

INTERPRETATIONS

Introduction

This section of the report will analyze the results of the archival research, the architectural recordation, and the various forms of information provided by the archaeological excavations. These information sources will be compared to one another in the derivation of a discussion of the past behavior of the site's occupants at the site and within the larger community. Thus, a study of the site on both an intra and inter-site level will be considered, including artifact distribution and soils chemical distribution studies, on the intra-site level, and with tax assessments, manufacturers censuses, and business records on the inter-site level. Following this discussion, conclusions will be presented that attempt to compare artifact classes and architectural remains at the Wilson-Slack site to other sites excavated in the Route 4 corridor.

Intra-site Artifact Distribution

In a preliminary stage of the analysis, site limits were defined through the construction of density distribution maps based on artifact counts from extensive shovel/postholer testing. The entire, undisturbed portion of the site within the project area was tested. The testing identified areas of high concentrations of artifacts suspected to be significant archaeologically, and worthy of further excavation through measured units. The data in itself that was produced was found to be very useful in presenting or investigating artifact patterning present at the site.

In order to determine if activity areas were present at the site, an analysis of the artifact densities was accomplished. A total of 335 shovel/postholer units were used in the study. For the purposes of this study, all of the units were assumed to be of equal volume (or depth). Based on the raw artifact counts obtained from these units, six artifact distribution maps were prepared (Figures 29-34). Density

