33. Split Sherd
    _0_ Sherd is not split
    _1_ Sherd is split

34. Orifice Diameter _##.##_ cm. (numeric)

35. Neck Diameter _##.##_ cm. (numeric)

36. Shoulder Diameter _##.##_ cm. (numeric)

37. Base Diameter _##.##_ cm. (numeric)

38. Neck Height _##.##_ cm. (numeric)

39. Shoulder Height _##.##_ cm. (numeric)

40. Body Height _##.##_ cm. (numeric)

41. Basal Height _##.##_ cm. (numeric)

Texture and Form Attributes

42 Texture:
    _1_ Very Friable (soft fired)
    _2_ Moderately Friable
    _3_ Compact (hard fired)

43. Core
    _0_ Absent
    _1_ Present

Shape Attributes

44. Rim Shape
    _1_ Straight/Direct
    _2_ Very Incurvate
    _3_ Incurvate
    _4_ Slightly Incurvate
    _5_ Slightly Excurvate
    _6_ Excurvate
    _7_ Very Excurvate
    _8_ Indeterminate

45. Lip Shape
    _1_ Squared/Flat
    _2_ Rounded
    _3_ Inverted/Interior Beveled
    _4_ Everted/Exterior Beveled
    _5_ Extruded
    _6_ Intruded
    _7_ Thickened
    _8_ Peaked
    _9_ Exterior Rolled

_10_ Interior Rolled
_11_ "T" Rim
_12_ Type A
_13_ Type B
_14_ Type C
_15_ Type D
_16_ Type E
_17_ Type F
_18_ Type G
_19_ Type H
_20_ Type I
_21_ Type J
_22_ Knife-Edged
_23_ Indeterminate

46. Shoulder Shape
_1_ Angular
_2_ Indeterminate

47. Basal Shape
_1_ Flat
_2_ Conoidal
_3_ Indeterminate

Decoration Attributes

48. Exterior Body Decoration
_0_ Absent
_1_ Type 1
_2_ Type 2
_3_ Type 3
_4_ Type 4
_5_ Type 5
_6_ Type 6
_7_ Type 7
_8_ Type 8
_9_ Type 9
_10_ Type 10

49. Interior Body Decoration (see #48)

variation occurred in sherd morphology or temper composition. On the basis of similarity in the primary and, in some cases secondary tempering materials, eight ware groupings were identified in the ceramic assemblage. Category designations were made within each ware grouping on the basis of exterior surface treatment. A general discussion of each ware group follows the descriptions.

Siltstone Tempered Ware Group

Category 1 - Siltstone Plain.

46CB41 (N=23)

A total of one rim, one basal and 21 body sherds were included in this category from site 46CB41. The primary temper consisted of small pieces of siltstone that ranged from 1.74 up to 2.74 mm in mean size and averaged 2.29 mm in size. This tempering material was quite soft and was easily scratched with the fingernail. Small amorphous holes, the result of leaching of the temper, could be observed on the surface of some of the sherds included within this category. The amount of temper in the paste was generally moderate with 22% of the sherds having a high density of tempering material and 13% having a low density. Pure siltstone temper represented 96% (N=22) of the sherds within this category.

One specimen exhibited limestone inclusions. These inclusions were relatively rare, constituting approximately 20% of the tempering agents and had a mean size of 1.30 mm. For the most part it appeared that its presence was almost fortuitous, as if the secondary inclusions were simply present in the clay and not intentionally added by the prehistoric potter. The texture of the sherds was generally moderately friable (N=19, 82.6%) with three very friable (13.0%) and one compact (4.4%). Eight of the sherds exhibited a core.

Exterior sherd surfaces were plain and smoothed to poorly-smoothed. Similarly, interiors were generally smoothed although three had eroded interior surfaces. Three small body sherds exhibited possible decoration consisting of one cord-wrapped dowel impression on the exterior surface (Figure 5, a and b). The width of the impression could be measured on one sherd and was 6.5 mm wide. The distance of the decoration from the rim and its orientation with respect to the rim could not be determined. The cordage characteristics for the cordwrapped dowel could also not be determined. Mean body sherd thicknesses ranged from 4.12 mm to 8.66 mm; the over all mean was 6.17 mm (N=18). The neck and lip sherd thicknesses were 6.42 mm and 5.80 mm, respectively. The one basal sherd in the assemblage suggested a flat bottomed form and was 16.00 mm thick (Figure 5, c).

The one rim sherd recovered from the 50N/40E auger hole was too fragmentary to suggest vessel form, but it probably represented a globular-shaped vessel. Because of its fragmented nature, the shape of the rim was indeterminate; however, the lip shape was peaked (Figure 5, d). The peaked portion of the rim was plain and well-smoothed. The orifice diameter could not be estimated.

46CB92 (N=1)

One body sherd was recovered from the surface of this site. The siltstone particles had a mean temper size of 2.16 mm and secondary inclusions were not observed in the sherd's paste. The density of the temper in the paste was high and its texture was moderately friable. Both the interior and exterior surfaces were moderately well-smoothed. The thickness of this body sherd was 5.74 mm and the sherd exhibited a core.

46CB98 (N=1)

One body sherd was recovered from the surface of this site. Secondary inclusions were not observed in the paste and the low density of siltstone temper particles in the paste had a mean size of 2.66 mm. The exterior and interior surfaces were moderately well-smoothed. The thickness of this moderately friable sherd was 9.68 mm.

46CB99 (N=1)

One body sherd was recovered from the surface of this site. The moderate density of siltstone temper particles in the paste had a mean size of 2.00 mm and secondary inclusions were not observed in the sherd's paste. The exterior and interior surfaces were moderately well-smoothed. This moderately friable sherd was 5.90 mm thick.

Category 2 - Siltstone Cordmarked.

Distribution:

46CB41 (N=5) (S-twist, N=1)

A total of one rim and four body sherds were included in this category from site 46CB41. The primary temper consisted of siltstone, the particles of which ranged from 1.68 mm to 2.46 mm in mean size and averaged 1.97 mm in size. The amount of temper in the paste was generally high (N=3, 60%) with one having a moderate density and one exhibiting a low density. Secondary inclusions were not observed in the sherd's paste. The texture of all the sherds was moderately friable. Evidence of an inner core was exhibited in two sherds.

Exterior sherd surfaces were cordmarked; however, a two ply S-twist cordage impressions could be determined on only one sherd. The diameter of cordage impressions exhibited a range of variation from 1.48 mm to 2.34 mm; the average diameter was 1.86 mm. The number of two ply twists per cm was three twists. Mean body/basal sherd thicknesses ranged from 5.18 mm to 8.50 mm, with a mean of 6.92 mm (N=3). Mean neck sherd thickness was 5.98 mm and the lip thickness was 7.96 mm. The orientation of the cordage impressions relative to the rim on the one rim sherd was perpendicular to the rim. Similarly, interior surfaces on four of the sherds were generally well-smoothed and one sherd had an eroded interior surface.

Given the size of the assemblage and the fragmentary nature of the one rim sherd, all that can be said about vessel form is that it probably had a

short-necked, globular shape. One rim sherd, recovered from unit 80N/20E, level 3, was included in this category. It had a straight rim shape and a squared or flattened lip shape with slightly rounded edges (Figure 5, e). The cordmarkings on the exterior surface extended to the lip edge. The brim of the lip and the interior surfaces were well-smoothed. Although the sherd was small and fragmentary the orifice diameter was estimated to be 22 cm.

Category 3 - Siltstone Smoothed Cordmarked.

Distribution:

46CB41 (N=57) (Z-twist, N=1; S-twist, N=1)

A total of four rim, two neck, one rounded shoulder and 50 body sherds were included in this category from site 46CB41. One additional rim with an eroded exterior surface was included in this category description. The primary temper consisted of siltstone, the particles of which ranged from 1.34 mm to 3.04 mm in mean size and averaged 1.97 mm in size. The amount of temper in the paste was generally moderate (N=28, 49%) with 33% having a high density (N=19) and 18% exhibiting a low density (N=10). Four of the sherds contained secondary inclusions consisting of quartz. The secondary inclusions generally reflected a relatively low density of tempering agent in the clay and it appeared that its presence was almost fortuitous; however, the percentage of inclusions in the paste ranged from as high as 50% to as low as 10% and averaged 30%. The secondary inclusions ranged in mean size from as large a 3.41 mm to as small as 1.00 mm and averaged 2.33 mm. On the whole these inclusions probably did not represent secondary temper. The texture of the majority of these sherds could be described as moderately friable (N=45, 79%) with 18% compact (N=10) and 4% being very friable (N=2). Evidence of an inner core was exhibited in 25 sherds constituting 44% of this assemblage.

Exterior sherd surfaces were smoothed cordmarked varying from poorly-smoothed to well-smoothed; the latter revealing only faint traces of cordage or linear rippling of the surface of the sherd. Where secondary smoothing did not obscure the cordage impressions, two ply Z-twist could be identified for one sherd and two ply S-twist could be recognized for another. The diameter of cordage impressions exhibited a range of variation from 1.38 mm to 1.88 mm; the average diameter was 1.63 mm. The average number of two ply twists per cm was four twists. The orientation of the cordage impressions relative to the rim was variable. Two sherds exhibited markings perpendicular to the rim and two had markings angled to the left of perpendicular. In addition, two of the body sherds exhibited crisscrossed cordmarkings. Interiors that were not eroded (N=6) were generally well-smoothed. Mean body/basal sherd thicknesses ranged from 4.52 mm to 10.40 mm, with a mean of 6.91 mm (N=45). Mean neck sherd thicknesses range from 4.40 mm to 7.32 mm and averaged 5.72 mm (N=6). Lip thicknesses ranged from 4.42 to 6.90 mm and averaged 5.87 mm (N=4).

Given the size of the assemblage and the rim sherds fragmentary nature, all that can be said about vessel forms was that they probably represented short-necked, globular shapes. A total of four rim sherds were recovered from 46CB41. The first, collected from 80.60N/13.35W, level 2, had a straight rim form and an interior rolled lip shape (Figure 5, f). The sherd had cordmark-

ings that extended up to the lip edge. Orifice diameter could not be estimated.

Two rim sherds from the same unit appeared to originate from the same vessel. It had an excurvate rim shape and a rounded lip shape (Figure 5, g). The two ply Z-twist smoothed cordmarked surface treatment extended up to the lip edge. A maximum of 4 twists per cm was evident on one sherd. The brim was plain and well-smoothed. A vessel orifice diameter for this sherd was estimated to be 26 cm.

The fourth rim sherd was recovered from level 1 in unit 80N/19E. It had a straight rim shape and a rounded lip shape (Figure 5, h). The smoothed-cordmarking on the exterior surface extended up to the lip edge. The interior surface was well-smoothed. The vessel orifice diameter could not be estimated.

One final rim sherd was recovered from 80.60N/13.35W, level 2. It had an indeterminate rim shape and a slightly intruded lip shape (Figure 5, i). The exterior surface was eroded and the interior surface was well-smoothed. The brim of this sherd was flat and smoothed except for two deep v-shaped notches placed approximately 7 mm apart. The notches were oriented parallel to the radius. The notches on the interior edge were only about 1 mm deep and became more pronounced at the exterior edge of the lip, reaching approximately 2.5 mm below the lip.

46CB90 (N=2)

Two body sherds recovered from the surface of site 46CB90 were included in this category. The sherds were purely tempered with siltstone of a 1.98 mm mean size. The density of the temper in the paste was high for both sherds and their textures were both moderately friable. One sherd exhibited evidence of a core. The exterior surface of each consisted of well-smoothed cordmarkings and the interiors were plain. Body sherd thicknesses ranged from 5.70 mm to 7.20 mm and averaged 6.45 mm.

