

THE TENANT FARM PERIOD (1862-1914)

The Blue Ball property continued to be owned by the Logan family until it was sold to Jonas Miller in 1862. Then, in 1868, it was sold to the E. I. Du Pont de Nemours and Company. After the Blue Ball property ceased to function as a tavern, by 1850-1852, it appears to have continued as a farm maintained by tenant farmers. As previously stated, farm tenancy was a dominant mode of agricultural production during this period. Agricultural tenancy as it applies here and as noted by DeCunzo (V:B:2:4) is not synonymous with farm labor, but denotes a non-landowning but land holding class of farmers and farm managers. Some owned their own livestock, and many shared profits with the landowner.

Many of the Delaware taverns seemed to be adapted as tenant farms in the middle to late 1800s. According to Scharff (1888:906), the Blue Ball 'building was enlarged and converted into a farmhouse, thus removing the old landmark.' Other examples include Smith's Tavern, two miles to the north, which closed some time after 1830. The reason for this change may center on the construction of railroads, which took much of the commercial traffic from the turnpikes. Although this signaled a regional decrease in the popularity of taverns, their local popularity as meeting places continued. The services of the stable-keepers and blacksmiths who often lived nearby also slowed the demise of the taverns (Michael 1971).

This section of the report presents the documentary and archaeological evidence pertinent to this phase of the site's history, which overlaps two research contexts as defined in the State Plan. They are the period of Industrialization and Capitalization (1830-1880) and the period of Suburbanization (1880-1940). The following discussion will segregate the pre- and post-1880 facets of the Blue Ball Farm where possible. Aspects of research interest include contrasts between land-owners and tenants in terms of their domestic and agricultural lives. Also, as a product of a large scale agricultural reform initiated throughout most of Delaware in the 1830's, by 1860 northern New Castle County farms had greater capital investments in improvements such as special purpose farm outbuildings and more tenant specific housing (DeCunzo and Garcia 1992:58). Capital investment continued throughout the following decades, with increased holdings in farm 'implements' and machinery. The Blue Ball site's long history of occupation may provide evidence of this socio-agricultural transition.

It has been speculated (Coleman et al. 1983:23) that the number of outbuildings present on a tenant inhabited and maintained farm complex would be fewer than on an owner operated farm. It may, however, also be anticipated that in cases where a tenant farm is owned by an absentee landlord, as is the case with the A. Temple Site (7NC-D-68), the Grant Tenancy Site (7NC-B-6), and the Blue Ball Site, that the dwelling would be larger and that all auxiliary structures needed to run a farm operation would be present (Hoseth et al. 1990). Also, many tenancies were originally constructed by an owner, and as such there may be little observable difference in owner and tenant dwelling complexes. It has also been hypothesized (Coleman et al. 1983: 24) that the artifact types recovered from tenant farmhouses should reflect a lower economic standing than those from owner

inhabited farmhouses. One way to test such theories is to compare architectural and archaeological findings at the owner and tenant's properties (Coleman et al. 1983:91). Given the exceptional wealth of the Dickinsons, Logans and du Ponts, however, that is an inappropriate avenue of research in this case.

History of the Blue Ball Farm

By 1852 and again in 1859 the Blue Ball property is referred to as a house and farm, rather than a tavern (Taylor et al. 1989: 205-6). In her will written in 1859, Maria D. Logan referred to the Blue Ball tract being in the tenure of Joshua Hutton and Hiett Hutton. A Joshua Hutton is mentioned in the 1828, 1829 and 1830 editions of the Delaware Advertiser as a hotel and tavern keeper. Joshua Hooten, a 67 year old farmer, is listed in the 1860 Brandywine Hundred census with \$1400 in real estate. His household consisted of Ann, presumably his wife, Hyatt, a 30 year old farmer and probably a son, and five others ranging from 11 to 25 years old. The 1860 Agricultural Census for Brandywine Hundred lists Joshua Hooten with 150 acres improved and 50 acres unimproved. The farm was valued at \$12,000 plus \$350 in implements and machinery, seven horses, four 'milch' cows, 19 other cattle, and four swine valued at \$1,200. Two hundred and ten bushels of wheat, 350 bushels of Indian corn, 200 bushels of oats, 100 bushels of Irish potatoes, 500 pounds of butter, 200 pounds of cheese, 18 tons of hay, and two pounds of hops were produced, and \$1,400 worth of livestock slaughtered the year prior to the census. Nothing else is known of this family.

The 1860 Lake and Beers Map of the Vicinity of Philadelphia and Reading, shows Dr. J. D. Logan, son of Albanus and Maria D. Logan, at three structures in the area, including Blue Ball, Chestnut Hill, and a structure northwest of the Concord Pike and Rockland Road intersection (see Figure 9). John Logan and his wife Susan sold their property on the east side of Concord Pike to Jacob R. Weldin in 1862 (DB P-7: 449). Jacob and his son, J. Atwood Weldin, were dairy farmers, and the Weldin family owned, occupied, and operated the farm from 1862 to 1934, during which time it was known as a successful dairy. By the beginning of the twentieth century it was regarded as "one of the most extensive dairy operations in the Hundred" (Taylor 1989:217; Runk 1899:501). The 1849 Rea and Price map (see Figure 4) indicating the tavern as 'Blue Ball Inn' also shows a smithy on the opposite side of Concord Pike. This is the only commercial development to occur at the intersection until the twentieth century, when a cinderblock service station was constructed there. Charles A. Rotthouse, whose family emigrated from Germany in 1853 (1900 Census), operated the smithy in the early 1900's, but previous tenants/smiths are unknown.

Maria D. Logan's estate sold the Blue Ball property to Jonas N. Miller in 1862, and within a week it was sold to Henry, Eleuthere, and Lammott du Pont of Christiana Hundred (DB Q-7:247 & 250). The 1868 Beers Atlas of New Castle County shows the name Du Pont and Company with a line drawn to two properties, one labeled "Blue Ball" in capital letters and the other just north of the Concord Pike and Rockland Road intersection (Figure 22). The latter is reputedly the location of one of the E. I. Du Pont de Nemours Company offices. The 1881 Hopkins map shows the E. I. Du Pont and

Company name on both sides of the Rockland Road intersection, although a structure is shown only at the words "Blue Ball," again in all capital letters (Figure 23). Various drafts of co-partnership agreements for E.I. Du Pont de Nemours and Company from 1858 to 1878 (59:G:69), found at the Hagley archives, reveal that Henry, Eleuthere, and Lammott were in equal partnership, but that by 1873 Henry maintained four times as many shares in the company. The 1878 revised agreement of co-partnership for the E. I. Du Pont de Nemours and Company (59:G:69), also found at the Hagley archives, was drafted after Eleuthere's death in 1877 and includes Henry's two sons, Colonel Henry and William du Pont, and his nephews, Eugene and Franklin du Pont. Lammott was still part of the co-partnership, and Henry Sr. maintained central control.