Figure 29: **TOTAL ARTIFACT
DENSITY DISTRIBUTION**

CONTOUR IS ARTIFACT DENSITY PER SHOVEL TEST UNIT

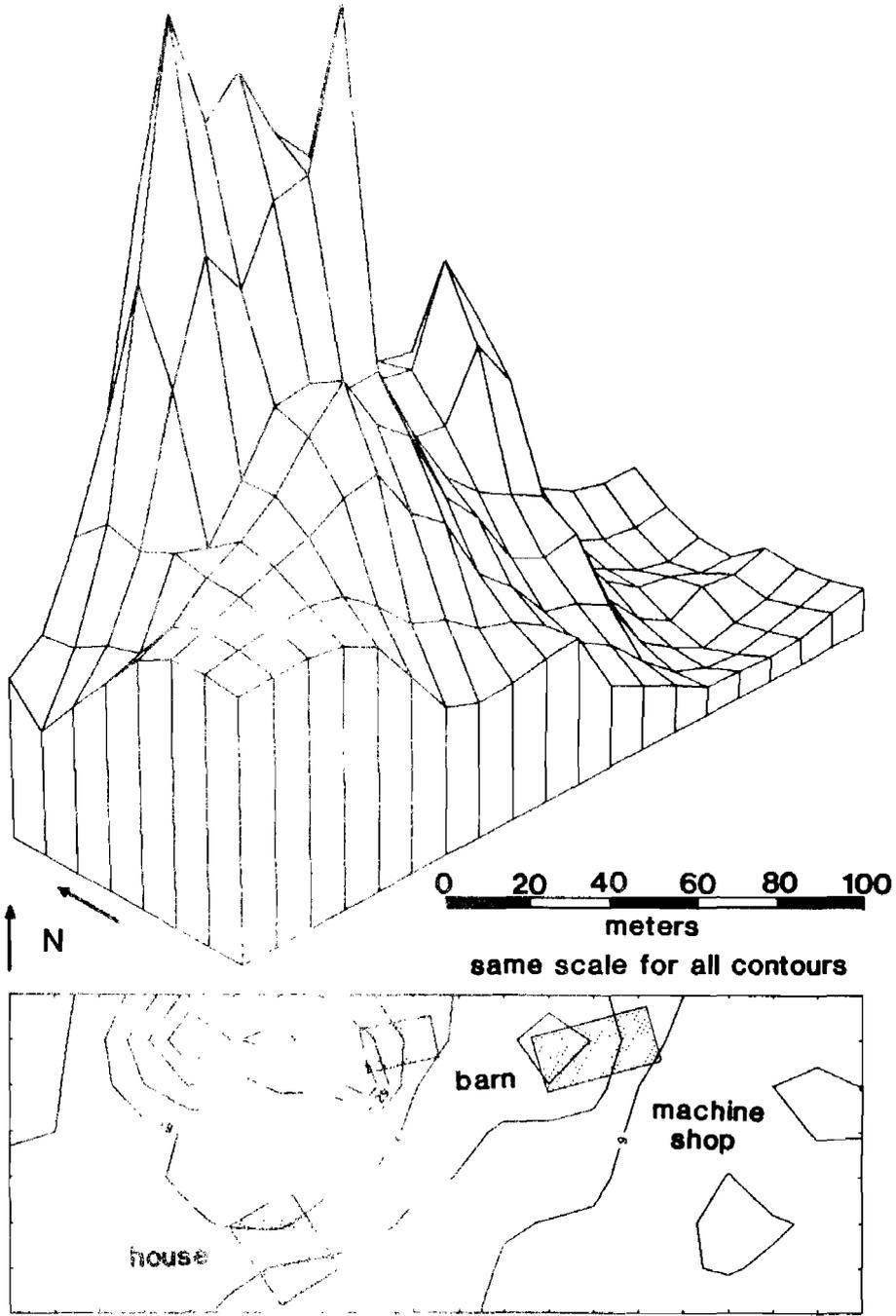


Figure 30: **KITCHEN GROUP**
DENSITY DISTRIBUTION

CONTOUR IS ARTIFACT DENSITY PER SHOVEL TEST UNIT

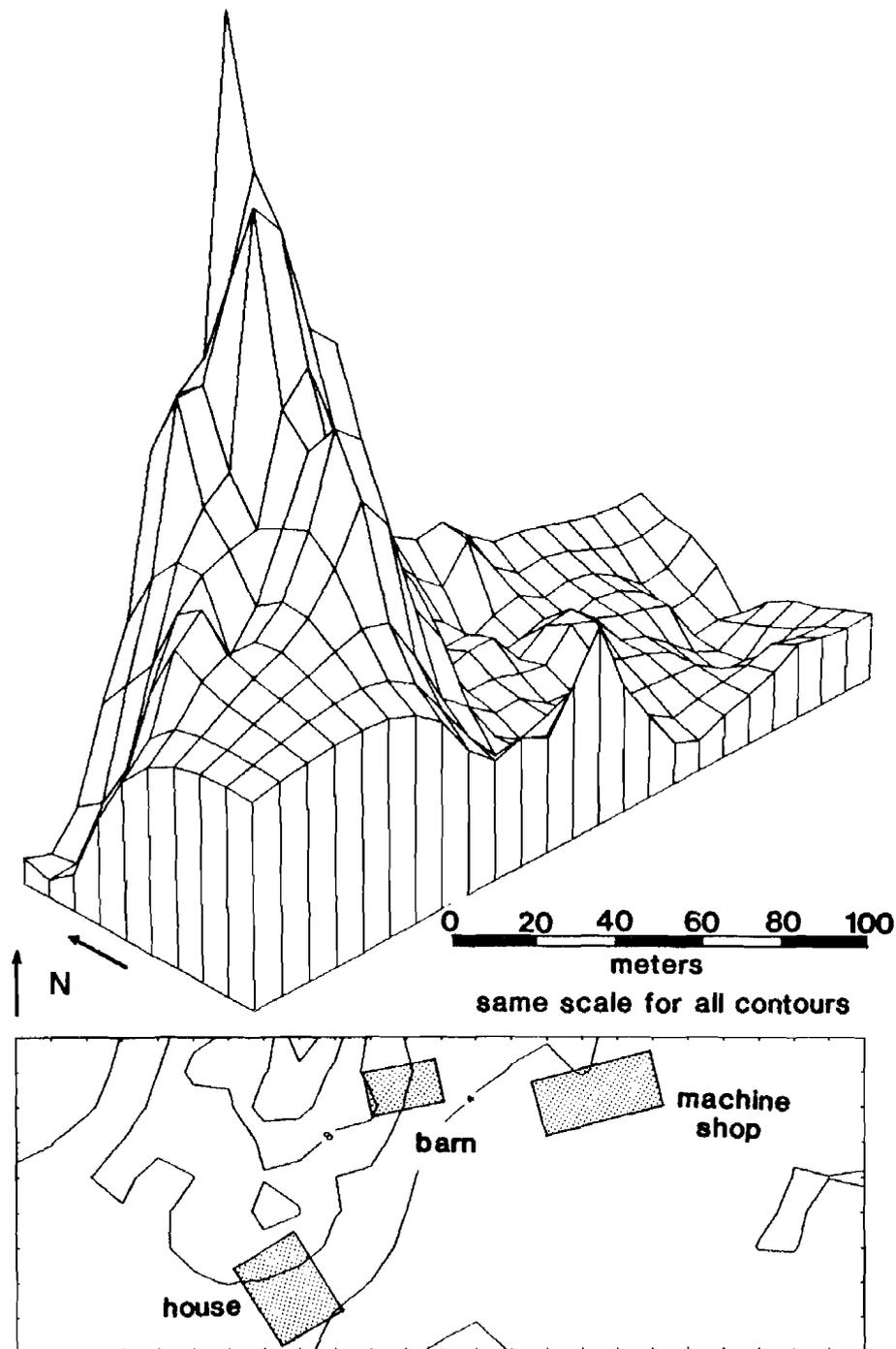


Figure 31: **ARCHITECTURE GROUP
DENSITY DISTRIBUTION**

CONTOUR IS ARTIFACT DENSITY PER SHOVEL TEST UNIT

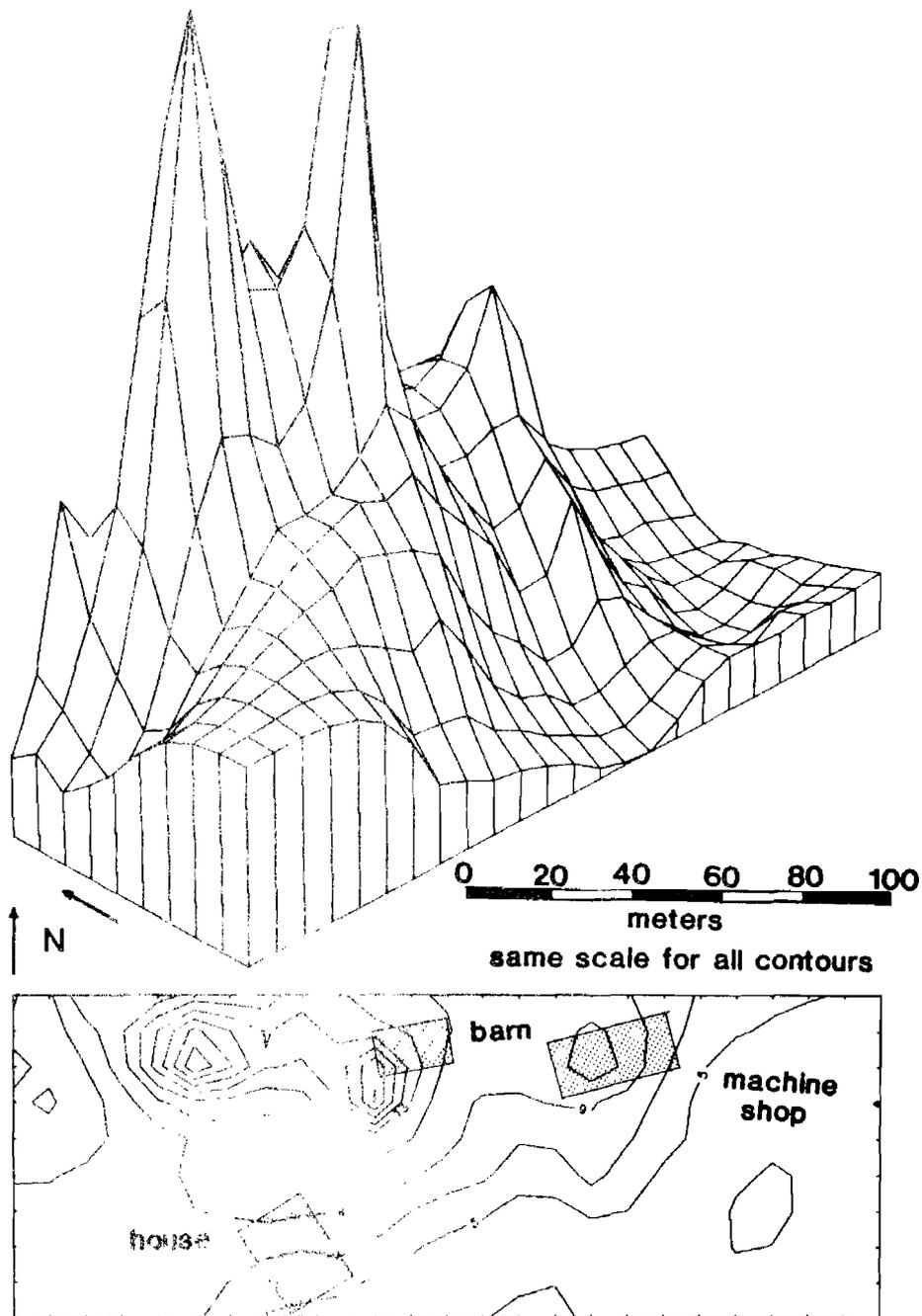


Figure 32: **PEARLWARE, YELLOWWARE,
REDWARE DENSITY DISTRIBUTION**

CONTOUR IS ARTIFACT DENSITY PER SHOVEL TEST UNIT

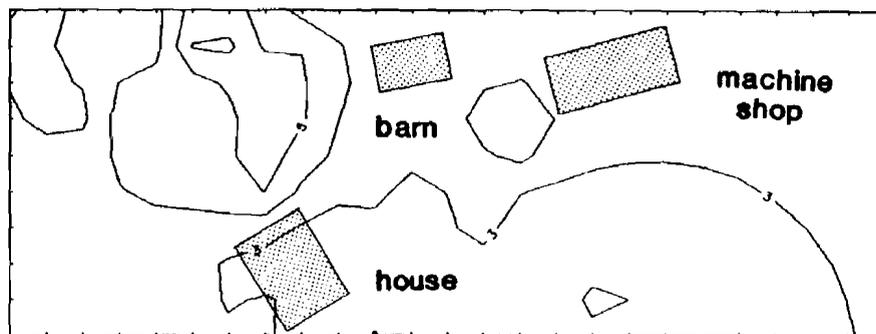
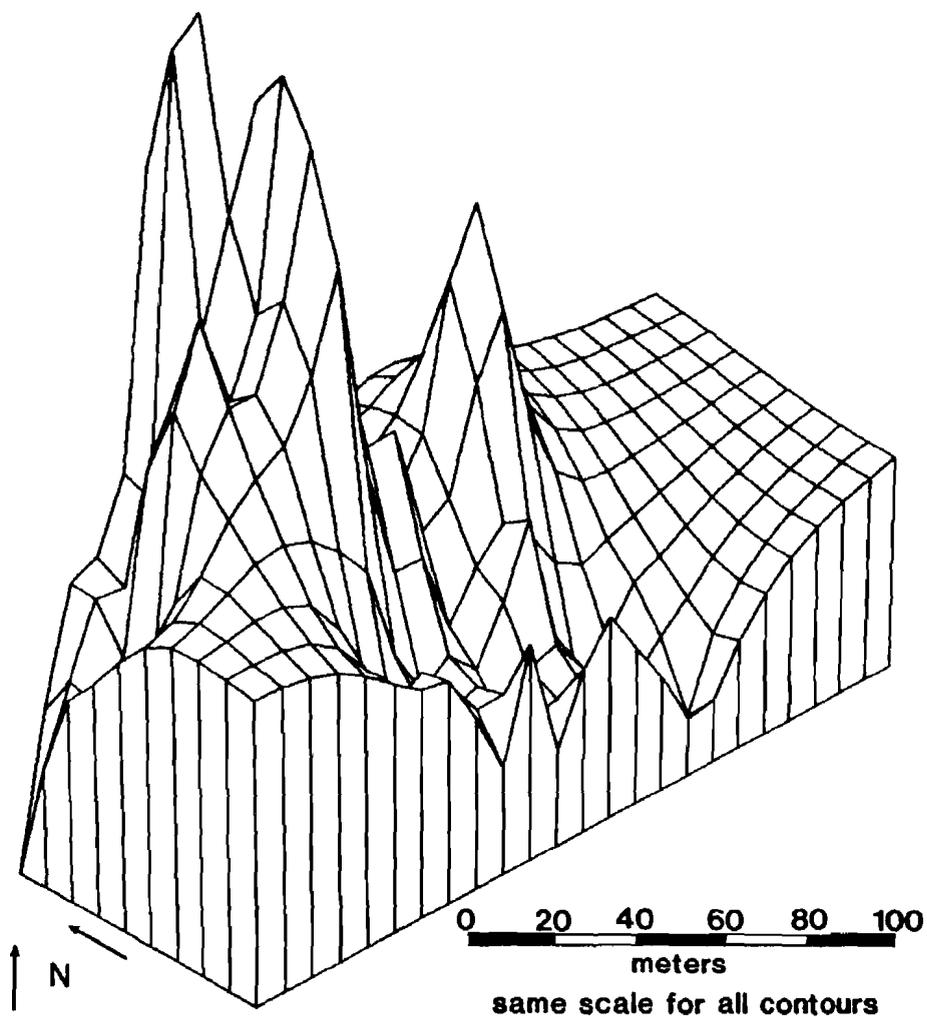


