The Longdale Iron Mining Complex:

An Assessment of Artifacts and Historical Structures With an Emphasis on the 1995 Research Area

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Artifact Analysis

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I would like to thank Chip Thompson, Kasey Wehrum, Robb Greenfield, Jason Myers, Delia Coil, and Rebecca Russell for their skills in artifact analysis and the access to their tables.

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Historical Overview of Longdale Mining Company

In the fall of 1991, the opportunity presented itself for the students of Washington and Lee's Anthropology 378 class to perform survey work on an area within the confines of the George Washington National Forest. This section of densely forested land in Allegheny County, Virginia stretches between Interstate 64 and the eastern slopes of Brushy Mountain. This area was known to contain several extant historical structure foundations which were believed to be related to the Longdale Iron Mining Company, operational from around 1827 until its closure in 1919.

Documentary and oral history research was performed in order to further understand the extent of the area the Longdale Company occupied as well as to realize the context in which the survey work and later excavations would take place. The iron industry in the United States became an important aspect of American life early on in the colonial period due to the needs of settlers for pig iron to manufacture goods more cheaply than iron goods imported from Europe. The Valley of Virginia, with its oriskany sandstone rich in iron ore, became one of the leading manufacturers of pig-iron and iron bar in the early 1820s and continued to produce these goods until the 1930s.

In the early 1800s, Colonel John Jordan and John Irvine formed a joint partnership in which they decided to build a cold-blast furnace in hopes of exploiting the hills of Brushy Mountain and North Mountain which were rich in iron-bearing oriskany sandstone. These mountains further contained an abundant supply of hardwood trees ideal for making charcoal to fire the furnace.

Transportation was easily attainable through existing waterways, thus facilitating the export of the company's iron goods. In 1827, these two men erected the Lucy Selina Furnace along the foothills of North Mountain. The extant remains of these stacks can still be seen today in the town of Longdale Furnace.

After the Lucy Selina Furnace became operational, the Jordan and Irvine Company implemented a three-phase operation consisting of manufacture, transport, and sale of their product to generate income. Open cut and pit iron ore mines were opened along the eastern slope of Brushy Mountain while loggers cleared this area of trees to manufacture charcoal for the furnace. The sandstone was then smelted in the Lucy Selina to create pig-iron which was subsequently transported to Clifton Forge where it was refined into iron bars, a more desirable product. "In 1831, the Jordan & Irvine Iron Company decided to dissolve their partnership, possibly to improve efficiency" (8).

After the dissolution of the Jordan & Irvine Company, Edwin and Ira Jordan became the sole proprietors of the Lucy Selina furnace and continued production there until 1852 when they decided to build a more competitive, hot-blast furnace. This furnace, called the Australia, was located 4.5 miles to the northeast of the Lucy Selina and became fully operational in 1854. A steam-driven hot-blast furnace, the Australia was larger and more productive than soon-to-be obsolete cold-blast furnace.

At the onset of the Civil War, F. T. Glasgow managed the Australia Furnace. During the war, Joseph R. Anderson purchased

the Australia furnace to help supply the Confederate Army with a constant supply of pig-iron for munitions, cannons, and rails. He also rebuilt the Lucy Selina prior to 1863 to aid in this effort. At the close of the war in 1865, all production at these furnaces ceased and Anderson abandoned all financial interests in his company.

William Firmstone, an immigrant from Shropshire, England and the inventor of the hot-blast furnace, bought the Lucy Selina and 22,000 acres in Allegheny County in 1870 with Ario Pardee. These two men then created the Longdale Iron Company which, in 1871, was granted its charter and the right to build up to 25 miles of railroad. These railways would connect the mines and furnaces held by the Longdale Company to existing and future railways. They converted the Lucy Selina to a hot-blast furnace and, in May of 1874, the furnace went into production for the third time. The construction of a larger, more efficient furnace was begun in 1880, and the Lucy Selina was renamed Longdale No. 1. The new furnace, which began operation early in 1881, was then named Longdale No. 2. At this time, mining the ore via open cuts was no longer possible, and subterranean mining was therefore implemented. Firmstone must be credited with the great expansion of the Longdale area, bringing in a larger work force and increasing the amount of land covered by industrial and domestic structures within the Longdale community. These larger scale operations continued until the Longdale Iron Company was forced to fold in 1911 due to their inability to compete with larger

furnaces and mills controlled by the steel moguls of the eastern United States. The enormous amounts and low costs of these mass-producing steel industries rendered smaller companies like Longdale obsolete.