The same 1878 document also specifies that William was to be in charge of the "farms, animal transportations, renting of all property in Delaware including farms...but excluding tenement houses." His brother Henry was to act as advisor in the "above special duties." It is presumed that the tenement houses refer to the workers' quarters at the powder mill and that William's duties would have included managing or overseeing activities at the Blue Ball Farm. Henry du Pont, Sr.'s 1889 will (Winterthur Manuscripts 7:B:12) bequeaths several lots in Christiana Hundred to his sons Colonel Henry and William du Pont, executors of his estate. The will also grants William "the Husband Farm, the property occupied by Nelson Talley and the Dan Harriett lot, all in Brandywine Hundred", and Codicil No. 1 grants him "115 acres in Brandywine Hundred & the wood lot 32 acres bought of the heirs of Jonas Miller adjacent to the above." A search of William's papers at the Hagley Archives located several references to various other properties but nothing pertaining to the Blue Ball property.

A plat map of the Du Pont Powder Company holdings made by Robert Frazer in 1889 and revised in 1903 shows the name Jonas N.(?) Miller on Tracts 48 and 62 (Figure 24). These two tracts may be the same as those purchased in 1862 and probably only refer to whom the property was obtained from, rather than the resident. The larger tract measuring 185 acres covers much of the project area. Four structures including the tavern/house structure are shown on Baist's 1893 Atlas of New Castle County (Figure 25). The three other buildings appear to have been outside the project limits. Miller was an employee at the Du Pont works from 1818 to 1873. Most of his time at the powder mills was spent as a foreman in the millwright department, and at least half a dozen du Ponts are reported to have served their apprenticeships under him (James 1941). Having apprenticed as a millwright in Wilmington, he erected the first paper mill in Brandywine Hundred for Jessup and Moore. He died in 1873 of injuries sustained from an explosion at the Du Pont works (HSD surname files). It does not appear that Miller ever resided at the Blue Ball property, as he is described as having been born and passing most of his life on the banks of the Brandywine in Christiana Hundred. Nothing else is known of him or how the Blue Ball property transaction came about.

The 1880 Agricultural Census for Brandywine Hundred lists E.I. Du Pont de Nemours and Company with 49 acres tilled, 49 acres wooded, 15 acres mown, and 20 acres not mown on a farm valued at \$8,900 with an estimated \$1,100 dollars generated in farm products. No livestock, orchard or dairy products were listed, just 30 acres of hay, 15

acres and 600 bushels of Indian corn, 15 acres and 300 bushels of wheat, and ten cords of wood cut. During the year prior to the census \$50 were spent on repairs and \$200 paid for labor and board for 33 weeks of hired labor. This would be the equivalent of one full time person at \$6 per week.

J.R. Weldin, at the farm across Concord Pike, is recorded in the same census as having a total of 339 +/- acres valued at \$13, 575. The farm maintained six horses, two mules, 16 milk cows, 41 other cows, six swine, and 14 poultry plus 60 hatchlings. During the year prior to the census the farm produced 300 bushels of wheat, 1200 bushels of corn, 300 bushels of oats, 30 bushels of potatoes, 50 bushels from the orchard, 300 pounds of butter, 7300 gallons of milk, 260 dozen eggs, and ten cords of wood cut. These products figured at \$2,800. Weldin spent \$75 in repairs and \$150 in fertilizer and paid \$936 for 156 weeks for hired farm labor, including board. This would be the equivalent of three full-time laborers for 52 weeks at \$6 per week each (Taylor et al. 1989:209).

In 1907 the E.I. Du Pont de Nemours Powder Company of Delaware transferred the property to the E.I. Du Pont de Nemours Powder Company of New Jersey (Taylor et al. 1989:274-7). Letters from 1908 show A. I. du Pont negotiating to purchase the Blue Ball Farm property from the E. I. Du Pont de Nemours Powder Company (A. I. du Pont Papers, Box 59-3). The main part of the farm, Tract 48, is stated to be about 185 acres 55 perches and valued at \$300 per acre, with two houses (#72 and #73), for a total value of \$60,873.99. One of these may be the Blue Ball Tavern site. The purchase from the New Jersey registered company was finalized in 1909 (DB D-22:155). The three outbuildings shown on the 1893 Atlas do not appear as part of the complex shown on a later 1917 Price and Price map (Figure 26).

The Archaeology of the Blue Ball Farm

Figure 27 is a rendering of the configuration of the site at this time. Distribution maps of artifacts potentially relevant to this phase are included in Appendix V. They include whiteware, cut and wire nails, and post-1864 window glass. Comparison with the distribution maps for the previous phase of the site's history reveals an expanded land use within the project limits. A decline in wrought and wire from cut nails is notable, corroborating a late nineteenth-century property renovation.

Tavern/House Foundation

As discussed earlier (in the Tavern section), the north room and the southeast room most likely belonged to the Blue Ball tavern era of the site's occupation. The southwest room, measuring 9 by 10.5 feet, was a later addition. A doorway along the east wall joined this room to the adjacent room to the east. Portions of the wood door were found among the rubble fill. The wooden sill was still in situ (Plate 32). Initial test unit and subsequent backhoe excavation in this room revealed brick flooring. Sub-floor excavation provided a TPQ date of 1910 on the installation of the brick floor (Plates 33 and 34). There was no anthrosol beneath the brick floor, but the same sterile sand overlying a gleyed clay was present.

This room had two bulkhead entrances, one along the center of the north wall and the other along the west wall in the northwest corner. The first of these was a four foot wide stair course outlined in mortared stone that had been sealed off with a mortared stone wall. It had five cut stone slab steps, each 0.25 foot deep, that came to a cement landing just outside the foundation (Plates 35 and 36). Feature 13 (N100W33) is a 0.8 foot square post hole and mold on the east side of these steps that extended 0.3 feet into the subsoil. Several rocks were found in the hole, and one whiteware sherd was recovered. The west wall stair course was still open, and again, each of the steps was constructed of a single cut stone slab over a layer of brick (Plate 37).

An interior stone column was found inside the room centered along the west wall. It was approximately four feet long against the wall and protruded 0.5 foot off the wall into the room. It was laid upon a square concrete slab that may have been a platform for a boiler that was pulled out with the rubble that filled this room (Plate 38). A gravel-filled trench associated with an unglazed terra cotta pipe ran along the north wall of this room. The trench had been dug sometime after the brick floor was laid, as there were broken and missing bricks in the area of the trench (Plate 39). This pipe is probably associated with the one found in Feature 21 (to be discussed later in this section), as it is the same unglazed and fitted multi-piece terra cotta.