46CB92 (N=2) (S-twist, N=2)

Two body sherds recovered from the surface of site 46CB92 were included in this category. The siltstone particles ranged in mean size from 2.36 mm to 2.60 mm and averaged 2.48 mm. The density of temper in the paste was high and secondary inclusions were not observed. The texture of the two sherds was moderately friable and one of the sherds exhibited evidence of a core. The exterior surfaces were smoothed cordmarked. Where secondary smoothing did not obscure the cordage twist characteristics, two ply S-twist cordage impressions were observed. The diameter of these cords was 1.32 mm and the maximum number of twists per cm equaled four twists. The interiors were plain. Body sherd thicknesses ranged from 5.62 mm to 7.90 mm and averaged 6.76 mm.

Sandstone Tempered Ware Group

Category 4 - Sandstone Plain

Distribution:

46CB41 (N=1)

One body sherd was included in this category from site 46CB41. The temper consisted of sandstone, the particles of which were 2.08 mm in mean size. The density of the temper in the paste was moderate and secondary inclusions were not observed in the paste. The sherd had a compact texture. Exterior and interior sherd surfaces are plain and smoothed. Mean body sherd thickness was 7.02 mm.

46CB90 (N=1)

One body sherd recovered from the surface of site 46CB90 was included in this category. The sherd was purely tempered with sandstone and the particles had a mean size of 2.08 mm. The density of temper in the paste was low and the sherd had a moderately friable texture. The interior and exterior surfaces were plain and smoothed and the thickness of this sherd was 8.02 mm.

Category 5 - Sandstone Cordmarked

Distribution:

46CB41 (N=1) (Z-twist, N=1)

Only one body sherd was included in this category from site 46CB41. The primary temper consisted of sandstone, the particles of which were 3.08 mm in mean size. The temper reflected a moderate density in the paste. Secondary inclusions in the sherd's paste consisted of limestone. The secondary inclusions consisted of approximately 10% of the temper. The secondary inclusions had a mean size of 2.82 mm. The inclusions probably did not represent secondary temper. The texture of the majority of these sherds could be described as moderately friable.

The exterior sherd surface was cordmarked. The interior was plain. Two ply Z-twist cordage impressions were identified on this one sherd. The cordage diameter impressions were 1.86 mm in diameter and the maximum number of two ply twists per cm was two twists. Mean body/basal sherd thickness was 10.66 mm. The orientation of the cordage impressions relative to the rim could not be determined.

46CB15 (N=1) (S-twist, N=1)

Only one refit body sherd was included in this category from site 46CB15. The primary temper consisted of sandstone, the particles of which were 5.35 mm in mean size. The temper reflected a moderate density in the paste. No secondary inclusions in the sherd's paste were observed. The texture of this sherd could be described as moderately friable.

The exterior sherd surface exhibited crisscrossed cordmarking. The interior was plain. Two ply S-twist cordage impressions were identified on this one sherd. The cordage diameter impressions were 2.1 mm in diameter and the

maximum number of two ply twists per cm was four twists. Mean body/basal sherd thickness was 5.15 mm. The orientation of the cordage impressions relative to the rim could not be determined.

Category 6 - Sandstone Smoothed Cordmarked

Distribution:

46CB41 (N=2)

Two body sherds recovered from site 46CB41 were included in this category. The primary temper was comprised of crushed sandstone particles which ranged in mean size from 3.48 mm to 4.86 mm with a mean particle size of 4.17 mm. Sandstone particles reflected a moderate density in one sherd and a high density in the other. The sherds had a moderately well-exhibited evidence of a core. The exterior surface was moderately well-smoothed and the secondary smoothing had obscured the cordage impressions. The interior surface of one sherd was plain and the other was eroded. Only one sherd gave an accurate thickness measurement which was 10.44 mm.

Limestone Tempered Ware Group

Category 7 - Limestone Plain.

46CB41 (N=50)

A total of one basal and 49 body sherds were included in this category from site 46CB41. The primary temper consisted of small and large pieces of limestone that ranged from 1.50 mm to 3.34 mm in mean size and averaged 2.32 mm. This tempering material reacted vigorously when HCl was applied. Small amorphous holes, the result of leaching of the temper, could be observed on the surface of some of the sherds included within this category. The amount of temper in the paste was generally moderate (N=27, 54%) with 36% of the sherds having a low density of tempering material (N=18) and 10% having a high density (N=5). Pure limestone temper represented 94% (N=47) of the sherds within this category.

Three specimens exhibited siltstone inclusions. These inclusions were relatively rare, constituting approximately 10% of the tempering agents and had a mean size ranging from 1.68 mm to 3.08 mm and averaging 2.55 mm. For the most part it appeared that its presence was almost fortuitous, as if the secondary inclusions were not intentionally added by the prehistoric potter. The texture of the sherds was generally moderately friable (N=45, 90.0%) with four compact (8.0%) and one very friable (2.0%). Eighteen of the sherds exhibited a core (36%).

Exterior sherd surfaces were plain and smoothed to poorly-smoothed. Similarly, interiors were generally smoothed although five had eroded interior surfaces. Mean body sherd thicknesses ranged from 3.32 mm to 13.74 mm; the over all mean was 7.16 mm (N=45). The one basal sherd in the assemblage suggested a round bottomed form and was 11.64 mm thick (Figure 5, j).

46CB100 (N=1)

One body sherd recovered from 46CB100 was included in this category. The primary temper consisted of limestone particles which were 3.03 mm in mean size. The temper reflected a moderate density in the paste and no secondary inclusions were observed. The texture of this sherd could be described as moderately friable. Both the interior and exterior surface of this sherd were plain and smoothed. The mean sherd thickness was 5.25 mm thick.

Category 8 - Limestone Cordmarked.

Distribution:

46CB41 (N=19) (Z-twist, N=6; S-twist, N=2)

A total of three neck and 16 body sherds included in this category were recovered from site 46CB41. The primary temper consisted of limestone stone, the particles of which ranged from 1.94 mm to 3.26 mm in mean size and averaged 2.43 mm in size. The amount of temper in the paste was generally moderate (N=13, 68%) with four having a low density (21%) and two exhibiting a high density (11%). Secondary inclusions were not observed in the sherd's paste. The texture of 84% of the sherds was moderately friable (N=16) and 16% were compact (N=3). Evidence of an inner core was exhibited in four sherds.

Exterior sherd surfaces were cordmarked. Two ply S-twist cordage impressions could be determined on two sherds and two ply Z-twist impressions were evident on six sherds. The diameter of cordage impressions exhibited a range of variation from 1.46 mm to 2.50 mm; the average diameter was 1.83 mm. The maximum number of two ply twists per cm ranged from three to four twists. Mean body/basal sherd thicknesses ranged from 4.94 mm to 8.96 mm, with a mean of 7.28 mm (N=15). Mean neck sherd thickness ranged from 5.40 mm to 8.38 mm and averaged 7.00 mm (N=3). Two of the neck sherds suggested that the orientation of the cordage impressions relative to the rim was perpendicular to the rim. Interior surfaces on eighteen of the sherds were generally well-smoothed and one sherd had a well-smoothed cordmarked interior surface.

46CB100 (N=1) (Z-twist, N=1)

Only one body sherd was included in this category from site 46CB100. The primary temper consisted of limestone particles which were 3.2 mm in mean size. The temper reflected a moderate density in the paste and no secondary inclusions were observed. The texture of this sherd could be described as moderately friable.

The exterior sherd surface was cordmarked and the interior was plain. Two ply Z-twist cordage impressions were identified on this one sherd. The cordage diameter impressions were 2.5 mm in diameter. Mean sherd thickness was 5.5 mm. The orientation of the cordage impressions relative to the rim could not be determined.

Category 9 - Limestone Smoothed Cordmarked.

Distribution:

46CB41 (N=141) (Z-twist, N=6; S-twist, N=1)

A total of two rim, four neck and 135 body sherds were included in this category from site 46CB41. The primary temper consisted of limestone, the particles of which ranged from 1.66 mm to 3.34 mm in mean size and averaged 2.39 mm in size. The amount of temper in the paste was generally moderate (N=73, 52%) with 31% having a low density (N=44) and 17% exhibiting a high density (N=24). Seven of the sherds contained secondary inclusions consisting of siltstone (N=2), sandstone (N=3) and quartz (N=2). The secondary inclusions generally reflected a relatively low density of tempering agent in the clay and it appeared that its presence was almost fortuitous. The percentage of inclusions in the paste was approximately 20% of the temper particles in six cases with one siltstone inclusion comprising only 10%. The secondary inclusions ranged in mean size from 2.16 mm to 2.78 mm for siltstone (mean=2.47 mm), from 3.06 mm to 4.02 mm for sandstone (mean=3.54 mm) and from 1.04 mm to 1.66 mm for quartz (mean=1.35 mm). On the whole these inclusions probably did not represent secondary temper. The texture of the majority of these sherds could be described as moderately friable (N=117, 83%) with 12% compact (N=17) and 5% being very friable (N=7). Evidence of an inner core was exhibited in 34 sherds constituting 24% of this assemblage.

Exterior sherd surfaces were smoothed cordmarked varying from smoothed to well-smoothed; the latter revealing only faint traces of cordage or linear rippling of the surface of the sherd. Where secondary smoothing did not obscure the cordage impressions, two ply Z-twist could be identified for six sherds and two ply S-twist could be recognized for one sherd. The diameter of cordage impressions exhibited a range of variation from 1.28 mm to 2.14 mm; the average diameter was 1.71 mm. The maximum number of two ply twists per cm ranged from three to six twists and averaged around four twists. The orientation of the cordage impressions relative to the rim was variable. Four sherds exhibited markings perpendicular to the rim and one had markings angled to the left of perpendicular. In addition, four of the body sherds exhibited criss-crossed cordmarkings. One of the very small body sherds also exhibited possible decoration. This consisted of two deeply incised parallel lines spaced five mm apart. The orientation of these incisions relative to the rim could not be determined. Interiors that were not eroded (N=8) were generally well-smoothed; however, one of the sherds exhibited smoothed cordmarkings on its interior surface. Mean body/basal sherd thicknesses ranged from 4.12 mm to 10.74 mm, with a mean of 7.15 mm (N=126). Mean neck sherd thicknesses ranged from 5.84 mm to 7.38 mm and averaged 6.56 mm (N=5). Lip thicknesses ranged from 4.90 to 6.88 mm and averaged 5.89 mm.

Given the size of the assemblage and the rim sherds fragmentary nature, all that can be said about vessel forms was that they probably represented short-necked, globular shapes. A total of two rim sherds were recovered from 46CB41. The first, collected from 76N/20W, level 3, had an indeterminate rim form and a squared or flattened lip shape (Figure 6, a). The sherd had well-smoothed cordmarkings that extended up to the lip edge. The brim of the lip was possibly cordmarked with the cordmarkings oriented to the right of the radius; however, the sherd was in a deteriorated condition and the exact nature of the rim is indeterminate. Orifice diameter could not be estimated.

The second rim sherd was recovered from unit 80N/20E, level 2. This small and fragmented rim sherd had an indeterminate rim shape and a rounded lip shape (Figure 6, b). The smoothed cordmarkings on the exterior surface extended up to the lip edge, but the interior and rim surfaces were plain and well-smoothed. Orifice diameter or vessel shape could not be determined from this sherd.

Chert Tempered Ware Group

Category 10 - Chert Plain

Distribution:

46CB41 (N=3)

Only three body sherds were included in this category which were recovered from site 46CB41. The primary temper consisted of crushed chert particles with a mean particle size of 2.24 mm and ranging from 2.02 mm to 2.42 mm in mean size. The temper in two of the sherds reflected a moderate density in the paste and one had a low density. Secondary inclusions were observed in two of the sherds and one sherd exhibited tertiary inclusions. The secondary inclusions consisted of sandstone ranging in mean size from 2.28 mm to 2.66 mm and averaging 2.47 mm. The sandstone particles comprised from 20% to 30% of the tempering material. The tertiary inclusion was siltstone measuring 2.56 mm in mean size and comprised 20% of the tempering material. On the whole these inclusions did not appear to be secondary tempering materials. Two of the sherds had a compact texture and one was moderately friable. One of the sherds also exhibited evidence of a core.

The exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness ranged from 6.96 mm to 9.08 mm and averaged 8.29 mm (N=3). The lack of rim, shoulder, or basal sherds precludes any assessment of vessel shape.

Category 11 - Chert Smoothed Cordmarked

Distribution:

46CB41 (N=6)

Two neck and four body sherds recovered from site 46CB41 were included in this category. The temper consisted of crushed chert particles, with only one sherd purely tempered with chert materials. The tempering material generally reflected a moderate density in the paste (N=4); however, one sherd had a high density and one sherd had a low density of temper in the paste. Mean chert particle size ranged from 2.08 mm to 2.88 mm. Sandstone (N=3) and quartz (N=2) were the inclusions represented in this group. They generally reflected a low percentage in the clay's paste, with sandstone comprising from 20% to 50% and quartz constituting 20% in both cases. Mean particle size for the inclusions ranged from 1.74 mm to 2.48 mm for sandstone (mean=2.23 mm) and from 1.88 mm

to 3.42 mm for quartz (mean=2.65 mm). One sherd exhibited tertiary siltstone inclusions 1.24 mm in mean size and comprising 20% of the tempering material. The texture of the sherds was generally compact (N=5, 83%) with one moderately friable. Evidence of an inner core is observed on three specimens.

Exterior sherd surfaces were smoothed-cordmarked and exhibit well- to poorly-smoothed surfaces. Determination of twist characteristics was impossible due to secondary smoothing. The diameter of the cords measured 1.16 mm and 1.90 mm in two cases. The two neck sherds suggested that the cordage impressions were oriented perpendicular to the rim. Interior surfaces were plain in five cases and the sixth had an eroded interior surface. Mean body sherd thickness ranged from 7.10 mm to 9.26 mm with a mean of 8.13 mm (N=3). Mean neck sherd thickness ranged from 7.50 mm to 9.06 mm and averaged 8.28 mm.

Quartz Tempered Ware Group

Category 12 - Quartz Plain

Distribution:

46CB41 (N=1)

One rounded shoulder sherd was included in this category which was recovered from site 46CB41. The primary temper consisted of crushed quartz particles with a mean particle size of 1.28 mm and reflected a low density in the paste. Secondary inclusions were not observed in this sherd. This sherd had a moderately friable texture. The exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness was 5.78 mm. The lack of rim, shoulder, or basal sherds precludes any assessment of vessel shape.

Category 13 - Quartz Smoothed Cordmarked

Distribution:

46CB41 (N=11) (Z-twist, N=1; S-twist, N=1)

Eleven body sherds included in category were recovered from site 46CB41. Included in this description is one rim sherd which had an eroded exterior surface. The temper consisted of medium-sized crushed quartz particles, with mean particle size ranging from 0.88 mm to 2.86 mm and averaging 1.98 mm. The majority of the sherds displayed a moderate density of temper in the paste (N=7, 64%) although three had a high density (27%) and one had a low density. to low in the paste. Quartz particles were the sole tempering agent in seven of the sherds. Limestone (N=3) and chert (N=1) were the inclusions represented in this group. Inclusions of limestones comprised 20% to 30% of the material and chert constituted 20%. Mean particle size for the inclusions range from 1.36 mm to 2.34 mm for limestone (mean=1.82 mm) and the chert particles measured 2.86 mm in mean size. The majority of the sherds exhibit a moderately friable texture (N=7, 64%) with four compact (36%).

Exterior sherd surfaces were smoothed-cordmarked and exhibit poorly- to

well-smoothed surfaces. The orientation of the cordmarkings with respect to the rim was indeterminate in all cases. One sherd exhibited overlapping or crisscrossed cordmarkings on the exterior surface. Where secondary smoothing did not obscure the cordage twist characteristics one sherd exhibited two ply Z-twist impressions and one displayed two ply S-twist impressions. The diameter of the cords ranged from 1.68 mm to 1.80 mm and averaged 1.75 mm. The maximum number of twists per cm equaled four twists. Mean body sherd thickness ranged from 4.42 mm up to 11.02 mm with a mean of 7.20 mm (N=10). Vessel shapes could not be determined.

One small, eroded rim sherd was included in this category. It was tempered with quartz particle measuring 1.24 mm in mean size. The density of the temper in the paste was low and the texture was moderately friable. This sherd also exhibited a core. Determination of the vessel shape again remains problematical because of the size of the sherd. The sherd had an indeterminate rim shape and a rounded lip shape (Figure 6, c). The exterior surface was eroded and the interior and brim surfaces were plain. The thickness of the lip was 4.12 mm. Orifice diameter could not be estimated.

Shell Tempered Ware Group

Category 14 - Shell Plain

Distribution:

46CB40 (N=37)

Five rim, six neck, one angular shoulder, one strap handle fragment and 24 body sherds included in this category were recovered from the surface of site 46CB40. The primary temper consisted of crushed mussel shell. The temper generally reflected a high density in the paste (N=18, 49%); however, 30% had a moderate density (N=11) and 22% exhibited a low density (N=8). Secondary inclusions were not observed. The texture of the sherds was overwhelmingly compact (N=29, 78%) and the remainder were moderately friable. Eighteen, or 49%, of the sherds exhibited a core.

The exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness ranged from 5.20 mm to 14.82 mm and averaged 8.02 mm (N=25). Neck sherd thickness ranged from 5.42 mm to 9.04 mm and averaged 6.94 mm (N=11). Lastly, lip sherd thickness ranged from 4.50 mm to 9.24 mm and had a mean of 5.85 mm (N=5).

A total of five rim sherds were recovered from the surface of the site. One of the rims appeared to be a fragment of a salt pan. It had a very excurvate rim shape and a rounded lip shape (Figure 6, d). All the surfaces were plain; however, the exterior surface was somewhat rough and possibly eroded. Two of the rim sherds had excurvate rim shapes and rounded lip shapes (Figure 6, e; f). The exterior, interior and brim surfaces were well-smoothed. One additional rim sherd also had a rounded lip shape; however, the sherd was too fragmented for an accurate rim shape description (Figure 6, g). The surfaces were well-smoothed. The brim of the lip also appeared to have two v-shaped notches oriented to the left of the radius. These notches were shallow and

were applied to the exterior edge of the brim. The notches originated near the interior edge and became deeper and more pronounced on the exterior edge occurring approximately one mm below the exterior lip edge. The final rim sherd exhibited a direct or straightened rim shape and a squared or flattened lip shape (Figure 6, h). The shape of the vessel from which this sherd came was most likely a bowl form. The exterior and interior surfaces were poorly-smoothed as was the brim. This sherd also displayed small notches on the exterior lip edge much like the rim sherd described above. One difference was that the notches were angled to the right of the diameter for this sherd. As compared to the other sherds the thickness of this bowl rim was much thinner measuring 4.50 mm for the lip and 5.42 mm for the neck or rim portion. Finally, one angular shoulder and one strap handle fragment were recovered from the surface (Figure 6, i; j).

46CB41 (N=16)

Sixteen body sherds included in this category were recovered from site 46CB41. The primary temper consisted of crushed mussel shell. The temper generally reflected a moderate density in the paste (N=8, 50%); however, 38% had a low density (N=6) and 12% exhibited a high density (N=2). Secondary inclusions were not observed. The texture of the sherds was compact (N=9, 56%) and the remainder were moderately friable. Six, or 38%, of the sherds exhibited a core. The exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness ranged from 5.06 mm to 8.70 mm and averaged 6.80 mm (N=16).

46CB92 (N=2)

A total of two body sherds recovered from the surface of site 46CB92 were included in this category. The primary temper consisted of crushed mussel shell. One sherd had a low density of temper in the paste and the other had a moderate density. Secondary inclusions were not observed in the paste. One sherd had a very friable texture and the other was moderately friable. The exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness ranged from 3.86 mm to 6.48 mm and averaged 5.17 mm.

46CB98 (N=3)

Three body sherds included in this category were recovered from the surface of site 46CB98. The primary temper consisted of crushed mussel shell. The temper reflected a low (N=1), moderate (N=1) and a high density (N=1) in the paste. Secondary inclusions were not observed. The texture of the sherds was compact and two of the sherds exhibited a core. The exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness ranged from 4.24 mm to 6.50 mm and averaged 5.57 mm.

46CB99 (N=3)

One basal and two body sherds recovered from the surface of site 46CB99 were included in this category. The primary temper consisted of crushed mussel shell. The temper reflected a moderate (N=1) and a high density (N=2) in the paste. Secondary inclusions were not observed. The texture of the sherds was moderately friable and all three sherds exhibited a core. The

exterior and interior surfaces were plain and well-smoothed. Mean body sherd thickness ranged from 5.90 mm to 6.90 mm and averaged 6.40 mm. The one basal sherd was 12.34 mm thick.

Category 15 - Shell Cordmarked

Distribution:

46CB40 (N=2) (Z-twist, N=1)

Two body sherds recovered from the surface of site 46CB40 were included in this category. The temper consisted of crushed mussel shell particles of a high density in the paste. The sherds had a compact texture and one displayed a core. The exterior sherd surfaces were cordmarked. Cordage impressions on one sherd exhibited a two ply Z-twist characteristic and a maximum of four twists per cm. The other sherd had overlapping or crisscrossed cordmarkings which obscured the twist attributes. The diameter of the cords were 1.70 mm and 1.82 mm and had a mean diameter of 1.76 mm. The interior sherd surfaces were plain. Mean body sherd thickness ranged from 6.64 mm to 7.28 mm and averaged 6.96 mm. Vessel shapes could not be determined.

46CB98 (N=2) (Z-twist, N=2)

A total of one rounded shoulder (Figure 6, k) and one body sherd recovered from the surface of site 46CB98 were included in this category. The primary temper consisted of crushed mussel shell. One sherd had a high density of temper in the paste and the other had a moderate density. Secondary inclusions were not observed in the paste. Both sherds had a compact texture and exhibited cores. The exterior and interior surfaces were cordmarked with two ply Z-twist cordage impressions. The diameter of the cords ranged from 1.48 mm to 1.64 mm. The maximum number of twists per cm equaled four twists. Mean body sherd thickness ranged from 5.66 mm to 8.24 mm and averaged 6.95 mm.

Category 16 - Shell Smoothed Cordmarked.

Distribution:

46CB40 (N=55) (Z-twist, N=12; S-twist, N=1)

A total of three neck and 52 body sherds were included in this category recovered from the surface of site 46CB40. The primary temper consisted of crushed mussel shell. The amount of temper in the paste was generally moderate (N=37, 67%) with 24% having a high density (N=13) and 9% exhibiting a low density (N=5). Secondary inclusions were not observed in the sherds paste. The texture of the majority of these sherds could be described as compact (N=39, 71%) and the remainder were moderately friable. Evidence of an inner core was exhibited in 24 sherds constituting 44% of this assemblage.

Exterior sherd surfaces were smoothed cordmarked varying from smoothed to well-smoothed; the latter revealing only faint traces of cordage or linear rippling of the surface of the sherd. Where secondary smoothing did not obscure the cordage impressions, two ply Z-twist could be identified for twelve sherds and two ply S-twist could be recognized for one sherd. The

diameter of cordage impressions exhibited a range of variation from 1.14 mm to 2.42 mm; the average diameter was 1.57 mm. The maximum number of two ply twists per cm ranged from three to seven twists and averaged around four twists. The orientation of the cordage impressions relative to the rim was perpendicular and five of the body sherds exhibited overlapping or criss-crossed cordmarkings. Interiors that were not eroded (N=3) were generally well-smoothed. Mean body/basal sherd thicknesses ranged from 4.30 mm to 8.88 mm, with a mean of 6.46 mm (N=51). Mean neck sherd thicknesses ranged from 6.66 mm to 9.74 mm and averaged 7.84 mm (N=3). There was a complete lack of sherds recovered that would suggest vessel forms and therefore no assessment was made as to vessel forms.

