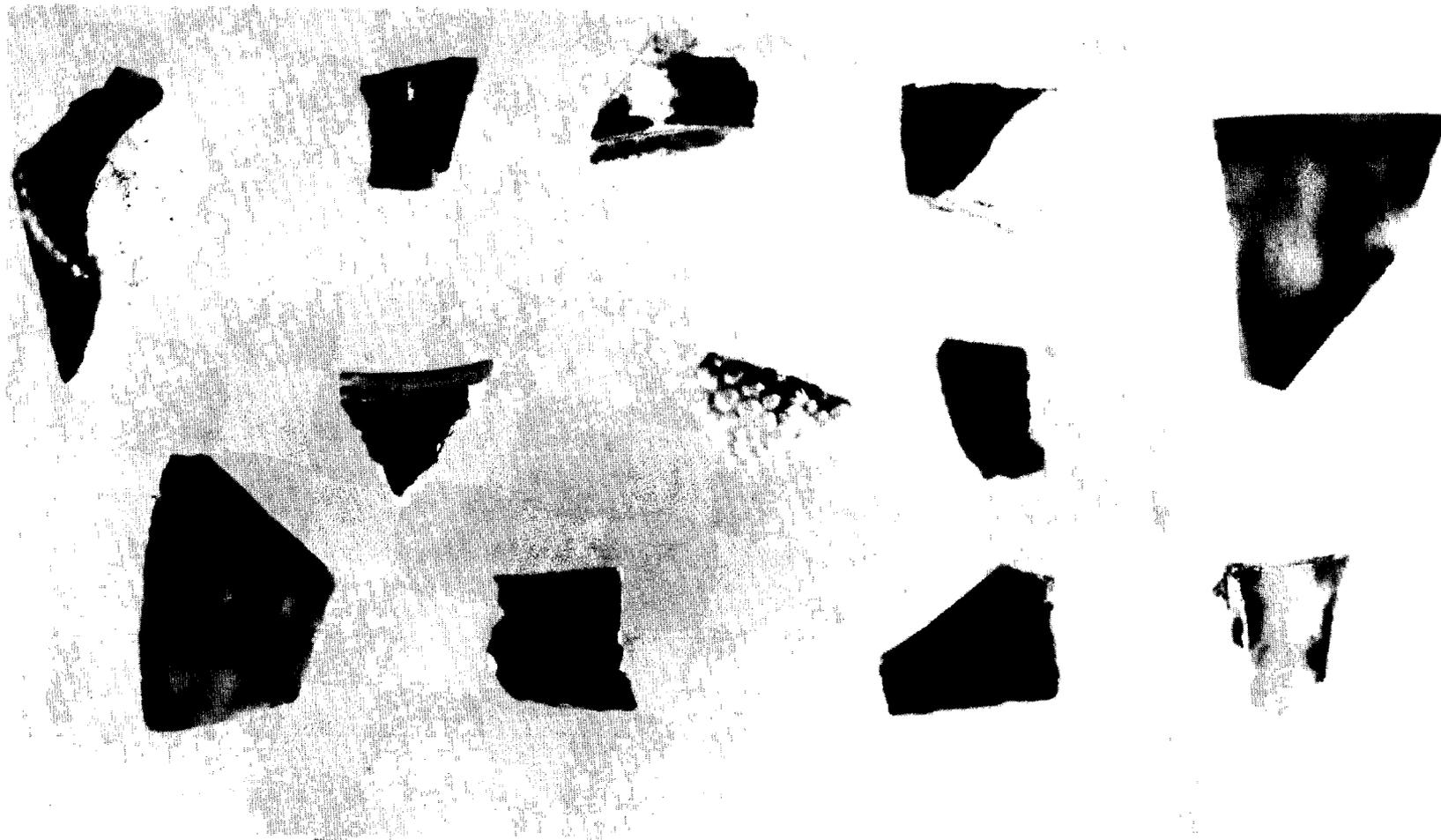


PLATE 26

Whieldon-type Wares



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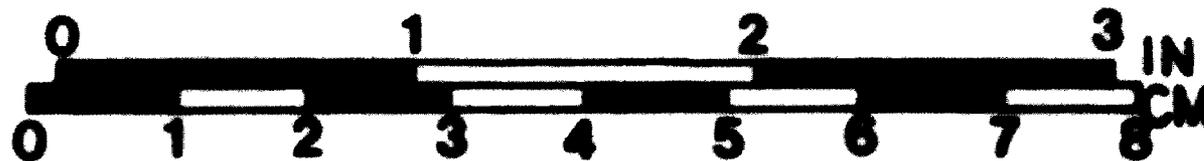


PLATE 27
Creamware

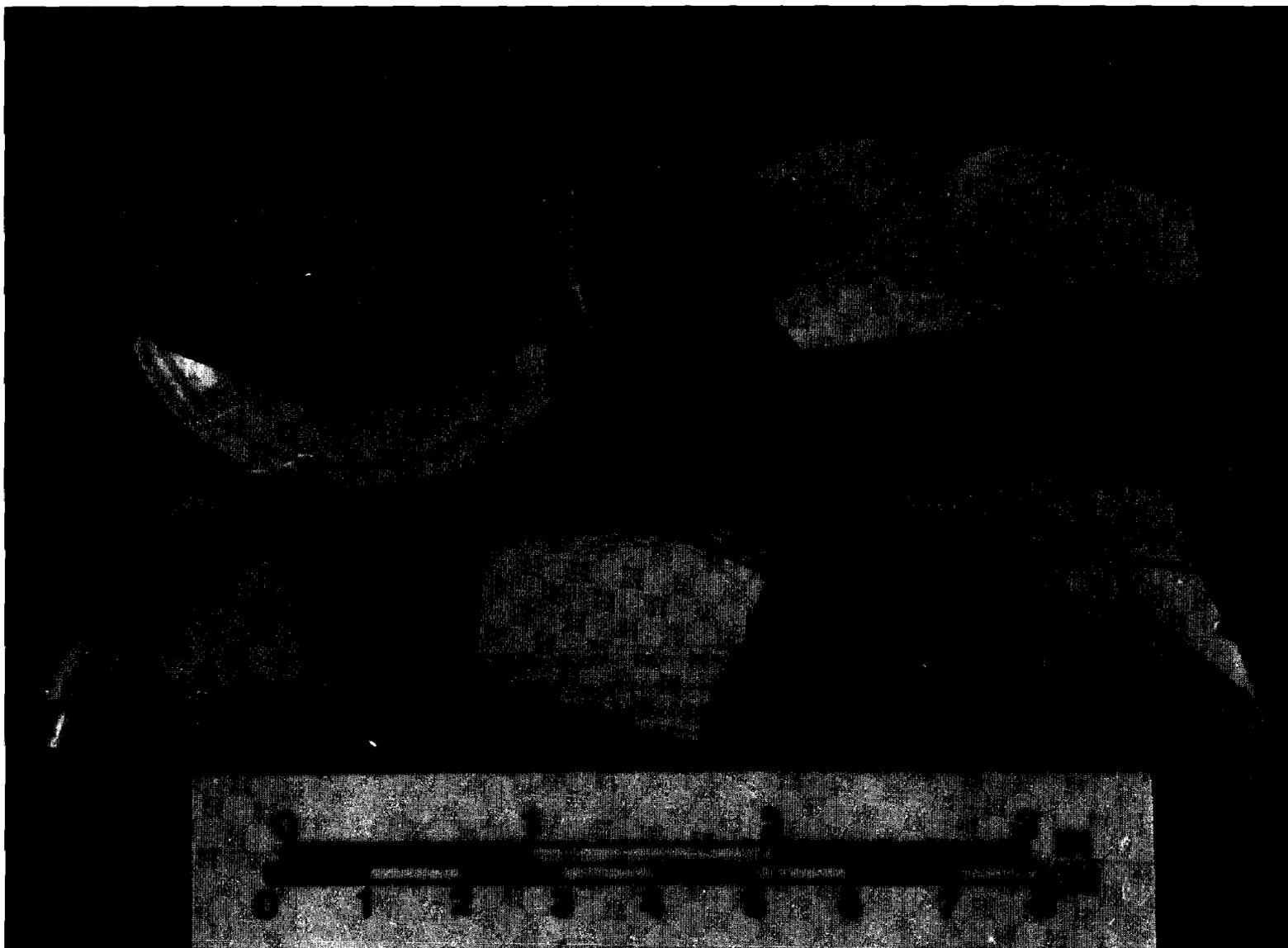


PLATE 28

Pearlware

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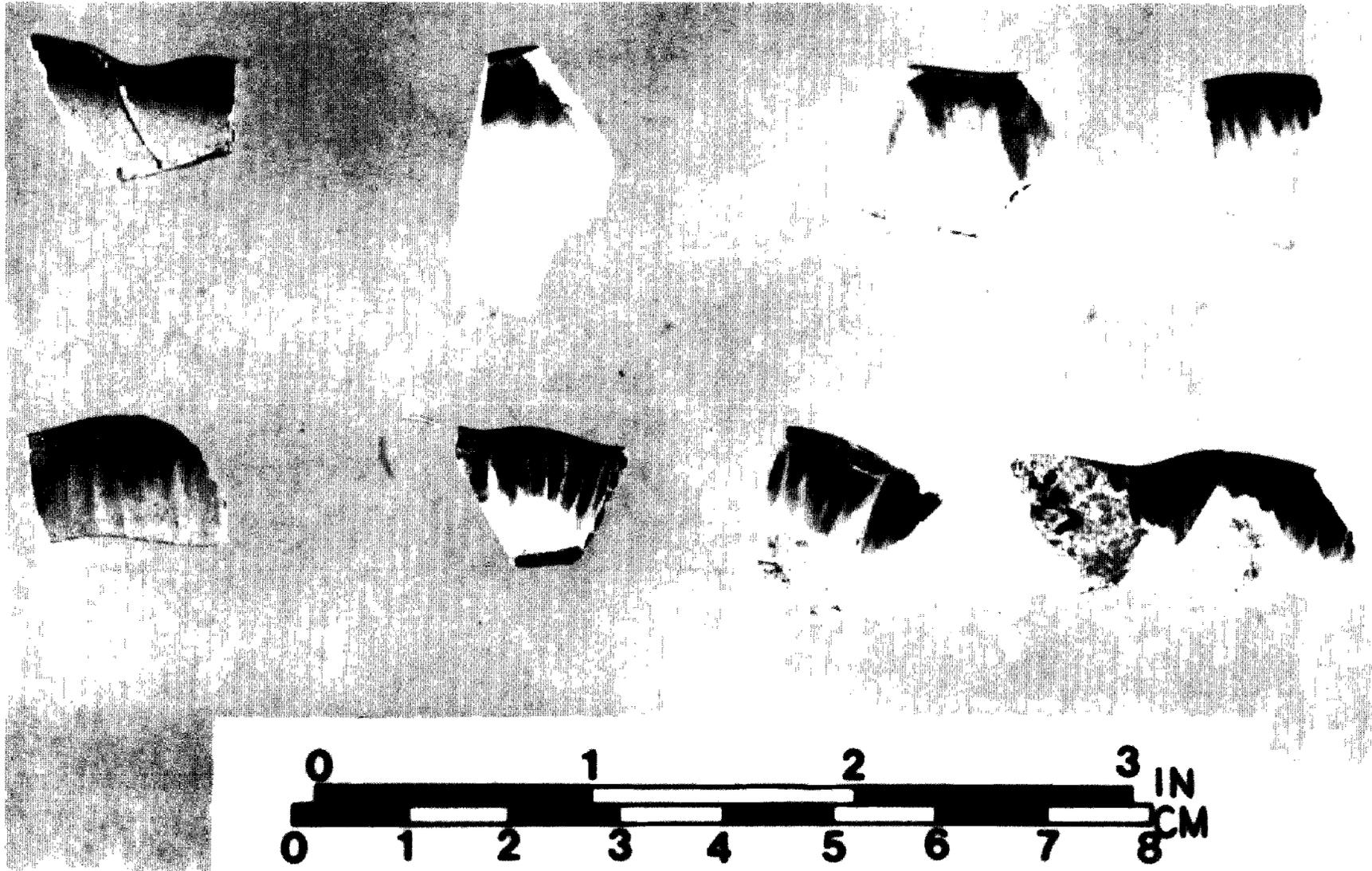
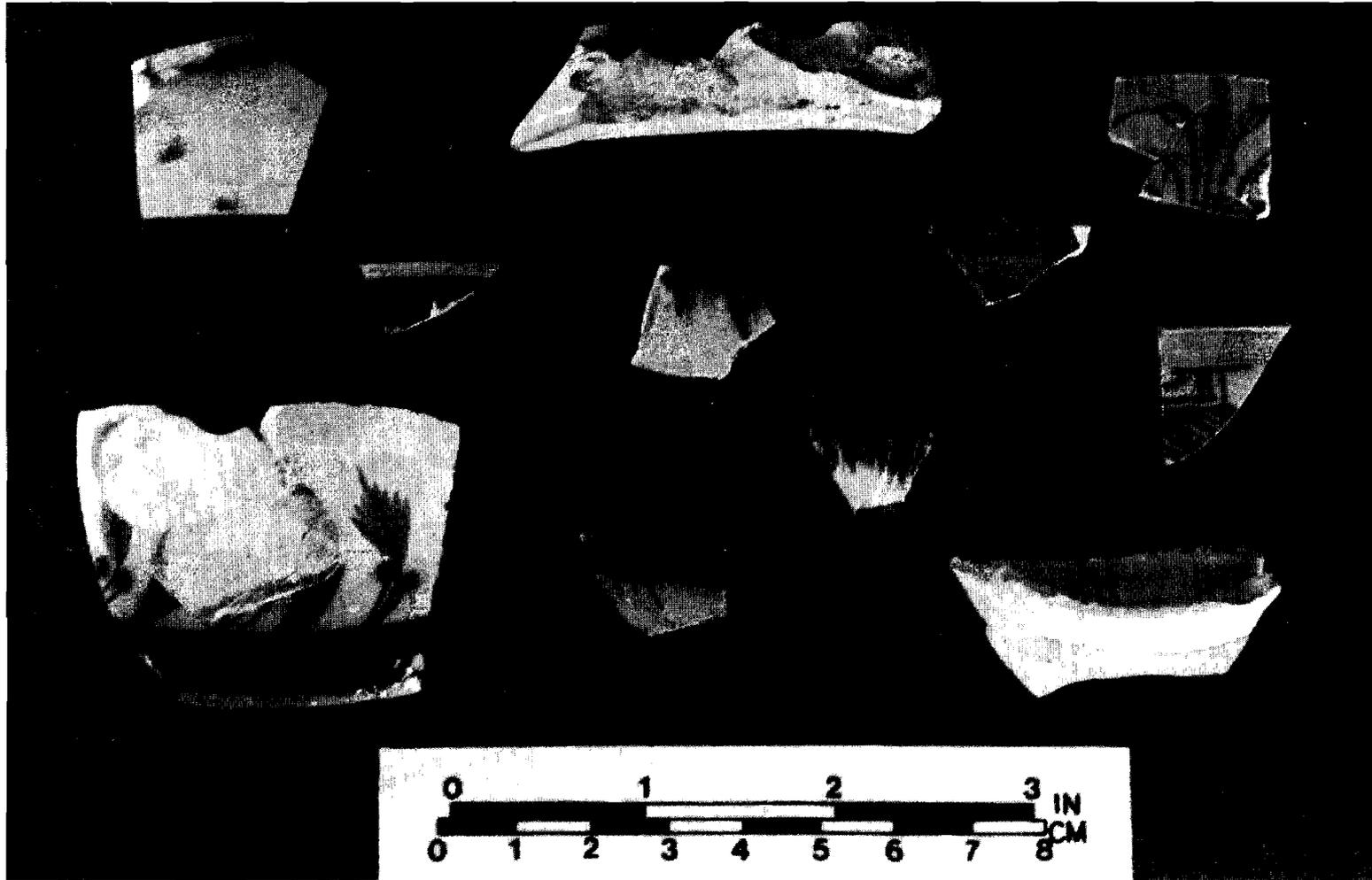