Geographical Overview of Longdale Lands

The area of the George Washington National Forest which includes the Longdale Mining Company lands extends from the north along Interstate 64 and extends southward into the foothills of North Mountain to include the town of Longdale Furnace. The westernmost boundary of this area is Interstate 64, and activities related to the industry continue up the eastern slopes of Brushy Mountain which contain identifiable iron mining shaft entrances (Topographic Map 1).

Most of the structures appear to be domestic in nature, evidenced in the presence of hearth mounds and surface artifacts. These structures appear in clusters, which are defined by distinct geographic location and similar architectural attributes, along both sides of Simpson Creek. Interspersed amongst these structures are others which are believed to be industrial in nature. This hypotheses is based on the larger sizes of the structures and the industrial nature of surface artifacts.

The complex of fifteen structures, located .4 mile northwest of Longdale Furnace, was first defined by George Tolley, an archaeologist with the George Washington National Forest. Preliminary pedestrian reconnaissance was performed by Tolley, who located fifteen extant hearth mounds and further noted that the area may have known prehistoric occupation. In a later survey, Tolley, Kurt Russ, and Washington and Lee students located all fifteen structures again, roughly mapped the area labeling the structures "A-O", and recorded the sizes of the

mounds in relation to one another.

The structures follow along the southern bank of Simpson Creek downstream in a linear patterning toward the town of Longdale Furnace (Maps 2 and 3). According to George Tolley, these structures are located across the creek from several iron mining shafts located in the eastern slopes of Brushy Mountain. It is this proximity to the mines which suggests that this area may have been a mining camp. Furthermore, the structures appear to be domestic in nature, each consisting of a hearth mound which has fallen into an oval shape. Several of the mounds are relatively substantial in size, comparable to those found at the original Longdale Complex, while others are smaller.

These mounds generally are defined by roughly dressed limestone, uncut limestone, and, in a few instances, brick rubble. Only Structure O has a clearly defined wall ridge, which shows the hearth to be located along one wall of a square cabin-like building. No surface artifacts could be seen at any of the structures, with the exceptions of a stove part at Structure G and a large piece of industrial metal at Structure I.

This surprising attribute led us to speculate as to possible reasons for such a lack of surface artifacts. One potential explanation is pot-hunting. Given the relative proximity of the structures to old Route 60 and the forest access road which rims the site, this would not seem unlikely. Further, the area has obviously been used as a camping site in the recent past due to fire pits which lie farther east along the service road. Another

possible explanation would be that the modest number of surface artifacts at the structures is indicative of a modest amount of cultural material left below ground.

After excavation was underway, another group of Washington and Lee students participating in the anthropology 377 class performed an independent pedestrian reconnaissance along the banks of Simpson Creek. Along the southern bank, their efforts were concentrated on the primary flood plain of the creek below the ridge the fifteen hearths are located on. It was on this flood plain that another structure was located. This structure consists of extant walls of roughly dressed limestone, one of which is situated, literally, on the bank of the creek and has been designated Structure H. It is for this reason that the structure is believed to be an old mill.

Overview of 1995 Research Area

Of the fifteen structures originally identified, chosen for initial excavation. The first of these, St is one of the smaller hearth mounds in the assemblag located on the eastern end of the complex, closer to t Longdale Furnace. It further appears to be the most we of the smaller structures and was seen as an representative of the structures its size, due large composition of the hearth. The lighting in this area, creating a photographic record of the excavation, and t large trees near the structure made it ideal for inquir

Structure C is defined by a small hearth mo contains several crudely cut and uncut limestone r mentioned earlier, no surface artifacts were apparent pedestrian reconnaissance missions which explored Moreover, there was neither a clearly defined wall r drip-trench, caused by run-off water from the roof, pre would help to define the structure's perimeters. D smaller size of the hearth mound at this structure hypothesized that the structure associated with said also smaller than others in the area.