Figure 33: **WHITEWARE / IRONSTONE
DENSITY DISTRIBUTION**

CONTOUR IS ARTIFACT DENSITY PER SHOVEL TEST UNIT

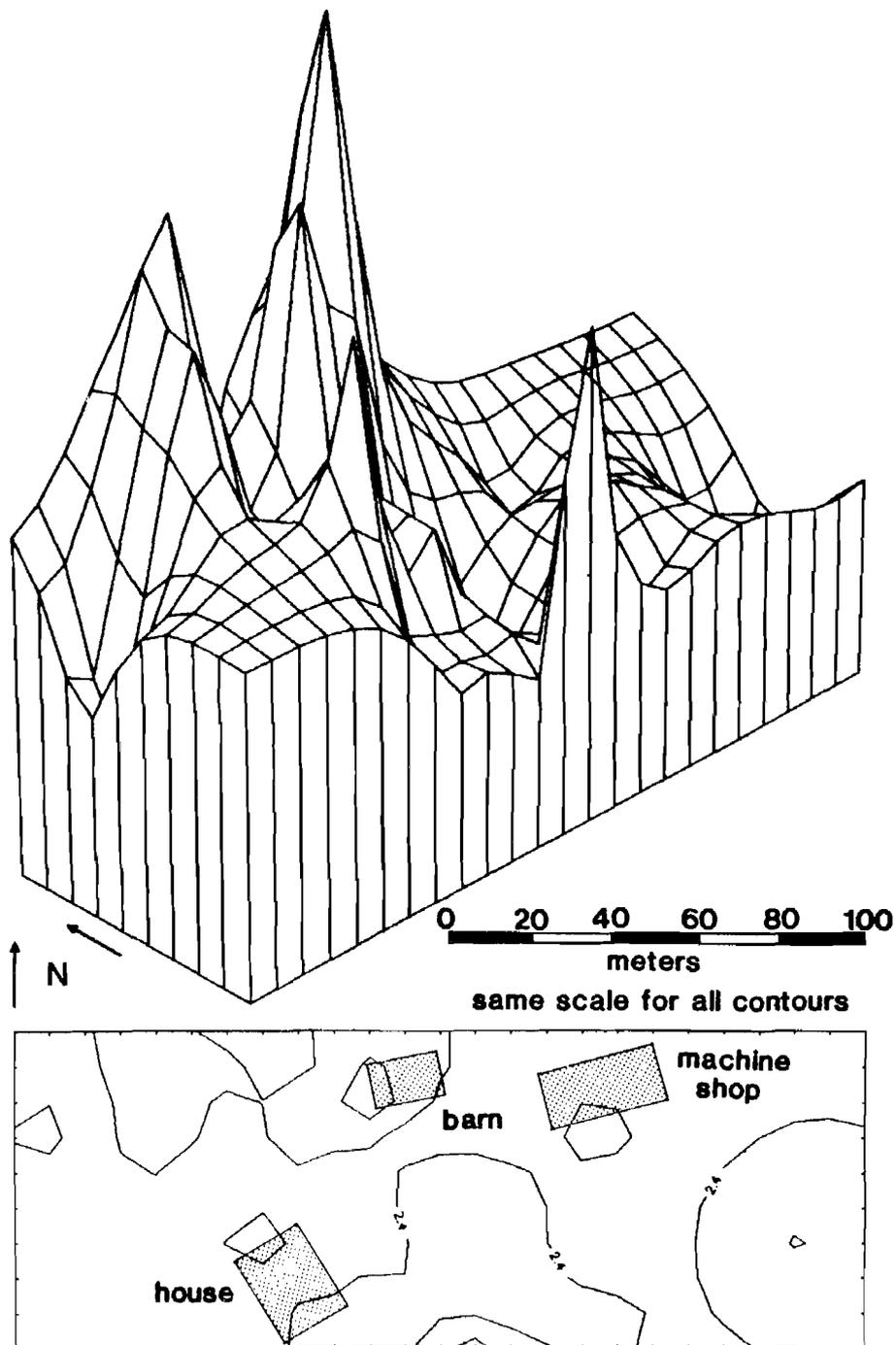
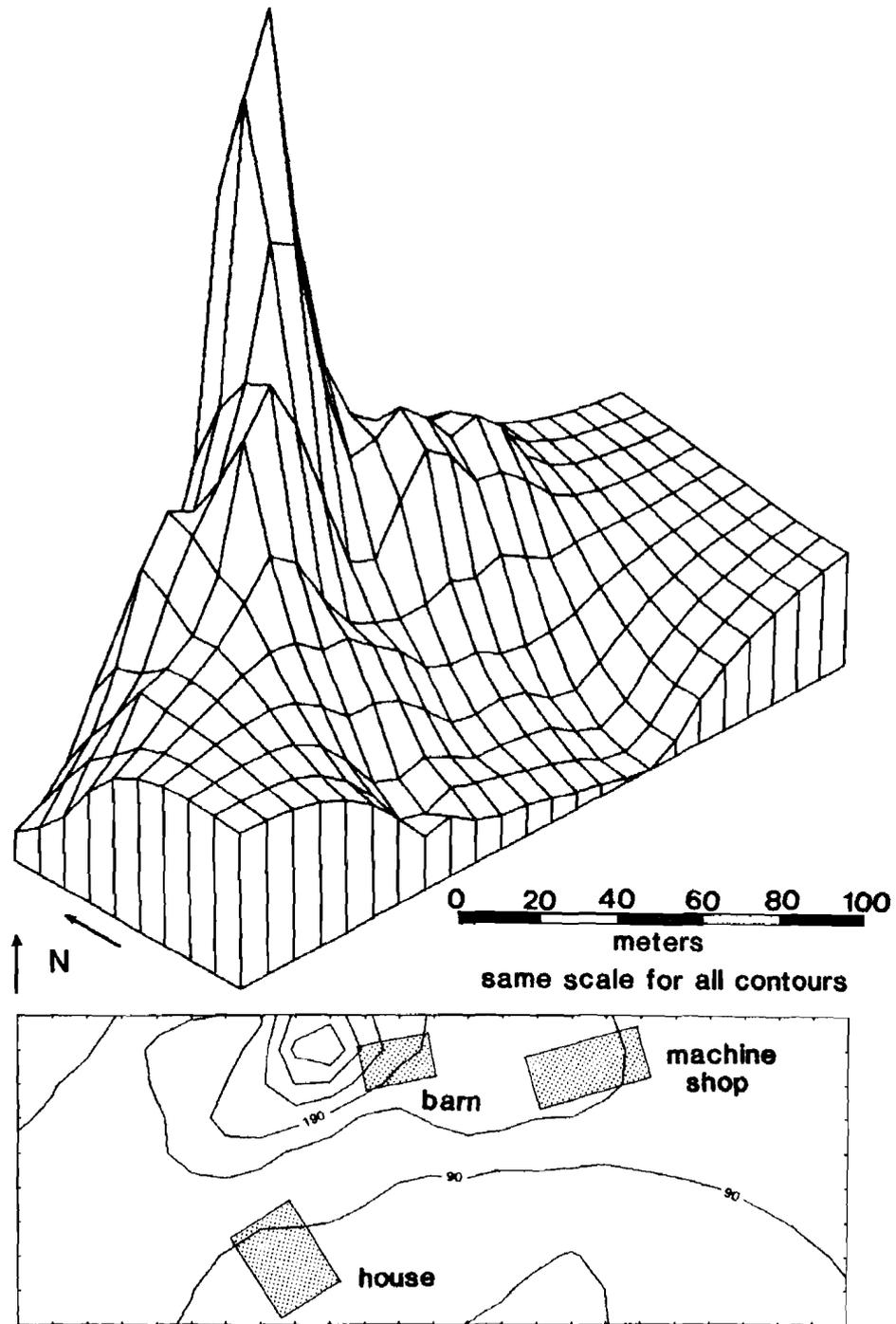


Figure 34: COAL DENSITY DISTRIBUTION

CONTOUR IS COAL WEIGHT IN GRAMS PER SHOVEL TEST UNIT



contours were manually plotted on these maps, revealing areas of the site that contained artifact concentrations for the specific artifact class or group. The interpretation of the data consisted of intra-site comparisons among these artifact classes and/or groups and further comparison with other known cultural features such as architectural foundations or fence lines. Thus, this analysis determined the presence or absence of interrelationships between archaeological and architectural features. The relationship between artifact distributions and soils chemical concentrations was also examined.

The maps prepared included one map of the total artifact counts, excluding those measured in grams, distribution maps of two of South's (1977) functional groups (kitchen and architecture), and two plots of artifacts thought to be chronological indicators. The separate plot of the distribution of coal was accomplished because of its abundance over the site as a distinct deposit in the form of lenses and layers. It was thought that the disposal pattern for coal might be different than for the other classes and groups of artifacts.