PLATE 29

Porcelain and Pearlware



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TOP ROW (Left to Right): porcelain, hand-painted pearlware, hand-painted porcelain.
MIDDLE ROW (Left to Right): hand-painted porcelain, shell edge pearlware, pearlware, hand-painted porcelain.
BOTTOM ROW (Left to Right): hand-painted polychrome pearlware, shell edge pearlware, shell edge pearlware, pearlware footing.

PLATE 30

Whiteware and Ironstone



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1. whiteware footring. 2. brown transfer print whiteware. 3. blue "willow ware" type transfer print whiteware. 4. ironstone dodecagon base. 5. ironstone handle. 6. whiteware footring. 7. brown transfer print whiteware.

PLATE 31

Gray Stoneware



PLATE 32

Reconstructed Glass "chestnut" Flask
from Features 65 and 65C

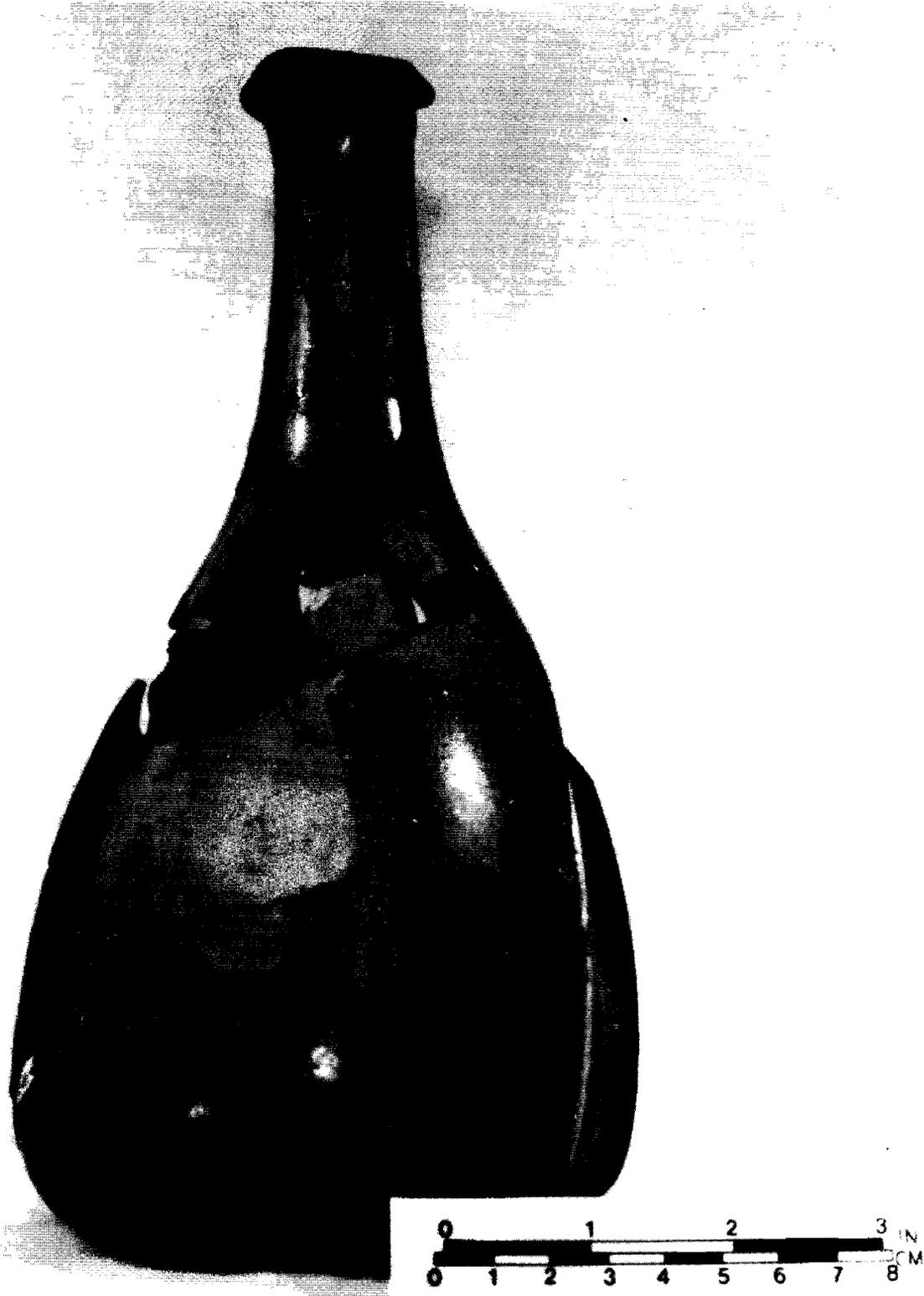


PLATE 33

Table Glass Fragments

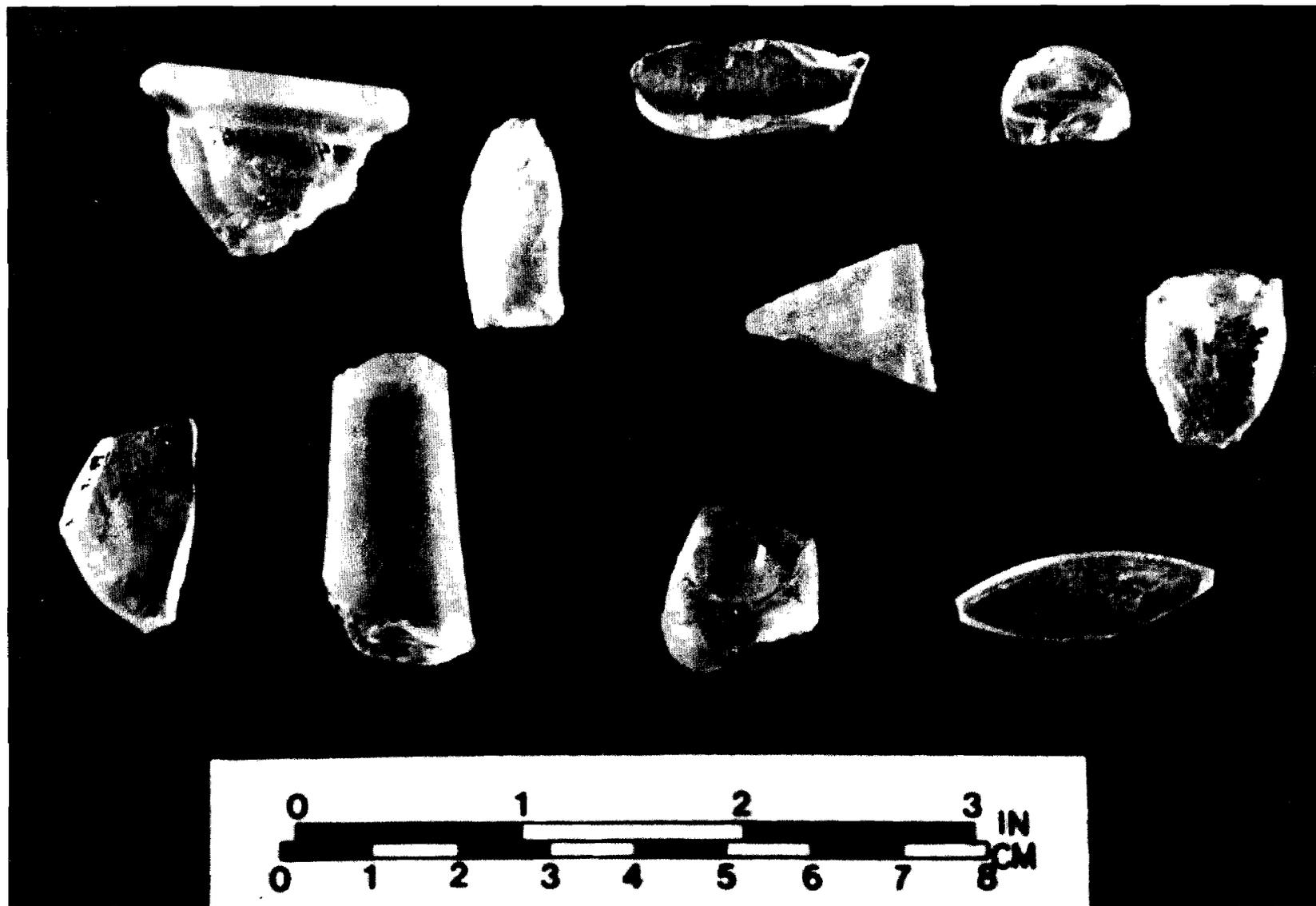
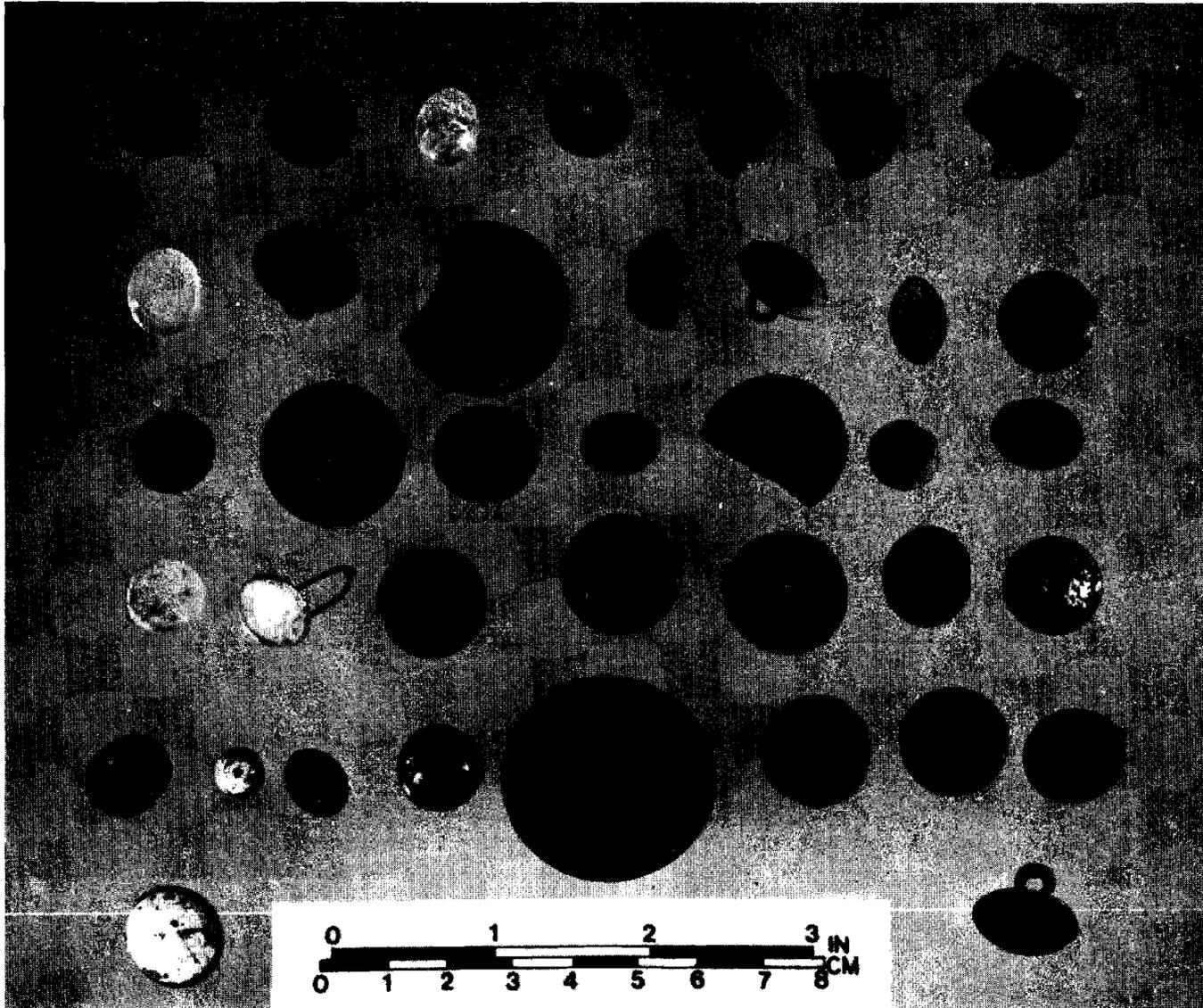