Buried Surfaces

Test unit excavation in the south and west yards revealed artifact bearing soil surfaces in both locations. Artifacts from these excavations indicate that they were exposed minimally before 1864.

South Yard (N58W06)

This surface was discovered just outside of the southeast room of the tavern/house at the bulkhead entrance. The soil constituting this surface was a mottled yellow brown (10YR 5/4 and 10YR 5/8) silty loam. The subsoil beneath was a reddish yellow (7.5YR 6/4-6/8) clay silt. The silty loam was encountered beneath Feature 72, the remains of a partially articulated group of bricks, possibly once a walkway. Excavation of this soil produced whiteware (14%), pearlware (31%), redware (55%), bottle glass, pre- (2%) and post-1864 (82%) windowpane glass, wrought nails, oyster, clam shell, and bone fragments.

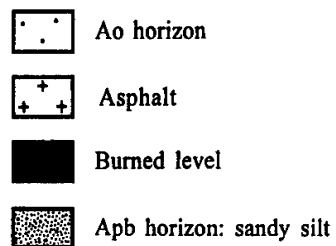
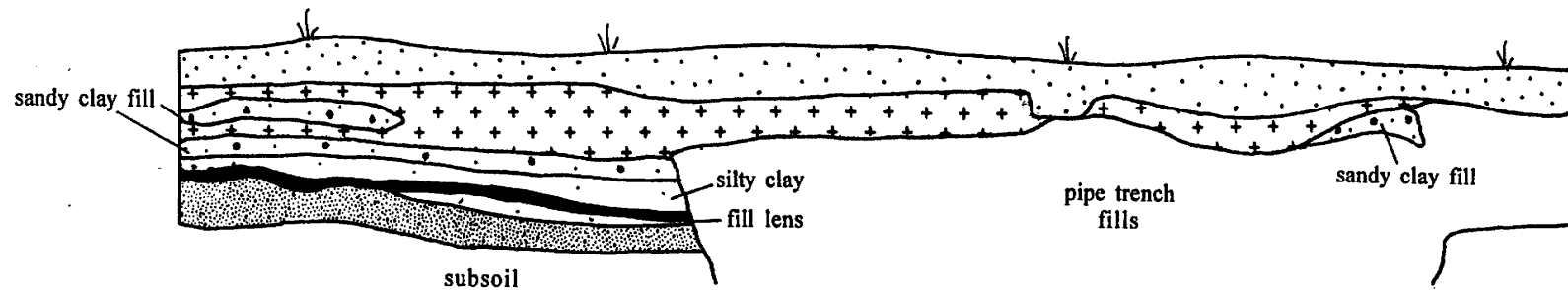
Feature 76 (N70W2) was a 1.1 foot square post mold that was discovered after the yard surface had been removed to the top of the subsoil and was also located just south of the steps. The feature was a (10YR 5/3) sandy clay and extended 0.8 feet into the subsoil. A concentration of mortar was found at the bottom of the feature fill. Pearlware, nails, bone, brick and metal fragments were recovered.

West Yard

This was a buried plowed surface, similarly leached of organic content as seen in the North Yard. It was identified and excavated from N86W84, level 5; N46W87, level 5; N49W80, level 5; N49W90, level 5 in the vicinity of Feature 64, a stone wall and pier complex (Figure 28). The soil was a 10YR 6/6 clay silt. This surface was capped by a burned soil horizon producing a large quantity of burned glass and metal. The artifact manufacture dates indicate that the burned horizon post-dates 1880/90. Materials from the buried surface include pre- and post-1864 windowpane glass, a quartz biface, redware, oyster shell, buttons, pre-1860 bottle glass fragments, post-1790 cut nails, a brass rivet, leather, nail, bone, and brick fragments and cinders. The surface therefore post-dates 1864.

Midden and Associated Features

The midden encompassed an irregularly shaped 65 square foot area in the north yard of the tavern/house, approximately 12 feet north of the foundation (see Figure 27). Nearly 100% of the deposit was excavated. The northern and western boundaries were not found due to the presence of a chain link fence along the northern edge and Feature 21, a curved trench that contained a fitted unglazed terra cotta pipe that truncated the midden to the west. A large Sycamore tree was located just west of Feature 21. Exploratory backhoe trenches to the north of the chain link fence did not produce evidence of the midden deposit. The midden was also truncated to the south by what may have been a two foot wide by five foot long stone pier (Feature 7) for a later porch addition that appears in an early twentieth century photo. An ashy gray soil mixed with coal slag was found around the stone pile in N112/N115/N120 W40. Cut nails and windowpane glass



1 foot/.30 meter

FIGURE 28
Profile of West Yard

account for most of the artifacts recovered from the soil around the feature. Mortar, brick, redware, whiteware, pearlware, yellowware, ironstone, buttons, bone, oyster shell, a 1795 George Washington half cent, bottle glass, brass lamp base and glass chimney fragments, a porcelain doll leg, and a cobalt glass bead were also recovered from the soil. A post-1851 hard rubber button was found beneath that soil.

Three additional trenches bisected the midden, one of which (Feature 8) had been back filled with midden soils and overlying fills. A one foot wide brick French drain (Feature 46) was encountered at the bottom of this trench. It ran diagonally from northwest to southeast toward the northeast steps of the main structure. There was a 0.2 to 0.4 foot wide builder's trench on either side filled with a fine olive green sand. This soil also runs beneath the bricks. The feature appears to have been three bricks deep, although in most places only one remains.

A mottled clay silt trench, Feature 1, running parallel to Feature 8, also bisected the midden, yet ran beneath Feature 7. This trench had been back filled with bright orange silty clay. Pearlware, whiteware, ironstone, yellowware, stoneware, redware, nails, bone, bottle glass and glass tumbler fragments were recovered from this trench. Another trench had been excavated to lay a pipe that presumably ran from the side of the structure into the field to the north.

Five post holes/molds were found either dug through or at the base of the midden. Feature 15 (N125W40, N130W40) was a rectangular post mold that had been dug through the midden soils. The hole was 1.8 feet north-south, with the mold itself measuring 0.6 feet square and situated in the corner of N125W40. The feature was recognized at 1.7 feet below surface, and barely extended into the subsoil. Whiteware, redware, pre and post-1864 windowpane glass, cut nails, bottle glass, and bone fragments were recovered.

Feature 16 (N120W35) was a 0.5 feet square posthole found 1.4 below the surface at the base of a mottled fill soil and extended another 1.2 feet into the subsoil. It was along the southwest side of Feature 8, which appears to have cut into it. The feature soil was dark yellowish brown (10YR 4/6) sandy silt. Bottle glass metal, a spike, 89.2 grams of brick, two pre-1864 and one post-1864 windowpane glass fragments were recovered.

