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Stoneware has long been recognized by historical archaeologists as a common artifact at many sites. At sites dating from the 17th and 18th centuries, it was generally of European origin while at 19th century sites stoneware was usually of local or at least American manufacture. It was the fact that nearly all the stoneware recovered from excavations at 19th century southwestern Pennsylvania sites had been locally produced and that documentation concerning its production was unavailable that a study of stoneware was undertaken at California State College, California, Pennsylvania.

The initial study had 2 objectives. First an attempt would be made to learn the specific attributes of stoneware that would aid the archaeologist in identifying sherds as to their technique of manufacture, method of motif application, distinguishing motif characteristics, and vessel form and function. After consulting standard works on American pottery such as John Spargo, *Early American Pottery and China* (1926) and John Ramsey, *American Potters and Pottery* (1939) and the more recent publications on stoneware by Donald B. Webster, *Decorated Stoneware Pottery of North America* (1971) and Cornelius Osgood, *The Jug and Related Stoneware of Bennington* (1971), it was clear that data on technical aspects of stoneware manufacture were plentiful, but data relating to the motif characteristics at various potteries ranged from sparse to non-existent.

The other main study objective was to develop an historical profile of the stoneware potteries of Southwestern Pennsylvania. It was a well-known fact that in the vicinity of New Geneva and Greensboro, Pennsylvania, about 50 miles south of Pittsburgh, Pennsylvania, there had existed a sizable deposit of blue or gray clay suitable for the manufacture of stoneware. Also it was commonly known in southwestern Pennsylvania that several, both small and large, potteries had produced a variety of stoneware pieces during the 19th century.

Since extant literature on the potteries was scarce, it was apparent that if excavated stoneware sherds were to be identified, a data base would have to be established.

The result of a search of the historical documents including county histories, atlases, tax records, wills, property deeds, and census records was the compilation of a minimum list of 15 stoneware pottery locations, within a radius of about 32 miles of the clay source, which operated from as early as 1850 until near WWI. There were 2 site locations in New Geneva, 1 in Springhill Township outside New Geneva, 4 in Greensboro, 1 in Rices Landing, 1 in Fredericktown, 1 in West Brownsville, 1 in Washington, 1 in Uniontown, 1 in Perryopolis, and 1 in East Pike Run Township, Washington County, near California. There was at least 1 site in Waynesburg, but no historical data on the site was located (Michael and Jack 1973:365-82). A further examination of the same data showed that over a 30 year period (1850-1880) the 15 potteries had a total of at least 36 different adult males working in some phase of the manufacturing.

Comparative data on the potteries within southwestern Pennsylvania and between the southwestern Pennsylvania potteries and those of all of Pennsylvania is difficult to acquire. About the only source of such data is the Manufacturing Schedules of the U.S. Decennial Census, and, unfortunately, recording inconsistencies from county to county and from census to census makes these data often of minimal value (cf., Table 1). However, some observations about the south-

Table 1

Stoneware Production in Fayette, Greene, and Washington Counties, Pennsylvania, 1860, 1870, 1880. From U.S. Decennial Cansus Manufacturing Schedules.

Category	Capital Invested	Clay Used (Tons)	Cost of Clay	Salt Used (Barrels)	Cost of Salt	Cobalt Oxide Used (Pounds)	Cost of Cobalt Oxide	Wood Used (Cords)	Cost of Wood	Coal Used (Bushels)	Cost of Coal	Slip Clay Used (Barrels)	Cost of Slip Clay	Horsepower	Number of Turning Wheels	Number of Kilns	Number of Hands (Adults)	Number of Hands (Children)	Average Monthly Labor Costs	Number of Months (Producing)	Annual Product (Gallons)	Annual Product (Dollars)	Annual Product of Other Articles (Dollars)	Total Annual Product (Dollars)
1850																								
William Boughner, Greensboro	Total Materials—$175.00 per year																2		50					1300
1860																								
Daniel Boughner, Greensboro	100	200	250	8	20	30	10	250	437								10		200					4000
James Hamilton, Greensboro	6000	600	800	50	75	130	50	700	1000								22		550		176000	11512	4000	15512
Henry Atchinson, New Geneva	300	100	150	10	20	75	20																	3600
William Winfield, East Pike Run Twp.	1500	20	159														6		23					4000 (Stone-ware, etc.)
Donnaho & Beall, Fredericktown	1300	120	360					140	210								2		25		33000	2800		2800
1870																								
James Hamilton & Co., Greensboro	13000	700	1300	55	125			650	1850	6000	275			Steam 12	11		18	6	834	12	200000	18000	1025	19025