PLATE 34

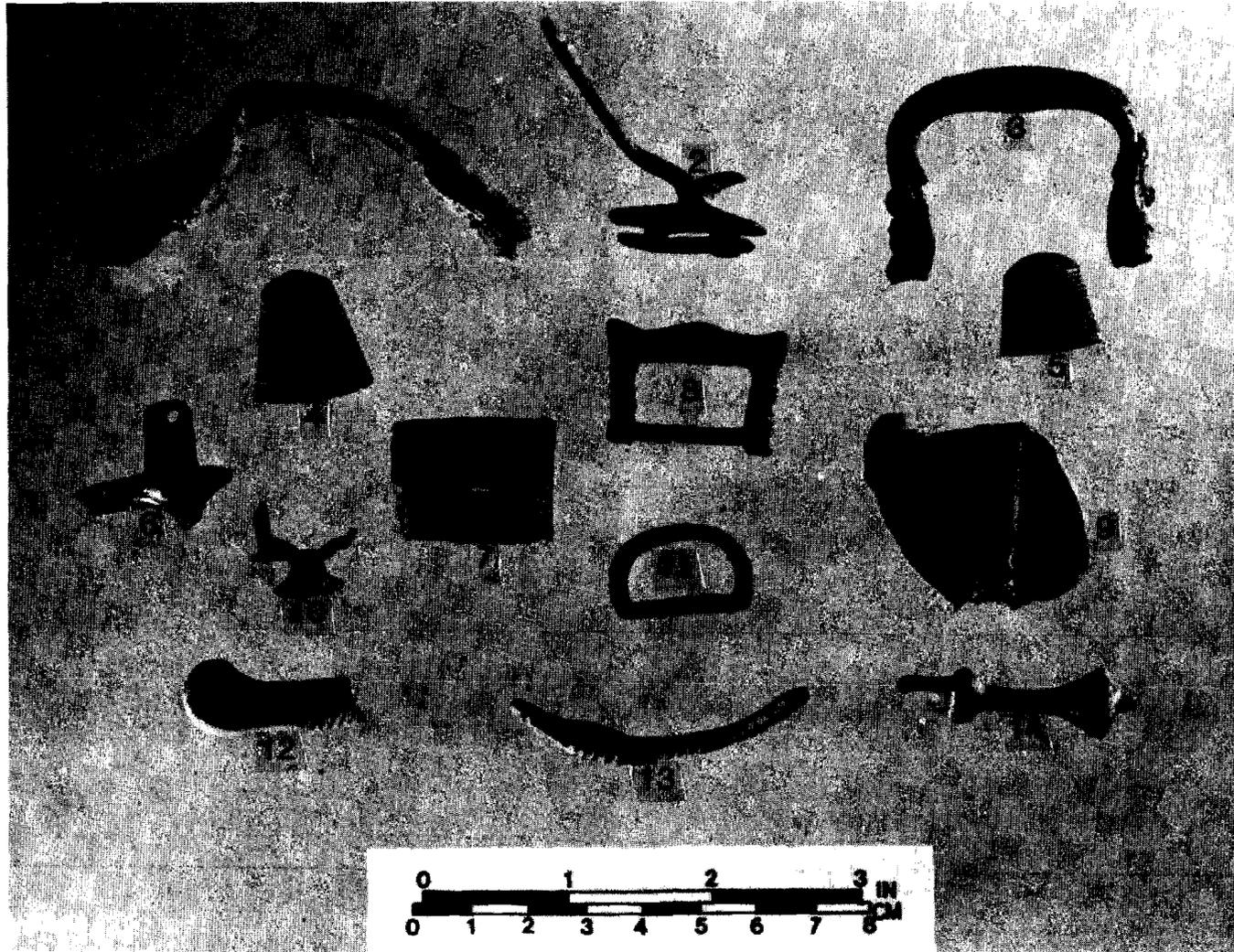
Buttons and Cuff Links



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PLATE 35

Small Metal Objects



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1. lead spew. 2. copper alloy object, possible a harness mount. 3. copper buckle.
4 & 5. copper thimbles. 6. bronze object. 7. folded copper sheet. 8. small copper buckle.
9. crimped lead sheathing. 10. copper object. 11. iron belt or harness loop. 12. pewter toy
pistol grip, knife, or fork handle. 13. pewter toy spoon handle. 14. copper alloy object.

PLATE 36
Gun Flints

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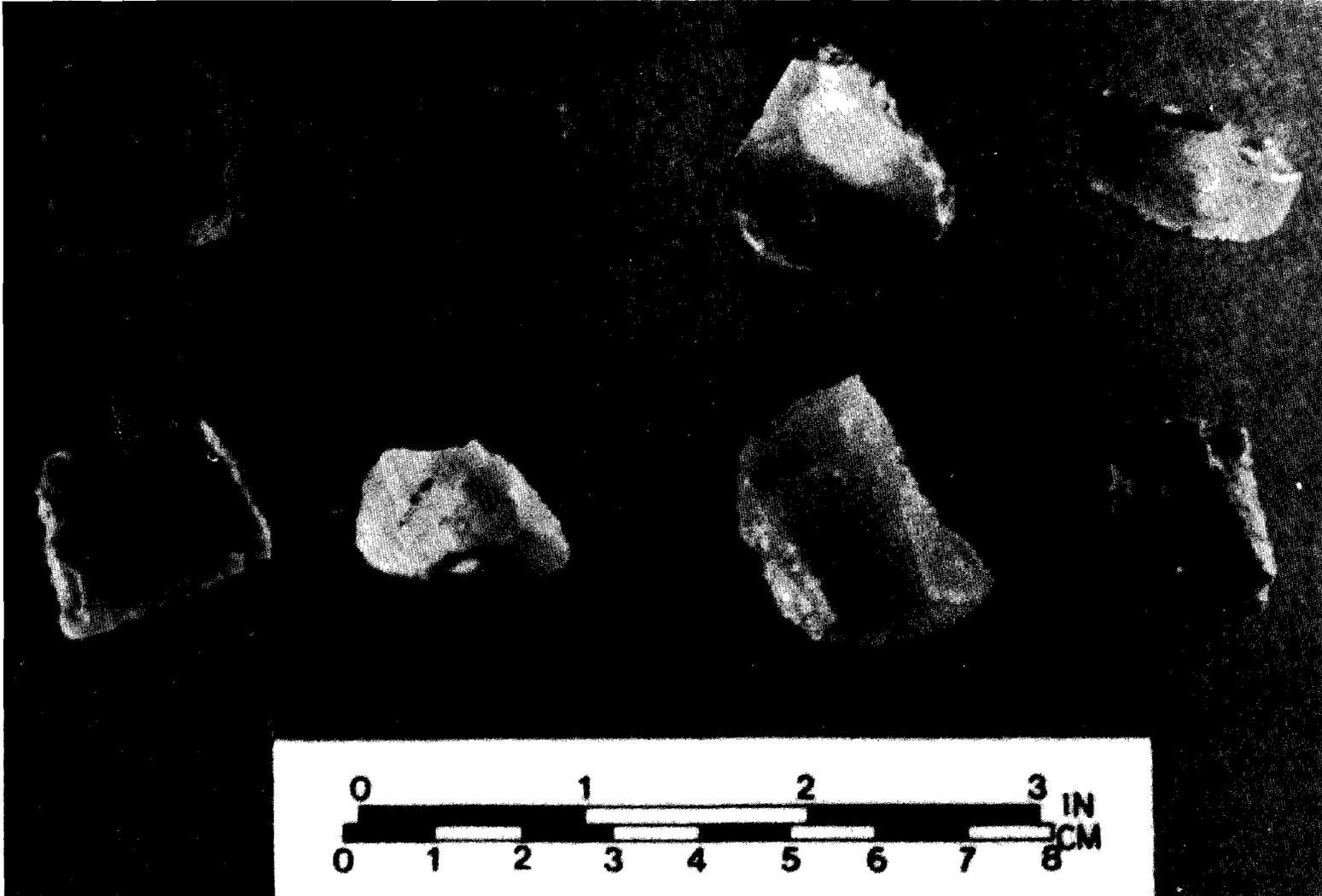
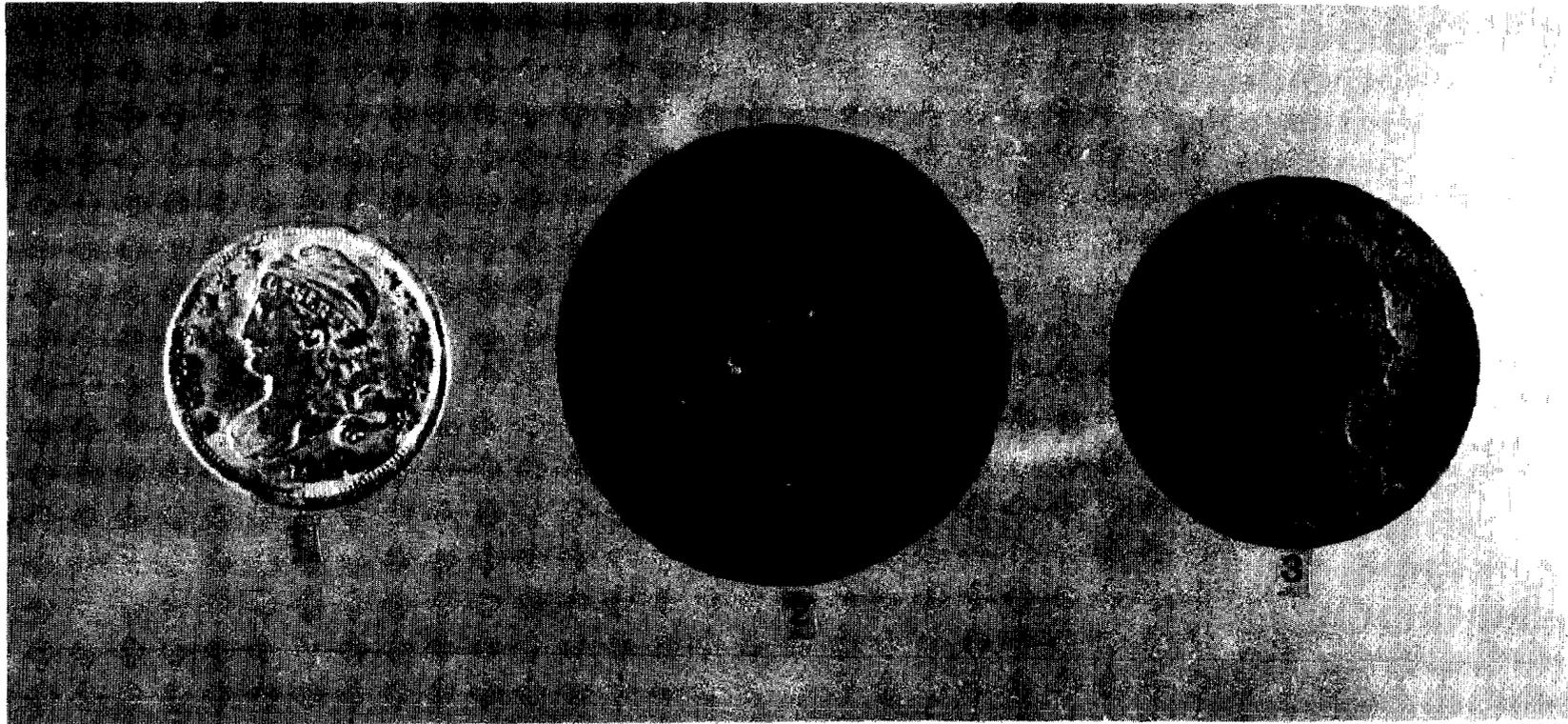
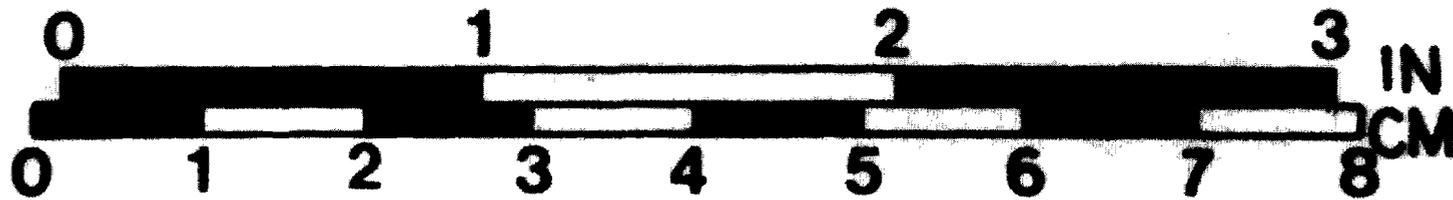


