V. Artifact Analysis

Analytical Methods

The project research domain is a study of the effects of industrialization on settlement patterning and consumer behavior in Wilmington, Delaware. Deposits and features containing specific sets of data are needed to archaeologically test the hypothesized effects of industrialization upon these variables. These sets of data include datable materials, refuse in primary and secondary contexts, faunal assemblages, and ceramic assemblages conducive to economic scaling analyses. The features and deposits listed in Table 15 yielded most, if not all, of these required sets of data.

This chapter examines each of these deposits and features, and presents trends and patterns which will aid in supporting or rejecting the research hypotheses. The various tests of the project hypotheses will be presented in the Synthesis chapter. This chapter begins with a discussion of the analytical methods employed, and opens with a discussion of the dating methods used to provide chronological control over the deposits. This is followed by a discussion of patterning analysis and other mechanical analyses such as analysis of functional groups within ceramic and glass assemblages. These analytical techniques provide data on patterning differences and similarities in land use types and socio-economic group residences in the pre-industrial and industrial periods; aid in the archaeological identification of land use types within the project area; and identify differences and similarities in the quantity and diversity of material goods consumed by different socio-economic groups. These analyses will also indicate which deposits and features are amenable to more detailed analyses, based on sample size and quantity and nature (e.g. percentage of vessel completeness) of ceramic assemblages.

The remainder of the methods discussion will include sections on ceramic set analysis, and the Wise and Miller analyses. Also, a discussion is included on methods used in the chemical analysis of soil samples taken from these deposits and features. These more sophisticated analytical techniques provide data on the qualitative differences in ceramic assemblages associated with different socio-economic groups, and support identification of land use types in the project area.

The statement of analytical methods, described in previous paragraphs, is followed by presentation of the resultant data achieved from analytical deposits. The archaeological contexts from the pre-industrial period will be examined first, followed by those from the industrial period. The order of feature and deposit discussion is presented in Table 15.

Dating Methods

Chronological control of deposits and features was based on calculations of mean ceramic dates, or MCD's (South 1977), and on the identification of bottle and ceramic marks. South (1977) has demonstrated that it is possible to date the median occupation of an eighteenth century site based on the median manufacturing dates of the ceramics from that site. However,

TABLE 15. Deposits and Features by Chronological Order

Pre-Industrial:	MCD
Area B:	
All marsh soil deposits	1771.83
Area E:	
Topsoil deposits on Market Street lot	1774.03
Topsoil deposits on Second Street lot	1782.03
MAAR Feature 2	1783.60
Area D:	
Feature 1 (ERD2)	1802.33
All topsoil deposits	1804.48
Area H:	
Lower topsoil/midden deposits	1807.94
Area B:	
ERB1E	1809.47
Area A:	
Lower topsoil deposits	1810.47
Feature 27 (ERA48)	1811.58*
Feature 28 (ERA49)	1815.09
Industrial Period	
Area A:	
Higher topsoil deposits (falls in the transition from pre-industrial to industrial)	1833.97
Area H:	
Upper topsoil/midden deposit	1840.01
Area A:	
Feature 17 (ERA38)	1849.69
Feature 15 (ERA36)	1849.80
ERA19Z1	1849.05
Feature 25 (ERA46)	1850.23*
Area H:	
Feature 2 (ERH11)	1860.33 (H11B1) 1854.33 (H11B2) 1851.88 (H11B3)
Feature 1 (ERH4)	1860.79
Feature 11 (ERH17)	1858.70
Area A:	
Feature 19 (ERA40)	circa 1900

* all levels combined

researchers have encountered problems in using South's ceramic date ranges for nineteenth century sites. Also, there is a general lack of good manufacturing date ranges for nineteenth century ceramics (Lofstrom 1976, Garrow 1982). Garrow (1982) has attempted to solve the problem of dating nineteenth century ceramics by using Miller's (1980) ceramic type descriptions. Miller used the ceramic terminology found in price fixing lists of the nineteenth century in his development of a ceramic economic scaling index. This terminology ignores the concept of "ware" (i.e. description of body type such as pearlware, whiteware), and uses the type of ceramic decoration, such as transfer printed, flow blue, hand painted polychrome, and others. Miller (1980) views the large ware groups (creamware, pearlware, whiteware) as a continuum that can only provide very gross dates. Garrow uses the general date ranges of Miller's decorative types, and date ranges obtained from other sources (Lofstrom 1976, Herskovitz 1978) for determining MCD's for the nineteenth century. Garrow continues to use the creamware and pearlware distinctions, and adds a "late ware" category for ceramics post-dating the 1830s and 1840s. South (1977) has identified those latter dates as the end dates for pearlware. It would be preferable to drop the ware distinction, which Miller has shown to have only gross dating value, and to refer to early and late decorative types instead. However, in order to present data comparable to other works, at least portions of South's ware categories are used. What results, is the following classification scheme:

Ware: Creamware, pearlware, late ware, cream colored wares, etc.
Type: Transfer printed, dipped, edged, etc.

The ware category thus follows the traditional scheme, with the addition of a late ware category, and the type categories following the "method of decoration" discussed by Miller for nineteenth century ceramics. Many of these decorative types are also found in South's (1977) ceramic classification for the eighteenth century.

A problem was encountered in distinguishing between pearlwares and late wares, similar to the pearlware/whiteware problem. Garrow (1982:230) found that the blue tinted glaze used as a pearlware identifier was invalid. This glaze color was found on ironstones which dated through the 1850's on the D.C. Civic Center site, well beyond South's end dates for pearlware. The following criteria were used to distinguish between pearlwares and later wares during this study: porosity, body color, and variety of decoration. Pearlwares were ususally more porous than later wares, had an off white body in relation to the late wares, and had distinct transfer prints and other types of decoration that can be dated to the pre 1830s-40s period.

The reader will notice in the following section on deposit and feature dating, and especially in the MCD calculations presented in Appendix D, that South's (1977:210-212) pearlware dates end by 1830 to 1840, while Garrow's (1982:230-241) beginning dates for late wares begin around 1830 to 1840. This reflects the difficulties of dealing with a continuum of ceramic ware production. To deal with this problem, Garrow has taken South's assigned ending dates as an arbitrary beginning point for the later wares, which are not pearlware, but continue to be decorated in the same manner as the earlier ware, e.g. transfer printed, edged, etc.