46CB41 (N=1)

Only one body sherd recovered from site 46CB41 was included in this category. The mussel shell tempered sherd had a high density of temper in its paste. This one sherd also exhibited evince of a core. The exterior surface was well-smoothed cordmarked obscuring the cordage twist characteristics. The interior surface was eroded and the texture of this sherd was moderately friable.

46CB98 (N=2)

Two body sherds recovered from the surface of 46CB98 were included in this category. These moderately friable sherds had a low density of crushed mussel shell tempering agent in their paste. Secondary smoothing of the cordmarkings had obscured the cordage twist characteristics on the exterior surfaces and the interiors were plain. Body sherd thickness ranged from 6.62 mm to 7.32 mm and averaged 6.97 mm.

46CB99 (N=2)

Two body sherds included in this category were recovered from the surface of site 46CB99. The density of the shell temper in the paste was moderate in one case and high in the other. Similarly, one sherd had a moderately friable texture and the other was compact. Both sherds exhibited a core. The exterior surfaces were smoothed cordmarked and the interiors were plain. The diameter of the cords on one sherd measured 1.28 mm. The body sherd thicknesses for theses two sherds was 4.24 mm and 6.62 mm.

Leached Tempered Ware Group

Category 17 - Leached Plain

Distribution:

46CB40 (N=1)

One body sherd included in this category were recovered from the surface of site 46CB40. The temper type was unknown. A moderate density of small, amorphous holes, the result of leaching of the temper, could be observed on the sherd's surface and cross-section. Although siltstone was the probable

temper, no evidence of it could be found in the temper cavities. The mean hole size was 2.28 mm. The texture of this sherd was moderately friable and it exhibited a core. The exterior surface was plain and well-smoothed as was the interior, and its thickness was 5.24 mm.

46CB41 (N=17)

Seventeen body sherds were included in this category recovered from site 46CB41. The density of the leached temper in the paste was predominantly high (N=8, 47%) although 41% had a low density (N=7) and 12% had a moderate density (N=2). In addition, seven of the sherds exhibited a core and the texture of the sherds was overwhelmingly moderately friable (N=16, 94%) with one compact textured. The mean hole size ranged from 1.52 mm to 2.88 mm and averaged 2.36 mm.

Exterior sherd surfaces were plain and well-smoothed and the interior surfaces which were not eroded (N=3) were also plain. Body sherd thickness ranged from 6.02 mm to 9.42 mm, the mean was 8.00 mm (N=14).

Category 18 - Leached Cordmarked

Distribution:

46CB41 (N=3) (Z-twist, N=1)

One rim and two body sherds constituted this category. The temper type was unknown. A moderate density of small, amorphous holes, the result of leaching of the temper, could be observed on the sherd's surface and cross-section. Although siltstone was the probable temper, no evidence of it could be found in the temper cavities. The mean hole size was 2.37 mm and ranged from 1.82 mm to 2.72 mm in size. The texture of the sherds was moderately friable and a core was exhibited by two of the sherds.

The exterior sherd surfaces were cordmarked and one sherd displayed a two ply Z-twist pattern with a maximum of three twists per cm. The cordage twist characteristics could not be determined from the other two sherds. Moreover, the cordage diameter had a range of 1.80 mm to 1.88 mm with a mean of 1.84 mm. Interior sherd surfaces were plain (N=2) and eroded (N=1). Mean body sherd thickness ranged from 7.04 mm to 8.04 mm averaging 7.54 mm (N=2). The lip thickness of the rim sherd measured 4.40 mm.

The one rim sherd was recovered from unit 80N/19E, level 1. The fragmented nature of the sherd precluded any assessment of vessel form or rim shape; however, the lip shape was squared or flattened (Figure 6, l). The cordmarkings on the exterior surface extended up to the lip oriented perpendicular to the lip and the brim was well-smoothed.

46CB15 (N=1) (S-twist, N=1)

One sherd recovered from 46CB15 could be included in this category. The temper type was unknown. A moderate density of small, amorphous holes, the result of leaching of the temper, could be observed on the sherd's surface and

cross-section. Although siltstone was the probable temper, no evidence of it could be found in the temper cavities. The mean hole size was 4.05 mm and ranged from 3.1 mm to 5.0 mm in size. The texture of this sherd was very friable.

The exterior sherd surface was cordmarked and the interior surface was smooth. This sherd displayed a two ply S-twist pattern with a maximum of three twists per cm. The cordage diameter was 2.0 mm. The orientation of the cordage twists relative to the rim could not be determined. The mean body sherd thickness was 6.0 mm.

Category 19 - Leached Smoothed Cordmarked

Distribution:

46CB41 (N=27) (Z-twist, N=1; S-twist, N=1)

One rim and 27 body sherds included in this category were recovered from site 46CB41. The temper type was unknown. Small, amorphous holes, the result of leaching of the temper, could be observed on the sherd's surface and cross-section. Although siltstone was the probable temper, no evidence of it could be found in the temper cavities. The density of the temper in the paste was generally moderate (N=15, 56%); however, 26% had a high density (N=7) and 18% had a low density (N=5). The mean hole size was 2.35 mm and ranged from 1.58 mm to 3.28 mm in size. The texture of the sherds included moderately friable (N=23, 85%), very friable (N=2, 7%) and compact (N=2, 7%). Evidence of a core was observed in 10 sherds (37%).

The exterior sherd surfaces were smoothed cordmarked ranging from poorly- to well-smoothed. Where secondary smoothing did not obscure the cordage twist characteristics one two ply Z-twist and one two ply S-twist pattern was observed. The diameter of the cords ranged from 1.72 mm to 1.80 mm, averaging 1.75 mm. The maximum number of twists per cm ranged from three to four twists. The orientation of the cordmarking could be determined in only one case and this was perpendicular to the rim. In addition, one sherd exhibited overlapping cordmarkings. Interior sherd surfaces were plain (N=26) and eroded (N=1). Mean body sherd thickness ranged from 4.70 mm to 9.02 mm, averaging 6.53 mm (N=25). The neck and lip thickness measured 6.76 mm and 5.98 mm, respectively.

The one rim sherd was recovered from unit 76N/3E, level 1. The fragmented nature of the sherd precluded any assessment of vessel form or rim shape; however, the lip shape was slightly thickened (Figure 6, m). The cordmarkings on the exterior surface extended up to the lip. The brim was flattened and well-smoothed and the interior surface was moderately well-smoothed. Orifice diameter could not be estimated.

46CB90 (N=2) (Z-twist, N=1)

Two body sherds included in this category recovered from the surface of 46CB90 contained purely leached temper. These moderately friable sherds exhibited mean size of the holes ranging from 2.30 mm to 2.46 mm which aver-

aged 2.38 mm. The density of the temper in the paste was moderate for one and high for the other. The exterior surface was poorly-smoothed cordmarked and one sherd displayed two ply Z-twist cordage patterns. These cords were 1.70 mm in diameter and the maximum number of twists per cm was three twists. The interior sherd surfaces were plain. Mean body sherd thickness was 7.34 mm, ranging from 7.08 mm to 7.60 mm.

46CB98 (N=1)

One body sherd recovered from the surface of 46CB98 was included with this category. This moderately friable sherd had a moderate density of temper in its paste, exhibited a core and also incorporated secondary quartz inclusions. The mean size of the leached holes was 2.50 mm and the quartz inclusions was 2.26 mm. The quartz inclusions constituted only 10% of the tempering materials, therefore it was assumed that its presence was fortuitous. The exterior surface was well-smoothed cordmarked obscuring the cordage twist characteristics and the interior was plain. The thickness of this body sherd measured 7.26 mm.

No Temper Ware Group

Category 20 - No Temper Plain

Distribution:

46CB40 (N=1)

Only one body sherd was included in this category and it was recovered from the surface of site 46CB40. No trace of temper or temper cavities were evident (even after breakage) along the sherd's exterior or interior. The sherd had a compact texture and exhibited a core. Exterior and interior sherd surfaces were poorly-smoothed. The thickness of the sherd was 5.52 mm.

Category 21 - No Temper Smoothed Cordmarked

Distribution:

46CB40 (N=2)

Two body sherds recovered from the surface of 46CB40 comprised this category. Tempering materials were not observed. The sherd had a compact texture and exhibited a core. The exterior surface was well-smoothed cordmarked which obscured the cordage twist characteristics. The interior surface was plain on both sherds. Body sherd thickness ranged from 5.12 mm to 6.38 mm.

Discussion. It is appropriate at this time to include a short but comprehensive overview of the possible type designations which may be applied to the collection of sherds recovered during the phase I and II investigations at Greenbottom. Nevertheless, the majority of the sherds will remain untyped because of the generally small size of the assemblage from each site. Within each section will be a discussion of the assemblages from each site and an inter- and intrasite comparison of those assemblages. The size of the assem-

blages recovered from each site was highly variable, introducing a level of bias into this analysis.

Siltstone

GEOGRAPHICAL RANGE: Siltstone/claystone tempered wares are quite common throughout West Virginia. On the basis of his survey in Nicholas County and his excavations at 46FR7, the Mount Carbon site (n.d.; 1962; 1965:94) and 46PU3, the Leslie Mound (McMichael and Mairs 1963), McMichael defined the siltstone tempered Armstrong Series. Unfortunately this series has been uncritically used throughout the region and at one time all siltstone tempered ceramics would be assigned to the Armstrong Series. According to McMichael this series dated from the late Early Woodland to Middle Woodland periods (1 to 500 A.D.); however, earlier and later dates have also been reported for Armstrong Series ceramics (McMichael and Mairs 1969; Wilkins 1979).

More recently, the Lick Creek Series was defined by Henderson (1985:325-504; 1986:40-47) from a collection of sherds from two sites (46SU67 and 46SU72) of the Green Sulphur Springs Site Complex in southern West Virginia. The Lick Creek Series was considered to be temporally and morphologically distinct from McMichael's Armstrong Series. According to Henderson (1986) some of the important characteristics of this series were alluded to in McMichael's (1965; n.d.) description of Armstrong ceramics, but were never adequately described. Lick Creek Cordmarked ceramics are reported to represent McMichael's second "type" of Armstrong ceramics. The Lick Creek Series was created to designate the thicker (2 mm), predominately cordmarked siltstone tempered ceramics which appeared to have been in use during late Middle Woodland to Late Woodland times. Lick Creek Plain ceramics were markedly different from McMichael's Armstrong Plain. In addition to vessel wall thickness, these differing attributes included paste characteristics, vessel wall thickness, surface treatment and lip/rim forms.

Recent excavations at the Woods site (46MS14) and the Niebert site (46MS103) led to the identification of a new provisional ceramic series; Woods Series, with Plain and Cordmarked types (Nancy O'Malley personal communication 1989). These two sites are located approximately 10 miles north of the Greenbottom. Both sites exhibited that the siltstone tempered sherds were associated with Late Woodland occupations. In addition, sites within the Greenbottom Mitigation Project area contained Woods Series ceramics associated with Late Woodland occupations.

CHRONOLOGICAL POSITION: If it is assumed that this ware group represents the Woods Series then the assemblage would be placed in a late Middle Woodland/Late Woodland context. Radiocarbon dates from features 3, 73 and 153 at the Niebert site, which contained Woods Series ceramics, produced uncorrected dates of 780 A.D. $\pm$ 50 (Beta 20927), 925 A.D. $\pm$ 50 (PITT-0315) and 745 A.D. $\pm$ 70 (PITT-0316), respectively. Furthermore, acceptable uncorrected radiocarbon dates from the Woods site for Woods Series ceramics ranged from 830 A.D. $\pm$ 60 (Beta 27282) to 1040 A.D. $\pm$ 60 (Beta 27285). The Woods site also produced two early dates which have not yet been explained adequately. It is possible that Woods Series ceramics have an even greater chronological range than stated above. These two early dates are A.D. 570 $\pm$ 60 and 510 $\pm$

50 (Beta-27284 and 27283, respectively).