PLATE 37

Coins



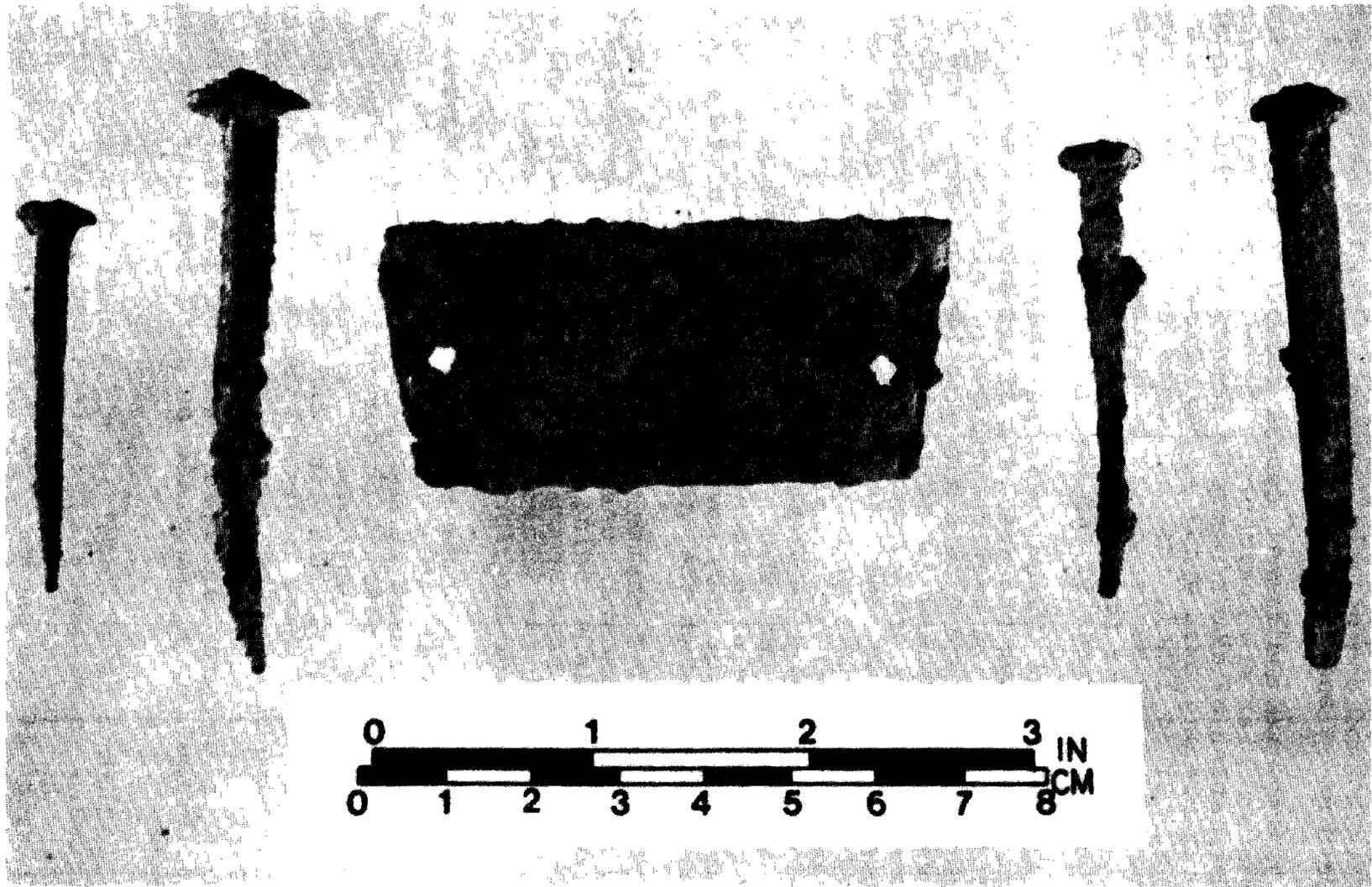
182



1. 1835 capped bust dime. 2. Late 1700s N.J. trade token. 3. 1808 draped bust large cent.

Nails

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glazed on both interior and exterior surfaces. One of these two also bears evidence of a lug handle. Five of the 52 vessels of this form were found in undisturbed contexts including Features 47, 51, 110 and conjoinable fragments from the others were found in Features 63 and 65 (Plate 17).

Thirty-two additional coarse redware vessels are indicated by even smaller rim fragments. These are all hollowwares, but determination of exact forms is impossible. Eighteen of these vessels are unglazed while 14 have brown glaze on the interior surface. It is likely that all represent utilitarian forms, and two may possibly be fragments of butter pots. All vessels in this category were found in the plowzone except for one vessel from each of Features 63 and 65.

At least 16 large, coarse redware dishes were also identified through the analysis of rim sherds, using rim shape and thickness as the main determinants. All are glazed brown on the interior surface with plain exterior surfaces. The glaze of at least 3 of these is mottled indicating the addition of manganese to the glaze. Four of these vessels are represented in Features 17, 69, 80, and 119. Fragments of 2 others were found during the Phase I/II surface collection. All others were found in the plowzone. The small size of the sherds makes it impossible to determine whether these were used in utilitarian or food consumption contexts. Numerous basal sherds from ceramics of this form were also found but were of no use in the minimum vessel estimate for they may all be portions of vessels already accounted for through the analysis of rims.

A minimum of 9 chamber pots is also apparent through the study of rim fragments. One of these is represented in Feature 65 with the remainder being found in plowzone contexts. Six of the chamber pots have brown glaze on both interior and exterior surfaces, 1 is brown-glazed with manganese added, and 2 are brown-glazed on the interior surface only.

In addition to these utilitarian redware forms, several forms indicative of table use are also apparent in the sample. For example, at least 21 small, refined redware bowls are in evidence with the estimation derived from the study of basal sherds (Plate 18). Conjoinable fragments of one of these were found in Features 27 and 118 and the refit establishes the contemporaneity of these features which are thought to be elements of Structure II. Another vessel of this form is represented in the Phase I/II surface collection and the remainder are from various plowzone contexts. All of the small bowls are characterized by brown glaze on both interior and exterior surfaces.

A minimum of at least 16 additional thin-bodied, refined hollowware forms are also represented on the basis of rim sherds. Although exact forms cannot be identified due to the small size of the sherds, they nonetheless are distinguishable from the aforementioned bowls. All are glazed brown on both

surfaces, and distinctions between individual vessels have been made primarily on the basis of glaze. One of these vessels is represented in Feature 43 with the remainder being found in the plowzone. At least 5 mugs are also represented through the study of basal sherds. Four of these are from plowzone contexts and are glazed brown on both surfaces. The fifth was found in Feature 144 and is clear glazed on both surfaces. Fragments of 37 strap handles and 7 lug handles were also found. Three of the strap handles are clear glazed and the remainder of the strap handles and all lug handle fragments are brown-glazed. All handle fragments were found in plowzone contexts; however, none are thought to represent additional vessels as all could conceivably be for a group of vessels already accounted for.

A minimum of 72 slip-decorated redware vessels are also represented in the redware assemblage. The shapes of both rim and basal sherds and characteristics such as paste, glaze, and decoration have been considered in the identification of individual vessels. Twenty-two of these are coarse flatware forms such as plates or dishes. One is represented in Feature 63 and two are represented in Feature 64. Fragments of a fourth vessel were found in Features 63 and 126 with the remainder being found in the plowzone. At least 39 additional slip-decorated vessels are characterized by distinctive impressed motifs at the rim. While the majority of these are also flatware forms, at least 4 are bowls. One of the bowls is represented in Feature 65, 4 of the flatware vessels are from Features 17(2), 19, and 80, and the remainder were found in plowzone contexts.

At least 13 additional coarse, slip-decorated vessels are apparent through the examination of basal sherds. Nine of these are small bowls of which one is represented in Feature 17. Three are hollow forms (bowls, cups, or mugs) and one is clearly a mug. In addition, nine more different vessels are of refined rather than coarse slip-decorated wares. Two of these are represented in Features 19 and 80 with the remainder being found in the plowzone. Due to the small size of the sherds, individual vessel forms cannot be discerned; however, like nearly all of the slip-decorated wares apparent in the assemblage these appear to have been used in food consumption.

Rhenish Stoneware (Plate 19)

At least one vessel of this distinctive gray salt-glazed stoneware is represented by seven body sherds. The raised banding apparent on one fragment suggests either a mug or tankard form. The remaining sherds, four of which are conjoinable, exhibit exterior decoration consisting of an incised, stylized foliate pattern outlined in cobalt blue. The interior is undecorated and very smooth. It has been suggested that this type of decoration indicates Rhenish stoneware of mediocre quality with the more finely-made varieties decorated with applied motifs and molded geometric designs. The manufacture of wares of lesser-quality has been attributed to the increase in exploration from the Rhineland in the eighteenth century.