Once chosen, Kurt Russ and three Washington and Le laid down three foot by three foot excavation units p the southern and western walls of the hearth mound surveyor's transit and students began excavation. L units would be added to the area around the hearth i uncovering portions of the wall as well as four six f

foot units placed across the hearth mound to help expose this architectural feature (Map 4).

The second structure chosen for investigation, Structure G, was likewise chosen for its well-defined extant attributes and for being a fair representative of the larger hearth mounds in the assemblage. Again, the lack of large trees on the structure and the amount of overhead exposure to light made Structure G an excellent candidate for excavation.

Structure G consists of a large, oval-shaped hearth mound measuring about 12 feet (from east to west) by 8 feet (from north to south). This mound consists of roughly cut and uncut limestone rock; no brick rubble was evident on the surface. Further, the structure appeared to have a large, platform area extending to the east of the hearth mound. Initial hypotheses include that this platform area defined part of the structure's boundaries and that the hearth was centrally located. This structure was viewed as representative of others which appeared to be similar in size due to its orientation to the creek as well as the composition of the hearth. Furthermore, it appeared to be well-defined, undisturbed, and easily accessible when equated to other structures of comparable size.

Kurt Russ and the Anthropology 377 student supervisors, again, placed rows of three foot by three foot excavation units parallel to the postulated walls of the hearth. One row of units were opened on the southern and western sides of the hearth. Later, additional rows of three foot excavation squares would be

added on each of these sides to help expose the remaining portions of the wall (Maps 5 and 6), and four six foot by six foot units were placed across the hearth mound to help define it further (Maps 7 and 8).[1]

In subsequent weeks of excavation, it was decided that the investigation of a third structure would be possible. After the careful consideration of several promising candidates, Structure I was chosen. This structure enjoyed good overhead exposure to light and relative freedom from large trees. Furthermore, it was deemed to be an adequate representative of the structures with larger hearth mounds due to its composition, the existence of a large, well-dressed limestone rock in the southeastern corner of the hearth mound, and the existence of three large cornerstones to the northwest, northeast, and southeast of the hearth mound which mark off a raised platform area similar to that seen at Structure G. This area is almost certainly the original extent of the structure (Map 10).

Three foot excavation squares were placed along the western and northern walls of the hearth mound so that each of the cornerstones were within a unit. This was done with the idea that portions of the wall would begin to surface in the units between cornerstones (Maps 11-13). Later, more rows of three foot by three foot units were added on each of these sides as well as four six foot excavation squares which spanned the hearth

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[1]The orientation of individual units shown in Maps 5 through 8 is shown in Map 9.

mound. It was hoped that time would permit the uncovering of the hearth so that its dimensions and composition would be more accurately known (Maps 14 and 15).

Artifact Analysis of Structure C
1995 Research Area

The analysis of artifacts at structures C, G, and I portray a fairly accurate assessment of the activities which took place at these structures. Although the numbers of artifacts recovered here are not, by an means, overwhelming, much information can still be gleaned from them.

One of the primary objectives of artifact analysis is the dating of these structures using Stanley South's mean ceramic dating formula. This process involves finding median dates for each ceramic type located at the structure: porcelains, whitewares, and earthenwares. The mean ceramic date found for Structure C was 1865. This, however, is not the median date of occupation which is calculated to be 1858 using South's method. Furthermore, this process has been repeated using only the ceramic types found in layer 3. The mean ceramic date here drops to 1862 with the mean date of occupation falling also to 1855. These computations performed for layer 3 are more likely to be accurate due to less artifact infusion from post-occupational activities. A penny dated 1879 was also found at the structure, indicating that occupation here continued from some time prior to 1855 until at least 1879 when the penny was minted.

Ceramics further provide insight into the kitchen-related activities taking place at this structure, as do artifacts such as medicine bottle fragments, glasswares, tablewares, bottle glass, and kitchenwares such as pots and pans. Structure C, one is able to tell, contained few artifacts relating to kitchen activities outside of the ceramics discussed and bottle glass.

The number of medicine bottle shards was relatively low compared to other structures at Longdale which may indicate a lower incidence of illness for the occupants of Structure C or a lower income level which did not allow amenities such as the home remedies common to the 19th century. Interesting kitchen related artifacts included decorated glasswares, a clear glass pitcher handle, tin cans which indicate the storage of certain foodstuffs at the structure, a salt or pepper shaker, milk glass canning jar insert which goes toward the idea of home preservation and storage of food, and numerous bone fragments which indicates that hunting for food and sport as well as the butchering of domesticated animals took place here. As with other structures at Longdale, the number of arms related artifacts is fairly low at Structure G. This would indicate that hunting took place on a relatively moderate scale.