PROJECT SITE COMPARISONS: Siltstone tempered wares were recovered from sites 46CB41, 46CB90, 46CB92, 46CB98 and 46CB99. They were initially described above in terms of three surface treatments; plain, cordmarked and smoothed cordmarked. As was the case with the other ware groups defined on the basis of tempering materials, an examination of each of these surface treatments was performed for several reasons. The first was to determine whether partial smoothing of the cordmarked vessels was the intent of the potter to create a plain or well-smoothed exterior surface. Similarly, this surface treatment could have been a distinct exterior surface treatment with chronological or cultural implications or could have been unintentional smoothing of the cordmarkings by the prehistoric potter. In any case, there was a continuum in the degree of smoothing on the sherds from very well-smoothed exhibiting only faint rippling of the surface and poorly-smoothed surfaces for the entire assemblage.

An examination of the data suggested that the siltstone tempered sherds were part of the same series regardless of surface treatment or site. The cordmarked (N=5) and smoothed cordmarked (N=61) sherds were most alike in temper size and body sherd thickness. Subtle differences did exist primarily between the plain (N=26) versus the cordmarked/smoothed cordmarked assemblages. These differences consisted of a slightly smaller average mean temper particle size and an approximately one cm thicker body sherd thickness for the cordmarked/smoothed cordmarked specimens. This would suggest that the smoothed cordmarked sherds should be included with the category of cordmarked sherds; however, their slight morphological differences from the plain sherds should not be overemphasized.

PROBABLE RELATIONSHIPS: No attempt was made to equate the Greenbottom siltstone tempered sherds with any defined type or to define a new type. The Greenbottom siltstone tempered sherds resembled several of the types discussed above but the size of the assemblage precludes any precise assignment.

Sandstone

GEOGRAPHICAL RANGE: The Buck Garden Series (McMichael 1965) included the use of sandstone as temper, but could also include flint and limestone tempering materials. McMichael noted few significant differences between the sandstone, limestone and flint tempered pottery and felt justified in combining these various tempered ceramics into one series. Maslowski's (1985:27) reanalysis of McMichael's data and ceramic assemblages from several of McMichael's Nicholas County sites revealed that limestone was actually the dominate (56.5%) temper in the Buck Garden Series. Sandstone and flint tempered ceramics made up 33.4% and 10.1% of the total Buck Garden ceramic Series, respectively. Based on Maslowski's (1980, 1985) findings and the generally inadequate definition of Buck Garden ceramics, it was very difficult to make accurate comparisons of Buck Garden with other ceramics. McMichael (1965) defined his Buck Garden Series as Late Woodland and radiocarbon dates from Buck Garden sites tend to support this temporal assignment (Maslowski and King 1983:73).

In eastern Kentucky, two sandstone tempered ceramic types, Johnson Plain and Levissa Cordmarked, were defined by Haag (1942:342-349) at the C and O

Mounds in Johnson County, Kentucky. The C and O Mounds dated to the Early Woodland Adena period. Unfortunately, these ceramic types have been applied uncritically throughout the region as a whole. Still, the fact remains that sandstone tempered ceramics are found in abundance throughout the Big Sandy River drainage. The predominate use of sandstone as tempering material in the Big Sandy drainage was probably related to the sandstone bedrock geology of the region and its close availability to Woodland potters rather than reflect any temporal development in temper choice.

Johnson (1982:780-802) described the sandstone tempered ceramics from the Paintsville Reservoir in Johnson and Morgan counties, Kentucky. Haag's types could not be assigned to these plain and cordmarked sherds even though they are located in the same area. Johnson (1982:790) dated the sandstone tempered assemblage to the late Early Woodland/late Middle Woodland periods.

At the Dow Cook site (15LA4), Cultural Resource Analysts' personnel recovered a partially reconstructable vessel from feature 43 that has aided in the definition of a new provisional type; Blaine Cordmarked. Two radiocarbon samples obtained from the feature yielded uncorrected dates of A.D. 530 $\pm$ 80 and A.D. 570 $\pm$ 45 (PITT-233 and PITT 234, respectively). Thus, there is a growing body of evidence to support Johnson's temporal assessment for this particular ceramic type.

CHRONOLOGICAL POSITION: It is assumed these sherds date to the Late Woodland.

PROJECT SITE COMPARISONS: Three sites in the project area produced sandstone tempered sherds; 46CB41, 46CB15 and 46CB90. As with the siltstone tempered sherds, the sandstone cordmarked (N=2) and smoothed cordmarked (N=2) were most alike and were slightly different from the plain (N=2) surfaced sherds. Some of the differences included much larger (1-5 mm) average mean temper particle size and much thicker (5-10 mm) average body sherd thickness for the cordmarked/smoothed and cordmarked sherds. Intersite comparisons were difficult because of the small sample size. One plain surfaced sherd was recovered from both 46CB41 and 46CB90. These two sherds were very similar and argue that the plain sandstone tempered sherds could be included in the same series. One sandstone tempered cordmarked sherd was recovered from both 46CB41 and 46CB15. These sherds exhibited many dissimilarities. First, the sherd recovered from 46CB15 exhibited two ply S-twist crisscrossed cordmarkings, large sandstone particles (5.35 mm), and was relatively thin (5.15 mm). The sherd recovered from 46CB41 displayed two ply Z-twist cordmarkings, smaller sandstone particles (3.08 mm), and was relatively thick (10.66 mm). Consequently it would appear that these two sherds do not belong to the same ceramic series.

PROBABLE RELATIONSHIPS: Again, the sandstone tempered wares recovered at Greenbottom conformed to several of the definitions above; however, the size of the assemblage made any assignment to a definite type difficult, if not impossible.

Limestone

GEOGRAPHICAL RANGE: Two defined ceramic types are most pertinent to the discussion of predominantly limestone tempered sherds: Buck Garden and Newtown.

Buck Garden Series ceramics have been described above and need not be reiterated here.

McMichaels (in Railey 1984:132-135) defined Newtown based on ceramic collections from Turpin (Starr 1960; Oehler 1973; Riggs 1980, 1986) and Sand Ridge (Starr 1960; Riggs 1980, 1986) in Hamilton County, Ohio. Many other sites in the area which had Newtown ceramics have been investigated since this time. They include Gillespie (Henderson 1987), Pyles (Railey 1984), Bentley (Henderson and Pollack 1982, 1985), Rogers (Pollack 1983), Hanson (Ahler 1988) and Leonard Haag (Reidhead and Limp 1974). Although there were very subtle differences between the assemblages from each of these sites Henderson (1989:366) concluded that:

> these sites in the middle Ohio River valley have produced such a regionally homogeneous ceramic tradition, aside from choice of preferred temper (which can be explained by differential access to different resources within a localized area along with particular site inhabitants' preferences), suggests that the inhabitants of this area may have been in close communication with each other and/or interacted with each other frequently.

Unlike the sites mentioned above, the limestone tempered sherds from 46CB41 and 46CB100 exhibit more than subtle differences with the Newtown Series ceramics as defined by McMichael (1984). The most pertinent differences were the absence of angular shoulder forms and the predominance of two ply Z-twist cordmarking over S-twist cordmarking.

CHRONOLOGICAL POSITION: It is assumed these sherds date to the Late Woodland.

PROJECT SITE COMPARISONS: Limestone tempered sherds were recovered from two sites in the project area, 46CB41 (N=210) and 46CB100 (N=2). Intersite comparison of these assemblages was difficult due to the marked disparity between the sample sizes. It may suffice to report that the plain (N=1) and cordmarked (N=1) sherds recovered from 46CB100 revealed no obvious contrasts with those sherds recovered from 46CB41.

Comparisons of the plain (N=51), cordmarked (N=20) and smoothed cordmarked (N=141) suggested that this assemblage probably represented a single ceramic series. Temper, texture, paste, thickness and other morphological attributes were very comparable for the three surface treatment assemblages.

PROBABLE RELATIONSHIPS: The size of the limestone tempered assemblage made any assignment to a definite type difficult. This is particularly true since the assemblage lacks salient morphological characteristics, such as Newtown's characteristic angular shoulders, that would have made an assignment to a specific ceramic series or type more positive.

CHERT

DISCUSSION: Only three plain and six smoothed cordmarked, chert tempered, sherds were recovered from 46CB41. Unfortunately, the size of the assemblage and the lack of diagnostic rim, lip, shoulder and basal forms hindered our

ability to assign the sherds to a type or series and were left untyped.

QUARTZ

DISCUSSION: Very little can be said concerning the plain (N=1) and smoothed cordmarked (N=11) sherds that contained quartz as their primary temper. Two ceramic assemblages from sites in the immediate vicinity contained sherds which included quartz or quartzite particles as a tempering agent. At Weed Shelter (46CB56), 15% of the ceramic assemblage was tempered with quartz or grit (Kuhn, et al. 1978:21). The authors assigned these sherds to an Early Woodland type. Also, a small number of sherds at least partially tempered with quartz were recovered from the Late Woodland Childers site (46MS121). These sherds were included in the grit tempered category. The exact number of sherds that included quartz particles was not given (Marwitt et al. 1986:11-13; Maslowski and Dawson 1980); however, grit tempered sherds comprised approximately 25% of the total ceramic assemblage from this site. The poor quality (lack of rims, bases, etc.) of the quartz tempered ceramic assemblage from Greenbottom precluded any assignment to type.

SHELL

DISCUSSION: Several shell tempered ceramic series have been defined for the region. Griffin (1966) has defined several plain and cordmarked, shell tempered ceramic types for the Middle Ohio River Valley. It is important to note that his type definitions are most applicable to whole vessels. The definitions provide little or no help when one has only a collection of assorted sherds to sort and type. They included Baum, Feurt, Proctorville, Anderson, Madisonville and Fox Farm cordmarked types and Madisonville plain. Other than incorporating the same type of tempering material, the Greenbottom shell tempered ceramic assemblage was difficult to compare to any of these types.

Shell tempered ceramics were recovered from five sites; 46CB40, 46CB41, 46CB92, 46CB98 and 46CB99. The most obvious result of this analysis proved that site 46CB92 contained only plain surfaced sherds. Similarly, the shell tempered sherds from 46CB41 were predominantly plain surfaced with one additional well-smoothed cordmarked sherd observed. In contrast, the sherds from site 46CB40 were predominantly smoothed cordmarked. Little could be said about the trends in exterior surface treatment for the other sites because of the small sample size. Very little can be said about comparing the possible variability in recognizable vessel forms from the sherds recovered from each site. Only one definite salt pan rim sherd was observed within the assemblage from 46CB40. Bowl shapes and globular jar shapes were also represented in the 46CB40 assemblage; and a possible jar shape with a rounded shoulder was observed within the assemblage from 46CB98. With regard to sites 46CB98 and 46CB99, the shell tempered ceramic sherds very likely originated from 46CB40 and were deposited on these sites through plowing activities. In the case of site 46CB98, there may be more to the presence of shell tempered ceramics on the surface. During the pedestrian survey of this site a moderate density of mussel shell was exposed by the plow. In addition, the topographic nature of this site, a well-developed levee extending to the southwest off of the main village of 46CB40, may prove to be a previously unrecognized extension of this site. Only further excavations will assist in the interpretation of this site as it relates to Clover.

Leached/No Temper

DISCUSSION: A total of fifty leached and three sherds with no temper made up this final ceramic group. Leached tempered sherds were recovered from 46CB15, 46CB40, 46CB41, 46CB90 and 46CB98. Sherds with no temper were recovered from site 46CB40. In the first ware group, temper particles had been leached out of the sherds, leaving empty angular holes in the paste. The temper was most likely siltstone, for the reason that several sherds which originally appeared to also have leached temper exhibited remnants of siltstone in the cavities upon closer inspection. These sherds were included with the siltstone ware group. The sherds that did not exhibit siltstone remnants were dumped into the leached ware group. Only three of the sherds did not exhibit temper in their paste even after breakage. Because of the small size of the assemblage not attempt was made to type these sherds.