Tin-glazed Earthenware (Plate 20)

Portions of at least four tin-glazed earthenware vessels were recovered, and all of these appear to be of English origin. Fragments of two vessels were represented in features while pieces of two additional vessels were found in plowzone contexts. Sherds found in features tend to be larger than those from the plowzone. Several basal sherds with foot rings, a rimsherd, and a few small body sherds, all from one vessel, were recovered from Feature 63. The glaze of this vessel has a strong blue tint, and several of the sherds exhibit a dark blue hand-painted foliate design on both interior and exterior surfaces. The basal sherds and the rimsherds indicate that a small bowl is represented. Fragments of a second vessel were recovered from Feature 19. The glaze of this vessel has a light blue tint with interior blue hand-painted foliate decoration. The largest of the sherds is a basal fragment with foot rim, suggesting that the vessel represented is either a plate or a saucer.

Body sherds from at least two additional vessels were recovered from the plowzone, although it is possible that even more vessels may be represented. The glaze of two of these plowzone body sherds suggests that a vessel other than the two aforementioned ones found in features is represented. The glaze is not blue-tinted, but rather is of an off-white color. The interior surface exhibits blue hand-painted decoration. However, neither of the sherds is large enough to identify the form of this third vessel. The glaze on another of the small plowzone body sherds indicates the presence of a fourth vessel. Unlike all of the previously described vessels, this one has a powdered purple exterior decoration. This distinctive decoration was produced by applying powdered grounds of purple pigment over the surface of the vessel (Miller and Stone 1970). Although only one sherd of this type was found, it clearly suggests the presence of fourth vessel.

Buff-paste Earthenwares (Plate 21)

These distinctive wares were produced by the potters of Staffordshire, England from the late-seventeenth century through much of the eighteenth century. The sample includes both yellow combed and dotted slip-decorated earthenware and brown glazed earthenware. At least four such vessels are represented, and all forms are either cups or mugs. Fragments of a minimum of three combed or dotted slipware cups or mugs were found in the plowzone. One of these is represented by a single rimsherd, which is slightly incurvate and of a deep-yellow color with the exterior dotted with dark brown. A second vessel is represented by another rimsherd with the distinguishing characteristic being the presence of a slight brim. This sherd also has a deep yellow color, but is not decorated. In addition, two deep-yellow colored undecorated basal sherds and deep-yellow colored combed slip-decorated handle fragments were also found. However, because these sherds could well be fragments of either of the two

aforementioned vessels defined on the basis of rimsherds, they are not thought to represent additional vessels although this possibility does exist.

The significantly lighter yellow color of additional combed slip-decorated sherds identifies a third vessel. One of these is a handle fragment, suggesting another cup or mug. Again, all sherds were recovered from plowzone contexts. A fourth buff-paste earthenware vessel is represented by two conjoinable basal sherds which form the largest portion of a single vessel of this type of ware. The fairly straight sides and horizontal band near the base clearly indicate a small mug. Both interior and exterior surfaces are decorated with brown glaze. The interior application ran and streaked resulting in a grained appearance and collected in the bottom of the vessel, making it much darker and thicker (Stone et al. 1973).

Jackfield (Plate 22)

This distinctive, highly-fired refined English-made redware dates from the early to late eighteenth century. Forty-two body sherds were found in plowzone and one was found in Feature 63. Four rimsherds from both plowzone and the Phase I/II controlled surface collection suggests that at least three small vessels, all of indeterminate hollow forms are represented. Each is characterized by purple to gray-colored paste with dark black glaze on each surface.

Buckley

At least two vessels of this equally distinctive English type manufactured throughout much of the eighteenth century are evident. One of these is one of the most intact vessels to be found during data recovery excavations. Several large conjoinable basal and body sherds were found within the rock concentration of Feature 21 representing nearly half of what was probably a butter pot (Plate 9). Several non-conjoinable fragments from this vessel were also found in the plowzone, one of which is a "brim" fragment (Griffiths 1978). Another Buckley vessel is represented by body sherds from the plowzone and Feature 63 with the paste identifying it as a different vessel.

Brown Stoneware (Plate 23)

One vessel of brown stoneware is identified by ten body sherds, one of which bears evidence of a strap handle suggesting that a utilitarian form such as a mug, pitcher, or tankard is represented. The exterior is of a tannish-brown color and is salt glazed. The interior is of a lighter beige color and is undecorated. This ware is probably of English manufacture and dates to the eighteenth century.

White Saltglazed Stoneware (Plate 24)

This ware was produced in England during the mid-eighteenth century and is characterized by its distinctive salt glaze which leaves the treated surfaces with a very subtle roughness (Miller and Stone 1970). Twenty individual vessels are represented, by fragments of a variety of forms including tea cups, small bowls, plates, small pedestaled vessels, and lids. Most of these are plain although relief-decorated, "scratch blue" decorated, and enameled sherds are present but in fewer numbers. A minimum of ten teacups is represented with the estimate being derived from basal fragments. These sherds exhibit considerable variability with regard to thickness, body composition, and the height of the foot rim and these characteristics make individual vessels discernible. Seven of these vessels appear to be plain, the interior of one is painted red, and two others are of the "scratch blue" type. These two tea cups are represented by rimsherds and both are decorated on interior and exterior surfaces with blue-colored incised lines and motifs. However, it is the body composition of these tea cups that distinguishes them from those represented by basal sherds. Although rimsherds from a third "scratch blue" vessel were also found, body composition indicates that it could be part of a teacup identified and accounted for in the minimal vessel estimate by its base. The same is true of a rimsherd with an interior red enamel border. All tea cups are represented in plowzone only.

Portions of at least two small bowls were also found. One of these is represented by fairly large, conjoinable rimsherds from Feature 118 and plowzone. Another is represented by a basal sherd from plowzone. Both appear to be plain and clearly larger than tea cups, suggesting that small bowls, possibly punch bowls are evident. Rim sherds from one additional hollow vessel were also found in the plowzone, although the form of this cannot be determined. Body sherds from a minimum of three plates were found in the plowzone. Each includes that portion of the vessel located between the rim and the side known as the brink (Griffiths 1978). Variation in both shape and body composition of these sherds is the distinguishing characteristic, and each of the vessels appears to be plain. In addition, a basal sherd with interior "scratch blue" decoration and a footrim was found on the surface of Feature 64 at the time of the limited test excavation during the Phase I/II survey. This could be indicative of either a small plate or a saucer.

Basal sherds from two small, pedestaled vessels are also present in the sample. These appear to be elements of small salt, sugar, or condiment dishes. Both are plain and from plowzone contexts. A fragment of one lid was also found in plowzone. Another sherd may be from a second lid, although it is also possible that it could be a rimsherd from another form of hollow-ware with a slight exterior rim. Its small size makes it impossible to determine which form is actually represented. Forty-eight additional white salt glaze body sherds were also found. Four of these were found in Feature 17 and one was found

in Feature 63, with the remainder in the plowzone. Included are one relief-decorated sherd with the motif consisting of a series of rectangular shapes and one exterior polychrome decorated sherd colored green, red, and black. All of these could be elements of the aforementioned vessels for which forms could be determined and consequently are not taken into account in the estimation of minimal number of vessels represented in the sample.

Red Stoneware, Engine-turned (Plate 25)

This temporally diagnostic ware was produced in England in the mid-eighteenth century (Noel Hume 1978; Brown 1982) and the 187 sherds recovered represent the highest raw count of any of the stoneware varieties found on the site. However, only 4 individual vessel forms can be identified from this great number of sherds, which is a function of breakage rather than the actual density of this type of ware. Variation in the color of the glaze is the major determinant in the identification of individual vessels. At least three tea pots and one mug or tankard are represented. Fragments of two tea pots and the mug or tankard were found only in plowzone contexts while sherds from the third tea pot were located in the fill of Feature 17. Both interior and exterior surfaces of all vessels are glazed and the exterior surfaces of all vessels are engine-turned.

One tea pot is characterized by a deep red-maroon-colored glaze. Two large rimsherds verify the form of the vessel as do three spout fragments and two perforated body sherds. Twenty-seven small body sherds can be attributed to this vessel on the basis of glaze color. All sherds were found in the plowzone. A second tea pot can be distinguished from the first by its orangish-red-colored glaze. As with the aforementioned tea pot, a rimsherd indicates the vessel form. Fifty small body sherds with the same orangish-red-colored glaze are probably from the same vessel, and all sherds were found in plowzone contexts. A third tea pot is of a deep red-colored glaze although this specimen is considerably lighter in hue than that which was described first. A rimsherd from the fill of Feature 17 identifies the vessel form. The fourth identifiable vessel of this type of ware has a very similar deep red-colored glaze. However, both basal and rim sherds from the plow zone indicate that either a mug or tankard is represented. Seventy-seven small body sherds with identical glaze coloring were also found in the plowzone; however, these fragments could be from either this vessel or the similarly-colored tea pot, or a combination of both.

Whieldon-type Wares (Plate 26)

These distinctive wares were produced by Thomas Whieldon and others in England in the third quarter of the eighteenth century (Miller and Stone 1970). At least seven Whieldon-type vessels are represented and variations in decoration serve to distinguish individual vessels from one another. Pieces of three of these vessels are present in both plowzone and features while

fragments of the other vessels were found in plowzone only. Three of the vessels are from tea services; however, forms cannot be determined for the remaining four identified vessels.

Small rimsherds from one teapot were found in the fill of Feature 17 and the plowzone. These have mottled brown and green exterior decoration with closely-spaced incised lines and undecorated cream-colored interiors. Fragments of two teacups were also found. One of these, a basal sherd with foot rim, has exterior decoration of mottled dark and light green with an undecorated cream-colored interior and was located in the plowzone. Rim and body sherds from a second teacup were found in Features 63 and 64 as well as in the plowzone. This vessel is unique in the sample as it is the only one with bifacial decoration which consists of mottled dark and light brown, dark yellow, and green over the cream-colored body.

Although forms cannot be ascribed to the remaining four vessels apparent in the sample, variations in decoration identify them. Two of these are of the Wedgewood-Whieldon type, molded in the forms of vegetables (Miller and Stone 1970). One such vessel is represented by a single body sherd recovered from the plowzone. The cream-colored exterior is molded in the form of a cauliflower with some green decoration. The cream-colored interior is undecorated. The second identified vessel of this type consists of five body sherds found in the plowzone. Exterior decoration consists of a molded, green-colored foliate motif and the cream-colored interior is also undecorated.

Decoration also identifies the final two Whieldon-type vessels for which forms cannot be determined. One is the only interior decorated vessel in the sample, consisting of mottled dark and light brown over the cream-colored body. In addition, the undecorated exterior is of a tannish-gray color as opposed to the cream-colored bodies observed on all of the other vessels. Seven body sherds of this vessel were found in the plowzone while one was recovered from Feature 69. The last identified vessel exhibits exterior mottling of dark and light brown and green colors over a cream-colored body and an undecorated interior similar to several of the aforementioned vessels. However, the body is of a substantially lighter cream-color than that of any of the other vessels, and this is the characteristic that distinguishes this vessel from the rest. Fourteen body sherds from this vessel were found only in the plowzone.

Creamware (Plate 27)

Production of this English-made earthenware began in the third-quarter of the eighteenth century and continued into the early nineteenth century although its popularity reached its peak prior to 1800 (Miller and Stone 1970). The earlier products are characterized by a deep-cream colored glaze while later creamware is of a lighter cream color (Noel Hume 1970). Examples of both varieties are found in the sample although light-cream-colored wares occur with greater frequency. At least thirty-five

creamware vessels are represented in several forms including plates, tea cups, a mug or tankard, a tea pot, a pedestaled dish or bowl, and a lid. No less than twenty of these vessels are flatware forms and while some are clearly plates, others could be platters. The determination of the number of minimum vessels is based primarily on the analysis of rimsherds, although one vessel is defined by a basal sherd. This particular vessel is one of only two flat ware vessels characterized by the deep-cream-colored glaze. The other is a rimsherd decorated with a "feather" relief border (Miller and Stone 1970). Both were found in the plowzone.