In general, the result of the distribution map of the total artifacts (Figure 29) shows that over time both the rear (north) yard and the east yard were used for the disposal of trash with the subsequent formation of a midden consisting of both yard scatter and purposefully dug trash pits. High concentrations were noted adjacent to the front door of the grist mill, the western door to the blacksmith shop, and within and surrounding the granary, chicken house, privy, red barn, and the small shed in the northwestern corner of the site. The very low densities surrounding most of the blacksmith shop and gristmill were not expected and are probably the result of non-deposition in these areas rather than any type of post-deposition disturbance to existing deposits. From the artifact patterning it appears that the majority of blacksmithing and repair work was done within the confines of the building rather than in the yard area in front. A comparison of the kitchen and

architectural groups' density distributions show both overlapping and separate disposal patterns for these artifact groups (Figures 30 and 31). The distribution of the kitchen group corresponds perfectly with what was called the domestic yard area and was confined to that area. The distribution of the architecture group, on the other hand, was neatly clustered around the location of extant and non-extant buildings. The presence of significant concentrations in the east yard provides an indication of the earlier use of this as an activity/work center at the site. This function of the east yard was assumed to have occurred prior to the filling and conversion into a formal yard in 1930-1940. The distribution of earlier ceramics (Figure 32) versus later ceramics (Figure 33) provides additional information on the changing yard usage at the site. Generally, the results show the presence of an earlier disposal pattern out the rear door of the main house and much less so to the east of the house (out the back porch). Later deposition as shown by the distribution of whiteware/ironstone (Figure 33), shows a major disposal/midden area stretching from the side porch to the red barn and east into the yard area. Also, the later distribution shows a lack of clustering out the basement cooking area door, a concentration that was present earlier (Figure 32). The distribution of coal (Figure 34) and total artifacts (Figure 29) were seen to correspond almost exactly and the assumption of a different disposal pattern for coal was not proven. Thus coal was treated as any other household artifact in its disposal except that in many instances when encountered in the excavation units the coal was used to fill in existing depressions, etc. prior to the use of the area for the disposal of household or architectural artifacts.

In general the results of the analysis of the shovel/postholer test units support their use as both a method of detecting buried archaeological features and as a method of determining gross disposal patterning at historic sites.

In order to provide further information on past behavior at the Wilson-Slack site, distribution maps were prepared based on the soils chemical values of the shovel/postholer tests. The actual values in mg/ dm³ and the pH were subjectively grouped into approximately five classes/intervals and these were then plotted on a distribution map as density values. These values were then subjected to further grouping by the manual plotting of contour intervals. The resulting Figures, #'s 16 to 20 were then interpreted in light of the results anticipated from historic research and informant interviews.

The first analysis done was the determination of the pH. Soil pH was tested to determine the availability and form of the phosphorus, potassium, calcium, and magnesium ions. The range of pH values, which was from 4.6 to 7.8 and falls in the moderately acid to weakly basic range, was concluded to have only a very limited effect on the availability and values of the chemicals being tested. The distribution of pH values in themselves yielded interesting results (Figures 16). The extreme northwestern corner of the site, known to have been in agricultural use, did not show any effects of liming, and instead had the most acidic soil within the testing area. The east yard area also contained soils more acidic than expected based on the known use as a vegetable garden. Areas of the site that were known not to have been intensively occupied and/or contained low total artifact densities (Figure 29) revealed values that indicated some correction of the natural acid-base balance. This can be seen in the high values for the majority of the area surrounding the blacksmith and grist mill and along Route 4. The anomalous readings between the house and the red barn were closely associated with the later ceramic distribution and were probably contaminated or altered by the contents of the midden deposit.

Two of the chemicals selected, calcium and magnesium, provided results that were much less informative (Figures 17 and 18). The distributions for both were

extremely similar, clustering high concentrations along the road edge, the result of processes not related to the archaeological site. An interesting concentration was apparent in the front and the rear of the grist mill. The reason for this concentration most likely was related to the buried building materials resulting from the demolition of the structure in the 1940's. A corresponding density in the architecture group artifacts in the same location lends support to this conclusion.

The three other soils chemicals each show specific characteristics amenable to interpretation. The phosphorus map (Figure 19), showed the suspected division between the domestic and industrial areas. The boundary between the two was sharply defined except in the area of the driveway opening in the fenceline. The sharp division was caused by the fence line known to have existed in this area based on the 1884 painting and on the results of excavation Unit 25 which located a north-south trending fence row. The concentration east of the blacksmith shop coincided perfectly with the location of the non-extant grist mill/machine shop. The processing of foodstuffs high in carbohydrates and other organic components, as would have occurred during milling and storage operations, was responsible for the elevated values. Historical and archaeological research provided an explanation for the high concentration northeast of the house. The area partially coincides with the midden deposits located between the house and the red barn. The phosphorus density probably indicates that a part of the midden received a higher percentage of raw garbage and other organic wastes versus other areas of the midden. The distribution of phosphorus did not show the sharp distinction that was expected in the rear (north) yard resulting from animal penning. It was especially anticipated that high concentrations would be present in the area of the chickenhouse and to the rear of the granary and privy.

The potassium results provided a unique set of concentrations with the exception of a similar high set of values around the non-extant machine shop

(Figure 20). Previous soils research has shown that potassium concentrations were caused by the deposition of wood ash. In the one area of known burning in the north yard no elevated levels were noted. The patterning shown did allow the division of the domestic and industrial areas to be made. From the results it appeared that potassium as well as phosphorus could be used as indicators of human activity. There also appeared to be a slight correlation between high potassium values and a lowered ph. This was especially evident in the area southwest of the blacksmith shop. The anomaly was probably caused by the purposeful dumping of ash in the driveway so as to raise and even out the surface.

In sum, the results of the soils analysis proved to be valuable indicators of human activity. The concentrations predicted both the location of the non-extant buildings and the location of the midden deposits. The association between these features and the soil concentrations was not as precise as the researchers had anticipated. The associations noted between some of the soils chemicals and any artifact type or class were similarly vague. It was recommended that in the future use of soils chemicals that the analysis be completed before the termination of fieldwork so that the anomalies can be better tested for the determination of the cause of the concentration.

Intra-site Economic Analysis

A total of eight of Alexander Wilson's business ledgers survive in the possession of his granddaughter, Mrs. Norman Slack. Also surviving are two business ledgers of Wilson's son, John T. Wilson. These documents are of three types: (1) day books which note the work performed, for whom the work was performed, and the cost of the work covering the period 1852-1877 for A. Wilson; (2) account books, which organize the day book information into specific customers' names and the work performed for them, cover the period 1850-1878 for A. Wilson and the period 1894-1899 for J. T. Wilson; and (3) ledger books that contain personal credit

and debts and cash paid for the period 1862-1873 and 1876-1878 for A. Wilson. The body of data contained in these business records combined with that from the Census of Manufacturers and his business correspondence provided extensive information on Wilson's business.

Del Sordo (1981) provided the first analysis of the business records. His study concluded that the income figures in Wilson's account books did not agree with that reported to the Federal census takers for the years 1860 and 1870. Another topic discussed by Del Sordo was the growth of Wilson's business through time. Several interesting facts were brought out by Del Sordo. The day books indicate that Wilson operated his business six days a week and even worked, on occasion, portions of major holidays such as the Fourth of July and Christmas. Another is that up until 1860, Wilson ended his business year in March. This was common practice until the calendar changed in the mid-eighteenth century in the English colonies. After 1752 the year ended in December though some still continued the practice of starting their year in March as this time of year was the beginning of the planting season. Since Wilson's business was so heavily tied to the agricultural industry it was only natural that he would follow their cycle. For the most part, monies owed were paid in cash and not by a barter system employed by other local merchants.

Del Sordo also made several statements based on his interpretations of the business records. One of these was questioned and addressed during the present study. This concerned the statement that the price of services and goods did not change through time. Examples chosen to test this assumption were the prices of "moves and removes" or in other words the changing of wagon wheels. From 1852 to 1872 the price remained at 15¢, but in 1876 the price had dropped to 12 cents. Another item, steel-toed shoes were priced at 44¢ each in 1872, and 31¢ each in 1876, both an increase over the 1867 price of 25¢ each. The cost of new shoes varied from 25¢ each in 1852 to 22¢ each in 1853 to 25¢ each in 1862 to 44¢ each in

1867 to 37¢ each in 1872. The above data was drawn from the sample in Appendix V. This same body of data can be used to give a very good indication of the daily routine of Wilson and adds to those facts brought out by Del Sordo. From the sample Wilson was responsible for the manufacturing of nails, hinge hooks, a fire poker, a grub hoe, hedge knives, corn knives, gate hooks, strap hinges and miscellaneous bolts, staples and nuts. Other activities performed with some regularity by Wilson included the manufacturing of horseshoes and the sharpening of agricultural implements such as ploughs, shears and post spades. By far the most profitable daily work for Wilson was his repair work on wagons and carriages. These tasks consisted of putting new spokes in wheels, installing new rims and balancing wagon wheels, replacing wooden seats and sides and bottoms in wagons, and the painting of wagon bodies. One final segment of business that Wilson engaged in frequently was the mending and manufacture of chain and single and double trees (used to harness the animal to a wagon or machine).

The picture of the business of A. Wilson that one receives was one of a true blacksmith participating in numerous, but very small paying manufacturing and repair jobs. That Wilson was indeed a manufacturer of small agricultural implements was also certain from this study. What was not possible to pick up from the day books and account books is the frequency of manufacture of new wagons, carriages and sleighs that Wilson's business produced. These are noted in the presentation of the census of manufacturers' records. Also not available for analysis from the account books was the significant business income Wilson received from his dealership in large agricultural implements such as reapers and threshers.