Garrow's median dates, derived from his date ranges for nineteenth century ceramics, seem to work for dating a site's median occupation date, as seen on the D.C. Civic center site and in the majority of the deposits in Wilmington. These site median dates coincide with the median occupation dates derived from historic documents. What remains in question are the date ranges themselves. One suggestion to deal with the date range problem is not to define specific beginning dates, but to look at ratios and frequencies of decorative types within a ceramic assemblage. By using sites that are tightly dated through historical documents, one can develop ratios of different ceramic types for sites of different periods. It will then be the ratios of types that provide the site date ranges. Garrow (1982:88-89) has done this for dating some of the Civic Center deposits, by examining the ratio of ironstone to transfer printed ceramics.

Though there are obvious problems with Garrow's date ranges, they are the best dates that are presently available, and they do seem to work in calculating MCD's. His work is a good beginning point in dealing with nineteenth century ceramics.

Dates from ceramics marks and glass embossments are also used in dating deposits and features. Godden (1964), Barber (1904) and Kovel and Kovel (1953) are used in dating ceramic marks. Glass embossment dates were obtained from several sources. Work by Toulouse (1971), Munsey (1970), and MacKearin and Wilson (1978), are used, in addition to data available from city directories and newspaper advertisements found in archival repositories. The latter sources were valuable in obtaining dates for bottlers and druggists in Wilmington and the surrounding area. Table 16 presents the MCD's for the deposits and features discussed in this chapter. The MCD calculations are found in Appendix D. Table 16 presents the calculated MCD's along with the date ranges of ceramic marks and glass embossments.

The majority of the MCD's fall within the date ranges of the ceramic and glass marks. Also, the mean mark dates generally coincide with the mean ceramic dates. The congruency of the MCD's and mark dates lends support to Garrow's median dates for nineteenth century ceramics. There are, however, several cases in which the makers marks do not coincide with the MCD's derived from both Garrow's and South's median dates. In these cases, we assume that the MCD's are valid, but that some other variables are involved in producing the dating discrepancies.

Feature 1 in Area D was interpreted in the Field Investigation chapter as a large cistern/privy associated with the occupation of the lot from the the 1770s to ca. 1810. The MCD supports the beginning data of the cistern deposit, but glass and ceramic marks suggest an end date of no earlier than 1821. An end date prior to 1824 is supported by the absence of stamped head straight pins which were introduced in 1824 (Noel Hume 1970).

Discrepancies are also found in the MCD's and makers mark dates from various topsoil deposits, such as the lower topsoil in Area A, and topsoils in Area D. This is easily explained in terms of the nature of these types of deposits. Given that they are horizontal surface deposits, they would be expected to receive trash over long lengths of time. The later mark dates, such as in the topsoil in Area A, probably relate to later periods of trash

TABLE 16. Ceramic Marks and Glass Embossments

Feature/Deposits	MCD	Ceramic Mark Date Ranges	Glass Embossment Date Ranges
Pre-Industrial Period			
Area B:			
All marsh deposits	1771.83	-	-
Area E:			
Topsoils on Market Street lot	1774.03	-	-
Topsoils on Second Street lot	1782.03	-	-
Area D:			
Feature 1 (ERD2)	1802.33	1817 (range not available) 1818-1834	1783-1830 1821-1850
All topsoil deposits	1804.48	-	1820-1906
Area H:			
Lower topsoil/midden deposits	1807.94	1810-1825	-
Area B:			
ERB1E	1809.47	-	-
Area A			
Lower topsoil deposits	1810.47	1814-1836 1828-1830	1848-1852
Feature 27 (ERA48)	1811.58	-	-
Feature 28 (ERA49)	1815.09	1851-1869	1837-1857 1845-1851
Industrial Period			
Area A:			
Higher topsoil deposits	1833.97	-	-
Area H:			
Upper topsoil/midden deposits	1840.01	-	-
Area A:			
Feature 17 (ERA38)	1849.69	-	1845-1853 1847 (embossed date) 1848-1852 1853-1865

TABLE 16. (continued)

Feature/Deposits	MCD	Ceramic Mark Date Ranges	Glass Embossment Date Ranges
Industrial Period			
Area A:			
Feature 15 (ERA36)	1849.80	1819	1845-1853
		(no date range	1847-1880
		on ceramic mark)	1848-1852
ERA19Z1	1849.05	-	1848-1852
Feature 25 (ERA46)	1850.23	1851-1869	1825-1860
			1845-1853
			1848-1852
			1857-1889
Area H:			
Feature 2 (ERH11)	1860.33	1842-1851	1828-1881
H11B1:		1851-1882	1837-1857
			1840-1860
			1857-1875
			1857-1889
			1860-1870
H11B2:	1854.33	1845-1860	1825-1860
		1847	1836-1855
		(register mark)	1843-1858
		1853-1855	1850-1865
			1857-1889
H11B3:	1851.88	1841-1860	1848-1852
		1842-1851	1853-1857
		1851-1882	1853-1878
		1856	1853-1910
		(register mark)	1854-1858
Feature 1 (ERH4)	1860.79	1863-1884	1868-1910
		1869-1875	1891-1910
		1884-1892	
Feature 11 (ERH17)	1858.70	-	1853-1857
Area A:			
Feature 19 (ERA40)	circa 1900	-	1860-1930
			1877
			1890-1910
			1890-1920

disposal. This explanation is probably the reason one of the embossment date ranges for Feature 17 in Area A is later than the MCD for this feature. It should be noted that this feature was a surface deposit in the rear of a lot. The deposit could therefore easily have received the two bottle fragments with the 1853-1865 date range at the end of its depositional history.

There are two other discrepancies in Table 16 that need to be explained. The MCD for Feature 28 (ERA49) in Area A (1815.09) is much earlier than the date ranges of both ceramic and glass marks. Originally, it was suggested that this barrel privy was associated with the Patten occupation, dating from 1797 to the 1820s. The MCD falls within the Patten occupation, but the marks do not. In addition, the ceramic marks dating from 1851 to 1869 were on two transfer printed saucers that matched a ceramic set associated with the Dowdall occupation of the lot (see Plates 61 and 62). At least part of the fecal deposit in Feature 28 was therefore associated with the Dowdall occupation.

An explanation of the differences between the MCD and mark dates for Feature 28 can be found in calculating percentage of vessel completeness for the feature. Of the 65 vessels counted for this feature, 58% were less than 5% complete and 25% were 5% to 25% complete. This lack of whole vessels suggests that the ceramics were originally from an occupation surface in the lot. Such a surface would contain small ceramic fragments resulting from trampling. Material from such a surface deposit was then redeposited within the fecal deposit in the barrel privy, probably during or after Dowdall's tenancy on the lot. The artifactual material from this feature thus contained displaced refuse, and possibly secondary refuse. Given the early MCD and the late mark date ranges, Feature 28 is a mixed context that cannot be related to any single occupation of this lot. Therefore, the deposit cannot be assigned to a specific time period, land use, or socio-economic group. Feature 28 in Area A will not be used in any additional analyses.