The remaining eighteen flatware vessels are of the light-cream-colored variety and all are undecorated. Enough of seven of these vessels was recovered to be indicative of plates molded in the Royal pattern (Noel Hume 1970). Fragments of the remaining eleven flatware vessels are not big enough to discern any specific rim pattern, although at least some of them are probably also of the Royal pattern. Sherds from ten of these vessels were found in plowzone only. Fragments of three are represented in both the plowzone and in Features (Features 17, 26, and 44A). Portions of three flatware vessels were found only in features (Features 12 and 17) and sherds from the remaining two flatware vessels were found during the Phase I/II pedestrian survey. Basal sherds with slight, rounded footrims indicate at least nine light-cream-colored vessels. However, all of these may be portions of vessels already accounted for through rim analysis and for this reason have no bearing on the minimum vessel count.

At least eleven creamware vessels occur in hollow forms. One of these is a teapot and is represented by a spout fragment from Feature 44A, a rimsherd, and a perforated body sherd, both from the plowzone. A mug represented by two basal sherds with exterior relief diamond pattern decoration was found in the plowzone. One deep-cream-colored teacup is represented by a basal sherd with a footring which was also found in the plowzone.

Rimsherds from two light-cream-colored teacups were found in the plowzone. One of these is undecorated while the other is decorated with a red overglaze enamel border. Fragments of six other light-cream-colored hollow forms were also found although not enough of any of them was recovered in order to determine exactly what form is represented. One of these is decorated with exterior red overglaze enamel in a foliate motif. Another is interior decorated with red overglaze enamel border and green foliate motif. A third is decorated on both surfaces with a red overglaze enamel border. Rimsherds from a fourth hollow form are decorated with an alternating punctated and raised dot relief border. A rimsherd from Feature 126 represents a fifth hollow form which is engine-turned. This sherd is large enough to indicate that the vessel represented is larger than a tea cup as is the sixth identifiable hollow form which is represented by several undecorated rim sherds. All but the engine-turned vessel are represented in plowzone contexts only. Basal sherds with foot rings from at least seven light-cream-colored hollow forms

were also found in the plowzone. However, like the majority of basal sherds from the flatware vessels, these cannot be used in the minimum vessel count as all could be from vessels accounted for through the analysis of rimsherds.

Found near the bottom of the well (Feature 17) was one of the few relatively complete ceramic vessels from the site. The green mottled effect apparent on this bowl is similar to some apothecary bowls known to have been produced in Philadelphia sometime in the late eighteenth or early nineteenth century (Hopkins and Shomette 1981). Both the specimens noted by Hopkins and Shomette and the tableware bowl recovered from the bottom of the well at the Whitten Road site had been exposed to water for extended periods of time prior to recovery. However, closer inspection of the glaze of the vessel reveals that it was probably intentional and was not caused by submersion in the well water. The form of the bowl retrieved from the well is similar to some in the collection of the Pennsylvania Historic and Museum Commission which were excavated in Philadelphia and suggests that it dates to the late eighteenth/early nineteenth century period and that it may well be a local product (Steve Warfel, Personal Communication 1986).

Portions of at least three other vessels were also found. Three small conjoinable fragments of a light-cream-colored lid were found in the plowzone. Distinctive relief-decorated body sherds represent the final two identifiable vessels and one is of a deep-cream-color and is decorated in a foliate motif. The other is a light-cream colored horizontally-molded sherd. The vessel form can be attributed to neither and both are represented in plowzone contexts only.

Pearlware (Plate 28 and 29)

This type developed out of the creamware tradition around 1780 and a number of decorative varieties were common from this time on and into the nineteenth century. A minimum of 30 vessels is represented with this estimation made primarily upon the study of rim sherds. Identifiable individual vessel forms suggest that pearlware was used primarily in food consumption. Like the other types, the majority are from the plowzone. At least 12 edge-decorated flatware vessels are indicated and three of these have blue scallop-impressed or shell-edge decoration. Five others are decorated with a series of closely impressed vertical lines, four in blue and one in green. The remaining 4 edged vessels are decorated with painted vertical lines. Three of these are blue and one is green. All forms are plates or saucers.

A minimum of ten underglaze blue hand-painted hollow forms are also present. One of these is represented in Feature 26. Decoration distinguishes individual vessels and consists of horizontal lines, swirls, geometric designs, and floral motifs. Three of these are decorated on both surfaces. The others are decorated on the exterior surface only. Most forms appear to be small bowls or cups. One final fragment of a lid to a covered

vessel was also found.

At least nine hand-painted polychrome hollow vessels are also evident. Individual vessels are identified primarily on the basis of design and color. In addition, five finger painted annular-ware vessels characterized by thick horizontal bands of various colors are also evident. One of these is represented in Feature 17 and at least one other is of the mocha-ware variety. Forms are most likely hollow. One engine-turned annular ware hollow form is also present as is a polychrome stencil decorated vessel and a black transfer printed hollow form.

Porcelain (Plate 29)

At least fourteen porcelain vessels are represented in the sample and all of these are hollowwares. Forms can be determined for only seven of these, consisting of four tea cups and three small bowls. Vessel counts are based primarily, but not solely, on basal sherds. The majority of the identifiable vessels are probably English-made; however, the decoration of at least four vessels, all teacups, suggests that they may be of Chinese origin. In either case all are thought to date to the late-eighteenth century.

The polychrome decoration of two of the tea cups suggests they are Chinese export items. Both are represented by rimsherds. One of these is decorated on interior and exterior surfaces with overglaze enamel. The interior design consists of a series of pink dashes between thin blue and pink borders while the exterior decoration is comprised of pink wiggly lines. This decoration is similar to that found on what have been termed "Deteriorated Chinese Trade" wares (Brown 1982). This sherd was found in Feature 17. A second tea cup is also identified by rimsherds and the decoration also consists of over glaze enamel. Only the interior of the vessel is painted with thin, pink wiggly lines, although this decoration is highly deteriorated and only a trace of it is evident. Several small conjoinable sherds were found in the plowzone and one sherd from the same vessel was in the fill of Feature 17. Another tea cup is decorated with underglaze blue on interior and exterior surfaces. The glaze is bluish-white. It is represented by rimsherds found in the plowzone and at least a portion of the decoration includes a hand-painted tree. This vessel is probably of English origin. A fourth tea cup is decorated with interior blue overglaze enamel. A fairly large basal sherd found in the plowzone defines the form of the vessel. It is possible that it may be Chinese-made.

Three small bowls are also represented and the forms are defined by basal fragments. Enough of the bases of each was recovered to indicate hollow forms larger than tea cups. Two of these are undecorated and are represented primarily in the plowzone, although a fragment of one was found in Feature 17 and a piece of the other was found during the Phase I/II surface collection. A third bowl has interior blue hand-painted underglaze decoration consisting of a floral motif. A sherd of

this vessel was found in Feature 17 and others were in the plowzone. All three vessels are probably English-made.

Basal sherds indicate the presence of at least seven other vessels, and although none are large enough to be indicative of individual forms, all seem to be hollowware and are most likely tea cups or small bowls. All sherds are undecorated and body paste suggests English manufacture. At least six vessels are represented by rimsherds, but because it is possible that all of these hollow forms could be elements of vessels already accounted for in the analysis of basal sherds, none are computed as distinct vessels in the vessel count. Four of these rimsherds are decorated with underglaze transfer print, indicating English origin.

Whiteware (Plate 30)

Whiteware developed out of pearlware in English ceramic manufacturing history around 1820. Production continued throughout the nineteenth and twentieth centuries. Its presence in the Whitten Road site assemblage is significant because it supports the documentary evidence of the occupation of the site into the 1850s. At least nine different vessels are present although form can be ascribed to only one of these which is most likely to be a mug or tankard fragment represented by a large, octagonal basal fragment which is undecorated. This basal sherd and a large handle fragment, likely to be from the same vessel, were found near the top of Feature 144 which also yielded evidence of at least 2 additional whiteware vessels. One of these is a circular basal sherd which appears to be part of another hollow vessel form. The other is of indeterminate form and is identified by body sherds with brown, transfer-printed floral decoration. Three additional transfer-printed whiteware vessels are represented in plowzone contexts by body sherds and these include blue-, brown-, and red- colored motifs. Three other undecorated whiteware vessels are represented by basal and rim sherds and are distinguished from one another by paste. All are represented in the plowzone only.

Gray Stoneware (Plate 31)

This ware is distinguished from Rhenish stoneware by its greater thickness and its hand-painted blue exterior decoration. In contrast to all other stoneware varieties found on the site, gray stoneware was produced locally beginning in the late-eighteenth century up until the nineteenth century. Vessel forms of this variety are largely confined to utilitarian wares (Noel-Hume 1970). A minimum of five vessels are represented. Large conjoinable basal sherds and handle fragments indicate that one of these is of a hollow form such as a jug, ewer, or pitcher with exterior hand-painted blue decoration. A second hollow form is also identified by large conjoinable basal fragments with similar decoration. Another jug or pitcher, or possibly a storage vessel, is represented. At least three other locally-produced gray stoneware vessels are represented and distinguished by the

variability observed among body composition. Forms can be determined for none of these. All five of the vessels are represented in plowzone contexts only.

Yellowware

This American made buff colored, yellow-glazed earthenware dates to approximately the 1830-1880 period. Over 40 very small body sherds were found in plowzone contexts only. All, however could be pieces of the same vessel. The vessel form is indeterminate. This ware dates to the final years of the occupation or may have been deposited after the site was abandoned.

Bottle Glass

At least 23 bottles are represented in the numerous glass fragments recovered from the site. Although the vast majority are of very small pieces found in the plowzone, several fairly large basal fragments were located in features. The identification of individual bottles was accomplished largely through the analysis of bottle bases although the color of the glass was also used as a determinant, to a lesser extent.

Sixteen of the 23 bottles are oval-based with round body forms ranging from globular to virtually straight-sided in shape. Five others are rectangular case bottles. Fragments of two smaller, apothecary bottles were also found. Of this total, fragments of five different vessels were found in Feature 65 and portions of individual bottles were located in Features 65C, 57B, 27, and 17. The remaining fourteen bottles were represented across wide areas of the plowzone.

Aside from differences noted regarding the various kinds of bottles, it is also quite obvious that two distinct types of glass are represented, with color being the main determinant. While some of the glass sample consists of the opaque, very dark-green colored glass characteristic of English-made bottles, a comparable amount is of a much lighter-green tone. This light-green color has been attributed to the presence of iron oxides in the sand of the eastern United States from which the glass for these bottles was manufactured (McKearin and Wilson 1978). With regard to individual vessels, 13 of the bottles are of the dark variety and thought to be of English manufacture. The remaining ten vessels are of the light-green type, and these are considered to be of local origin.

By the late eighteenth century, several glasshouses were in operation in both southeastern Pennsylvania and southern New Jersey and several detailed overviews of these operations are readily accessible (McKearin and Wilson 1978; Palmer 1976; McKearin and McKearin 1950). Although it is impossible to pinpoint which glass house produced the light-green vessels in the sample from 7NC-D-100, it seems most likely that they were made in one of them. The glass houses of Gloucester and Salem Counties in New Jersey would have been the sources closest to the

site, although Philadelphia is also a possibility as a source.

Little is known of early American glass from archaeological contexts, although fragments of some of these bottles have been recovered from the Wistanburgh site in Salem County which was in operation from 1739 to 1780 (Palmer 1976). Although a minimum of ten such glass bottles are represented in the sample from 7NC-D-100, only a fraction of the bottle is present in nine of the cases. However, enough conjoinable pieces of one of the bottles were present in Features 65 and 65C to provide a view of the overall shape of the vessel (Plate 32, Figure 64). The body of this vessel is more flask-like than the globular to straight-sided forms observed among the English bottles, and is rather asymmetrical. The kick-up at the base is subtle and a glass-tipped pontil mark is present (White 1978). The shoulders of the bottle are gradual, forming a slender neck. The applied lip is irregular and pinched against the neck at only one point. The rim is not stringed. In form, this bottle resembles a "chestnut" flask, so named for its shape, which is a common form among glassware produced in America in the late eighteenth century and into the early nineteenth century. Several complete specimens have been illustrated (McKearin and Wilson 1978; Spillman 1983).

A large basal section of a second bottle and a large basal section and a neck of a third locally-made light-green bottle were recovered from features (Figure 64). Like the aforementioned fairly complete bottle, both basal fragments display very subtle kick-ups and glass-tipped pontil marks, one of which has been virtually ground off. The neck piece is also similar to that of the fairly complete bottle, being slender with an applied lip which was pinched against the neck at only one location. The rim is also not stringed.