The account books of J. T. Wilson for the period 1894-1899 allow for a glimpse into his business practices which were similar to, but, also different from, A. Wilson's. One of the major differences from the business of A. Wilson was the

method of payment that J. Wilson would accept for his work. Instead of requiring payment in cash, he accepted such items as vegetable plants, corn grown by others, stove wood, strawberries, planking, credit for a days work, credit for use of horses and credit for a load of manure. Another difference was in the type and variety of work performed by J. Wilson. While he did not completely give up blacksmithing work, the largest income by far was the result of his sale of grain, hay, and coal. On a percentage basis 25 percent of his income was derived from machining and blacksmithing, and 75 percent was derived from the sale of grain, hay, and coal. Another segment of his business was the custom grinding of grain and the sawing of lumber for others. The types of grain that were sold included cracked corn, shell corn, corn meal, feed, corn and oats mixture, white meal, bran, and flour. J. Wilson also seems to have sold his goods regularly to a much larger geographical area than A. Wilson, having numerous customers in Port Penn, Delaware City, and Wilmington. He also operated a regular, large volume business in coal that supplemented his grain sales during the off months. Wilson sold coal to many of the larger and more important businesses in the area. An example of this was his extensive sales to the proprietor of the Deer Park Hotel, Mr. John E. Lewis. The only large scale blacksmithing manufacturing done during by J. Wilson his period was the sale of over 500 pounds of spikes to New Castle County. Very infrequently in the records was there mention of Wilson actually manufacturing anything, except for the occasional nut or bolt. The mention of electric welding, a late 19th century invention, does appear in J. Wilson's account book. The only wheelwrighting that J. Wilson did consisted of the hooping of wagon wheels. The rates charged by Wilson during this time period reflect little variation in price. For example in 1894 the cost of grinding a bag of grain was 7¢ and in 1899 was still 7¢ a bag.

The probate inventory of Alexander Wilson is included as Appendix III. The inventory provides invaluable information on the total material goods of Wilson that are not available from a study of other business records. It also represents the accumulation of goods from his 45-year career as a blacksmith, wheelwright, and machinist. Unfortunately the listing of household domestic goods was not itemized, unlike the probate records from earlier in the century. Among the topics that can be studied from the data include a comparison of the total value of the estate with other sites, subjects of previous DeLDOT research (Coleman et al, 1983, 1984). Additionally, the probate records provide another list of individuals included within the rural community of the Wilson family. These persons are included in the list because of their debt to Wilson or because Wilson's estate owed money to them for services previously rendered. The fact that Wilson was involved in money lending and mortgage securing provided further information of his above average social and economic standing in the community.

From the previous DELDOT research the 1899 probate of the estate of Arnold Naudain is the only comparative data available. The inventory follows the same general outline as Wilson's with no detailed description of household goods, and listing only goods valuable in the production of agricultural products. For Wilson this same pattern was repeated, listing only goods used in his business. An exception to this is the listing of extremely precious and valuable household goods such as an organ, an iron safe, and a jump seat carriage. The value of household goods of the Wilson family at \$300 was six times the \$50 given for the Naudain family. In one room, #8, of the Wilson House were goods valued at the entire total of the Naudains.

Other conclusions that can be made from an examination of the inventory was that A. Wilson owned items that did not make it into the inventory list. The reason for this may be that Wilson's son, J. T. Wilson, who was expected to

continue the family ironworking tradition, might have been willed some of the most essential goods. The only information we have to confirm or not confirm this question was through an examination of Wilson's purchases made through the business correspondences used previously. For example, Wilson purchased a bolt machine from the Wilmington firm of D. H. Kent and Co. in 1875 for the sum of \$60.00. However, the inventory fails to list any such machine and it was probably passed on to J. Wilson.

One additional insight into A. Wilson, the entrepreneur, was the correspondence between S. H. Lee and Brothers, agents for Champion reapers and Wilson. From the available evidence Wilson became an agent for the company in 1870. While the details of this arrangement were not known, it appears that Wilson was acting much like a automobile salesman of today. In part of his shop he operated a sort of showroom with the various models on display. The commission that Wilson received ranged from 10-15%. In February of 1872 the company wrote to Wilson that, "we are pleased to have you continue agency of Champion Reapers and Mowers and we feel confident that the entire trade will fall into your hands.....If you decide to order 10 machines we can ship a car load direct to Newark or Elkton. We think you will need 20 machines to supply your trade". There are no records available on the dollar amount of sales resulting from this part of Wilson's business. The information would not have been included in the Census of Manufacturers data, and thus the income was additional to that listed. This fact makes difficult the comparison of the entire business of Wilson with other wheelwrights, etc. What will be compared is the manufacturing and repairs side of their businesses. While Wilson may appear not to have earned much money, the money derived from the sale of new machines must be considered. The known price of one of the machines sold by Wilson was \$210.00 and the income from commissions on ten of these machines would represent a 20% increase in his

manufacturers income of \$1360. The effects of the additional income on the total income of Wilson were not considered in the research of Del Sordo (1981). It becomes apparent that to successfully compare Wilson to any other manufacturers in the same occupation more than a simple analysis using the census information must be used. Thus, while conclusions will be made concerning Wilson's status in the business community it must be remembered that many of the hidden assumptions remain to be tested.

Intersite Analysis

Because the artifact assemblages from the Wilson-Slack site were quite small, detailed comparisons to artifact assemblages from other sites in the Route 4 Corridor were not possible. Nevertheless, it can be noted that on an impressionistic basis, there do not seem to be any apparent, significant differences among the artifact assemblages from the Wilson-Slack, Ferguson, and Hawthorn sites (see Coleman et al. 1983; Coleman et al. 1984). Although the Wilson-Slack site did have more manufacturing debris than the other sites, as would be expected, the domestic ceramic assemblages among the sites are quite similar in composition. Artifact disposal patterns are also very similar in content and location among the three sites.

Faunal remains are scarce at the Wilson-Slack and Hawthorn sites and non-existent at Ferguson. Nonetheless, one difference in butchering patterns can be observed between the Hawthorn and Wilson-Slack sites in spite of the small samples. At Wilson-Slack, there are fewer head and feet parts, which indicates off-site butchering and processing, than at Hawthorn (compare Appendix VIII of this report with Coleman et al. 1984; Appendix XIII). Also there are more large mammal (cow, pig, and sheep) bones with saw and cut marks at the Wilson-Slack site than at Hawthorn. This difference indicates that more store-bought cuts of meat such as steaks and roasts were purchased and consumed at the Wilson-Slack

site than at the Hawthorn site, where lower quality on-site butchered meat parts were consumed in meats and stews. The implications of these differences will be discussed later in the concluding section of this report.

Although the artifact patterns and faunal remains allow for limited intersite analysis, many of the historical documents allow for analysis of the regional setting of the Wilson-Slack site. These analyses are presented below.

U.S. Manufacturers Census

The mid-19th Century through the Civil War was a prosperous one for the carriage manufacturing industry in Delaware. The growth of this industry and related industries in northern New Castle County can be traced through a study of U.S. Census of Manufacturers for the years 1850-1880. Census information has provided the primary data base for all in-depth studies of manufacturing in the U.S. (Clark 1928, for example). For the present research, data was gathered for Pencader, Christiana, White Clay Creek, and Mill Creek Hundreds (Appendix IV). Manufactures were recorded who participated in all aspects of iron manufacturing. All types of mills (grist, saw, etc.) were also recorded. A key for the tables preceeds their listing in the appendix.

Information on the present research topics gained from the analysis included: 1) a simple ranking system of the four hundreds placing A. Wilson's business within this system, 2) comparison of the number of blacksmith and wheelwright shops listed in the census schedules with that of the historic maps for 1868 and 1888, which will give some idea of the frequency of shops reporting to the government, 3) tracking of the general features of industrial development on an inter-hundred basis, and 4) tracking special financial aspects of business such as profit margin and salaries.