The second problematic feature is Feature 1 in Area H (ERH4). As with Feature 28 in Area A, Feature 1's MCD is earlier than the date ranges of the ceramic and glass marks from the feature. This barrel privy did not contain fecal material but was filled with a homogeneous deposit of ash, cinders, clay, rubble and artifacts. We had stated earlier that this deposit constituted a secondary refuse context. The feature's MCD and the dates from the marks suggest that the fill deposit received trash over a long period of time. The calculated percentage of vessel completeness for the barrel privy suggests that the ceramic sherds were originally from a surface deposit. Of the 41 ceramic vessels in Feature 1, about 70% were less than 25% complete, with 60% of the glass vessels being less than 25% complete. These data indicate that the fill in Feature 1 in Area H contains displaced refuse, and thus is not suitable for further artifact analyses.

One final date on Table 16 needs to be discussed. This is the 1819 ceramic mark date within Feature 15 in Area A (ERA36). This mark date was from Kovel and Kovel (1953). They did not indicate a date range for this mark, but simply indicated a 1819 date, which we assume is a beginning date for this specific mark. Thus, the range for this mark may overlap with the feature's 1849.92 MCD. An alternative explanation is that this ceramic vessel is an heirloom piece that was finally disposed of in this trash filled trench.

Through this dating analysis, using mean ceramic dates and contrasting them with date ranges from ceramic marks and glass embossments, we have begun to refine our interpretation of the features and deposits selected for analyses. Two features, Feature 28 in Area A and Feature 1 in Area H, were dropped from further analysis, because the temporal analysis indicated that artifacts within the features were in a displaced refuse context. The remaining features and deposits that held their analytical value through the temporal analysis will be examined using South's pattern analysis (1977), refined by Garrow (1982).

Pattern Analysis Methods

The artifact pattern analysis employed in this report is based on the artifact pattern concept as developed by Stanley South (1977), and modified by Patrick Garrow (1982). South (1977:31-45) developed the artifact pattern approach in response to what he termed the "antiquantification attitude" that was prevalent among colleagues in historical archaeology. South (1977:83-167) then proposed artifact pattern models for British-American Colonial sites and for sites that had been located in a "frontier" setting.

Garrow (1982:57-67) modified the South artifact pattern approach by realigning certain artifact classes within groups to achieve more functionally based artifact groupings. Further, upon realigning those classes he noted that the "Frontier Artifact Pattern" as proposed by South had become similar to artifact patterns reported by Wise (1978) for the Delaware State House (Kent County Office Building) excavation, and by Ferguson at Fort Watson (South 1977:158-159) in South Carolina. Garrow (1982:66) further noted that the Revised Carolina Artifact Pattern and what he termed the "Public Interaction Pattern" reflected domestic versus public function sites, which became an important concept for studying the pre-industrial and industrial artifact assemblages within the Wilmington Boulevard Project.

Table 17 illustrates the Revised Carolina Artifact Pattern presented by Garrow (1982:58). The major differences between Garrow's Revised Carolina Artifact Pattern and the Carolina Artifact Pattern proposed by South (1977) is that Garrow excludes over half of the sites used by South to support that pattern model, and moves colono ceramics (produced either by Afro-American slaves or Indians) from the Activities to Kitchen Group. The revised model appears to apply well to Colonial domestic sites in rural settings, although Garrow (1982:59-66) points out that sites occuppied by groups who do not share Euro-American culture (such as unacculturated African slaves) do not reflect the Revised Carolina Artifact Pattern Model.

The second model proposed by Garrow (1982:59-66) that has applicibility to the Wilmington Boulevard Project is the "Public Interaction Pattern". That pattern was based on revised artifact percentages within what South (1977) termed the "Frontier Artifact Pattern," with the addition of Wise's "Public Structure Pattern" contexts, and the artifacts patterns achieved from Fort Watson (South 1977:158-159). A total of six sites were used to support the Public Interaction Pattern, and a summary of the numbers and percentages of artifacts in each site by group is presented in Table 18. The sites that comprise the "Public Interaction Pattern" shared similar functions. Most of those sites served partial domestic functions, but primarily fulfilled public

TABLE 17. The Revised Carolina Artifact Pattern*

Artifact Group	Brunswick S25 (1732-1776)		Brunswick S10 (1728-1830)		Cambridge 96 (1783-1820)	
Kitchen**	22710	61.77%	6795	51.80%	12916	64.97%
Architecture	9620	26.17%	4116	31.38%	5006	25.18%
Furniture	83	.23%	82	.63%	35	.18%
Arms	34	.09%	45	.34%	27	.14%
Clothing	1070	2.91%	72	.55%	1069	5.38%
Personal	71	.19%	20	.15%	108	.54%
Pipes	2830	7.70%	1829	13.94%	379	1.91%
Activities***	347	.94%	159	1.21%	340	1.71%
TOTALS	36765	100.00%	13118	100.00%	19880	100.01%

From Garrow 1982:58
*Modified from South (1977:83-139).
**Includes Colono ceramics.
***Colono ceramics deleted.

access related functions. The site list includes forts, stores, and one courthouse. Garrow (1982:66) interpreted the shared public access nature of the sites to be the key to their similar artifact patterns, and under his interpretation similar patterns should be present on sites fulfilling at least partial commercial functions within the Wilmington Boulevard project area.

The Washington, D.C., Civic Center site investigated by Garrow (1982:164-167) yielded artifact patterns that did not conform to the two decribed models. Garrow investigated three areas within that project that yielded collections that were amenable to detailed analysis. Analysis subsequently proved that one deposit, designated "B1", yielded an inadequate sample to support more than superficial interpretation. Two areas, "D1" and "B2" yielded large samples, and produced artifact patterns that are potentially of interest for comparison with the Wilmington Boulevard artifact patterns and the established pattern models.