FIRED OR BURNED CLAY

A total of 27.3 g of fired or burned clay were recovered from one auger hole and three test units at 46CB41. These fragments were defined on the basis of their amorphous, rounded shape, lack of temper particles in the paste and their brittle texture and fire reddened color. Fired or burned clay fragments are often found in features and may be related to hearth construction and use. They may also be remnants of daub (clay packed onto the walls of structures) from burned wattle and daub structures; however, there were no linear impressions in the burned clay specimens. These impressions commonly resulted from sticks or grasses incorporated into the spaces between the larger posts of the structure onto which the clay was packed, or included in the daub itself.

Summary and Conclusions.

The ceramic assemblage from site 46CB41 comprised more than 75.0% of all the sherds that were recovered from the study area sites. Limestone tempered sherds accounted for more than 50.0% of the site assemblage. Limestone tempered ceramics also represent more than 40.0% of all sherds recovered from the study area sites.

The ceramic data from 46CB41 indicate that the Late Woodland period occupation(s) was dominate. The relatively sparse presence of shell tempered sherds suggests a less intensive Late Prehistoric occupation/use of 46CB41. Limestone tempered sherds were also recovered from site 46CB100 and may be related to the ceramic series at 46CB41. Limestone tempered cordmarked sherds from both sites exhibited predominately two ply Z-twist cordage impressions.

The second most frequently occurring ceramic series recognized were those which were tempered with shell. Surface treatments include plain and cordmarked, and eroded sherds whose surface treatments could not be determined. The majority of the shell tempered sherds were recovered from site 46CB40 (Clover site) which was a known Late Prehistoric/Protohistoric village site. Additionally, shell tempered sherds were recovered in relatively high percent-

Table 12. Count and frequency of cordage twist characteristics by provenience and by time period.

	Z-twist		S-twist	
Provenience	#	%	#	%
46CB40				
surface	13	92.85	1	7.14
46CB41				
Auger 40N/80E			1	100.00
72N/20E, lev 2	5	100.00		
76N/20E, lev 2	4	100.00		
lev 3	4	80.00	1	20.00
80.60N/ 13.35W, lev 2	1	100.00		
80N/20E, lev 2	2	100.00		
lev 3			1	100.00
80N/19E, lev 1	1	100.00		
76N/3E, lev 2			4	100.00
Total	17	70.83	7	29.17
46CB15, riverbank profile			2	100.00
46CB90, surface	1	100.00		
46CB92, surface			1	100.00
46CB98, surface	2	100.00		
46CB100, surface	1	100.00		
Project Total	34	75.56	11	24.44

ages from sites 46CB92, 46CB98 and 46CB99.

Siltstone tempered sherds represented more than 18.0% of all sherds recovered from the study area sites. With the exception of sites 46CB15, 46CB40 and 46CB100, siltstone tempered sherds were present on all sites in varying proportions. Sandstone tempered sherds were relatively underrepresented; however, one sandstone tempered, cordmarked sherd exhibiting S-twist cordage impressions was recovered from site 46CB15 and is representative of at least one Late Woodland occupation. Small numbers of sherds with various combinations of temper types, predominantly grit, chert, sandstone, and siltstone were also recovered. Some sherds were recovered in which the particles had leached out leaving angular holes in the paste. Although we cannot determine what temper had been used in ceramic manufacture, it is highly likely that it was limestone or siltstone.

According to Maslowski (1984), cordage twist preference is a culturally learned attribute and can reflect culturally related populations. The predominance of the identifiable Z-twist cordage impressions (74.42%, N=32; Table 12) at the Greenbottom sites was consistent with our expectations for these sites. It appears that two-ply Z-twist cordage impressions were culturally continuous over time, spanning the Late Woodland (46CB41) through the protohistoric (46CB40) time periods (Table 12). Of the sherds from 46CB41 recovered in test pits from proveniences below level 1, it is possible if not likely that many of these came from the same vessel, thereby inflating the two ply Z or S-twist cordage counts. With the exception of sherds recovered from 46CB41, all of the pottery obtained during this investigation was recovered from surface contexts.

Table 12 (continued). Count and frequency of cordage twist characteristics by provenience and by time period.

	Z-twist		S-twist	
	#	%	#	%
46CB40 Woodland Late Prehistoric	13	92.85	1	7.14
46CB41 Woodland Late Prehistoric	17	70.83	7	29.17
46CB15 Woodland Late Prehistoric			2	100.00
46CB90 Woodland Late Prehistoric	1	100.00		
46CB92 Woodland Late Prehistoric			1	100.00
46CB98 Woodland Late Prehistoric	2	100.00		
46CB100 Woodland Late Prehistoric	1	100.00		
Project Total	34	75.56	11	24.44

HISTORIC MATERIALS RECOVERED

A total of 2,785 historic artifacts and artifact fragments were recovered during the investigation of the Greenbottom sites. There was also a sum of 1195 grams of faunal material recovered from site 46CB41. The assemblage includes artifacts that have been assigned to kitchen, architectural, furniture, arms, tobacco, clothing, personal, activity and miscellaneous groups (after South 1977). These groups and the artifacts assigned to each are described below. Generic descriptions of historic material artifact types were taken from Niquette and Hand (1987), Niquette et al. (1988) and from Genheimer and Hughes (1988).

Kitchen Group

The ceramic inventory consisted of 280 sherds. Eight different ware groups were represented, including whiteware, pearlware, ironstone, porcelain, yellowware, redware, buff bodied earthenware and stoneware. Whiteware, pearlware, ironstone and porcelain constitute the late refined wares which account for 82.86% of the ceramic inventory. The predominance of whiteware (91.37% of the refined wares) was predictable, since it was the daily-use tableware during the period of the site occupation. Stoneware, earthenware and yellow ware include utilitarian vessels for food processing and storage. In general, these wares represent a different set of activities than do the refined wares. The patterning of stoneware, earthenware and yellow ware (17.14% of the ceramic assemblage) can be expected to reflect functional variation on an intrasite basis. Container glass comprised 61.87% of those artifacts included in the kitchen group. Kitchen group artifacts are described below. Ceramic artifacts were first broken down by ware group and further divided by decorative type.

Whiteware. As a ware group, whiteware includes all refined earthenware exhibiting a dense, relatively non-porous, white to grayish-white clay body. Undecorated areas on dishes exhibit a white finish under clear glaze. This glaze is usually a variant combination of feldspar, borax, sand, nitre, soda and china clay (Wetherbee 1980:32). Small amounts of cobalt were added to some glazes, particularly during the period of transition from pearlware to whiteware and during early ironstone manufacture. Some areas of thick glaze on whiteware may therefore exhibit bluish or greenish-blue tinting. Weathered paste surfaces are often buff or off-white and vary considerably in color from freshly exposed paste.

Most whiteware produced before 1840 had some kind of colored decoration. These decorations are often used to designate ware groups, i.e., edgeware, polychrome, and colored transfer print. Most of the decorative types are not, however, confined to whiteware and taken alone are not particularly accurate temporal indicators or actual ware group designators (cf., Price 1981).

The most frequently used name for undecorated whiteware is the generic "ironstone", which derives from an "Ironstone China" patented by Charles Mason in 1813 (Mankowitz and Hagger 1957). Ironstone is theoretically harder and more dense than whiteware produced prior to about 1840. Manufacturer variability is, however, considerable and mitigates against using paste as a

definite ironstone identifier or as a temporal indicator. Consequently, without independent temporal control, whiteware that is not ironstone is difficult to identify, as is early versus later ironstone. Some producers have changed standard forms and pastes very little since 1850. In some cases, marks were not changed over a 90-100 year period (Fischer 1978:263; Noel-Hume 1976: 131). Wetherbee suggests that British ironstone produced during the 1840's and 1850's was thinner and exhibited a more bluish-white glaze cast as opposed to later American and post Civil War British wares (Wetherbee 1980).

Seven decorative types are represented among the whiteware sherds collected. The most frequently occurring type is transfer printed whiteware (N=23). Of these, blue transfer printed wares were the most common (N=12), followed by pink/green (N=5), red (N=4) and violet (N=1). Other decorative types in the collection include flow blue (N=1), blue shell edge (N=5), hand-painted blue and polychrome (N=4), banded (N=3), lustre (N=2),and molded (N=2). Each of these types and the undecorated whiteware sherds recovered are discussed below.

Edge Decorated Whiteware (N=5)

All edge decorated whiteware rimsherds recovered were blue shell edge, either with or without molding. This decorative type is a continuation of the edge decoration most prevalent on pearlware plates and first appeared circa 1779 (Noel-Hume 1978:45). It can occur with or without other decorations, such as hand painting or spatter decorations; these usually occur on plate bottoms (Greaser and Greaser 1967). Later ironstone plates generally exhibit only the edge decoration. This decorative type was relatively rare at the Jenkins site and all specimens were plate rims. Where the sherds were large enough to tell, the molding on the specimens included within this group was variable. Of the four edge decorated sherds collected from 46CB41, one sherd had a scalloped rim with curved impressed lines and three were unscalloped and unmolded. According to a recent study of shell edged ceramics by George L. Miller (n.d.), the former type of decoration was common between 1795 and 1845. Miller suggests a mean date of 1817 for this rim treatment. One edge decorated sherd recovered from 46CB103 also exhibited this rim treatment. As shown in Table 13, Miller believes that the sherds with unscalloped and unmolded rims reflect a more recent mean production date of 1879.

Noel-Hume (1978:45-46) provides additional insights into molded varieties of shell edge that were in production during the 1820's. The contrast between this more elaborately molded and more carefully painted style with other varieties is described by Noel-Hume as follows.

> At the outset, the painting of the rims harmonized with the grooved modeling of the shell edge, the brush strokes being carried to the center so that a feathering effect was achieved...Before long, the painters...simply placed the brush at right angles to the rim and applied a stripe as the plate was rotated. This technique was still being used well through the second quarter of the nineteenth century, though the latest examples were generally not on pearlware, but on

Table 13. Date ranges for the periods of highest popularity and production for the different types of shell edge decorated pearl and white-wares. From George L. Miller (n.d.:Shell edge study in progress).

Rim Type	Mean Beginning and End Dates		Mean Date	Range of Production
Rococo	1788	1812	1800	1780-1820
Scalloped rim impressed curved lines (1)	1802	1832	1817	1795-1845
Scalloped rim impressed straight lines (2)	1809	1831	1820	1795-1840
Scalloped rim impressed bud (3)	1813	1834	1823	1800-1850
Embossed patterns (4)	1823	1835	1829	1820-1845
Unscalloped impressed rim pattern (5)	1841	1857	1849	1825-1891
Unscalloped unmolded (6)	1874	1884	1879	1850-1897

harder and coarser whiteware that succeeded it.

This contrast in edging styles does not, however, permit unquestionable dating of edge-decorated rims.

A study by Sussman (1977:108) indicates that even for the nineteenth century pearlware, "The degree of sharpness of the molded relief was not helpful in dating shell edge dinner ware." Sussman (1977:108) notes that the simpler and more stylized shell edge versions were occurring as early

as the eighteenth century and by the end of the pearlware production period, variation in design was significant. It is reasonable to suggest that the degree of refinement on late nineteenth century edge decorated whiteware is related more to retail price than to temporal change.

DISTRIBUTION: 46CB41 (N=4) 46CB103 (N=1)

Transfer Print Decorated Whiteware (N=23)

By the late 1780's transfer printing was being developed among the Staffordshire, England potteries as a fast and inexpensive method of mass-producing decorated pearlware and whiteware. It was originally perfected circa 1756 for use on porcelains; however, it was not used on earthernwares until Thomas Minton circa 1780 designed his blue willow pattern which instigated a wider commercial use (Norman-Wilcox 1978) (Little 1969:15-17 in Majewski and O'Brien 1984). The process is described as follows.