Tables 13-16 were constructed to provide a simple ranking scheme for manufacturers in Pencader, Mill Creek, White Clay Creek, and Christiana

TABLE 13

1850 RANKING OF MANUFACTURERS IN
PENCADER, MILL CREEK, WHITE CLAY CREEK & CHRISTIANA HUNDREDS

	<u>Owner</u>	<u>Type of Operation</u>	<u>Annual Value of Product</u>
1.	William Cooch	Grist Mill (P)	\$ 30,200
2.	Allan Wood	Sheet Iron Forge (MC)	30,000
3.	C & J Marshall	Sheet Iron Forge (MC)	25,000
4.	William Shakespeare	Flour Mill and Saw Mill (P)	12,950
5.	George B. Lolman	Grist Mill (P)	8,360
6.	W. McConaughy	Saw Mill (P)	4,500
7.	J. H. Todd	Coach Maker (P)	3,260
8.	Israel Pritchard	Blacksmith (WC)	3,205
9.	Charles Clement	Saw Mill (P)	2,750
10.	John Steel	Blacksmith (C)	2,100
11.	Edward S. Carpenter	Tin Smith (C)	2,000
12.	Joseph Cloud	Coach Maker (P)	1,800
13.	Samuel Wright	Blacksmith (WC)	1,575
14.	James Campbell	Wheelwright (C)	1,500
15.	John A. Wilkins	Tin Smith (WC)	1,305
16.	Joseph Turner	Blacksmithing (C)	1,300
17.	James Aikin	Blacksmith (C)	1,200
18.	Leonard C. Darder- grift	Wheelwright (WC)	1,200
19.	Thomas Yeatman	Blacksmith (MC)	485
20.	WILSON & CO.	WHEELWRIGHT (P)	1,155
21.	Wm. Jones	Tin Smith (MC)	1,080
22.	John Cooper	Blacksmith & Wheelwright (C)	1,000
23.	Samuel Farris	Blacksmith (WC)	1,000
24.	William M. Francis	Wheelwright (WC)	1,000
25.	Thomas Hall	Wheelwright (C)	1,000
26.	John R. Hill	Cartwright & Wheelwright (P)	1,000
27.	Thomas Smith	Blacksmith (C)	1,000
28.	John Bennet	Blacksmith (WC)	900
29.	Wm. Kennedy	Blacksmith (WC)	900
30.	E. B. Collins	Wheelwright (WC)	863
31.	James McCoy	Wheelwright (P)	850
32.	Thomas Carinder	Blacksmith (MC)	800
33.	Isaac Sinex	Blacksmith (C)	700
34.	Stephen Marrell	Blacksmith (MC)	650
35.	William Bullock	Wheelwright (C)	600
36.	Thomas J. Moore	Blacksmith (MC)	600
37.	William Newlin	Blacksmith (MC)	600
38.	Wilson Pierce	Blacksmith (C)	600
39.	Jonatran Durnen (?)	Wheelwright (WC)	550
			\$ 152,238

TABLE 14

1860 RANKING OF MANUFACTURERS IN
PENCADER, MILL CREEK, WHITE CLAY CREEK & CHRISTIANA HUNDREDS

	<u>Owner</u>	<u>Type of Operation</u>	<u>Annual Value of Product</u>
1.	John Marshall & Bros.	Rolling Mill (MC)	\$ 35,000
2.	Delaware Iron Works	Rolling Mill (MC)	30,000
3.	Wm. Cooch	Grist Mill (P)	13,200
4.	Maylen Batten	Grist Mill (P)	11,385
5.	John Dayett	Grist Mill (P)	10,811
6.	Blandy & Bros.	Casting (WC)	9,800
7.	Amos Bradley	Grist Mill (P)	6,700
8.	James Nicholdson	Butcher (P)	5,465
9.	Wm. Hutchinson	Butcher (P)	3,091
10.	Thomas Cavender	Blacksmith (MC)	1,300
11.	Stephen Marcell	Blacksmith (MC)	1,200
12.	ALEXANDER WILSON	BLACKSMITH (P)	1,180
13.	Thomas Singles	Pump Maker (MC)	1,100
14.	John Hanna	Blacksmith (MC)	1,000
15.	John Lagwell	Blacksmith (P)	1,000
16.	Isaac Morrison	Blacksmith (MC)	750
			\$ 132,982

TABLE 15

1870 RANKING OF MANUFACTURERS IN
PENCADER, MILL CREEK, WHITE CLAY CREEK & CHRISTIANA HUNDREDS

	<u>Owner</u>	<u>Type of Operation</u>	<u>Annual Value of Product</u>
1.	Marshall & Co.	Sheet Iron (MC)	\$ 66,000
2.	Cooch & Barton	Grist Mill (P)	19,405
3.	W. C. Blandy & Co.	Iron Foundry (WC)	9,270
4.	G.P. Whitaker	Iron Ore Miner (P)	9,000
5.	Z. McKensy	Grist Mill (P)	6,800
6.	ALEXANDER WILSON WHEELWRIGHT & BLACKSMITH (P)		5,000
7.	Hill & Pritchard	Wheelwright & Blacksmith (WC)	4,956
8.	Joel Woodward	Merchant & Gristmill	4,276
9.	Wm. McConaughy	Saw Mill (P)	3,750
10.	Washington Barron	Wheelwright (P)	3,500
11.	Casho & Co.	Agricultural Implements (WC)	3,275
12.	Marshall-Morrison & Co.	Carriage Manufacture & Blacksmith (WC)	2,950
13.	A. P. Cornagy	Blacksmith (P)	2,750
14.	R.D. Moss	Blacksmith (P)	2,653
15.	Deweese Chandler	Blacksmith (MC)	2,500
16.	James H. Mackey	Carriage Manufacture & Blacksmith (WC)	2,405
17.	McClelland & Co.	Carriage Manufacture & Blacksmith (WC)	2,160
18.	Thomas Reese	Blacksmith (C)	2,000
19.	D.C. Webb	Wheelwright (P)	2,000
20.	W. & T.B. McConaughy	Iron Ore Mines (P)	1,800
21.	Albert Enricken	Blacksmith (C)	1,650
22.	Adam Dayett	Grist & Merchant Mill (P)	1,604
23.	Michael J. Ford	Blacksmith (C)	1,500
24.	John Ritchie	Wheelwright (C)	1,500
25.	Joseph Chambers	Blacksmith (MC)	1,250
26.	John G. Fisher	Blacksmith (MC)	1,200
27.	Moore & Mitchell	Blacksmith (MC)	1,200
28.	Levi Huggens	Wheelwright & Blacksmith (P)	1,050
29.	John W. Lynam	Blacksmith (C)	1,000
30.	Prosper Chapell	Tinsmith (C)	950
31.	Philip Chandler	Wheelwright (MC)	900
32.	David Woods	Wheelwright (C)	900
33.	William Soward	Blacksmith (MC)	700
34.	Joseph Barrett	Wheelwright (C)	600
35.	William Ingram	Blacksmith (C)	500
			\$ 172,954

TABLE 16

**1880 RANKING OF MANUFACTURERS IN
PENCADER, MILL CREEK, WHITE CLAY CREEK & CHRISTIANA HUNDREDS**

<u>Owner</u>	<u>Type of Operation</u>	<u>Annual Value of Product</u>
1. Marshall Bros. & Co.	Sheet Iron (C)	\$ 75,000
2. ALEXANDER WILSON	BLACKSMITH & WHEELWRIGHT (P)	7,600
3. ? Allen	Foundry (WC)	4,500
4. James Ward	Spokes & Handle (MC)	4,000
5. Washington Barrons	Wheelwright (P)	3,000
6. Robert D. Moss	Blacksmith & Wheelwright (P)	3,000
7. Joseph Lutton	Blacksmith (WC)	2,500
8. Israel Pritchard	Blacksmith (WC)	2,000
9. McCoy Yearsley	Blacksmith (MC)	1,800
10. Joseph H. Chambers	Blacksmith (MC)	1,600
11. Joan McClintock	Blacksmith (WC)	1,500
12. James Polk	Blacksmith (MC)	1,500
13. John H. Thornton	Blacksmith (P)	1,500
14. Thomas Ectors	Blacksmith (MC)	1,400
15. Geo. Chandler	Wheelwright (MC)	1,300
16. James H. Macky	Carriage Maker (WC)	1,200
17. Isaac Morrison	Blacksmith (WC)	1,200
18. Marshall & Son	Carriage Maker (WC)	1,000
19. Levi Huggins	Wheelwright (P)	900
20. Moore & Mitchell	Blacksmith (MC)	900
21. Robert Banks	Wheelwright (MC)	800
22. George Goyle	Carriage Maker (WC)	800
23. Louis McCormick	Blacksmith (WC)	800
24. Willard Pierson	Blacksmith (MC)	500
		\$ 120,300

NOTE:

Marshall & Brothers 62.3% of total vol. of product
 Wilson 6.3% of total vol. of product
 Blacksmith & Wheelwright have a total vol. of product of \$33,800
 Wilson represents 22.4% of total for blacksmith's & wheelwrights

Hundreds. The ranking was based on the gross annual value of product listed in Appendix IV. These tables show the gradual rise in the business of Alexander Wilson from a middle ranking business in 1850 and 1860 to the highest ranking blacksmith/wheelwright in the four hundreds by 1870. The large increase in his annual product between 1860 and 1870 was at least partially a result of the expansion of the working facilities and the implementation of steam powered equipment. By 1880 A. Wilson was the second ranked manufacturer in all the hundreds, earning more than twice as much as the closest blacksmith/wheelwright. Of a total dollar product of \$33,800 for blacksmiths/wheelwrights, Wilson's income represents over 20% of the total. It can be seen from the 1880 data that a majority of the blacksmiths/wheelwrights income and businesses remained at the small scale that Wilson began with in 1850. This was especially evident in the owners of businesses in Christiana and Mill Creek Hundreds, that presumably served a more rural clientele than did Wilson. The close association of Wilson's business with steady, large income concerns such as Cooch and Barton, G. P. Whitaker, and W. McConaughy provided Wilson with the income advantage seen in his gross annual product.