The Washington Civic Center "D1" deposit was a small family dump that dated between ca. 1844 and ca. 1857. Excavation units were confined entirely to the dump, and did not extend to structural areas of the lot. The artifact pattern derived from "D1" (Table 19) reflected a high Kitchen Group percentage in relation to the Architecture Group, and that factor plus the high bone count led Garrow (1982:70) to interpret the deposit as "peripheral secondary refuse" as defined by Stanley South (179-182). The dump was located to the rear of the lot occuppied by the family who generated the trash, and even encroached slightly on an adjacent lot. The "D1" deposit would definitely

TABLE 18. The Public Interaction Pattern

	Camden Toft 8		Hepburn-Reonalds House		Delaware State House (1742-1788)	
Kitchen	966	52.27%	3714	45.39%	2041	50.50%
Architecture	824	44.59%	3953	48.31%	1757	43.47%
Furniture	0	0.00%	18	0.22%	4	0.10%
Arms	1	0.05%	12	0.15%	7	0.17%
Clothing	0	0.00%	24	0.29%	102	2.52%
Personal	0	0.00%	4	0.05%	4	0.10%
Tobacco Pipes	16	0.87%	374	4.57%	92	2.28%
Activities	41	2.22%	84	1.03%	35	0.87%
TOTALS	1848	100.00%	8183	100.01%	4042	100.01%

*South 1977:126-127, adjusted with Colono sherds moved to Kitchen
+Lewis 1976:116

	Fort Prince George (Revised)		Fort Watson (South 1977:158-159)		Spalding's Lower Store (Revised)	
Kitchen	4262	42.7%	627	43.8%	5956	35.5%
Architecture	4252	42.6%	595	41.6%	7222	43.0%
Furniture	6	.1%	19	1.3%	51	.3%
Arms	471	4.7%	128	8.9%	227	1.4%
Clothing	70	.7%	23	1.6%	51	.3%
Personal	9	.1%	2	1.0%	10	.1%
Tobacco Pipes	851	8.5%	18	1.3%	2344	14.0%
Activities	50	.9%	20	1.4%	909	5.4%
TOTALS	9971		1432	100.0%	16770	100.0%

From Garrow 1982:61-63

TABLE 19. The Washington Civic Center Artifact Patterns

Artifact Group	Area D1	Area B2
Kitchen	74.5%	69.2%
Architecture	22.8%	29.4%
Furniture	0.0%*	0.1%
Arms	0.0%	0.0%
Clothing	0.9%	1.0%
Personal	0.1%	0.1%
Pipes	0.7%	0.2%
Activities	1.0%	0.3%
Totals	100.0%	100.3%**

Garrow 1982:164
* corrected figure
** error due to rounding

qualify as an analytical context within the Wilmington Boulevard Project, although no comparable discrete dumps were found at Wilmington.

The second deposit reported in the Washington Civic Center report that has applicibility to Wilmington Boulevard was termed "B2". That deposit consisted of a midden that accumulated over an entire lot, plus material recovered from inside of the lot structure. The "B2" deposit is most similar in physical characteristics to the "topsoil" deposits from Wilmington Boulevard, and the artifact pattern achieved from "B2" (Table 19) has value for comparison with the Wilmington deposits. The "B2" materials spanned the period from ca. 1845 to 1946 (Garrow 1982:165). That deposit reflected an artifact pattern that was similar to that achieved from "D1", in that the Kitchen Group artifact percentage was very high in relation to the Architecture Group percentage.

Two artifact pattern models are thus available for comparison with the Wilmington Boulevard material. The "Revised Carolina Artifact Pattern" represents a rural domestic pattern, while the "Public Interaction Pattern" reflects both rural and urban public access sites. Further, the artifact patterns extracted from the Washington Civic Center project offer two contexts that can be used in conjunction with the Wilmington Boulevard patterns to compare rural and urban domestic sites.

The use of the artifact pattern method involves assigning the artifacts recovered from a context or linked set of contexts to specific artifact classes within larger functional groups. South (1977:95-96) established eight major artifact groups: kitchen, architecture, furniture, arms, clothing, personal, tobacco pipe and activities. All but two groups (furniture and tobacco pipe) were further subdivided into artifact classes that directly related to artifacts recoverable from historic sites.

South's artifact pattern classes were devised primarily to reflect the content of Colonial Period sites, and it was necessary to add and/or delete certain classes to make this approach applicable to the industrial contexts within Wilmington Boulevard. This means that for the most part the pre-industrial contexts follow the established South classes, while the industrial classes reflect those necessary modifications. Each artifact group and its constituent classes are discussed below, and the class level differences in the pre-industrial and industrial patterns are delineated.

Kitchen Group

The Kitchen Group was organized to contain items related to food preparation, service, and storage. This group also contains medicinal items. Table 20 reflects the artifacts classes included by South (1977:95) within this group.

TABLE 20. The South Kitchen Group

Group	Class
Kitchen	Ceramics
	Wine Bottle
	Case Bottle
	Tumbler
	Pharmaceutical Bottle
	Glassware
	Tableware
	Kitchenware

The Kitchen Group as used by South is not a completely functionally aligned group. The ceramics class includes such items as chamber pot sherds, which are not compatible with the predominately food preparation, service, and storage function of this group. The Wilmington Boulevard pre-industrial artifact pattern charts conform with South, and include those vessels of disparate function under the title "ceramics". Some thought was given to separating such sherds, and the decision was made not to make the attempt as the data presented in South (1977) was not sufficiently detailed to allow that change to also be made on his pattern charts. A unilateral change of items such as chamber pots sherds would have therefore rendered the charts from Wilmington noncomparable to the South examples.

The bottle classes presented by South are largely self explanatory. It is relatively easy to distinguish between wine, case and pharmaceutical vial sherds on Colonial to early nineteenth century sites. South's bottle classifications broke down on later sites. As bottle form complexity increased in the nineteenth century, it was often impossible to assign bottle sherds to a more specific category than simply "bottle". This led to consolidation of those categories presented by South into the class "bottle" for industrial

period deposits. The changed Kitchen Group classes for industrial deposits are presented in Table 21.

TABLE 21. Kitchen Group Classes for Industrial Period Deposits (Garrow 1982:91)

Group	Class
Kitchen	Ceramics
	Bottle Glass
	Tumbler
	Glassware
	Tableware
	Kitchenware

These classes appear to work well on sites dating through the mid-nineteenth century, although complete description of later sites will probably require the inclusion of the class "tin can" in the Kitchen Group.

The tumbler and tableware classes are relatively straightforward. Tumbler sherds are fairly distinctive in most categories, and the flatware types that comprise the tableware class are easily sorted. The glassware category includes a variety of glass service vessels, and the only real problem that has been observed with this class is that it is difficult to distinquish certain types of service vessels from decorative glass vases. The kitchenware class is a catchall category, and is made up of metal vessels used in food preparation, service, or storage.