Feature 17 (N125W40) was a nearly round posthole and mold, 1.3 by 1.5 feet in diameter, extending from the base of the midden into the subsoil and yielding creamware, pre-1864 windowpane glass, and oyster shell.

Feature 22 (N120W31) was a round posthole found below the midden soils. It was 1.6 by 1.6 feet, extended 0.7 feet into the subsoil, and was filled with coarse sandy gravel. Two pieces of pearlware, a piece of whiteware and of redware, pre-1864 windowpane fragments, nails, and oyster shell fragments were recovered.

Feature 96 (N130 W40) was a 0.7' square post mold that appeared below the midden soils and extended 0.3 feet into the subsoil. It yielded no artifacts.

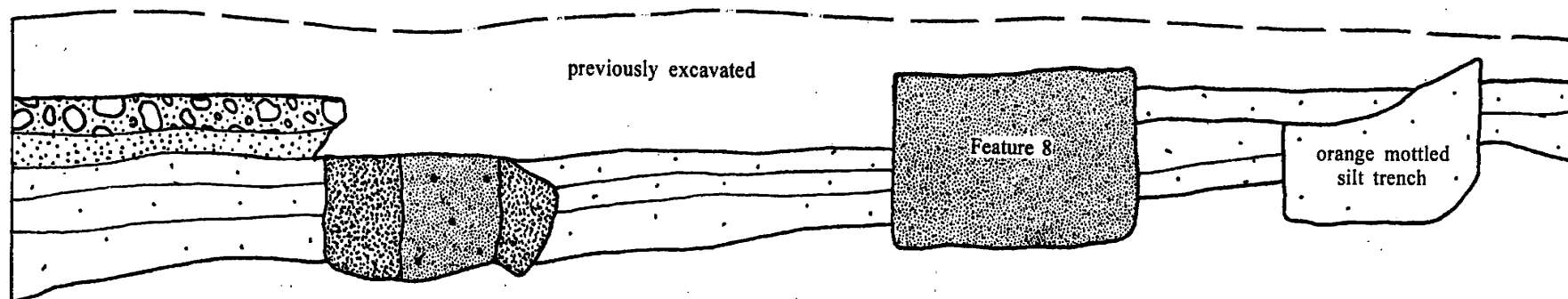
Discontinuous layers and pockets of fill covered the midden. The fills were characterized as either mottled silty clay or a redeposited mixture of the midden soils and in some cases the mottled fill. The Ao horizon had developed on the fills. The Ao horizon and fills were sampled in the initial stages of midden excavation, revealing a wide range in diagnostic artifacts, many of which post-date 1880 in manufacture.

Three soils (I, III, and II) were excavated from the midden as potentially separate cultural horizons, each of which may represent discrete dumping episodes. The numbering of these zones, I, III, and II is the result of encountering Zones I and II first at excavations along the edge of the midden. Subsequent excavations in the center of the deposit revealed the third midden soil, which was actually found to overlay Zone II. Beneath Zone II along the eastern edge of the midden, Zone III interfaces with the underlying yard surface. This surface continues to east along the side of the structure, truncated in one place by Feature 20, a large pipe trench. Zone I, the uppermost midden soil was found to cover the entire deposit. Zone III was found to interface between Zones I and II only in the center of the deposit, and Zone II, the lowest midden soil rested directly upon the subsoil throughout all portions of the midden except the eastern edge (N130 W25). Over a liter of soil was collected for flotation from each of these soils.

The absence of the yard surface beneath most of the midden suggests that it may have been intentionally removed to create a basin for the refuse deposit. The combined thickness of these three soils ranged from one half foot to one and a half feet. The lowest of these soils was the thickest, the richest in organic content, and produced the greatest quantity and diversity of artifacts. Excavation of the midden revealed that it was thicker in the center, and soil depths suggest that it was formed by depositing refuse into a pre-existing shallow basin with gradually sloping sides along the south and east. Figure 29 provides a cross-section of the midden, overlying fills, and trenches.

Almost 7,500 artifacts were recovered from these three zones. Artifacts included a variety of materials such as ceramics, bottle glass, windowpane glass, oyster and clam shell, animal bone, nails, pipe fragments, buttons, cutlery fragments, lamp chimneys and globes, mirror fragments, jewelry fragments, machinery parts, horseshoes, and agate doorknob fragments. This assemblage demonstrates the diversity of activities that would have occurred in and around the structure and includes a number of personal and farm related items. Farm related items consist of materials such as horseshoes and toe clips, carriage bolts, and equipment parts. An abundance of architectural items were also recovered.

The materials have been organized in Table 9 according to South's (1977) functional categories. Domestic refuse, primarily from kitchen related activities, and architectural remains are the two predominant categories represented. Animal bone, oyster and clam shell, ceramics, bottle glass, and glass tableware are all part of the former assemblage. Ceramic vessel forms include hollow varieties such as bowls, cups, crocks, chamber pots, and pitchers, and flat varieties such as platters, plates, saucers, and pie plates. These vessels represent cooking, storage, service, consumption, and basic household items. Bottle glass remains include fragments of spirits bottles, tobacco jars, medicine and



-  Brown gravelly soil
-  Mottled fill
-  Feature 8: gravelly sandy loam trench
-  Post mold
-  Post hold

1 foot/.30 meter

FIGURE 29

perfume bottles, demijohns, decanters, and ale, porter, cider and mineral water bottles. These forms represent service, storage, consumption, and personal items. Nails and windowpane fragments comprise most of the architectural category. A variety of nail sizes, from very small 2d nails to large 60d spikes were recovered, as was a variety in glass types such as potash, lime, soda, and arsenic.

Table 9
Artifacts From Midden By South's Functional Groups

	kitchen	architectural	arms	clothing	personal	tobacco	activities
Zone I	57%	39%	<1%	1%	<1%	<1%	<1%
Zone III	52%	48%	0	0	0	<1%	0
Zone II	45%	51%	0	1%	<1%	<1%	<1%

Each zone within the midden has a Mean Ceramic Date in the 1840s; however, glass and nail manufacture dates provide more precise date ranges. Based on the Terminus Post Quem (TPQ) dates for each zone it appears that, although there may be some temporal stratigraphy corresponding to the three zones, the entire deposit was formed after 1860. This means that the midden was not associated with the era in which the tavern was in operation, but with the subsequent domestic and agricultural occupations. Zone I, the uppermost midden soil post-dates 1890. Based on glass manufacture dates for Zone II, both Zone III and II must post-date 1864. Moreover, the high ratio of architectural materials recovered from all three zones, particularly Zone II, suggests that the midden was formed at or after a time in which structural demolition or remodeling was undertaken. It is possible that up to two such episodes are represented here. One of these we know from Scharff's account (1888:906) occurred sometime prior to 1888.