Hamilton & Jones, Greensboro	6000	400	720	50	112			500	1500	1500	90			Steam 1			12	1	500	12	150000	12000		12000
Johnston Little & Co., Greensboro	3000	150	300	10	25			130	390	600	30				6		7	1	100	6	28000	2500		2500
A. Conrad & Co., New Geneva	2500	250	400	25	62	50	20	250	562			10	40	Steam 1	3		5		173	12	54000	4860		4860
Leander Dilliner & David L. Davis Springhill Twp., Fayette Co.	900	50	100	5	12	20	8	50	75			3	15	Steam 1	3	1	5		133	6	10000	900		900
Stephen Ward, West Brownsville	400	40	160						125		3				2		2		50	6				800
Isaac Hewitt, Rices Landing	2000	300	700	15	40	50	25	250	700			10	50		3		6		175	12	45000	4500	2070	6570
Hall & Greenland, Uniontown	500	40	80					80	240						3		3		60	10	20000	2200		2200
Thomas Suttle, Perry Twp., Fayette Co.	1000			Wood and Coal—$250													2		50	12				1000

1880

James Hamilton & Co., Greensboro	25000	Total Material—$4,000 per year											Steam 12			35	10	667	12				16000
Hamilton & Jones, Greensboro	10000	Total Material—$3,000 per year											Steam 12			30	6	500	12				18000
Hamilton & Jones Tile Works, Greensboro	2000	Total Material—$362 per year											Steam 12			3	1	67	6				2000
Isaac Hewitt, Rices Landing	800	Total Material—$400 per year														3	1	112. 50.					1800

Table 2

Southwestern Pennsylvania Potteries

Year	Number	Capital Invested	Hands (Maximum Adult)	Material Costs	Annual Wages	Product Value
1860	5	$ 9,200	40	$ 3,561		$29,912
1870	9	29,300	60	10,384	$23,975	48,855
1880	4*	37,800	74	7,762	14,900	37,800

*Including Hamilton and Jones Tile works.

western Pennsylvania industry and how that industry compared to the general stoneware industry of Pennsylvania are possible.

Above is a summary of some of the southwestern Pennsylvania findings (U.S. Decennial Census, Manufacturing Schedules, Fayette, Greene, and Washington Counties, 1860, 1870, 1880).

From the table it seems that the industry production peaked after 1870 and before 1880. By the latter year the local industry had consolidated with only the largest potteries surviving. The capital investment was up from 1870, but the total product had dropped slightly. However, the drop in annual wages and the slight decrease in material costs partially offset the drop in product value. It appears that the companies were attempting to increase production efficiency as reflected in their capital investment and were decreasing labor and material costs. What is missing is quantitative-production figures for 1880 so that a comparison of volume output for 1870 and 1880 could be made. Consolidation and increased capitalization of the local industry possibly indicates increased business competition, for example, from Ohio potteries. From the same data on pottery producers, several other computations were made and conclusions were drawn (Table 3). First, the raw materials consisted of clay purchased by the ton, salt by the barrel, cobalt oxide by the pound, slip clay by the barrels, wood by the cord, and coal by the bushel. Little can be ascertained of the specific technology of pottery making that was not already known about the local industry, but by examining the data, it is clear that sometime between 1860 and 1870 the Greensboro potteries began relying heavily on coal as a fuel. They converted evidently to coal fueled steam-power and coal fired kilns at that time. Since they were located midst the butuminious coal fields of Pennsylvania, such fuel was readily available and undoubtedly low priced.

The same data that allowed the above interpretation to be made also indicated that the cost of producing a storage jar, canning jar, or water cooler averaged about 6.3¢ per gallon and they sold for nearly 8.9¢ per gallon, thus allowing for a 29.2% profit.

The significance of the southwestern Pennsylvania stoneware industry can perhaps best be realized when the product value of those potteries is compared with the total Pennsylvania stoneware production figures (U.S. Decennial Manufacturing Schedules, Pennsylvania).