The Kitchen Group thus predominately addresses artifacts related to food preparation, service, or storage, although it is not completely functionally aligned. This group is one of the most sensitive of the pattern groups, and the occurrence of Kitchen Group artifacts in relation to the Architecture Group forms the signature for each of the formal models discussed to date.

Architecture Group

South (1977:100) describes the Architecture Groups as:

> . . . quite different from the group of artifact classes resulting from discard of items from the kitchen. These items can be the result of loss of nails and spikes during construction of buildings, or the remains left after such structures are torn down, burned, or abandoned, or they can result from intentional discard along with kitchen midden. This group represents those items most often not intentionally discarded, but directly related to the architecture on a site.

The Architecture Group thus consists of the hardware used to build or repair a structure. This group does not include construction fabric such as brick, stone, mortar, or wood, as quantification of those items would greatly bias the resultant artifact pattern and contribute little to understanding the artifact content of the site.

The artifact classes included by South (1977:95) in the Architecture Group are presented in Table 22.

TABLE 22. The South Architecture Group

Group	Class
Architecture	Window Glass
	Nails
	Spikes
	Construction Hardware
	Door Lock Parts

The Architecture Group classes are relatively straightforward. The class "construction hardware" includes a range of artifact types, and consists of the fasterners, hinges, window elements, and the like that are not included in the other classes.

The only modification that was necessary to use the Architecture Group on industrial period deposits was to collapse nails and spikes into the class "nails". The term spike had a meaning in the nineteenth century that was somewhat different from the eighteenth century usuage, and collapsing those classes avoids confusion on later sites (Garrow 1982:101).

Furniture Group

The South (1977:95) Furniture Group includes the single class "furniture hardware". That class includes the various fasteners, hinges, pulls, locks, lock plates, handles, rollers, and the like that were used in furniture construction. The single class "furniture hardware" was applicable on pre-industrial and industrial sites.

Arms Group

The Arms Group, as proposed by South (1977:95) consists of three artifact classes. Those classes are presented in Table 23.

South's Arms Group Classes hold up well until the introduction of percussion weapons in the nineteenth century. Items such as percussion caps and later bullets and shell casings can be added to existing categories or as new

categories to revise the Arms Group. Those decisions are fairly clearcut, and require no additional discussion at this time.

TABLE 23. The South Arms Group

Group	Class
Arms	Musket ball, Shot, Sprue
	Gunflints, Gunspalls
	Gun Parts, Bullet Molds

Clothing

The South (1977:95) Clothing Group includes eight artifact classes. Those classes are presented in Table 24.

TABLE 24. The South Clothing Group

Group	Class
Clothing	Buckles
	Thimbles
	Buttons
	Scissors
	Straight Pins
	Hook and Eye Fasteners
	Bale Seals
	Glass Beads

The individual artifact classes within the Clothing Group are self explanatory. This group can be expanded as necessary to add specific clothing related artifacts.

Personal Group

The South (1977:95) Personal Group includes three artifact classes. Those classes are presented in Table 25.

The first two classes are self explanatory, but the "personal items" class requires interpretation. South (1977:95) cites examples of this class which include: "wig curlers, bone brushes, mirrors, rings, signet sets, watch fobs,

fob compass, bone fan, slate pencils, spectacle lens, tweezers, watch key, and other personables". The "personal items" class can be somewhat confusing, As an example, pencil leads were placed under the Activities Group in the Washington Civic Center report (Garrow 1982:106), as that seemed to be a more appropriate placement for that artifact. At any rate, the "personal items" class is employed on the Wilmington Boulevard Project for those items of personal adornment or personal hygiene that did not seem to fit other groups and classes.

TABLE 25. The South Personal Group

Group	Class
Personal	Coins
	Keys
	Personal Items

Tobacco Pipe Group

South (1977:96) included the single class "tobacco pipes" under the Tobacco Pipe Group. He reserved that category for ball clay pipes, and placed what he termed to be "stub-stemmed pipes" under the Activities Group. All tobacco pipes, whether ball clay or "stub-stemmed" are included under the Tobacco Pipe Group within the Wilmington Boulevard artifact charts. The artifacts models that have been previously discussed incorporated that revision, so that those models should be fully comparable to the artifact patterns achieved from Wilmington Boulevard.

Activities Group

The South (1977:96) Activities Group basically includes all of those artifact classes that could not be placed within other groups. This is South's miscellaneous category, and does not represent a tight functional grouping of artifact classes.

The twelve classes included in South's Activities Group are presented in Table 26.

The Activities Group used for Wilmington Boulevard does not include stub-stemmed pipes (moved to Tobacco Pipe Group), Colono-Indian Pottery (absent at Wilmington, but moved to Kitchen Group in the comparative examples), or ethnobotanical. Ethnobotanical has been dropped from the artifact pattern charts at Wilmington, and that class is discussed under a separate chapter on subsistence. This is a logical step, as application of aqueous flotation techniques on a site such as Wilmington Boulevard yields such a high ethnobotanical count that inclusion of a seed count in the artifact charts would tend to obscure most other classes and groups.

TABLE 26. The South Activities Group

Group	Class
Activities	Construction Tools
	Farm Tools
	Toys
	Fishing Gear
	Stub-stemmed Pipes
	Colono-Indian Pottery
	Storage Items
	Ethnobotanical
	Stable and Barn
	Miscellaneous Hardware
	Other
	Military Items

The Activities Group is perhaps the most expandable of any of the artifact groups. This group was used on the Wilmington Boulevard project as a miscellaneous category, but still remained a minor constituent in terms of percentage of occurrence within most contexts. One major exception was within those contexts that included quantities of glass lamp globe fragments. Glass lamp globe fragments did not fit well within any of the other existing artifact groups, and were thus placed within Activities. This problem will have to be addressed on future projects, but for now those artifacts are clearly identified under Activities, and can be moved and manipulated as needed on future studies.

The artifact pattern concept was utilized as a functionally subdivided artifact listing scheme on the Wilmington Boulevard Project. Future work will doubtlessly demonstate that certain artifacts should be moved to other artifact groups, or that new artifact groups will become necessary. At any rate, the Wilmington Boulevard artifacts recovered from analytical contexts are presented in a manner so that future manipulations will be possible.

Methods for Analysis of Functional Groups within Ceramic and Glass Assemblages

It is important to understand the nature of each deposit to be analyzed in any historical archaeological research project. For example, is the deposit in question from a domestic or commercial activity? If the deposit is associated with domestic land use, does it represent the full range of activities one expects within such a land use? Does the deposit under study contain an adequate sample of material to discuss all aspects of domestic activities that took place on the study lot?