Zone I

Zone I is the uppermost midden soil. It is a brown to yellow brown (10YR 5/3) silty loam and appeared in the following excavation units: N112W40, level 3; N115W35, level 4; N120W35, level 3; N125W45, level 3; N130W25, level 3; N130W30, level 3; N130W40, level 4; and N130W45, level 4. A total of 3,051 artifacts, excluding weighed items such as shell, brick, mortar and plaster, was recovered from this zone. The Mean Ceramic Date for this deposit is 1845, and the Mean Beginning and Ending dates are 1808 and 1882. Creamware, pearlware, whiteware, ironstone, and yellowware are all present. Whiteware is the most frequent of these at 34%, occurring at a 2:1 ratio over creamware and pearlware combined and a 9:1 ratio over ironstone. Yellowware occurs at only 1%. Ceramics are present at an almost 7:1 ratio over bottle and tableware glass. Bottle glass includes pre-1850, pre-1860, and post-1880 manufacture dates. Of the diagnostic fragments, 20% were manufactured pre-1880 and 2% post-1880. Sixty percent of the identifiable nails were manufactured post-1790, and one wire nail

manufactured post-1890 was identified. Both pre- and post-1864 manufactured windowpane glass fragments were recovered. These dates indicate that this portion of the midden was used for refuse deposit until sometime after 1890. The TPQ was not used to calculate the formation date on the midden since it is considered an accretional deposit.

Domestic refuse, primarily from kitchen related activities, was the predominant functional category represented in Zone I. Kitchen remains account for almost 57% of the assemblage. Architectural materials are also present at a very high ratio of almost 40%. A range of nail sizes from 2d to 60d spikes was recovered, although 7d and 9d were most common, just under 2% of which had been bent, evidence for removal.

Refined (54%) and unrefined (46%) ceramic wares occur at an almost 1:1 ratio. Redware (43%) is, however, the most highly represented ceramic type and present at just slightly over a 1:1 ratio to whiteware (34%). Over twice as many of the vessels were fragments from hollow vessels (17%) as from flat vessels (6%), and most of the glass bottle fragments were from spirits/liquor bottles (7%) manufactured before 1860. The remainder were from jars containing either mineral water or cider (5%), and one fragment was from a tobacco jar. Four times as many artifacts (80%) as bone (20%) were recovered. The former include a ceramic marble, a carriage bolt, a key, part of a bracelet, pipe fragments, a tobacco jar, pewter, a thimble, brass cartridge cases, slate pencil fragments, a porcelain doll head, and several buttons, including a middle nineteenth-century U. S. infantry General Services Eagle button.

Zone III

This soil separates Zones I and II, but it is not a continuous layer across the midden. In certain areas of the midden it is not present and Soil I rests directly upon Soil II. It was a brownish yellow (10YR 6/6) clay silt and was encountered in excavation units N115W40 level 4; N120W35, level 4; N120W40 level 4; and N125W40 level 5. Two hundred and twenty artifacts were recovered from this zone. The Mean Ceramic Date is 1849, with Mean Beginning and Ending dates of 1811 and 1888. Creamware, pearlware, whiteware, and ironstone are all present, whiteware being the most common at 25% and almost three times as frequent as creamware and pearlware combined. Whiteware is also three times as frequent as ironstone. Yellowware is absent from this zone. Ceramic and bottle glass remains occur at a near 1:1 ratio, with bottle glass slightly more frequent than ceramics. Both pre- and post-1864 manufactured windowpane fragments were present. Other diagnostic glassware includes post-1848 manufactured tumblers. Only post-1790 cut nail fragments were recovered.

Domestic refuse was the predominant functional category represented in Zone III. Almost 52% of the assemblage are kitchen remains, and the remaining 48% are architectural. This is a near 1:1 ratio and is again a very high representation of architectural materials. Over thirteen times as many artifacts (93%) as bone (7%) were recovered. Refined (55%) and unrefined (45%) wares occur at an almost 1:1 ratio. Redware is, however, present at almost twice the frequency of whiteware at 41%. Over four times as many of the ceramic fragments were from hollow vessels (30%) as were from flat types (3%), and the majority of the bottle glass remains were from liquor/ spirits

bottles (55%). Other identified bottle forms include mineral water or ale containers (28%). Lamp chimney fragments, pipe fragments, and buttons were among other materials recovered from this zone.

Zone II.

Zone II is the lowest level of the midden and is a rich brown (10YR 4/3) silty organic soil with a relatively high carbon content. The carbon is one of the distinguishing characteristics of this soil. For analytical purposes it includes: N112W40, level 6; N113W45, level 3; N115W40, level 5; N117W45, level 3; N120W31, level 4; N120W35, level 5; N125W40, level 6; N125W45, level 5; N130W25, level 4; N 130W40, level 6; and N130W45, level 5. A total of 4, 217 artifacts were recovered from this zone. The Mean Ceramic Date is 1846, with a Mean Beginning Date of 1809 and a Mean Ending Date of 1883. Whiteware is present in the greatest frequency (36%) at a more than a 2:1 ratio over creamware and pearlware combined and 6:1 over ironstone. Four yellowware sherds were recovered. Ceramics and bottle glass occur at an 11:1 ratio. Pre-1853 crown glass and both pre- and post-1864 manufactured windowpane glass were present, and all nails were manufactured after 1790. One bottle fragment was manufactured post-1880.

In this zone architectural remains (51%) are more prevalent than the domestic kitchen items (45%). Nail sizes ranged from 2d to 30d spikes, but 8d, 9d, and 10d were the most common. Less than 1% could be identified as bent. Almost five times as many artifacts (83%) as bone (17%) were recovered. Refined wares (61%) are more frequent than unrefined wares (39%), although whiteware and redware are present at a 1:1 ratio. The former is opposite from Zone I. Hollow vessel forms occur at about a 1.5:1 ratio over flat vessel forms. Bottle glass forms are predominantly from spirits/liquor containers (28%), and mineral water containers (9%). Other bottle types recovered include porter/cider containers and medicine and perfume bottles. Several kaolin and a few earthenware pipe fragments were recovered, some of which had maker's marks. One was marked "Glasgow" on one side and "Davidson" on the other and was manufactured between 1861 and 1900. Another was marked "...Chambers...W York" on one side and "Try.Lorilll...Tobacc..." on the other and was manufactured between 1863 and 1882.

There is greater diversity in artifact type and a larger range of activities represented in this zone than the other two. Agricultural items such as equipment parts, horseshoes, and miscellaneous hardware were present. Other materials include porcelain and stone marbles, a porcelain figurine, China Trade porcelain, chamber pots, pie plates, lamp parts, mirror fragments, cutlery, a brass escutcheon, eyelets, leather, slate pencil fragments, a goblet stem, part of a glass flask, part of an agate doorknob, jewelry fragments, a redware bottle, and several buttons, among which is another U.S. infantry General Services Eagle button. Approximately 8% of the ceramics had been burned. These included not only the expected utilitarian coarsewares, but also shell edged, transfer printed, and hand painted whiteware and pearlware plates and cups. Some pieces were burned along broken edges.