As with other structures excavated in the area, numerous buttons were found. These types include button types 11, 12, 13, 22, and 23. The majority of these buttons appear to have come from women's blouses although some are most certainly related to male occupants. This pattern of larger numbers of female related artifacts has been seen at other excavations within the Longdale Community. Rather than concluding that more women than men occupied this structure over the course of its history, it is more likely that the women merely spent more time in the home and, therefore, lost more items there such as blouse buttons than did their male counterparts.

Artifact Analysis of Structure G
1995 Research Area

One is also able to glean information about the activitie of the individuals at this structure from the artifact recovered. While only one pair of scissors was found, it i likely that these indicate sewing and mending activities too place here. Further, a tobacco pipe stem was found signifyin that some of the workers living here relaxed with tobacco an perhaps other products after working. The presence of tobacc pipes is something not seen at the other structures of Longdal and may indicate these individuals were of a lower social clas than those occupants of the domestic clusters to the northwest A modest amount of horse tack was also recovered from th structure, meaning that these occupants may not have owned thei own horse for transportation and enjoyment. This would furthe indicate that the occupants of Structure C were of a lower socia class than the residents of other clusters within their ow cluster at Longdale.

This interpretation of social class standing is furthe illustrated in the architectural features uncovered durin excavation. First and foremost, there is no foundation to thi structure. If one ever existed, it seems likely that it wa crude as no trace of it remains today. Further, the relativel small size of the hearth indicates that the structure associate with it was smaller than others nearby.

The number of ceramics found at Structure G far outweigh those found at Structure C, as do most of the artifact types due to the more intensive excavation which took place at this structure. In the 44 units opened at Structure G, however, few different types of ceramic were unearthed. This, along with certain artifact similarities to other clusters in Longdale, may indicate that these individuals shopped at a company store. Again, South's median ceramic dating method was applied to help orient Structure G chronologically. When all of the layers were included in this analysis, the result was a date of median occupation in the late 1880s. It is for this reason that the median date of occupation was again figured. This provided a median date of 1854.4; thus, Structure G has a slightly earlier median date of occupation than Structure C, although the two dates are similar enough that these can be asserted with relative confidence.

It is again possible to understand some of the activities associated with Structure G by closely analyzing the artifacts recovered here. Kitchen-related artifacts are composed primarily of ceramics which were used as serving pieces rather than storage vessels. These ceramic types include sponge decorated polychrome whiteware, which were perhaps the most impressive pieces among the assemblage, ironstone china, and undecorated whiteware. A porcelain bathroom fixture shard dating from the late 1800s was also recovered from one of the units close to the hearth, indicating that indoor plumbing of some sort may have been

available in this structure at that time. Four coins were also recovered from the units at Structure G.

As before, these coins have been primarily used to solidify the median date provided by ceramics and to extend the range of occupation of the structure. Two of these, Indian head pennies, date to 1851. While these do not conform to the median date of occupation, it is possible that these coins were in circulation prior to the building of these structures and it was not until after the structure was built that the pennies were dropped. It is further possible, although not likely, that Structure G was occupied as early as 1851 and that the median date provided by the ceramic artifacts found simply reflects the period of the structure's most intense usage. An oversized Liberty head penny also dating to 1851 was found. As the numbers of pennies dating to this year increase, one must begin to wonder if the structure may have been built in 1851 and these pennies left, as is a tradition amongst some people, for good luck and the commemoration of the event. Finally, a nickel with a hole bored in it for use as a jewelry charm was uncovered as well. Unfortunately, the date had been worn away over the course of the years.

Perhaps the most exciting ceramic find was a broken ironstone plate which bore a maker's mark. This mark was from the H. Burgess Company in England and dates specifically from 18 to 18 . The same maker's mark was found on an ironstone plate fragment at Structure I and has been seen in the past at other

Longdale sites which further suggests that a company store may have been the primary supplier of ceramic and other goods to the community.