South's pattern analysis (1977) provides some data for identifying land use type and on the extent to which a deposit represents a given land use type. The South pattern analysis alone is not adequate for assigning function to a deposit. One method that can be used as a supplement to the South pattern

analysis is analysis of ceramic and glass vessel forms from a deposit. This analysis examines the percentage of ceramic and glass vessels within functional categories (c.f. Beidleman 1980). These categories are as follows:

For Ceramic Vessels
1. Food Service
2. Food preparation
3. Decorative
4. Hygiene
5. Toy
6. Beer bottle
7. Miscellaneous
8. Unknown

For Glass Vessels
1. Wine/Spirit
2. Culinary/Condiment
3. Tumbler
4. Glassware
5. Soda
6. Beer
7. Personal
8. Miscellaneous
9. Unknown

The frequency of artifacts within these categories should indicate what portion of domestic activities are represented in a given deposit or feature. For example, certain frequencies would be expected within each of the above categories if the deposit under study represents the full range of domestic activities that occurred on a lot, and another set of frequencies if only portions of past domestic activities were represented. We would also expect differences in the frequencies among deposits associated with commercial land use as opposed to domestic land use. The actual frequency ranges for deposits containing fairly complete samples of materials representing domestic activities as opposed to partial or inadequate samples has not been fully developed, as has been done for South's percentage frequencies for different pattern types (South 1977). However, frequencies of the above categories from deposits recovered in Washington, D.C. (Garrow 1982) and Alexandria, Virginia (Cressey 1982) are available as beginning points for developing a measure of adequate sample size. We will compare the frequencies from these two projects to the frequencies obtained from the deposits and features from Wilmington.

If, for example, all known domestic properties from the three projects contain similar frequencies of the above categories, it can be assumed that they all probably represent a similar range of domestic activities. If the frequencies are different, then the questions of adequate sample size and representativeness can be examined. This analysis may also aid in delineating the type of land use that existed on a study lot, based on differences in the frequencies of the above categories. For the latter, land use would first be independently identified through historical data.

The analysis of functional groups within ceramic and glass assemblages is a mechanism for determining the sample adequacy of a given deposit or feature.

The results of this analysis will be a be means of selecting features and deposits suitable for additional analysis. This analysis will also be an aid in the identification of land use type, to be run in conjunction with the pattern analysis. These data will be used to test the hypotheses on land use patterning changes in the pre-industrial and industrial periods.

Methods for Ceramic Set Analysis

The analysis of ceramic sets provides data on the nature of the deposits under study, in addition to the consumption and disposal patterns of the household associated with the deposits (Miller 1974, Garrow 1982). Miller (1974), in his study of ceramics from Tabb's Purchase in Maryland, and from probate lists for the county in which Tabb's purchase was located, found that study of ceramic sets demonstrated consumption differences in poor and wealthy households in the first half of the nineteenth century. For example, he found that wealthy households purchased entire sets while poorer, tenant farmers bought ceramic vessels piece by piece (Miller 1974). Cressey et al (1982) found a similar pattern in Alexandria, Virginia. There were many more ceramic vessels making up sets in the privy trash deposits of merchant class households than in the trash deposits associated with poor free black households.

Garrow's (1982:107-115) work in Washington, D.C. demonstrated additional values in the analysis of ceramic sets. He found that in analyzing the distribution of ceramic vessels from specific sets, within a back yard trash deposit, one could identify whether or not a trash deposit was related to a single household. Garrow traced the life cycle of specific ceramic sets through the trash deposit, and found an orderly progression of set replacement within the dump, indicating the association with a single household. Garrow's analysis of ceramic sets in the Washington, D.C. Civic

Center site trash dump provided data on the dynamics of the dump's formation. In addition, the analysis provided information on the ceramic assemblages used by a household over time.

Similar studies were conducted on the ceramic sets recovered from the Wilmington deposits and features listed in Table 16, with the exclusion of Features 28 in Area A and 1 in Area H, for reasons stated in the temporal analysis discussion. The frequency of sets within each of the selected deposits and features is examined in addition to their distribution within these archaeological contexts, and how and why these frequencies and distribution changed over time.

For the purpose of this study, ceramic sets are defined as vessels of the same decoration type and design motif. For example, a plate, cup and saucer having the same transfer printed design will be considered as part of the same ceramic set. The design elements must cross ceramic vessel forms to be considered a set. Two vessels of the same form and pattern do not automatically constitute a set. Difficulties are encountered when using this definition of set in the study of plain ironstone vessels. It is often very difficult to link plain ironstone vessels of different forms to a specific set due to their lack of decoration. However, when ironstone vessels with molding are examined, set identification is more straightforward.

The concept of ceramic set appears to be a nineteenth century phenomenon, appearing in the archaeological and historical record around 1840 (c.f. Miller 1974). There were ceramic sets in the eighteenth century, but they were very rare and restricted to households of the uppermost socio-economic level (Miller 1980). By the end of the nineteenth century, large elaborate sets are prevalent, as indicated in store catalogues of the time (c.f. Sears, Roebuck Catalogue 1902). Though sets, as defined above, were rare in the eighteenth and early nineteenth centuries, sets of ceramic tea ware were common. The frequency and distribution of tea ware sets were examined in a similar manner as for those ceramics meeting the full set criteria. Tea ware set types and frequency of tea set replacement are used, to a large extent, as a measure of the socio-economic level of the household associated with the deposits containing the tea sets. Historical archaeological research has found that tea wares, and high frequencies of such wares, are correlated with households and individuals of middle to high socio-economic levels (c.f. Otto 1980, Cressey et al 1982).

The specific procedures for analysis of ceramics sets from the selected Wilmington deposits and features are as follows. In the analysis of the ceramics, the provenience of each sherd that could be mended into a vessel was recorded. All mends were similarly recorded on a vessel by vessel basis. As the minimum number of vessels was counted, vessels were grouped into possible ceramic sets based on ware type and design motif. All sherds that could not be assigned to a specific vessel, but could be determined to be part of a specific ceramic set, were also recorded. In this manner, it was possible to study sherd and ceramic set distribution within each of the selected deposits and features. In addition, mends between contemporaneous deposits and features were identified whenever possible. This permitted the tracking of ceramic sets among different deposits, linking deposits temporally and to specific households and individuals occupying a given lot.