Discussion

The three midden zones were excavated and analyzed separately to control for temporal

stratification. Similar patterns of discard are seen in the distribution of types of disposed materials for all three zones of the midden. An even kitchen to architectural ratio (36% and 32%), the low presence of bone (18%), a near 1:1 ratio of refined (57%) to unrefined (43%) ceramic wares, a near 2:1 ratio of hollow vessel forms (18%) over flat forms (10%), a predominance of cut nails, and a notable occurrence of pre-1860 manufactured bottle and tableware glass (26%) characterize the deposit as a whole. The only thing that appears to distinguish these zones, aside from the soils composition, is the near absence (one bottle fragment) of post-1880 manufactured materials in Zones III and II and the greater diversity of artifact types in Zone II.

The following table shows the quantity, diagnostic types, and refined versus unrefined ceramic ware by midden zone. The dates reflect the Mean Beginning and Ending dates for each zone. As can be seen there is little in the distribution of ceramics to distinguish the three zones.

Table 10
Breakdown of Ceramics from the Midden by Type and Zone

	Zone I (1808-1882)	Zone III (1811-1888)	Zone II (1809-1883)
Creamware	39(3.6%)	1(2%)	33(2.6%)
Pearlware	115(11%)	3(7%)	137(11%)
Whiteware	365(34%)	11(25%)	461(36%)
Ironstone	42(4%)	4(9%)	82(6.3%)
Porcelain	10(1%)	0	12(1%)
RWE	16(1%)	5(11%)	12(1%)
Refined redware	4(0.3%)	0	12(1%)
Yellowware	15(1%)	0	8(0.6%)
Redware	466(43)	18(41%)	446(35%)
Stoneware	9(0.8%)	1(2%)	16(1.2%)
American Blue & Gray	0	0	5(0.4%)
Rockingham /Bennington	6(0.5%)	0	0
Earthenware	15(1%)	1(2%)	37(3%)
Total	1087	44	1283
Refined wares	576(53%)	24(55%)	771(60%)
Unrefined wares	511(47%)	20(45%)	512(40)

That Zones III and II possibly pre-date 1880 indicates that they may relate to the structural enlargement and conversion to which Scharff (1888:906) refers. The high frequency of architectural remains and the low proportion of bone suggest that this portion of the midden was not formed solely as the result of daily domestic activity, but rather represents, at least in part, the debris from structural renovation or demolition. The presence of pre- and post-1864 manufactured windowpane glass, and the variety of nail sizes suggest that this may have entailed more than one such project and/or involved more than one structure or multiple episodes on one structure. The early twentieth-century remains from Zone I suggest that it may post-date the pre-1888 enlargement to which Scharff refers. The proportions, however, of materials that pre-date 1880 are higher than those that post-date 1880, and the relatively well represented proportion of pre-1860 manufactured materials, including bottle glass, pearlware and creamware, suggest that accumulated belongings were discarded during the renovation process. This is an activity that may mark a change in ownership and/or signal a shift in overall site function.

The remainder of this section will discuss the other features related to the Blue Ball Farm. These include three drainage trenches that cut through the midden, a brick drainage feature at the base of one of the drainage trenches, four post hole/molds, and the stairway in-fill at the southeast stair case.

Drainage Features

Features 1 and 8 ran diagonally through the midden from southeast to northwest. Feature 21 was located at the west end of the midden, and Feature 46 was found at the base of Feature 8.

Feature 1

Feature 1 was bright red trench that ran diagonally through the north yard midden and post-dates the midden. It ran through N120W40, N125W40-45, and N130W45, running parallel to Feature 8 on its southwest side. There was no pipe at the base of the trench. The TPQ is 1860.

Feature 8

Feature 8 (N112-130W31-50) was a 25+ foot long trench filled with brown (10YR 4/3-5/3) silty sand and sandy loam containing pea gravel. It ran diagonally from southeast to northwest from near the north wall of the house foundation through the midden, which it had been dug into. There was no pipe in association with this trench. In the northwestern portion of the midden, it was found about 1 foot below surface. It measured approximately 2 feet wide at the top and 1.5 feet wide at its base, and it was 1.3 feet thick, extending only 0.2 feet into the subsoil. In the middle, there was stone and brick along the sides of the trench, and these became articulated in the extreme southeastern corner of N120W35. The soil in this unit was a gravelly sand, and the trench was 1.75 feet wide and 1.0 foot deep. The articulated brick with the associated builder's trench are described as Feature 46. An area of stone and brick rubble and oyster shell in the northeast side of Feature 8 in N120W35 has been recorded as Feature 8B. The soil

matrix within and surrounding the rubble is like that in Feature 8, and the material in Feature 8B may have been displaced from the top of the feature or the result of the same filling episode.

The Mean Ceramic Date is 1854, and the Mean Beginning and Mean Ending dates are 1814 and 1893. Ceramics recovered include Nottingham (an eighteenth-century stoneware), creamware, pearlware, whiteware, ironstone, and yellowware. Whiteware is the most common ceramic type (42%), present at a 7:1 ratio over creamware and pearlware combined. Whiteware is represented at almost three times more than ironstone. Just over 1% of the ceramic assemblage was yellowware. Both pre- and post-1864 windowpane glass were recovered, and only post-1790 cut nails. The presence and quantity of glass manufactured post-1880 provides a TPQ of 1880. The stratigraphic arrangement of the feature and the mixing of earlier and later ceramics indicate that when the trench was dug, it not only cut through the midden but through portions of the underlying yard surface as well. Consequently, materials from both of these contexts were redeposited along with the feature fill.

Feature 21 -Terra cotta French drain

Feature 21 (N113-130+W45, backhoe trench 1, square 1) was a pipe trench that had been excavated through the west end of the midden. The midden soil appears to have been mixed with a mottled clay silt and redeposited into the trench. The pipe trench runs north-south beginning in Backhoe Trench 4 on the north side of a chain link fence and continuing to about N115 on the site grid. The trench then curves southeast, toward the northern end of the house foundation. At the base of the trench is an unglazed terra cotta pipe consisting of various lengths 0.3 feet in diameter, fitted to conform to the curved shape of the trench. In Backhoe Trench 4, the pipe was located below 4.4 feet of modern fill and 1.0 feet of buried plow zone. The feature was seen about 1.6 feet below the surface in the midden area. At the N130 line the depth of the pipe was 3.5 feet below ground surface, while at the southern end where the pipe curves it was less than 3.0 feet below surface. The pipe trench contains a thick level of mottled redeposited soils, including midden soils, silty clay subsoil, and a sand that is probably also part of the subsoil. Just above the pipe the soil is a fine gray sand in the center, while the edges of the trench contain mottled fill. There are some rocks placed along the sides of the trench to support the pipe. French drains were introduced by Henry French in 1859. They were specified to be cylindrical one inch terra cotta tubes. Similar features have been identified at the Buchanan-Savin Farmstead in Blackbird Hundred (Scholl et al. 1994:44) and have been interpreted as pre-dating iron pipes based on French's discussion. The presence of circa 1880 medicine bottle fragments and post-1890 wire nails establishes that the trench was dug and the pipe laid after 1890.