The assessment of the reliability of the U.S. census taking, or conversely of the map makers, was examined through the construction of Table 17. The discrepancy in the number of establishments in the hundreds reported by the two sources is the result of several factors. First, the 1870 census of industry only reported those businesses that had an annual gross product of \$500 or more. Thus, the larger number of businesses shown on Beer's Atlas represents the total number of shops in the area, and was not limited by annual income as were those that the census listed. Second, the terminology used to describe these businesses varies between the Atlas and the Census. An establishment recorded on the Atlas as a "B.S. Sh. & W. Sh. may be listed as only a blacksmith in the Census, thus throwing

TABLE 17

**BLACKSMITHS/WHEELWRIGHTS LISTED ON BEER'S ATLAS 1868
FOR PENCADER, WHITE CLAY CREEK, AND MILL CREEK HUNDREDS
COMPARED TO THE 1870 CENSUS**

<u>PENCADER HUNDRED:</u>	<u>BEER'S 1868 ATLAS</u>	<u>1870 CENSUS</u>
Blacksmith & Wheelwright	3	2
Blacksmith	1	2
Wheelwright	<u>0</u>	<u>2</u>
	4	6
 <u>White Clay Creek Hundred:</u>		
Blacksmith & Wheelwright	4	1
Blacksmith	2	3
Agricultural Implement	1	1
Wheelwright	<u>1</u>	<u>0</u>
	8	5
 <u>Mill Creek Hundred:</u>		
Blacksmith & Wheelwright	6	0
Blacksmith	3	5
Wheelwright	<u>0</u>	<u>1</u>
	9	6
 Total:	 21	 17

off the intra-hundred totals. Finally, these sources of information were compiled three years apart during a period of industrialization and economic change in the region. Some of the shops listed on the Atlas may well have been out of business or involved in another line of work by 1870. In sum, the results of the comparison show that no one single data source should be employed to the exclusion of others. This was thought to be especially important to the initial location/identification phase of cultural management studies where site location and function are sometimes determined solely from map work without consultation with other original sources.

From a general survey of Appendix IV, it was seen that regionally, these censuses show the decline of the more traditionally oriented businesses such as grist mills and blacksmiths and the rise of more modern, industrial businesses, such as iron foundaries and rolling mills. Throughout these four decades the product values of the newer industrial establishments account for one-third to one-half of the total product valuations of the four hundred areas. The milling and smithing trades remain as small, local industries that cannot compete with the larger concerns in salaries paid, profit margins, and gross value of their annual product.

The business of Wilson from 1850 to 1880 consistently employed more hands than any other blacksmiths and/or wheelwrights in the four hundred area. The larger iron-related industries were the only businesses that employed more men than Wilson. It was also noted that no operation in the four hundred area employed women, even on a part time basis. In the area of wages paid, A. Wilson paid the highest wages (\$1.50 per day) for ordinary laborers of any business in the sample. The rate that he paid for skilled mechanics (\$1.75 per day) was in the middle of a payment range from \$1.00 per day to a high of \$2.50 per day paid by J. McClintock and I. Morrison. The reason for the high wages paid by Wilson for ordinary laborers stems from his extensive use of apprentice help. In order to ensure that

he obtained the most responsible persons, he offered an attractive starting wage. In order to keep his overall salary payout low, his salary for skilled help was kept low which discouraged their continued employment at the higher skilled wages. In this way a constant supply of young, hardworking apprentices was assured.

Catchment Area Study

The goal of this research was to determine the geographic areas from which Alexander Wilson obtained both raw materials and replacement parts and also whole machines (implements). Because the day and account books do not contain the type of information needed, a collection of business correspondence from the period 1853-1886 held at Morris Library, University of Delaware was employed. Due to the quantity of the collection, approximately 1,000 items, only a sample of the entire collection was used. The index to the collection was used to separate the correspondence into two types, personal and commercial. Generally, the boxes and folders with personal letters were not sampled as it was assumed that the letters concerning business matters and the index provided the information needed, ie. geographic location. For the total collection of 78 folders, every 4th folder was sampled providing a 25% sample. Other folders of special interest were also chosen so that the total sample approximated 40% of the total. The commercial correspondence included queries and complaints, receipts, bills and monthly statements, and tax statements and business licenses.

The personal correspondence did provide the researcher with subjective and other information to enrich the personal history of Alexander Wilson and his family. During the period from 1873 to 1877 Wilson served on the New Castle County Board of the Trustees of the Poor. This body was composed of persons of upstanding reputation in the community, and much of the correspondence included concerns different individuals promoting themselves for appointment. Also included were request to Wilson to release monies previously allotted to certain families.

As regards the commercial correspondence, the majority of the material is for the 1870's, and from these data these years would seem to rank as his most profitable. This period corresponds to a rapid increase in the value of products produced by A. Wilson. Some of the letters from his personal customers provide insight into the quality and punctuality of A. Wilson. For instance, B. D. Bowers of Elkton, Md., stated that the "jack made by Wilson was no use at all". A Timothy Slack of Oxford, Pa., asked in several letters, "where is his drill?"

The following is a listing of personal correspondence on business matters:

1)	Robert Alexander	Elkton, Md.
2)	H. Baumgardner	Lancaster, Pa.
3)	R. M. Black	Glasgow, De.
4)	E. Mortimer Bye	Wilmington, De.
5)	D. Cope	Kemblesville, Pa.
6)	H. A. Perkins	Odessa, De.
7)	Barney Reybold	Near Delaware City, De.
8)	John Ries	Glasgow, De.
9)	Timothy Slack	Oxford, Pa.
10)	Elijah Thompson	New London, Pa.
11)	J. G. West	Kimbleville, Pa.
12)	John Best	Lancaster, Pa.
13)	William Reynolds	Baltimore, Md.
14)	B. D. Bowen	Elkton, Md.
15)	George Howard	Elkton, Md.
16)	George Jackson	Near Wilmington, De.
17)	George C. Marshall	Dinnewiddie County, Va.
18)	Fairlawn Church	Richmond, Va.
19)	J. R. Hall	Middletown, De.
20)	Adrian Cornell	Newtown, Pa.
21)	C. B. Ellison	Bellevue, De.
22)	N. C. Jones	Dow Run, Pa.
23)	H. H. Kimble	Fair Hill, Md.
24)	William Webb	Summit Bridge, De.
25)	George Williams	Newark, De.
26)	B. Everitt Hill	Newark, De.

The following is a listing of companies and/or individuals from which A. Wilson purchased goods or services:

- 1) Newark Iron Foundry (Lewis L. Allen)
- 2) C. W. Blandy & Brothers, Newark, De. - Iron Founders - Castings
- 3) George W. Bush & Sons, Wilmington, De. - Coal Dealers - Sm. Stove Coal
- 4) Casho Machine Company, Newark, De. - Machnists, Agricultural Implements
- 5) W. R. & H. Cause, Wilmington, De. - Hardwoods
- 6) Cranston & Newbold, Newport, De. - Lumber & Grain

- 7) Gawthrop & Brother, Wilmington, De. - Plumbing, Gas, & Steam Fitters
- 8) Ferris and Garrett, Wilmington, De. - Plumbers and Gas Fitters
- 9) B. Fritsch, Wilmington, De. - File Manufacturing
- 10) Kent, Garrett and Co., Wilmington, De. - Iron, Steel, Hardware, and Coach Material
- 11) Garrett and Son, Wilmington, De. - Iron and Hardware Dealers
- 12) Geiser Mfg. Co., Waynesboro, Pa. - Grain Seperator, Cleaner, and Bagger
- 13) B. Gill & Son, Trenton, NJ. - Agricultural Works
- 14) Emlen, Graham & Passmore, Philadelphia, Pa. - Seeds & Farm Machinery - Steel Plow
- 15) Hilles & Jones, Wilmington, De. - Machinists
- 16) Hoffman & Son, Baltimore, Md. - Iron Dealer
- 17) D. H. Kent & Co., Wilmilngton, De. (Formerly Garret & Kent)
- 18) L. H. Lee & Brother, Baltimore, Md. - General Agents for "Champion" Reapers & Mowers
- 19) Campbell Longcope & Co., Baltimore, Md. - Anthracite and Bituminous Coal
- 20) McConaughy Bros., Georgetown, De. - Lumber
- 21) Wm. McNience, Philadelphia, Pa. - Excelsior Saw Works
- 22) J. Marshall & Co., Newport, De. - Rolling Mill
- 23) New Jersey Agricultural Works, Trenton, NJ - Mfg. of Horse Powers, Threshing Machines
- 24) New Jersey Steel & Iron Co., Trenton, NJ - Castings
- 25) Phoenix Iron Co., Philadelphia, Pa. - Castings
- 26) William H. Pierson, Wilmington, De. - Building Materials
- 27) Jones Pusey & Co., Wilmington, De. - Ship Builders
- 28) A. M. Quimby & Co., Wilmington, De. - Lumber
- 29) Morley Springer, Wilmington, De. - Gause
- 30) Charles Stewart, Wilmington, De. - Iron Founder
- 31) E. C. Stotensberg & Sons, Wilmington, De. - Iron Founders - Castings, Bar Iron, Pulleys
- 32) John A. Wilson, Wilmington, De. - Cumber Wood Pumps
- 33) H. B. Wright & Co., Newark, De. - Hardware Store - Pig Iron
- 34) Nathan Zeigler, Newark, De. - Stoves and Tinware
- 35) Pennsylvania Agricultural Works, York, Pa.
- 36) Joseph Dean & Son - Lumber
- 37) Wheeler & Melick Co., Albany, NY

Thus, Wilson obtained raw materials and supplies within an area ranging from Baltimore, Maryland, northward to Albany, New York. Of the above businesses the Wilmington firm of Garret, Kent and Company received the largest amount of business. During the period from 1865 to 1872 it appears that Wilson bought most of his raw and finished metal goods from this firm. With the change in ownership of the firm in 1873, the relationship of the company and A. Wilson changed. In July 1873 the owners sent Wilson a rather abrupt and urgent request for the money owed

them in the sum of \$255.62. It is assumed that Wilson paid the bill owed since his dealings with the firm continued well after this date.