Table 4 shows that southwestern Pennsylvania stoneware production accounted for a significant proportion of Pennsylvania's stoneware production in both 1860 and 1870. The magnitude of southwestern Pennsylvania stoneware manufacture is even clearer when the distribution of Pennsylvania stoneware production is depicted county by county. The greatest production concentration in 1860 was in Fayette, Greene, and Washington counties.

Table 3

$1.90	per ton of clay
2.35	per barrel of salt
.44	per pound of cobalt oxide
2.84	per cord of wood
.05	per bushel of coal
4.78	per barrel of slip clay
.063	per gallon of stoneware produced
.089	value of product produced per gallon
.026	profit per gallon of stoneware

Table 4

Southwestern Pennsylvania and Total Pennsylvania Stoneware Production*

Year	SW Pa.	Pennsylvania	% of Pa. Total from SW Pa.
1860	$29,912	$ 70,512	42.4%
1870	$48,855	$142,717	34.2%

*The Pennsylvania figures are based on census entries for stoneware manufacture or entries that showed the use of salt in pottery manufacture. Also in 1880 the type of pottery was not indicated, *i.e.*, earthwares, stonewares, and dinnerwares were lumped together, so comparative figures for that year were unavailable.

In 1870, with the exception of Philadelphia County, the largest production area was Fayette and Greene counties.

After the data from the manufacturing schedules seemed to be exhausted of analytical information, several simple statistical operations were performed on the occupational tax assessment data for the towns and townships where the potteries were located and these results were compared with the same measurements for the entire taxable population of the same units. Likewise, the standard deviation for the data was calculated and confidence tests were performed to ascertain whether potters differed significantly for the general population of the towns and townships in which they worked. The results showed that the potters did not differ significantly at either the .05 or .10 levels of confidence. In fact, the mean and median occupation tax assessments for the potters paralleled those of skilled craftsmen as a group (Pennsylvania, Fayette and Greene Counties, Treasurer's Office, Property Rolls, 1850-1900).

The collection and analysis of historical documentation could have been carried further, but since an expansion of such a study would not bring the identification of stoneware sherds closer, it was not carried further—adequate information on which to begin a study of stoneware attributes had been collected. At that point the second thrust of the overall study was started.

Since it was unknown which manufacturing techniques, types of motif application, and motif elements were diagnostic for the identification of stoneware as to pottery site, as comprehensive an attribute list as possible was compiled for extant vessels from the sites under study. Fortunately, Waynesburg College, Waynesburg, Pennsylvania, had a large representative collection of the wares. Information from each of over 200 pieces was recorded.

After basic cataloging data had been listed, each piece was classified as to its basic purpose. At the several southwestern stoneware potteries, the products had been storage jars, canning jars, water coolers, jugs, pitchers, spittoons, doll's heads, umbrella stands, churns, cake pans, cream pans, butter pots or dishes, chambers, grease lamps, flower pots, lift pumps, water pipes, lids, meat tenderizers, ink stands, chimney pots, chemical wares, and cemetery boundary markers.

Next the process of identifying decorative elements was begun. As the result of preliminary study of the Waynesburg College collection, numerous basic elements variants were recognized. The elements identified were then analyzed as to frequency to determine if the presence or absence of certain elements could be related to local potteries. Also it was hoped that this data would be useful for identifying Southwestern Pennsylvania stoneware from stoneware made elsewhere. The results of this analysis are summarized in Table 5.

It appears that too few of the elements were used with a high enough degree of consistency to allow predicting the manufacture of a piece as having been from a pottery in Southwest Pennsylvania when a certain decorative element is present. The list may only be useful to predict place or area of manufacture when a decorative element used in the area was unique, at least to the region. The mere fact that a piece has a fleur de lis, arrow or

Table 5

Decorative Attributes: Percentages

Attributes or Motif	%	N= 116
Incising or Ribbing	72.4	
Cobalt Band-Straight	54.3	
Capacity Figure	40.5	
Cobalt Bands—Wavy	29.3	
Cobalt Bands Over Incising or Ribbing	27.6	
Fleur de lis	25.9	
Tulips, Stems, Leaves	23.3	
Vignette	20.7	
Sprigs	19.8	
Short Cobalt Bands	19.8	
Stems and Leaves	17.2	
Ellipse	6.9	
Eagles	6.9	
Circles, Semi-circles, Dots	6.0	
Stars	5.2	
Unidentified Flower, Leaves	4.3	
Unidentified Flower	4.3	
Framing	4.3	
Tulips, Stems	3.5	
Roses, Leaves, Stems	3.5	
Radiating Lines	3.5	
Diamond	3.5	
Shield	3.5	
Triangle	2.6	
Crescent	2.6	
Cross	1.7	
Arrow	1.7	
Spital	1.7	
Pear	1.7	
Dove	1.7	
Leaves	.9	
Tulips	.9	
Roses, Leaves	.9	
Roses	.9	
Unidentified Flower, Leaves	.9	
Compass Star	.9	
Human Figure	.9	
Cornucopia	.9	
Primrose	.9	
Lily	.9	