Feature 46 - Brick drain

Feature 46 (N120W31-35) was discovered at the base of the southeast segment of Feature 8. It was a linear arrangement of partially articulated brick approximately 1.25 feet wide. Almost 7 feet of its length remained, five of which was articulated. The trench (Feature 8) under which it lay had been dug through the midden, and it also appears to post-date the midden. It ran northwest to southeast and was one brick deep at its southeast. It was

three bricks deep along the sides and one brick in the center at its northwest segment. Builder's trenches that had been filled with a 10YR 4/4 gravelly sand were identified on both sides of the brick. Patches of concrete covered portions of both builder's trenches. Nail fragments and three whiteware and two redware sherds were recovered from the builder's trenches. This feature has been interpreted as having been constructed for drainage purposes, probably to channel runoff water from the tavern/house structure toward the north field.

Stairway In-fill and Structural Remains

Feature 9

Feature 9 (N75W02 and N75W07) was a slag deposit mixed with large brick pieces and whole brick in the southeast corner of the house foundation. This deposit, approximately 1.5 feet wide by 4.5 feet long, was found to overlay the steps near the southeast corner of the house. A section of stone foundation sealed the basement off from these steps. The feature is therefore a fill episode that post-dates the time when these steps were sealed off. Two post-1864 and two post-1874 windowpane fragments were recovered.

The following features have been assigned to this period of the site's occupation because they do not appear on either the 1917 Price and Price or 1952 DelDOT map of the Blue Ball complex. It has been presumed that they had been demolished by the time the Blue Ball Dairy was in operation.

Feature 30 - Stone Wall Remains

Feature 30 (N63W21, N43W20, N24W20, N20W20, N12W20, and N05W20) is the remains of a mortared stone yard wall in the south field (Figure 30 and Plate 40). It runs parallel to, and is set back 30 feet from, the existing wall parallel to Route 202. It is two feet wide, 54 feet in length, and extends 0.4 feet into subsoil. There appears to be four sections of wall, each ten to fourteen feet in length and broken up by a two to five foot gap in which there is a seated stone slab. A narrow builder's trench was found on either side of the wall from which unidentifiable nail and metal fragments were recovered. The wall is on line with, but not connected to, the interior wall that separates the two rooms on the south side of the house/tavern. The north end of the wall is located about two feet from the south wall of the main structure. The south end is less than a foot from Feature 60. It appears that the wall was bulldozed to just about the top of subsoil.

Feature 29 (N24W20)

This feature is a circular post mold potentially associated with and located just west of the middle portion of Feature 30. It is 0.9 feet in diameter and extends 1.3 feet into the subsoil. One piece of ironstone, post-1790 and unidentifiable nails, and two brass fragments were recovered. Based on South's dates for ironstone, the TPQ is 1813.