> The required pattern is first engraved by hand on a copper plate, from which a tissue-paper print, called a "pull" or "proof" is taken. Then, by pressing the tissue against a piece of undecorated ware, the design is deposited or transferred to the surface of the article. Glazing and baking complete the process (Norman-Wilcox 1978:167).

According to Hughes and Hughes (1968:150) and others (cf., Godden 1963:113), blue was the dominant color of transfer printed wares prior to the 1830's. With advances in ceramic technology, brown and black prints appeared after 1825, and by 1830, green, red, pink, mulberry, and light blue were being produced (Bemrose 1952:23; Little 1969:13-22; Wetherbee 1980:15). By the late 1840's, a technique for transferring more than one primary color to a vessel was perfected (Godden 1965:xx).

Early patterns include the willow pattern and other chinese design motifs. Although some Chinese-style motifs were still being used, the use of classical and romantic scenic themes became popular in the early nineteenth century. These patterns included country scenes, floral motifs, and travel scenes. Patterns depicting American buildings and scenery were popular after 1812. (Little 1969:25-26 in Majewski and O'Brien 1984) The patterns on these sherds were suggestive of prints of the early nineteenth century (Price 1979:19). The transfer printed designs use country scenes and floral motifs.

DISTRIBUTION:

Blue:	46CB41 (N=11)	46CB103 (N=1)
Red:	46CB41 (N=2)	46CB103 (N=3)
Violet:	46CB100 (N=1)	
Pink and Green:	46CB41 (N=5)	

Flow Blue Decorated Whiteware (N=1)

Flow blue decoration is a variant of transfer printing, and was popular from 1830 to 1860 (Price 1979:21-22). The peak period of production was apparently 1850 to 1860 (Freeman 1954:8). Later varieties occurred; however, they are not normally found on whiteware bodies and often exhibit gilding or molding. Flow blue, along with flow mulberry, black, yellow, brown and green appear most frequently on ironstone wares (Collard 1967:118 in Majewski and O'Brien 1984) Little (1969:21) indicates that "flowing" or "flown blue" was developed in England during the 1820s.

The term "flow blue" is derived from the fact that the transfer print, or other underglaze decoration, actually flows or blends with the clear glaze during the glost firing. The effect is a blurring of print or hand-painted details, and a deep creamy glaze. Many have attributed its success to the reduction in the mechanical effect of the print. The "flowing" was obtained by placing either a flow powder or cups of a flow liquid in the saggers during the glost firing. The "flowing" compound was usually a volatilizing mixture such as lime or chloride of ammonia, which would evolve chlorine at the glost firing temperature. As chlorine evolved from the mixture, it combined with the cobalt glaze, in effect rendering it soluble in the glaze (Dodd 1964:117; Little 1969:21).

DISTRIBUTION: 46CB103 (N=1)

Hand-Painted Whiteware (N=4)

Hand-painted (underglaze) decorations were applied to whitewares immediately after their introduction in the first quarter of the nineteenth century. Blue was the most frequently used color, although pinks and greens were also used. The dominant motifs were banding, usually surrounding the rim, and floral designs. When only one color was utilized, blue (cobalt oxide) was typically selected. Again, only colors capable of withstanding the heat of the glost firing could be applied. Greaser and Greaser (1967) reported that children were utilized by some Staffordshire potteries to produce hand-painting on ceramics. Price (1979:21) suggested a ca. 1830-1860 time frame for hand-painted ceramics recovered in Missouri, and Garrow and Wheaton (1986:Appendix 2, Page 6) utilized a 1830-1875 manufacturing range. The term "polychrome" refers to the use of more than one color in hand painting. Green, brown, yellow, and pink were most frequently combined. Of the three hand-painted sherds collected from 46CB41, one sherd exhibited polychrome hand-painted decoration.

DISTRIBUTION: 46CB41 (N=3) 46CB103 (N=1)

Banded Whiteware (N=3)

Banding occurred on creamwares in the eighteenth century and on pearlwares as early as 1795 (Hume 1969:131). When whiteware began to supplant pearlware in the 1820s, the use of banding was continued. Banded whiteware, or "annular ware", as it is often referred to, consists of horizontal rings or concentric bands of color or slip around the vessel exterior. The slip was applied with

a stationery quill or set of quills, through which the clay suspension was drawn (Hughes and Hughes 1956:136). The banding was often utilized in conjunction with colored glazes and decorative motifs such as "cat's eye", "earthworm" (finger-painted), and mocha. The latter was incorporated into earlier styles (Van Rensselear 1978:240).

Those English potters who immigrated to the United States in the 1830s and 1840s continued to manufacture banded or annular ware; however, stoneware and yellow ware were the common paste types. The production of American yellow ware, in particular, incorporated many of these designs; banding, "cat's eye", "earthworm", and mocha (dendrites) motifs were utilized, often more than one on the same vessel.

DISTRIBUTION: 46CB41 (N=2) 46CB103 (N=1)

Lustre Whiteware (N=2)

The application of metallic decoration was not attempted in England until the early nineteenth century (Godden 1965:xxiv). Basically it was an English commercial adaptation of Hispanic-Moresque pottery (Hughes and Hughes 1956:103); a thin deposit or wash of metal resinates was applied to the body, resulting in a metallic or iridescent sheen. After 1810, the majority of decorated lustre wares were prepared by the resist method. The vessel was painted with wax or other resistant medium and then brushed with the lustre resinate. Those parts which had been waxed would not take up the resinate. Other decorations, often transfer printing or painting in purple lustre or polychrome enamels, were restricted to unlustred reserves. The color of the lustre often depended on the color of the body. The metallic films were transparent and appeared lighter on light colored bodies. Silver lustre was produced with platinum and was introduced as early as 1805 by Wedgwood (ibid.:103). It appeared mostly on teapots and candlesticks, and was actually an imitation of real silver (Lewis 1950:33). Gold produced a pink or copper lustre, depending on the number of washings and the color of the body. It was introduced by 1807. Nine carat gold lustre was termed copper lustre. True copper lustre, utilizing a copper resinate, was produced from 1804 (Hughes and Hughes 1956:103). Lustre decorations range from a complete body wash to the application of a single rim band. Freeman (1954:8) indicated that "lustre" decorations generally dated from 1855 to 1865 on ironstone/whiteware. Two lustre decorated whiteware sherds were recovered, one of which exhibited underglaze transfer print with overglaze lustre decoration.

DISTRIBUTION: 46CB41 (N=2)

Molded Whiteware (N=2)

This term was utilized to indicate otherwise plain, undecorated whiteware that exhibited some form of molding or embossing. While many vessel forms, particularly hollow wares, were molded during production, molded whiteware refers to the inclusion of an embossed, recognizable design or pattern to the exterior body. Molding designs was not new to the nineteenth century, although the technique was not as popular during the peak period of production for transfer prints (1820-1840). In the 1840s and 1850s, the molding of whitewares was common; angular and sculptured forms prevailed. By the 1860s,

the molding had become weaker and more pastoral, and during the 1870s and 1880s, the molding occupied less and less of the vessel (Wetherbee 1980).

DISTRIBUTION: 46CB41 (N=1) 46CB95 (N=1)

Plain Whiteware (N=182)

This ware type includes dishes with no colored decoration. Whiteware can frequently exhibit some form of molding or embossing. Molded designs were simplified on pearlware as transfer printing became popular. It was revived with the introduction of ironstone in the late 1830's, but did not attain the elaborateness of previous forms. Specialized moldings for ironstone were common in the 1840's, when the ware had a more limited and generally more affluent market. During the 1860's molding tended to become more soft and shallow relief as opposed to the angular and sculpted forms of the 1840's and 1850's (Wetherbee 1980). During the 1870's and 1880's, molded decorations occupied smaller areas on dishes, with elaboration confined to handles and lids. British stylistic trends dominated the embossed and molded ironstone industry throughout most of the nineteenth century (Wetherbee 1980).

DISTRIBUTION: 46CB41 (N=170) 46CB94 (N=2) 46CB96 (N=2) 46CB99 (N=1)
46CB100 (N=3) 46CB103 (N=4)

Ironstone. Ironstone, a highly refined, vitreous, opaque earthenware with a clear glaze, is often indistinguishable from whiteware, particularly when sherds are being viewed. Ironstone differs from whiteware in that the body is more vitreous and dense and a bluish tinge or a pale blue-gray cast covers the body. In some cases, a fine crackle can be seen in the glaze (Denker and Denker 1982:138); however, this condition is not restricted to ironstones. Classification of white bodied earthenwares is further compounded by the use of the term as a ware type or trade name. Both ironstones and whitewares were marketed with names such as "Patent Stone China", "Pearl Stone China", "White English Stone", Royal Ironstone", "Imperial Ironstone", "Genuine Ironstone", "White Granite", and "Granite Ware" (Gates and Ormerod 1982:8; Cameron 1986:170). These names do not imply that true ironstone was being manufactured. Some investigators avoid the distinctions entirely by including ironstones as a variety of whiteware, while Wetherbee (1980) adopted the opposite course, referring to all nineteenth century white bodied earthenwares as ironstone.

Charles James Mason is usually credited with the introduction of ironstone (referred to as Mason's Ironstone China) in 1813 (Dodd 1964:176), although others, including the Turners and Josiah Spode, produced similar wares as early as 1800 (Godden 1965:xxiii). This early phase of ironstone production was instigated by British potters as a competitive response to the highly popular oriental porcelain. The ironstone of this early phase bears a faint blue-gray tint and oriental motifs much like chinese porcelain. A second phase of ironstone was prompted after 1850 in response to the popularity of a hard paste porcelain being produced in France. This variety of ironstone reflected the gray-white color of French porcelains. While some ironstones continued to use oriental design motifs, the general trend was toward undecorated or molded ironstones (Collard 1967:125-130;Lofstram et al. 1982:10 in

Majewski and O'Brien 1984). Ironstone continued to be produced in England, and after 1870 it was manufactured by numerous American concerns. Majewski and O'Brien (1984) report that by the late 1800's thick, heavy ironstones were losing popularity and began to be equated with lower status (Collard 1967:135 in Majewski and O'Brien 1984). Its production all but ceased by the second decade of the twentieth century (Lehner 1980:11).

Ironstone is typically thicker than whiteware, and was utilized for dinner plates, platters, pitchers and sanitary ware. A total of two undecorated ironstone sherds were recovered from site 46CB41.

DISTRIBUTION: 46CB41 (N=2)

Pearlware. The British potter Josiah Wedgewood is credited popularly for the invention and naming of pearlware (Noel-Hume 1972:232; Price 1979:10)). "Pearl white", as Wedgewood referred to his new ware as early as 1779, is a late refined earthenware which exhibits a white paste and clear lead glaze to which a small amount of cobalt was added. Pearlware differed from creamware largely because the former's whitened body and its bonding acceptance of blue painting and blue printing (Noel-Hume 1972:232-233). According to Noel-Hume (1985:129-133), pearlware "is the most common ceramic item found on sites of the early nineteenth century. It can readily be distinguished from late creamware by the way in which the glaze appears blue in crevices of footrings and around handles." Although puddling is one characteristic of pearlware, it also may appear on early whiteware sherds. The primary distinguishing characteristic of pearlware is the presence of an overall blue or bluish-green cast (Lofstram 1982:6; Price 1979:13-14 in Majewski and O'Brien 1984). The popularity of British pearlware began to diminish by the 1820s, being replaced by especially locally made, hard whitewares. Vessel forms manufactured from pearlware were highly variable but shell-edged plates with either blue or green painted rim designs and pearlware mugs, jugs, and bowls with annular rings running parallel to the rims were particularly common. All of the pearlware sherds recovered from the Greenbottom sites were undecorated.