Other kitchen-related artifacts include several tableware pieces, primarily pewter knives, forks, and spoons, numerous medicine bottle fragments, other bottle fragments, and decorated glasswares. The relative abundance of medicine bottle shards indicates that these individuals either had a higher income to buy medicine with, had greater tendencies toward sickness, or perhaps both, when compared to the inhabitants of Structure C. Here, a relatively large number of animal bone fragments, both domestic and non-domestic, were found in conjunction with greater numbers of bullet casings. This indicates that hunting may have been more widely practiced at Structure G than at Structure C, although conclusions such as these are often difficult to make due to the differences in size of the artifact assemblages.

Clothing related artifacts again consisted primarily of buttons made of porcelain and metal. These are of the same types mentioned previously and seem to be predominantly from articles of clothing worn by females. Furthermore, several stones from jewelry pieces were uncovered here, indicating the presence of women. A small number of belt buckles and overall clasps were also unearthed in this structure, however, indicating, along with finds such as a pocket knife blade, that men were present here. Further, a porcelain doll's leg was recovered from one of the hearth units. Again, this artifact type has been found at

several of the Longdale structures excavated in the past, indicating the presence of a company store in the area. These artifacts all taken into account, it would seem most likely that this structure was occupied by a family rather than solely by females.

Other activities taking place at this structure were sewing and mending. Two pair of scissors were recovered from unit 12 located just east of the hearth, indicating that these activities may have taken place here on a fairly regular basis. A relatively large number of earthenware tobacco pipe bowl and stem fragments were recovered from this structure along with one ceramic pipe stem with the letter "D" engraved in it. This indicates that the individuals at Structure G also smoked tobacco as a form of relaxation and entertainment in their spare time. This, again, seems indicative of a lower social class as there has been an absence of these items at other domestic structures excavated within the Longdale Community.

The only other artifact type which offer insight into the activities taking place here is horse tack. Not only were commonly found artifacts from this category, such as horse shoes, recovered but also a girth buckle and a metal rivet attached to leather which almost certainly came from a bridle.[2] Thus, it would seem that the individuals at Structure G owned a horse as their means of transportation.

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[2]The girth is a cinch which fits across the horse's chest behind his front legs. It is used to hold the saddle in place while riding.

The socio-economic level of the inhabitants of Structure G seems to be higher than that of the occupants of Structure C, based not only upon the artifact assemblage recovered but also on the existence of a structure foundation at G. This wall is composed of crudely cut limestone rocks which are by far smaller and less worked than the foundation stones at other Longdale clusters farther upstream on Simpson Creek. However, the existence of this wall indicates that Structure G was better constructed than Structure C. The more extensive artifact assemblage at Structure G further indicates a higher class position as do the types of artifacts recovered.

Artifact Analysis of Structure I
1995 Research Area

Although the excavation of Structure I was more limited than that of the other two structures in this cluster, the artifact assemblage recovered is complete enough to allow some basic assertions to be made about the lifeways of its occupants. Much like Structure C, the foundation stones of Structure I were non-existent. However, it appears that, along the eastern wall of the structure several large, well-dressed limestone rocks compose part of the wall. This feature, in addition to the cornerstones identified in the preliminary stages of investigation, indicate that a well-defined foundation once stood here. It is probable that the missing wall stones were pilfered by individuals building another structure after this area had been abandoned by the Longdale community. The structure appears to be roughly the same dimensions as Structure G, and the hearths are comparable in size.

Ceramics can again be used to provide a median date of occupation for this structure using South's ceramic dating formulas. This date, about 1854, is perhaps more accurate than that of Structure C due to the larger range of ceramic types found here. These include undecorated ironstone, salt-glazed stoneware with an Albany slip interior which came from the Parkersburg kiln[3], undecorated stoneware, hand-painted polychrome whiteware, blue shell-edged whiteware, flow blue whiteware, undecorated whiteware, hand-painted porcelain, and a

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[3]Identifiable due to the remaining portion of a maker's mark on this storage vessel shard.

porcelain shard with gold decoration. Interestingly, Structure C contained only one storage vessel shard, that being a piece of earthenware, and Structure G contained none of these. Thus, it appears that while the inhabitants of Structure I stored food on the premises, the inhabitants of structures C and G did not. It is possible that these structures had smaller, poorly constructed ancillary structures for these purposes or they may have utilized nearby food cellars which are no longer identifiable for their storage needs.