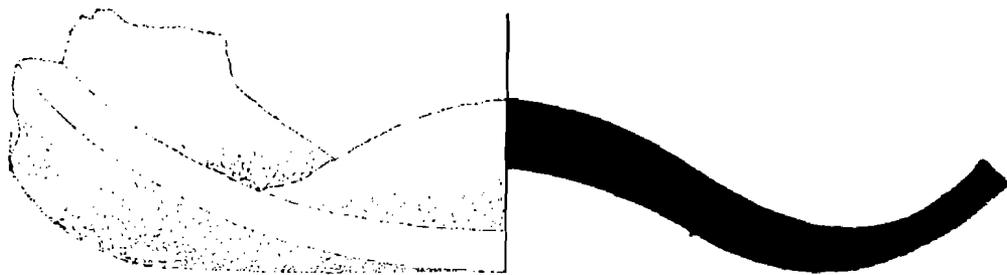
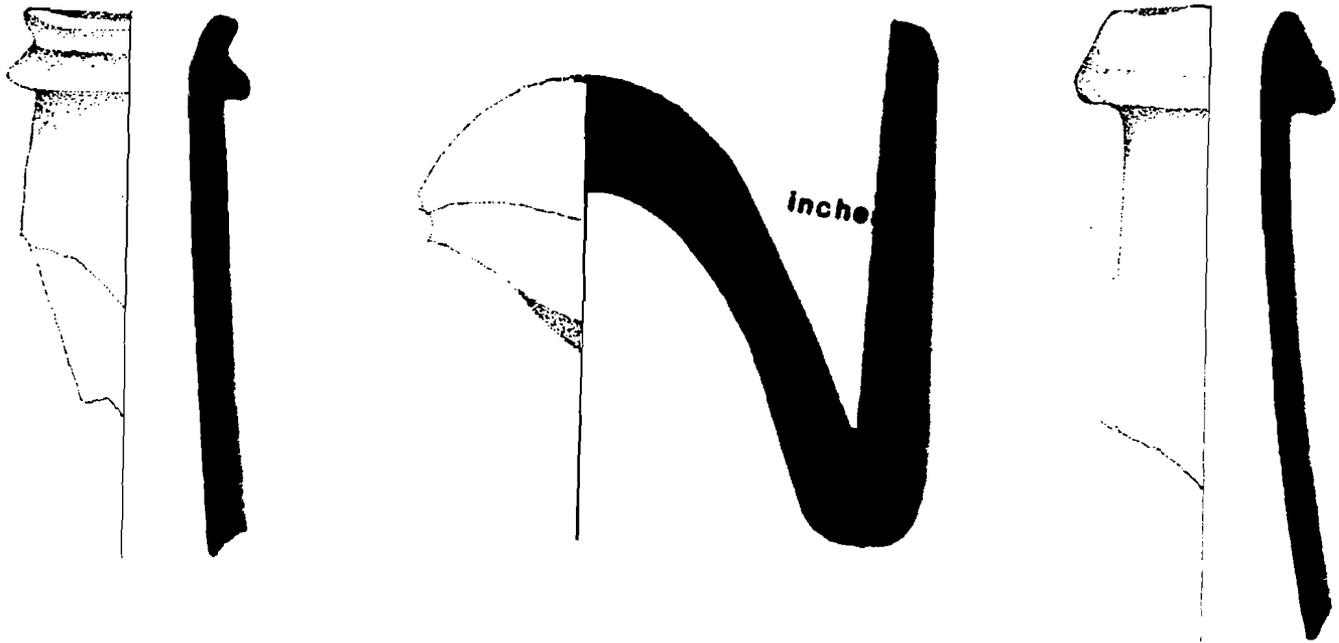
In contrast, the rims of at least four of the darker English-made bottles are stringed. Enough of only one of these bottles has survived to provide a glimpse of its overall shape (Figure 64). This vessel exhibits a high kick-up measuring a full two inches and the body appears to be fairly straight-sided. This form is similar to that of an illustrated bottle bearing a seal dated 1783 (Noel Hume 1978:Figure 13).

The presence of early-American bottles at 7NC-D-100 is significant in two regards. First, the most complete specimen (Plate 32) provides a rare opportunity to consider an example of this poorly-understood glassware within an archaeological context. Secondly, these vessels can be seen to mark the emergence of a truly American material culture.

While the presence of English-made bottles suggests that to some degree the young nation was still dependent upon the material goods of the Old World, a supposition also corroborated by the aforementioned ceramic assemblage from the site, the presence of locally-made bottles confirms the development of an American glass-making industry to provide a less-expensive alternative to serve the needs of Americans. The fact that both

FIGURE 64

Drawings of Glass Bottle Necks and Bases



types of glass were recovered from within one of the undisturbed deposits (Feature 65) suggests that both English-made and locally-produced glass bottles were used contemporaneously at the Whitten Road Site.

Table Glass (Plate 33)

Fragments from at least two lead-glass vessels for table use were recovered from the plowzone and both are stemware. While one has been basically split down the middle, the other is more complete and can be used for comparative purposes. Plain and with a short, drawn stem, this specimen is similar in form to example "XXIV" in Hume's illustration of stemware (Noel Hume 1978). Hume suggests that this type of stemware could be a local rather than English product produced in the Amelung factory in Maryland and provides a bracketed date range of 1780-1805 for the piece.

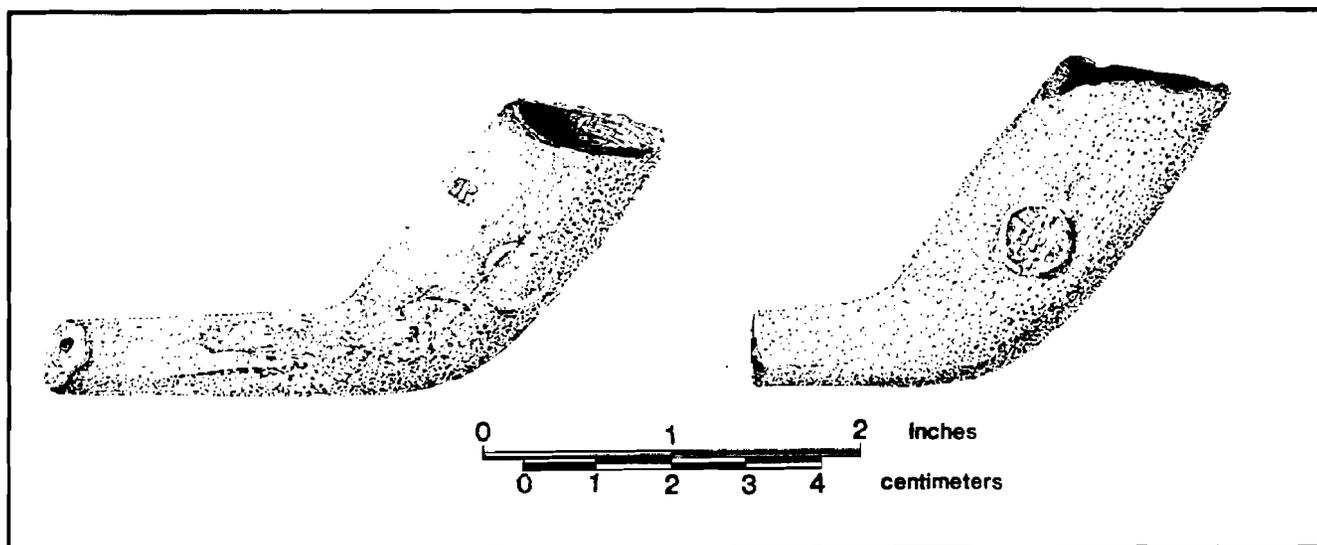
A possible decanter is represented by a rim fragment. Essentially straight-sided and with a broad, flat lip, this form is most similar to "No. 13" in Noel Hume's illustration of decanters (Noel Hume 1978). However, some clear apothecary bottles which date to the late-eighteenth century have similar characteristics (Noel Hume 1978). Not enough of this glass vessel was recovered to be able to ascertain its form. Seventeen lead glass body fragments were also recovered from the plowzone; however, no additional individual forms can be identified from these. In addition, a small fragment of a wine glass base was also found, although it is possible that this could be a fragment of the wine glass already accounted for. As has been mentioned in the preceding discussion of bottle glass, at least one other glass vessel, a rim fragment of a light green-colored tumbler, presumably for table use, was also recovered.

Tobacco Pipes

The importance of the study of English tobacco pipes from historic sites has long been recognized because these artifacts are easily dated and their chronology is well-documented (Oswald 1951; Harrington 1954; Binford 1962; Noel Hume 1978). One hundred five kaolin pipe fragments were found of which over 80% were stem pieces with measurable bore holes. Binford's (1962) formula for dating pipes involving the measurement of bore holes was employed and the sample yielded a date of 1743. However, it has been demonstrated that this formula tends to produce dates consistently earlier than those suggested in cases when evidence other than the diameter of pipe-stem bore holes is available (Noel Hume 1978).

Approximately two-thirds of the pipe-stem sample was found in the plowzone. Pipe-stems were also found in Features 17, 43A, 63, 122, 126, and 144. The stems from the plowzone are generally smaller than those found in features, and this is most likely the result of plow damage. Most of the stems found below the plowzone were located in Feature 144. In addition, this outlying

FIGURE 65
Drawing of Pipe Bowls



midden deposit yielded two intact pipe bowls, and the charred mouths and interiors of both indicate that they had been heavily used.

Although several fragments of bowls were found in the plowzone, the only whole bowl forms came from Feature 144. Significantly, makers' marks are clearly legible on one of these (Figure 65). The initials "RT" are stamped on the back of the bowl, and a circular, relief-molded cartouche on the side of the bowl contains the letters "R.TIP.PET." Three individuals by the name of Robert Tippet are known to have manufactured tobacco pipes in Bristol in the last quarter of the seventeenth century and the first quarter of the eighteenth century (Oswald 1951). A pipe bowl with identical markings is also illustrated in a study of Bristol pipe-makers and their marks (Jackson and Price 1974). Pipes with this mark have also been found in the fill of a well at a historic site on Arnold Creek in lower Delaware, which is thought to have been occupied during approximately the second quarter of the eighteenth century and also at the historic site at Webb's Landing on the Murderkill (Wise 1979). An R. Tippet pipe was also found in a Contact Period Indian grave, which is thought to date to the first quarter of the eighteenth century, at the Lancaster County Park Site (Kinsey and Custer 1982). Tippet pipes were also found during excavations at the Caleb Pusey House in Delaware County, Pennsylvania (Schiek 1976). Similar pipes have also been found at British campsites of the Revolutionary war (Grimm 1970) and at Fort Michilimackinac (Miller and Stone 1970). Application of the Binford formula to the latter sample yielded a date of 1754 (Stone 1974). The other intact pipe bowl from Feature 144 also has a cartouche on its side and stamped letters on its back. However, both marks are

highly worn and illegible. Nonetheless, these characteristics coupled with the overall shape of the bowl suggest that it dates to the first half of the eighteenth century (Noel Hume 1978).

Thus, the analysis of kaolin pipe fragments indicates that these artifacts date to approximately the mid-eighteenth century. This correlates well with some of the temporally-diagnostic ceramic types found at the site, particularly the various English stonewares.

Buttons (Plate 34)

Thirty-three buttons were found during data recovery excavations and only two were not in plowzone contexts. Seven of these are hollow cast buttons and are thought to date to the first half of the eighteenth century (Noel Hume 1978). Holes to facilitate the release of gases during manufacture are evident on the backs of three of these buttons. All are plain and undecorated and of a copper alloy. Examples were found in Features 17 and 63 and in the plowzone.

Flat disc buttons were found in greater frequency with twenty four examples collected from the plowzone. Eleven of these are tin-plated, eleven are of a copper alloy, and the blackened faces of two may be indicative of silver-plating (Noel Hume 1978). Three of the copper alloy buttons are decorated and all designs are impressed. One consists of a floral border around an eight-pointed star and another has a wreath-like design around a goblet form. A third flat button is roughly diamond-shaped with a beaded border. In addition to this diamond-shaped flat button one of the tin-plated flat buttons is of an octagonal shape. The rest are round with one being more oval than circular.