Figure 1. Canning jar by Hamilton and Jones, Greensboro, Pennsylvania (ca. 1851-1893). Dove; tulip, stem, and leaves; fleur de lis. Stenciled.

Figure 3. Canning jar by John P. Eberhart, New Geneva, Pennsylvania (1880-ca. 1882). Cornucopia. Stenciled.

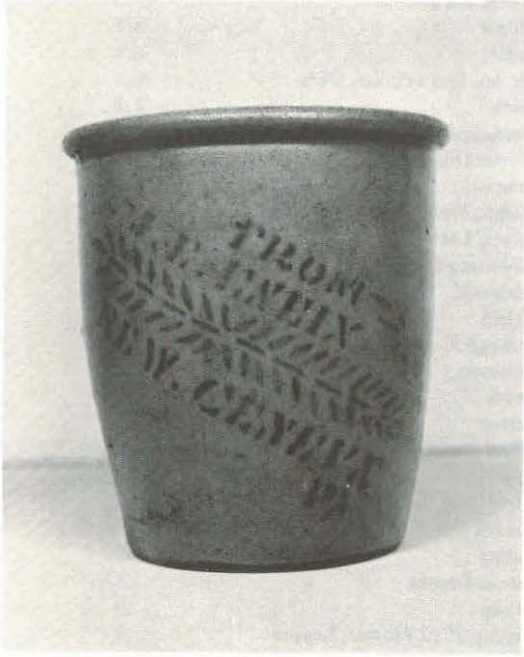

Figure 2. Storage jar by J. E. Eneix, New Geneva, Pennsylvania (1874-1876). Sprigs. Stenciled.

Figure 4. Canning jar, Greensboro, Pennsylvania. Pears, stem and leaves. Stenciled. Ribbing.

Figure 5. Canning jar. Human figure. Incising. Handpainted.

Figure 7. Canning jar. Straight-sided star (incised and filled-in), stem and leaves, cobalt bands-straight, cobalt band over incising, ribbing. Handpainted.

Figure 6. Canning jar by Hamilton and Jones, Greensboro, Pennsylvania (ca. 1851-1893). Shield, fleur de lis, sprigs. Stenciled.

Figure 8. Pitcher. Spiral, ribbing. Stenciled.

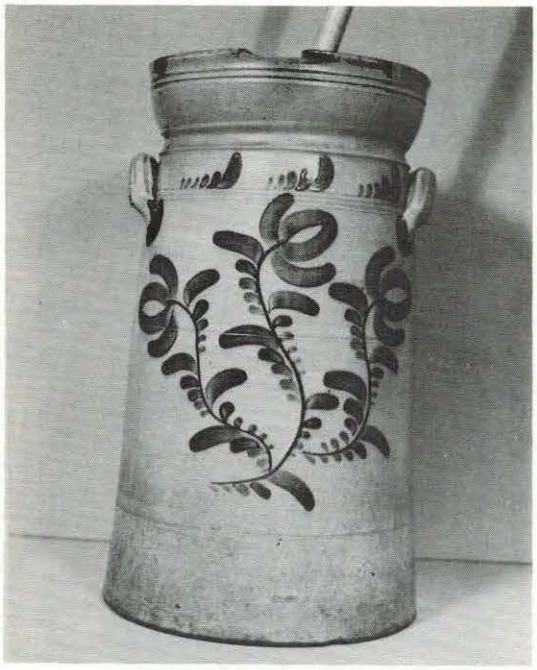

Figure 9. Churn (ca. 1850-1870). Tulip, stems, and leaves, incising. Handpainted.