DISTRIBUTION: 46CB41 (N=3) 46CB103 (N=2)

Porcelain. Porcelain is the name given to the high-temperature fired, translucent Chinese ware introduced to Europe by Portuguese sailors in the sixteenth century. The formula for true, or feldspathic porcelain was not discovered in Europe until 1708, and not marketed until 1713 (Boger 1971:266). The production of true porcelain was limited to three factories in England; all other products were softer porcelains made with glass, bone ash, or soapstone. Bone china became the preferred product after 1800, since it was harder and cheaper to produce than the other two formulas (Mankowitz and Hagger 1957:179). Among the more affluent households, porcelain was a common tableware used during the 18th and 19th centuries (Fay 1986:69).

Porcelain production in America was not successful until 1826 and the number of porcelain factories in the United States remained small through the nineteenth century. Bone china, which may contain as much as 40% bone ash, was also the most common porcelain manufactured in America

(Mankowitz and Hagger 1957:27).

DISTRIBUTION: 46CB41 (N=2)

Yellow Ware. Ramsay (1939:148) stated that yellow ware represents the transition from "pottery" to earthenware. The paste is finer than the coarse earthenwares but coarser than more refined earthenwares, such as whiteware and ironstone. Prior to the glost firing, the paste is a buff or cream color; however, the addition of an alkaline glaze creates a deep yellow upon firing. Yellow ware was universally a utilitarian ware; chamber pots, slop jars, urinals, mugs, pitchers, bowls, cuspidors, pie plates, food molds, and canning jars, were produced.

For the purposes of this study, yellow ware is assumed to be American, although it is realized that the wares were generally of English inspiration and that some English yellow ware was imported into this country. James Bennett, an English emigre who had just left Cincinnati in 1839, is generally credited with the introduction of American yellow ware to East Liverpool in 1840 (Stout 1923:16; Gates 1984:47). Vodrey and Frost of Pittsburgh were the first to produce yellow ware in the United States, perhaps as early as 1827 (Ramsay 1939:74). Yellow ware, produced in molds, was very susceptible to mass production, and other potters in Ohio, Vermont, and New Jersey opened factories in the 1840s. Ohio was one center of yellow ware manufacture, and it is estimated that in 1850, half of all U. S. yellow ware was manufactured in East Liverpool (Gates 1984:47).

East Liverpool manufacturers confined themselves to yellow ware and Rockingham production as late as 1872 (Gates and Ormerod 1982:5), but by 1880 it was being supplanted by the more refined whitewares. The peak period of production for American yellow ware appears to have been 1845 to 1875. Ramsay (1939:74-78) suggested a manufacturing range of 1830 to 1900. In Cincinnati, a mean date of 1860 was calculated for yellow ware production based on directory entries (Cinadr and Genheimer 1983).

Decorations on yellow ware were patterned directly after English banded and mocha wares (Denker and Denker 1982:134; Ketchum 1983:110). Bands of colored slip surrounded the vessel, and "cat's eye", "earthworm" and "seaweed" (mocha) often were enclosed. Brown, blue and white slips were common. The "cat's eye" and "earthworm" motifs were typically finger applied and were generally swirled around the vessel in a curvilinear fashion. Mocha ware was characterized by dendritic patterns formed by applying a mixture of pigment (usually brown, but blue, green, and black were used) with tobacco juice and urine (or hops) to a damp slip (see Hughes and Hughes 1956:112; Cameron 1986:228). Feathery or moss-like patterns resulted as the mixture flowed. Mocha ware was named for its resemblance to the mocha stone or moss agate (Dodd 1964:182). Unfortunately, the term mocha ware has now come to include all banded wares (Foshee 1981:58-59, 112).

Rockingham is simply a mottled, brown-glazed yellow ware. It is sometimes referred to as Bennington ware; however, it was manufactured throughout the eastern United States. A glaze of pure oxide of manganese produced a brown or purple brown tint; a mottled or streaked effect resulted (Hughes and Hughes

1956:130). Originally, Rockingham ware referred to ornate porcelain manufactured between 1826 and 1842 at Swinton, Yorkshire, England on the estate of the Marquis of Rockingham (Dodd 1964:232). Hence, the term is not actually paste specific; the characteristic glaze was applied to redwares, whitewares, porcelain, and yellow ware. Rockingham wares were introduced to the United States in about 1845 by Christopher Webber Fenton at Bennington, Vermont. Yellow ware potteries in East Liverpool and other parts of Ohio and the eastern United States, quickly took up its production. Bennington designs were closely copied in Ohio, including hound-handled pitchers, book flasks, picture frames, mugs, pie plates and milk pans (Ramsay 1939:76-77). During the mid-nineteenth century, both Rockingham and yellow ware were marketed as "Liverpool" ware and "Queensware" (Gates and Ormerod 1982:7). Yellow ware is rarely marked, although William Bromley, who operated potteries in Cincinnati and Covington during the mid-nineteenth century, included an elaborate molded mark on some of his finer Cincinnati pieces (Genheimer 1987).

Only five yellow ware sherds were recovered from the Jenkins Site excavations, and of these four were Rockingham decorated and one was undecorated. The one yellow ware sherd recovered from 46CB94 exhibited a colored glaze.

DISTRIBUTION: 46CB41 (N=5) 46CCB94 (N=1)

Buff Bodied Earthenwares. Buff/orange bodied earthenwares, coarse earthenwares, or coarse wares, as they are often called, exhibit soft, porous, non-vitreous, bodies (Dodd 1964:93). The paste was usually buff, although orange and red tints are common. Earthenwares were fired at low temperatures; a biscuit firing temperature of 1100-1150 degrees centigrade was sufficient. With the exception of flower pots, tile, and other non-kitchen vessels, buff-bodied earthenware was nearly always glazed. The most common glaze or coloring was manganese dioxide, which provided a sepia, or brown to black, lustre. Greens were also produced by using copper salts (Ramsay 1939:13-14). Buff bodied kitchen ceramics were usually utilitarian vessels; storage crocks, bowls, jars, pans and sanitary ware, were well represented. The interior was normally glazed on containers used for wet storage or transport.

Unfortunately, it is extremely difficult to date these earthenwares. Local potters produced earthenwares as early as the late eighteenth century, and their production continued through the nineteenth century. In most instances, however, they would have been replaced by the introduction of more refined earthenwares during the early to mid-nineteenth century. All of the buff-bodied earthenware sherds collected exhibited a brown glaze.

DISTRIBUTION: 46CB41 (N=2) 46CB94 (N=1)

Stoneware. Stoneware served as the "daily use" pottery of America, particularly rural America, after its introduction during the last decade of the eighteenth century. Stoneware is a vitreous, but opaque ware, manufactured of a naturally vitrifying fine, but dense, clay. The pottery was fired longer and to a higher temperature than earthenwares; a kiln temperature of at least 1200 to 1250 degrees centigrade must be obtained (Dodd 1964:274-275; Cameron 1986:319). As a result, stoneware exhibits a hard body and a very homogeneous texture. Its body is nonporous and well suited to liquid storage. It is not

a refined ware, and was typically utilized for utilitarian purposes; jars, churns, crocks, tubs, jugs, mugs, pans, and pots were produced. The paste may vary from grays to browns, depending on the clay source and length and intensity of the firing. Vessels were typically glazed; salt glazing and slip glazing were the most common.

Although salt glazing was practiced in England during the eighteenth century, it was not introduced to the United States until the early nineteenth century. Indeed, by 1780 the production of English salt glaze had been virtually supplanted by the manufacture of cream colored earthenwares (Lewis 1950:29). Salt glazing was accomplished by introducing sodium chloride into the kiln, where it quickly volatilized. The vapor reacted with the clay to form a sodium aluminum silicate glaze (see Billington 1962:210; Dodd 1964:239). The surface of the glaze is typically pitted. Stoneware may also be coated with a colored slip, a suspension of fine clay and a pigment. Slips are typically brown. The Albany slip, named after the particular source of slip clay, is most common (Denker and Denker 1982:82). Of the 22 stoneware sherds recovered from 46CB41, 18 were salt glazed, one was brown glazed, and three were unglazed, and all sherds were grey bodied.

DISTRIBUTION:

Gray bodied:			
salt-glazed:	46CB41 (N=18)	46CB96 (N=1)	46CB103 (N=4)
brown glazed:	46CB41 (N= 1)	46CB100 (N=5)	46CB103 (N=1)
pumpkin glazed:	46CB100 (N=2)		
unglazed:	46CB41 (N= 3)		
burned:	46CB100 (N=1)		
Brown bodied:			
salt-glazed:	46CB97 (N=1)		
clear glazed:	46CB94 (N=1)		
Buff-bodied:			
salt-glazed:	46CB103 (N=3)		
brown glazed:	46CB103 (N=1)		

Redware. This ceramic type was made from about 1730 up until 1840 and is the earliest type of pottery to be made in America. As an artifact category redware comprises a broad spectrum of specific paste and decoration variations. It is generally manufactured from rather unrefined materials and fired at relatively low temperatures. Decoration may take the form of colored slips, colored glazes, incisions, etc. Manganese-based glazes were typically used to produce hues such as brown and yellow, brownish-black and copper green (Ray 1974:184 in Majewski and O'Brien 1984). Since redware bodies tend to be quite porous, interior glazing is common on those vessels intended to hold liquids (Ramsay 1947:128 in Fay 1986). The lead glaze on redware affords the vessel a glossy surface finish that may be produced with a low firing temperature. Two brown glazed redware sherds were recovered from 46CB103.

DISTRIBUTION: 46CB103 (N=2)

Container Glass. Kitchen glass was sorted first by type and then by color. Identified types included container glass, molded/pressed tablewares, and miscellaneous glass items.

Machine made bottles exhibited either full body molding (seams extended from the body and over the lip of the bottle) or an Owen's suction scar on the base (see Jones and Sullivan 1985:38, Figure 22). Non-machine made bottles were typically fragmentary and exhibited some indication that they were not fully automatic containers. The presence of hinged or post bottom mold scars were one such indication. The category of hand turned lip bottles was also reserved for lip or bottle top fragments. Here, clear evidence of hand turning or tooling was present. Applied lip bottles exhibited an applied lip or a tooled and applied lip. Both indicated that the bottle was produced in steps and not as a unit. Blown in mold bottles exhibited a pontil scar on their bases; glass rod, solid rod, and improved (bare iron) pontils were included. Pharmaceutical bottles were small paneled containers which typically contained medicinal extracts during the mid-nineteenth century. These bottles were only placed in this category if they were not adequately covered by any of the above subtypes.

Twelve glass colors or tints were recognized for the Jenkins Site. Where possible, all Kitchen glass was sorted by these colors. Dark green, yellow green, green, light green, modern soda green, aqua, cobalt blue, opaque blue, amethyst, clear, amber, and milk glass were listed.

DISTRIBUTION:

Container Glass Fragments:	46CB41 (N=344)	46CB94 (N=13)	46CB95 (N=6)
	46CB96 (N=3)	46CB99 (N=6)	46CB100 (N=3)
	46CB103 (N=2)		
Container, Blown in mold:	46CB41 (N=1)		
Container, Hand-turned lip:	46CB41 (N=8)	46CB94 (N=1)	
Container, Machine made:	46CB41 (N=3)	46CB97 (N=1)	
Container, Non-machine made:	46CB41 (N=1)		
Container, Pharmaceutical:	46CB41 (N=1)		
Molded/Pressed Tableware:	46CB41 (N=20)		
Miscellaneous glass:	46CB41 (N=13)	46CB96 (N=1)	
Unidentified glass:	46CB41 (N=6)		
Thermally altered glass:	46CB41 (N=23)	46CB100 (N=1)	

Biological. Biological items recovered from 46CB41 included 1195.0 grams of bone fragments and tooth fragments. The majority of the bone were either mammal or bird.

DISTRIBUTION: 46CB41 (1195.0 g bone)

Plastic. One plastic stopper was recovered from the Jenkins Site.

DISTRIBUTION: 46CB41 (N=1)

Architecture Group