Two small, domed backless buttons were also found. The shanks of these are attached to the hollow back side of the buttons. A similar, slightly larger domed item has no evidence of a shank on its inside. It is also unlike the crowns of any of the hollow cast buttons, suggesting that it may not be a button and raising the possibility that it could be furniture hardware or horse furniture. This item is tin-or possibly silver-plated.

Cuff Links (Plate 34)

One semi-intact cuff link was recovered from the plowzone and it consists of two buttons with copper alloy backs into which clear, circular glass inlays with engraved intaglio foliate designs have been set with the two pieces linked by a brass wire. Two other glass inlays with engraved intaglio designs were also recovered. One design is of an eight-pointed star and the other is of a tree. Both of these are probably inlays which were originally set into cuff links. Both are also oval-shaped, a characteristic common in the 1770's and after (Noel Hume 1978). All cuff link-related items were found in the plowzone.

Buckles (Plate 35)

Of the four buckles represented, only one is clearly clothing-related and it is approximately one-half of the frame of a rectangular brass shoe buckle with rounded corners. A raised foliate design is apparent on both inside and outside edges on either side of what were centrally-located pin holes. The face of the buckle is also decorated with incised wavy lines. This shoe buckle fragment was found in Feature 65.

A smaller fragment of the frame of another possible buckle was found in the plowzone. The face of this brass item is decorated with alternating sets of from three to five vertical incisions and single horizontal incisions. While this could be a fragment of a shoe or belt buckle, the lack of any diagnostic characteristics, such as pin holes, suggests that the item could also be from a drawer pull or a bracelet. Not enough of the artifact survived in order to ascertain exactly what type of form is represented.

A more complete buckle was found in Feature 8. It is considerably smaller than the shoe buckle and is of a copper alloy. In contrast to the shoe buckle, the pin and the frame are cast in one piece, and the lack of an independent pivot suggest that this may be a harness buckle (Noel Hume 1978). Similar buckles of which the hook bar or pin is a part of the buckle frame have been found on eighteenth-century military sites, and have been described as military stock, belt, and sling buckles (Grimm 1970; Stone 1974). Although several possibilities with regard to both form and function of this buckle exist, one thing that is clear is the fact that it represents utilitarian rather than clothing use. A fourth buckle also appears to have been used in a utilitarian rather than a clothing context. This brass buckle has a D-shaped frame and is most likely a strap-end buckle from either a harness or a musket stock (Noel Hume 1978; Stone 1974).

Armament-related Artifacts

Eleven gunflints comprise the majority of the armament-related artifacts found at 7NC-D-100 (Plate 36). Nine of these were found in the plowzone and were widely distributed across the core area of the site. One was found in the fill of the well (Feature 17) and another was found in Feature 126, south of the core area.

Six of the eleven specimens are fashioned out of dark gray-to black-colored flint from Dover, England. Three appear to have been made from light gray chert cobbles obtained locally. The remaining two are of honey-colored French flint. In addition to these eleven relatively intact flints, portions of three partially-worked pieces of local chert were also found, the general forms of which suggest that they may represent aborted attempts at gunflint manufacture. Five flakes of very similar material were also found, although it is possible that these are

part of the prehistoric occupation. It is certain however, that the single flakes of both English and French flint which were also recovered are the product of the refurbishing of gunflints in historic times.

As a group, the English gunflints are generally rectangular in shape, and cortex remains on the top of one of these. The gradual concavity of one end of one of the French flints is similar to some illustrated French flints from Fort Michilimackinac, Michigan (Witthoft 1966). Two of the three local flints exhibit irregular shapes and this appears to be related to the presence of impurities in the stone. The heavily battered edge of at least one of these suggests that it may have been used as a strike-a-light.

Gunflints clearly represent the bulk of the weapon-related artifacts, and this is not surprising because flints were undoubtedly the most easily replaceable element of the firearm and were discarded once they were no longer serviceable. It is also not surprising that only one gun part, a fragment of a brass trigger guard, was found because the musket was most likely one of the more valuable of possessions on a farmstead or tenancy of the late-eighteenth/early-nineteenth century.

A final armament-related artifact is a brass scabbard clip identical in form to Grimm's Type 1 (Grimm 1970) which is similar to the majority of scabbard clips from the mid-eighteenth century occupation at Fort Ligonier and was probably used on a bayonet scabbard. It was attached by two rivets to the leather scabbard.

Thimbles and Pins

Two brass or copper thimbles were found in the plowzone and fragments of two brass or copper straight pins were found in Feature 17 (Plate 35). One of the thimbles is slightly larger than the other. These are clearly clothing-related items.

Jewelry

One wire-wound glass bead was found in the plowzone. This is round with highly visible circumferential striations. Of a grayish-white color and with white patination, this is probably a necklace bead (Stone 1974). Small fragments of what may be three additional pieces of jewelry were also found. One of these may be a fragment of a copper alloy brooch which is tin-plated on its exterior surface and was found in Feature 17. Fragments of two other copper alloy items, both of which exhibit open-work patterns, may also be from brooches, although one could also be a fragment of an intricately-designed buckle. One was also found in Feature 17 while the other small fragment was located in the plowzone.

Miscellaneous Brass Artifacts (Plate 35)

One small bell-clapper was found in the plowzone. A rivet affixed to a small strip of the same material was also found in the plowzone and was most-likely used on a harness strap, although it is also possible that it was used to secure a barrel hoop or a lug to a kettle rim (Noel Hume 1978; Stone 1974). One problematical brass item, which was hollow and of a cylindrical shape, was also recovered from the plowzone. One end is worn considerably thinner than the other, and the thick end bears evidence that it was sawn off an even larger tube-like object.

Coins

Four coins were found in the course of data-recovery excavations (Plate 37). One of these is copper, and it cannot be identified as both surfaces are highly worn and no detail is discernible. This coin was found in the plowzone. A token produced by the state of New Jersey in the years 1786 through 1788 was found near the bottom of Feature 17, as was noted earlier. In addition, an 1803 cent and an 1835 dime were found in the plowzone.

Other Kitchen-related Items

Fragments of three pewter spoons were recovered and all were found in features. The most complete specimen was found at the bottom of Feature 55, one of the postholes of Structure I. It has a rounded stem end and a rounded bowl. This spoon was bent out of shape which is probably the reason for its being discarded in a posthole. A rounded stem end spoon handle was also found in Feature 144 and a spoon bowl fragment was found in Feature 17. In addition, a fragment of a brass handle inlay from a small knife was found in the plowzone. The exterior is decorated with incised diagonal lines and the butt end of this decorative inlay is rounded.

Graphite

Fragments of graphite pencil "leads" were found in both the plowzone and Feature 17.

Brick (Plate 13)

Along with sherds of red earthenware, brick fragments were among the most common artifacts found on the site. Pieces of brick were present in both the plowzone and the undisturbed features. In order to investigate the true distribution of brick in the plowzone, pieces were weighed rather than counted because the incidence of plow-induced breakage is subject to considerable variability.

Because the true density of brick lies in its weight, this was used to gauge the distribution of brick in the plowzone across the site (Figure 61) and the location of the greatest

TABLE 13

BRICK MEASUREMENTS

Feature	Length	Width	Thickness
17	8 1/2"	4 1/4"	2 1/4"
	8 1/2"	4"	2 1/4"
	8 1/2"	3 3/4"	2 3/8"
	8 1/4"	3 3/4"	2"
	8 1/4"	4 3/16"	4"
65		3 4/5"	2"
		3 3/5"	2 4/5"
		3 9/10"	2 2/5"
		3 7/10"	2 1/5"
		3 1/10"	2 3/5"
		3 1/2"	2 1/2"
		3 3/5"	2"
63		3 1/2"	2 1/10"
		3 1/2"	2"
		3 7/10"	2 1/5"

concentration corresponds well with that of Feature 63. However, this does not suggest that this feature contained more brick than the well-fill (Feature 17) because while approximately half of the former feature was destroyed by plowing, a much smaller fraction of the latter was disturbed due to its depth. These bricks which were deliberately broken during renovation or upon the abandonment of the site clearly represent demolition debris. Many of the whole bricks and smaller fragments found in the well-fill exhibited black, sooted sides, lengths and widths alike, although this detail was found in none of the fragments found in any of the other features, nor from the plowzone. Mortar was also found on many examples.

It is probable that the bricks were manufactured on-site. The clay, sand, and water necessary were readily available, as was the wood needed to burn the brick. Most of the whole bricks and the large fragments are imperfectly made, varying slightly in length, width, and thickness (Table 13). The bricks were most-likely formed in wooden molds, and because the clay was not compressed, individual units typically shrunk and warped, accounting for the variability observed in the dimensions of the measurable pieces (McKee 1973). The whole bricks from the fill of Feature 17 weighed approximately five pounds each, although this too varied somewhat. Approximately 25 bricks would be required to make up one cubic foot. Although only the whole bricks and few of the larger sections were collected as a sample from the demolition level of the well-fill, several hundred bricks were represented in this deposit. It is estimated that at

least twelve cubic feet of brick were deposited in the shaft of the obsolete well, enough for a hearth, but probably not for a complete chimney. This may well have been construed of mud-covered timber as fragments of burned clay, or daub, were found in several of the features.

Nails (Plate 38)

Nails make up the majority of iron artifacts recovered from the site. Of the 750 specimens, 405 (54%) were found in the plowzone with units yielding from a minimum of zero to a maximum of 54 nails. In general, iron was not well preserved within the plowzone and most of the nails being heavily corroded, fragmentary, or both. Of the plowzone sample, only 20 nails could be identified as hand-wrought, while three appeared to be cut nails. However, nails with both of these traits shared considerable overlap in the duration of their popularity (Nelson 1968) and in this instance cannot be looked upon as diagnostic.

Three hundred forty-five nails were recovered from undisturbed contexts and compose the remaining 46% of the sample. Two features account for 76% of this number. Two hundred-ten of these were found with the fill of the well (Feature 17) and many of these were doubtlessly used to hold the framing of the plank-lining together. Like the nails found in the plowzone, most of these were heavily corroded, rendering impossible any attempt to determine what type of nail was represented. However, several hand-wrought nails were found preserved within in situ deposits in Feature 17. None of the nails recovered from the intact portions of well cribbing could be positively identified as hand-wrought.

Feature 144 yielded 52 nails and generally, these were found to be in good condition, and some were found in a remarkably good state of preservation. The remaining nails were found in other features located across the core area of the site although the majority were within the Feature 65 complex. These nails were also very heavily corroded, although a few could be identified as being hand-wrought. The corrosion on several of these was laden with carbon flecking and ash and a vestige of the grain of wood was apparent on one suggesting that these nails are also demolition debris. Because archaeological evidence noted earlier suggests the destruction of Structure I by fire, the burned nails found in the Feature 65 complex could indicate that at least a portion of the charred ruin was deposited here.

Window Glass

Eight hundred-eighteen small fragments of clear aqua-tinted window glass were recovered from the plowzone and 120 fragments were found within intact deposits. Approximately 86% of the sample found in features (103 pieces) was found within the fill of the well (Feature 17) in the level characterized by vast amounts of demolition debris. These pieces are generally larger than those found in the plowzone, although none have been found

to be conjoinable and no intact panes are included. The fragmentary nature of the window glass renders an estimation of the dimensions of individual panes virtually impossible. It appears as if at least two types of windows were in use as some of the fragments measure 1/32 inch in thickness while others are 1/16 inch thick. It is also likely that this glass is locally-made rather than imported as the early American glass houses were producing panes by the late eighteenth century (McKearin and McKearin 1950). The most significant inference to be drawn from the presence of window glass on the site is that the windows were probably located in a domestic structure, which supports the contention that a dwelling house (albeit a meager one) was located on the site.

Iron Artifacts

Four hundred twenty-six miscellaneous iron fragments were also recovered during data recovery excavations. Of this total 384 (90%) were found in the plowzone with the remaining 42 fragments recovered from features. All specimens were quite corroded, regardless of context. However, the shape and general flatness of many suggests that they may be fragments of iron kettles. In fact, two such fragments found in Feature 65 exhibit evidence of handles, with one being of a lug type while the other appears to have been an open handle which was at some point flattened against the body of the vessel. Other fragments appear to be elements of various types of hardware such as hasps, handles, and open-ended hooks. Tools, including an awl and a chisel-like implement were also recovered from the plowzone, and a bladed-implement similar in form and shape to a scythe was found in Feature 65. In spite of the fact that few forms can be identified, a variety of iron artifacts were recovered including items related to domestic activities and those concerned with the everyday workings of the farmstead. Several examples of what appear to be ox-shoes were also found.