Once sets were identified, and their proveniences noted, the location of the sets were tracked within the selected deposits, and the frequency and size (i.e. number and form of vessels within a set) were calculated for each deposit and feature. This study provides the following data: (a) the linkage between levels within deposits and among features, (b) the stage of the use life cycle of the sets recovered, such as the presence of full sets as opposed to set remnants, (c) the representativeness of a given artifact deposit in terms of the ceramic assemblage used by a given household (e.g. deposits containing a high frequency of set remnants may represent a normal consumption rate of ceramics as opposed to a very short term depositional episode, and thus may represent the full range of ceramic types used in a household), and (d) linkage of ceramic set frequencies to specific socio-economic groups to identify similarities and differences in the ceramic assemblages of these groups over time.

The ceramic set analysis aids in the interpretation of deposits, identifying long as opposed to short term deposit accumulation, and possibly permitting the identification of deposits associated with single or multiple households. This analysis also provides data to test the hypotheses on the qualitative differences in goods consumed by different socio-economic groups, in to some extent the pre-industrial and more so for the industrial periods.

Methods for Measuring Economic Level of Ceramic Assemblages

One of the data requirements of the project's research hypotheses was to obtain archaeological measures of the socio-economic level of households. In earlier chapters, it was proposed that these data be obtained through the analysis of cost and qualitatively sensitive artifactual materials, i.e. ceramics. The resulting economic measurement can then be compared to the historical socio-economic identification of the household associated with the ceramic assemblage under investigation. Two independent archaeological measures of socio-economic level were conducted. The first is the Wise analysis, developed by Cara Wise (1976) and the second is the Miller analysis, developed by George Miller (1980).

Wise Analysis

Wise (1976) has employed an economic scaling index based on the ratios of different ceramic types calculated from sherd counts. She bases her indices on the premise that ceramics of low cost and utilitarion function will be found as a high percentage of lower socio-economic group assemblages, and as a lower percentage within assemblages associated with upper socio-economic groups. The reverse would also be true, where less accessible, more costly ceramics, with decorative and utilitarian functions, would be predominately found in upper socio-economic assemblages (Wise 1976).

The ware categories used in this analysis include coarse wares, refined earthen wares, and porcelain. Coarse wares consist of red bodied earthen wares and heavy stonewares. Refined wares include decorated earthen wares (excluding red bodied slipwares of American manufacture), white salt glaze and other fine stonewares, and ware types such as creamware and pearlware. The porcelain category is self explanatory, and includes both Chinese and European porcelain.

Wise uses these ceramic ware types to calculate two "Status Indices", which measure the relative "status" value of a given ceramic assemblage. Index I compares the frequency of refined wares (refined and porcelain) to coarse wares, using the following formula:

$$\frac{\text{No. refined wares sherds}}{\text{No. coarse wares sherds}} = \text{Status Index I}$$

The second index compares the frequency of porcelain sherds to refined ware sherds:

$$\frac{\text{No. porcelain sherds}}{\text{No. refined ware sherds}} = \text{Status Index II}$$

All of the deposits listed in Table 15 have been subjected to this analysis, excluding Feature 28 in Area A, and Feature 1 in Area H. One advantage of this potential measure of economic level is that sherd counts may be used; while the Miller analysis, which is discussed in the next section, requires the use of minimum vessel counts. The results of the Wise analysis will be presented in bar graphs for comparing the "Status Indices" of deposits and features through time, and for comparing different types of deposits, e.g.

topsoil levels to privies. The latter aids in identifying the different types of depositional processes that created these archaeological contexts, in a similar manner as the vessel functional groups analysis discussed earlier.

It has been assumed that this analysis will measure the relative economic, and thus socio-economic, value of a given ceramic assemblage. There are, however, some obvious problems with this assumption. First, there is a problem in the type of deposits that may be used in this analysis. For example, if a kitchen deposit is analyzed using this index scheme, the deposit would probably contain a high percentage of coarse wares, especially if it dates from the eighteenth and early nineteenth centuries, when coarse wares were the prodominate ware used in food processing. Even though the deposit was associated with a high socio-economic household, the table wares that would indicate the household's social position may not have been discarded with material from the kitchen. A second problem is time. By the middle and late nineteenth century, refined wares appear to dominate food processing assemblages due to the low cost of these wares as compared to earlier periods. Thus the presence of a high percentage of refined wares in such a late deposit would not indicate high socio-economic level, but changes in ceramic technology and pricing. The use of the "Status Index" may therefore apply only to eighteenth and early nineteenth century assemblages.

The comparison of porcelain to other ceramic wares is less problematic. It has been established that porcelain is consistently more expensive than other wares, and thus can be used as a good relative cost measure for a given ceramic assemblage.

The results of the Wise analysis are compared to the results of the Miller analysis. This comparison highlights where the Wise analysis does not measure cost, but other variables, such as discussed above.

Miller Analysis

Miller's (1980) analysis is a process whereby the ceramic assemblage from a site, lot, or deposit can be used to measure the relative economic value, i.e. relative cost, of the assemblages. This measure, in turn, theoretically provides a means to roughly determine the economic, and thus socio-economic position of the household that purchased and discarded the ceramics. Miller's ceramic economic scale is based on the index values assigned to certain categories of refined wares, expressed in relation to cream colored wares (cc wares). Based on his extensive study of ceramic price fixing lists, Miller found that cc wares consistently represent the least expensive refined earthen ware available in nineteenth century markets. His economic index is thus based on establishing a fixed value of 1.00 for cc wares through time. The value of other wares is then expressed in relation to the 1.00 index value of cc wares at specific points in time.

Miller demonstrates that the value of certain wares fluctuated through time with a general trend being an overall decrease in cost in relation to cc wares. As an example, a transfer printed bowl carried an index value of 2.80 in relation to cc ware in 1814, and a value of 2.00 in 1855. This means that a comparable transfer printed bowl valued at 2.8 times the value of a cc ware

bowl in 1814 would cost only twice as much as a comparable cc ware bowl in 1855 (Miller 1980:33). Miller used his indices to establish a formula for plates, cup, and bowls, that results in a chart that can be used to compare the ecomonic value of one ceramic assemblage with another. The comparison of assemblages in turn provides a statement of the rough economic positions of the household under study (Garrow 1982:66).

The resulting chart is one means for comparing the value of ceramic assemblages from deposits. It was found that calculation of a mean ceramic value for each analyzed deposit easily summarized the results of Miller's original tables. This mean ceramic value simplified the comparison of deposits with a single value, allowing for statistical comparisons of the value of the ceramic assemblages from different deposits. This was not possible with Miller's original table format. The mean ceramic values are simply a summation of all values within an assemblage and are derived by summing the indices of cups, plates and bowls, and dividing this sum by the total number of ceramic vessels.