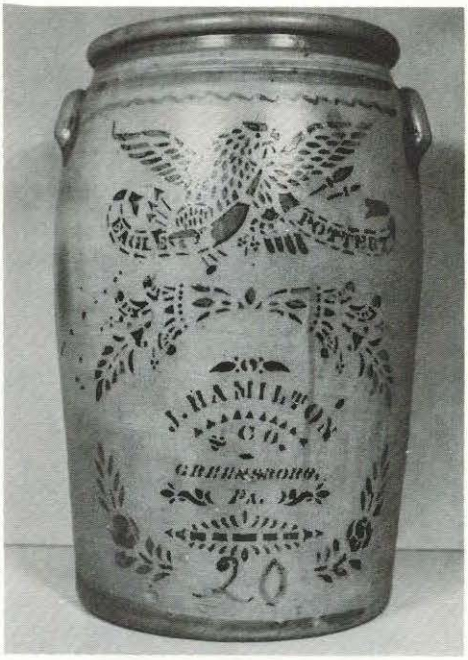

Figure 11. Storage jar by James Hamilton and Co., Greensboro, Pennsylvania (ca. 1851-1880). Eagle, cobalt band-wavy, cobalt bands-straight, vignettes, diamonds, fleur de lis, sprigs, capacity figure, ribbing. Stenciled.

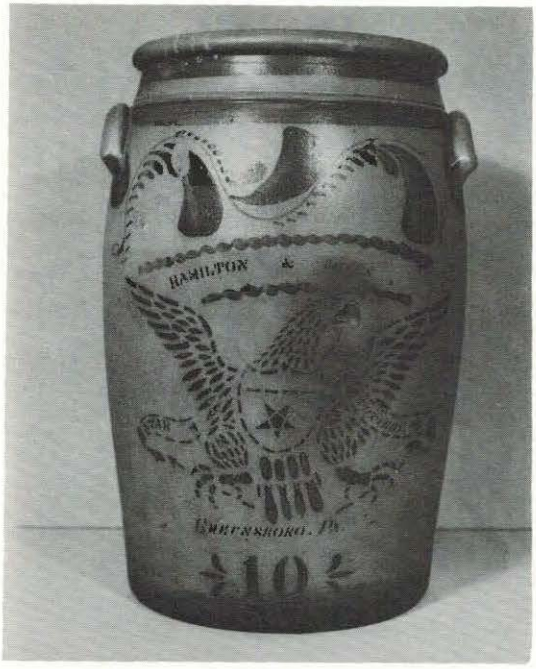

Figure 10. Storage jar by Hamilton and Jones, Greensboro, New Geneva (ca. 1851-1893). Eagle, cobalt bands-wavy, short cobalt bands, stem and leaves, fleur de lis, straight-sided star, ribbing; capacity figure. Stenciled and handpainted.

Figure 12. Storage jar by A. and W. Boughner, Greensboro, Pennsylvania (ca. 1859-1868). Stems and leaves; tulips, stems, and leaves; incising, cobalt bands-straight. Handpainted.

sprig on it would not allow drawing the conclusion that the piece was from Southwest Pennsylvania. It may though be possible to establish the local origin of a piece if the presence of a specific style of a decorative element is identified. Testing of this is, however, beyond the scope of the current study.

The decorative element list may have limited predictive value, but it is an extensive list of such elements that appear on the area stoneware. In that vein it can be seen that while many different elements were used, certain elements that were popular elsewhere, *e.g.,* animals, and ships, were never used.

Further, not only were the motifs often in variation with those frequently seen on nineteenth century vessels, but the most usual method of motif application was relatively unique. Of the seven basic methods of motif application seen on the extant vessels: incised, handpainted, molded in relief and applied, outlined with a quill and filled-in by hand painting, slip cup applied, incised and filled-in by hand painting, and stenciled, the dominant technique used locally was stenciling. In fact 60.3% of the sample pieces had at least some stenciling.

Following stenciling in frequency of technique of motif application were handpainting, 56.9%; quill outlining then handpainting, 3.5%; and slip cup, .9%.

An attempt to explain that fact and the occurrence or absence of various attributes is held in abeyance as there is no obvious answer. What is clear from this study is that the stoneware potteries in Fayette, Greene, and Washington counties jointly produced large quantities of gray salt-glazed stoneware with variously colored slipped interiors and that the majority of the stoneware when decorated was stenciled, and the designs although they can in most instances be identified, were not used exclusively enough to allow pieces to be identified merely because they had certain decorative elements.

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