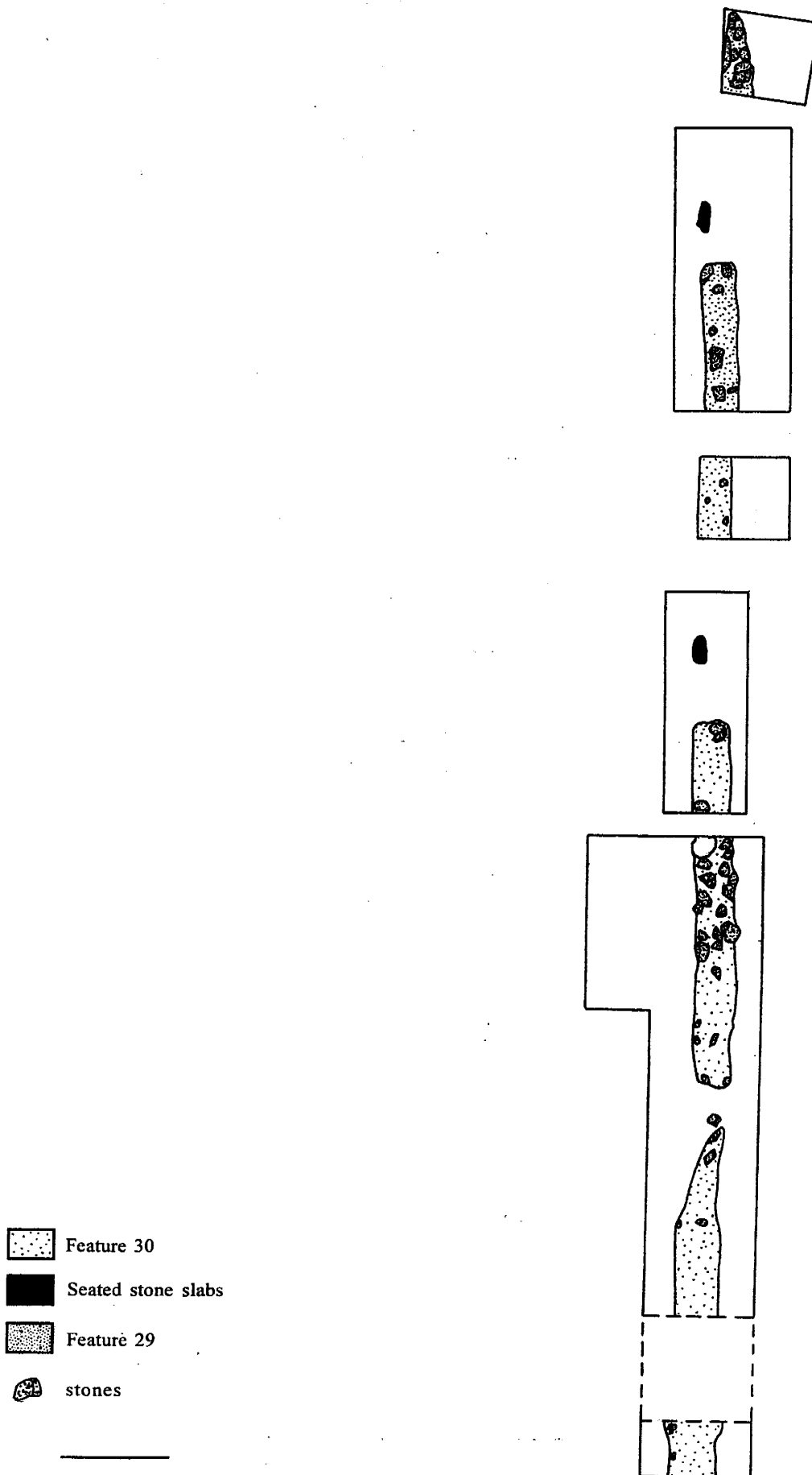


FIGURE 30
Plan View of Feature 30, Stone Wall

Feature 60 - Mortared stone foundation remains

Feature 60 is the foundation remains of a mortared stone outbuilding in the south yard area (Figure 31 and Plate 41) about 50 feet south of the tavern/house foundation. Only the south and west foundation walls were located. The south wall was thirteen feet long and the west wall fourteen feet long. A large square posthole abutted the eastern terminus of the south wall. Feature 30 was located about two feet north of this and runs on line with where the east wall would have been expected. The west wall of Feature 60 lay four feet east of Feature 45. The northern terminus ended before reaching the terminus of Feature 32. This wall lay just off where the eastern wall of Feature 32 would be expected, but they do not connect, and again there is no evidence that these features were linked temporally or functionally. Builder's trench excavation yielded brick, mortar, bottle glass, nail fragments, and one post-1790 manufactured cut nail.

Feature 51 (N03W20) is a one foot diameter circular post hole located between the southern end of Feature 30 and the eastern end of Feature 60. It yielded metal, a post-1790 nail, cinders, coal, and brick.

Isolated Post hole/molds

Features 24, 34, and 62, based either on horizontal or vertical positioning or the TPQ, have minimally been assigned to this phase of the site's occupation. They may, however, post-date this period.

Feature 24 - Posthole and mold

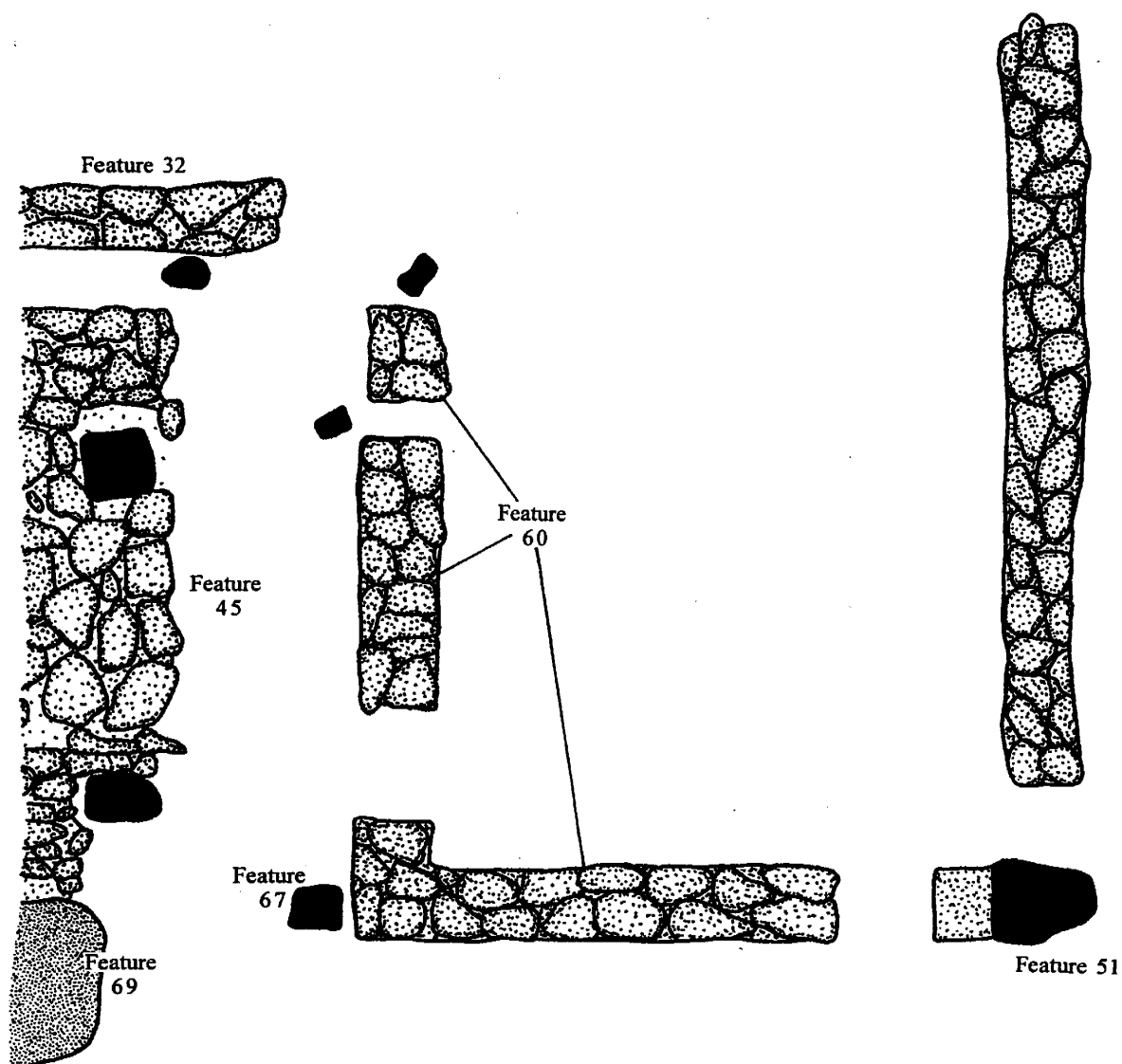
Feature 24 (N83W80) was a round posthole and mold located 40 feet west of the house foundation. The stain measured 1.2 feet in diameter and extended 0.9 feet into subsoil. Artifacts from the overlying soil included a post-1848 manufacture telegraph insulator. Artifacts from the feature included pre-1864 windowpane fragments, pre-1860 bottle glass fragments, and redware.

Feature 34 - Posthole

Feature 34 (N18W03) was a round posthole that had been dug through Feature 81, the bottle dump. Only a metal barrel band fragment, post-1790 manufactured cut nail, and cinders were recovered from the hole. However its stratigraphic position, having been dug through Feature 81, suggests that it post-dates the latter and the TPQ would be 1857.

Feature 62 - Post mold

Feature 62 (S36W08) was located near the standing stucco wall in the south field. The feature is a 0.9 by 1.3 foot rectangular post mold at the base of the plowzone and extends 0.4 feet into the subsoil. The TPQ is 1864.



Post hole



Foundation stones

FIGURE 31
Plan View of Feature 60, Building Foundation