Prerequisites for using Miller's economic scaling are accurate minimum vessel counts and an adequate vessel sample (which is difficult to define). Many of the features we selected for analysis met those criteria. The Miller analysis was applied to those features that met the criteria, and the results of that analysis are discussed in this chapter. There are, however, some difficulties in using Miller's economic values, which should be discussed.

Miller's index values are extremely useful, but are often incomplete. There are many years in which some decorative ceramic types do not have an index value. This problem was solved by lumping ceramic types together and assigning values based on relative values of other types in the same time period. For example, flow blue and ironstone plates were not assigned a value in the indices for 1846 (cf Miller 1980:26). Both types are then assigned the same value as printed wares, based on two assumptions. First, as shown in Appendix D, Part 1 of Miller's article (1980:26), ironstone and printed wares shared the same values in the 1850's. Second, later flow blues were demonstrated to have a higher value than other printed wares, thus assigning flow blues the same value as printed ware would be a conservative error that would not overstate the value of flow blue. Every attempt was made during this analysis to insure that errors introduced by use of interpolated values understated rather than overstated individual ceramic values.

The following is an example of how values were assigned in lieu of specific index values for a given year. The 1846 scale lacked a value for porcelain cups, so a value was assigned based on the relative value of porcelain and printed cups for other years on the price fixing lists. Porcelain cups were valued at 51.15 percent more than printed cups for other years in Miller's indices for cups. This percentage value was added to the handled printed cups value (as the cups under question were handled) for 1846 to arrive at a porcelain value of 4.55 times the cost of cc ware for that year.

Chemical Analysis of Soil Samples

As an additional measure of land use differentiation, a series of tests were conducted to determine if different land use activities produced different

chemical characteristics in soils. Two types of chemical analyses were conducted, ph and phosphate. Soil samples of 5 liters each, were taken from deposits identified in the field as occupation levels or features. A standard sample of five liters was also taken from each deposit exposed by the backhoe trenches. Approximately eight ounces of each sample was separated in the laboratory and sent to soil testing laboratories for ph and phosphates testing. Ph would indicate level of soil acidity, where a ph value of 7.0 is neutral, above 7.0 indicates an alkaline soil, and below 7.0 indicates the soil is acidic. The results of those tests were then plotted for each historic period and specific land use for each period. In this manner, correlations between ph or phosphate level and land use type over time could be identified.

The phosphate tests measure the level of phosphorum within a given sample, indicating, for example, the presence of fertilizer, ash, bone ash, animal decomposition, and animal or human wastes. For this test, phosphorum was expressed as parts per million (mg/kg)P. In urban environments, normal background phosphorum would be 25 to 100. Anything above this would be an anomoly (Shilstone Engineering Testing Laboratory, Inc., personal communication).

Unfortunately, the deposits and features recovered in the data retrieval program produced an insufficient sample to test differences in land use types. The majority of land use types within the project area that contained archaeological material were residential, residential and commercial combined, and one strictly commercial. No industrial properties were present. Therefore, the results of the two chemical analyses cannot assist in testing the research hypotheses.

However, some interesting results were obtained in the ph analysis, though not directly related to the research questions. Topsoil deposits and fill deposits contained similar ph values (Table 27); and somewhat similar values to privy deposits, i.e. fecal material. Trash deposits, on the other hand, differed somewhat from these latter types of deposits. Surprisingly, privies are more alkaline than expected, in fact they are almost neutral. This may

TABLE 27. Results of Ph Tests on Deposits
*(Areas A, B, D, E, and G)

	Mean	Standard Deviation	Variance	Range	Number of Samples
All Topsoils	7.51	.96	.897	4.8-9.1	37
Fill Deposits	7.93	.74	.54	4.7-9.2	59
Privies	7.09	1.05	.97	5.0-8.2	8
Trash Deposits	6.65	1.33	1.48	5.2-8.6	6

*Samples from Area H were lost by the soil testing laboratory

indicate the use of lime in privies. Also, the trash deposits are more acidic than expected, but this can be explained by the presence of horse manure in one of the trash deposits (Feature 19 Area A). Though the number of samples was small, it appears that no significant difference in the ph of these features and deposits is present. We cannot say if this type of analysis is useful in distinguishing between land use types, however, as there appears to be no difference between commercial/residential and strictly residential properties.

Analysis Results

Artifact Patterns

The Field Methods and Results Chapter identified eleven pre-industrial and ten industrial deposits that could potentially provide tests for the project research design. A number of secondary fill deposits were eliminated from further consideration in that chapter, as were contexts that yielded samples too small for the type of analyses employed on this project. Detailed chronological analysis of the twenty-one remaining deposits presented earlier in this chapter indicated that two additional deposits had to be dropped from further analysis. Those deposits, which included a pre-industrial deposit from Area A (Feature 28, ERA49) and an industrial deposit from Area H (Feature 1, ERH4), were found to contain mixed artifacts from two or more occupation episodes. Thus ten pre-industrial and nine industrial deposits remain that can yield the type of information dictated by the project research design.

The pre-industrial and industrial deposits can be further subdivided for ease of discussion. The pre-industrial deposits are composed of seven occupation levels (also called topsoils, midden deposits, and, - in the case of Area B - marsh soil deposits) and three features. The industrial deposits are primarily features, with three occupation levels and six features. All of the pre-industrial occupation levels can be grouped for ease of discussion. The industrial period occupation levels for Areas A and H can also be grouped, although the deposit that relates to the Dowdall occupation in Area A (ER A19Z1) will be retained with the other Dowdall features (15, 17, and 25), since that occupation level can be firmly attributed to the Dowdall residency.

The occupation levels attributable to the pre-industrial period will be presented in chronological order, based on MCD's. Those deposits, while valuable for considerations of artifact patterning, have little to offer in terms of sophisticated artifact analysis. Instead, the purpose of exploring those deposits will be to determine if functionally aligned artifact patterns can be discerned, and how those patterns relate to patterns achieved from features. The artifact patterns for the pre-industrial features will be discussed following presentation and discussion of the occupation levels. The same sequence of presentation and discussion will be followed for the industrial deposits.

Pre-Industrial Period Occupation Levels

The pre-industrial occupation levels were, for the most part, products of long-term trash deposition in "backyard" settings. The vast majority of the