The most informative information pertaining to the notion that A. Wilson was a manufacturer of agricultural implements was found in his business correspondence. A series of letters between Wilson and Messrs. J.P. & W.H.H. Cobb of Dudley, N.C., sheds much light on this subject. In January of 1871 a contract was drawn up for the manufacture of plows for the Cobbs. Evidently, A. Wilson had big plans for this endeavor as one of the prime reasons for the agreement was that in the future the Cobbs would give Wilson "the best references in this state". By February the Cobbs were inquiring "how long before 200 man plows or vegetable cultivators are ready and can you make 100 right and ready?". By all appearances it seems that Wilson's business was on the verge of becoming a major manufacturer. Later correspondence reveals first, that many of the plows, shipped by rail, were broken in transport. The major blow for Wilson, however, was the fact that payment for the goods was not received. The correspondence continued for a period of two years between Wilson and his lawyers in Goldsboro, North Carolina. Finally in 1873 Wilson received most of his investment in a judgment reached against the Cobbs. The marketing of finished manufactured goods to the southern states was one practiced by a large number of the companies in Wilmington (Hoffecker 1974). The fact that small concerns outside the city engaged in such commerce has implications for research into the consumption and trade of goods in Northern Delaware and shows the wide ranging effect the railroad had in the area of consumer behavior. This process would have allowed Wilson to orient his work to the production of much higher priced goods while maintaining his day to day local business. It was noted that much of the business with persons outside of the regular business area was also in large ticket items such as new carriages or wagons. These persons were not picked up in the business area study

because they would not be located on the Delaware maps used for the analysis. This data thus serves to supplement the results of the following section of the business/service area of A. Wilson.

Business/Service Area Study

The goal of this study was to determine the geographic area which was serviced by A. Wilson's business. The day and ledger books of A. Wilson were used as data sources. These were completely searched to recover all of the names of the individuals who did business with Wilson for three different time periods; 1852-1864, 1864-1869, and 1869-1878. The number of names that were recorded in the books was judged to be too large to allow for the use of the complete listing. Thus, a random sample was taken of the complete list. For each period, a 15% sample was taken through the use of a random numbers table. In the selection process, names with incomplete or unsure spellings were eliminated and new numbers with corresponding names were selected. Maps used to plot the residences of the individuals sampled were the Rea and Price Map of New Castle County (1849) and Beers' Atlas of the State of Delaware (1868). White Clay Creek Hundred and Pencader Hundred were found to be the most useful for locating the data points. Figure 35 shows the results of the map plots.

One of the conclusions drawn from this study was the fact that in spite of the use of a random sample, almost every family in the immediate area was found to frequent Wilson's shops. Related to this point, it became obvious that each area of northern Delaware had its own blacksmith that serviced a segment of the population, which could be used to defined separate communities. Murdock (1949) has defined a community as "the maximal group of persons who normally reside together in face-to-face association." Through this geographical analysis the boundaries of an historic rural community could thus be defined on two levels. Figure 36 presents the cumulative results of the geographic analysis. For most

persons using Wilson's services regularly, close proximity to his shop seems to have been the most important variable. Wilson had an especially strong clientele southeast of his shop. By considering Wilson's clients as his shops' "resources", the catchment area shown in Figure 36 with a radius of about 4½ miles represents the maximum area that Wilson serviced, and thus is the largest area which could be termed a community.

Figure 37 was based on a plotting of individuals who were Wilson's best ie., most frequent, customers. These names were chosen from the 1869-1878 account book index (the only book to contain an index). A correspondence between the number of entries of an individual and the frequency of business of that individual was assumed. Thus an individual recorded in more than five entries was assumed to have done "regular business" with Wilson. Figure 37 shows the locations of the residences of these individuals, and presents an area within which daily interactions with Wilson were common.

Tax Assessment Research

As in the previous use of tax assessments for economic ranking at the William M. Hawthorn site (Coleman et al. 1984), the tax assessment values for the occupants of the Wilson-Slack site were compared to those of the entire hundred. The purpose of this comparison was to provide a means by which some objective statements about the wealth of the occupants through time could be made, separate from those based on the interpretations from the archaeological evidence. Tax assessments were chosen because: 1) they generally sample more completely the entire population of a certain location, instead of selectively as do wills and probate records, 2) they allow for a synchronic study of the economic standing of the site's occupants instead of the diachronic end-of-the-line view supplied by probate records, and 3) the relevant data was much easier to assemble than with probate records, the entire listing for a given year being available in a single volume or microfilm reel.

Table 18 shows the results of a comparison of the tax assessments of the Wilson-Slack site occupants to those of the William M. Hawthorn and Robert Ferguson site. In general, Alexander Wilson's income placed him in the low range, below the higher incomes of the Hawthorn and Ferguson occupants. Compared to the other two incomes, which remained stable through the period, the income of Wilson rose during this same period. This fact would have allowed Wilson's economic standing to increase relative to the occupants of the other sites. Thus, while it appears that a rural businessman ie. A. Wilson maintained a lower economic standing versus moderate scale farmers, he did have a much better ability to increase his income in the face of declining agricultural production.

Figure 38 was constructed to compare the income categories from White Clay Creek Hundred (Coleman et al. 1984) with those of Pencader Hundred for the mid-late 19th century. The major difference between the two was found in the lowest income category (\$0-\$264) and in the highest category (over \$1,944). Approximately 75% of the white taxables in Pencader Hundred were within the \$0-\$264 category, while just under 50% of the White taxables were in the same category in White Clay Creek Hundred.

The bulk of the lower income category white wage earners in White Clay Creek Hundred were placed within the \$265-\$504 category so that the total taxables within these two categories were very similar in the two hundreds. The cause for the abundance of the slightly higher white incomes in White Clay Creek was probably related to the higher assessment values placed on property in the City of Newark. Pencader Hundred was a much more rural hundred and possessed no such urban environments. It did possess, however, a large quantity of rich farmland, and this was reflected in the larger number of white taxables in the uppermost income category (over \$1,944), compared to White Clay Creek Hundred.

TABLE 18

TOTAL ASSESSED VALUATION FOR OCCUPANTS OF WILSON-SLACK,
HAWTHORN AND FERGUSON SITES AND MAXIMUM ASSESSMENT
IN PENCADER & WHITE CLAY CREEK HUNDRED, 1845-1903

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<u>Year</u>	<u>Hawthorn Site Occupants</u>	<u>Wilson-Slack Site Occupants</u>	<u>Ferguson Site Occupants</u>	<u>Maximum Assessment of an Individual In Pencader</u>	<u>Maximum Assessment of An Individual In White Clay Creek</u>
1845	Wm. Hawthorn \$2,775	John R. Hill \$1,056	Robert Ferguson \$6,970	Henry Cazier \$24,829	Rothmell Wilson \$21,836
1857	Wm. M. Hawthorn \$910	Alex. Wilson \$1,200	-	Henry Cazier \$44,150	Rothmell Wilson \$2,784
1868	Wm. M. Hawthorn \$4,552	Alex. Wilson \$1,485	-	Cantwell Clark \$41,349	Mary Canby \$18,950
1879	-	Alex. Wilson \$2,595	-	Jacob B. Cazier \$65,290	-
1881-85	Arnold Naudain, Sr. \$4,685	Alex Wilson \$2,740	Robert Morrison \$9,906	Jacob B. Cazier \$65,540	William Cooper, Est. \$29,200
1893-1897	Arnold Naudain, Sr. \$4,695	Alex Wilson \$3,625	Robert Morrison \$8,185	William Skinner \$18,387	Mary Cooper-Smith \$26,850
1901-1903	-	Alex Wilson, Est. \$2,520	-	William Skinner \$16,950	** -

*West Precinct Only

**North Precinct Only

Figure 38: **PENCADER HUNDRED –
WHITE AND BLACK TAXABLES
BY INCOME CATEGORIES**