The increased number of ceramic types further indicates that the inhabitants of Structure I may have been wealthier than their neighbors at structures C and G although this is difficult to determine with any degree of confidence based on ceramic artifacts alone. Other kitchen related artifacts recovered from Structure I include pewter tablewares, an enormous amount of tin cans from unit A of the hearth area, Mason jar and fruit jar lids which indicate canning activities, and bottle glass. Shockingly, no medicine bottle fragments were unearthed. This may simply be due to the fact that an intensive excavation of the structure could not be undertaken due to time constraints.

Interestingly, the hardware artifact assemblage at this structure is very thorough when compared to the other two structures. These include metal keys, hooks, rings, nuts, bolts, a door hinge, a chimney tool, a drain pipe, and roofing slate. These finds further strengthen the argument that the individuals at Structure I were of higher social class than those occupants

of Structures C and G. The roofing slate is especially interesting as this process was often overlooked by individuals of lower income levels due to the expense it added to the building and maintenance of a structure.

Clothing related artifacts at Structure I are again primarily composed of buttons, although a belt buckle and a thimble for mending were also recovered. These buttons seem to belong to women's clothing more often than men's, although both are present. These button types include all of those mentioned previously as well as types 32, 18, 22, and 20. One of these has been identified as a Goodyear button which bears the date 1851. Several jewelry pieces were also found at this structure which may further evidence a higher socio-economic level. These include a metal necklace medallion and the metal backing of a cameo.

Activities engaged in at this structure are the preparation and serving of food, evidenced by bone fragments and ceramics, possibly hunting, due to relatively frequent encounters of bullet casings, sewing and mending, evidenced by the thimble recovered, tobacco smoking, indicated by the pipe stem found, and childhood playing, evidenced by another porcelain doll appendage like that found at Structure G. It therefore seems likely that a family of a slightly higher social class lived in this structure. This estimation is based upon the numbers of male-, female-, and child-related artifacts unearthed as well as the attributes of the assemblage itself.

Assessment of Longdale Mining Complex Based on Artifact Analysis and Architectural Attributes

The excavation of structures C, G, and I have answered many of the research questions laid out prior to the excavation of this area. Although the ethnicities of the individuals living in this cluster still cannot be determined with any degree of accuracy, the hypothesis set forth that these were shanties which housed black slaves owned by the Longdale Company seems unlikely. The artifact assemblages seem too like those of the structures excavated in other residential clusters in the Longdale Complex for this to seem accurate. One would expect a more noticeable difference in the standard of living of black slaves and free white workers than was apparent in the assemblages collected here.

Despite this lack of evidence regarding ethnicity, however, the excavation of these structures has enabled one to identify these structures as components of the Longdale Iron Mining Company due to the similarities in artifact assemblages between the clusterings and to date them to approximately 1854. This dates these structures about 10 years earlier than the other residential clusterings of the Complex farther west along Simpson Creek. It therefore does not seem unlikely that this residential clustering was a mining camp and that the inhabitants worked across Simpson Creek in the iron mines located on the eastern slopes of Brushy Mountain (Map 1).

Furthermore, the question of the existence of a company store now seems to be resolved. The similarities in artifact assemblages, especially noticeable in the doll appendages and

ironstone plates manufactured in England by H. Burgess and Co., provides strong indications that such a store existed. The only question pertaining to the Longdale Complex as a whole, then, regards the amount of control the owners of Longdale asserted over the private lives of their workers. The foremost consideration being the measures of domination, if any, were exerted to suppress the issue of social class amongst the workers. It could be said that the existence of a company store at which virtually all of the goods purchased by residents indicates that the owners of the company were trying to eradicate the issue of social class and status amongst their workers. However, one need only look at the sizes of the structures on the Longdale Mining Complex Ridge in comparison to the mining camp close to Longdale Furnace to see that social class remained an issue in this community. It can be further asserted that the distinct geographic clusterings likely fostered a sense of security amongst co-workers but did little for the sense of community felt between the occupants of separate clusterings. Finally, the differences in the artifact assemblages, most obviously in the types of ceramics and the amounts of decorated glasswares, indicates that no such control over social class was exerted.