

COALPORT AND ITS RELATIONSHIP  
TO THE EARLY HISTORIC POTTERY INDUSTRY  
IN THE DES MOINES RIVER VALLEY

by

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## TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iii
INTRODUCTION	1
FIRST SECTION: ECOLOGY	4
Location and Geomorphology	4
Coal Resources	13
Clay Resources	16
SECOND SECTION: SETTLEMENT OF MARION COUNTY AND OF COALPORT	23
Survey and Original Settlement	23
Economy and Subsistence	24
Transportation	25
Churches	29
Settlement of Coalport	29
Ceramic Industry	36
THIRD SECTION: ARCHAEOLOGICAL INVESTIGATIONS	53
Location and Description of the Sites and Surroundings	53
History of the Investigation	54
Investigation and Excavation at 13MA103	61
Investigation and Excavation at 13MA106	181
FOURTH SECTION: RECONSTRUCTION OF SOCIO-CULTURAL ACTIVITIES AT THE COALPORT KILN	193
The Nature of the Activities at the Coalport Kiln	197
CONCLUSION	202
BIBLIOGRAPHY OF PUBLISHED MATERIAL	210
BIBLIOGRAPHY OF UNPUBLISHED MATERIAL	215
PLATES 1-29	219

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## LIST OF FIGURES

Title	Page Number
Figure 1. Map of a Portion of Polk Township, Marion County, Iowa	6
Figure 2. Map of Polk Township, Marion County, Iowa	7
Figure 3. Map of Polk Township, Marion County, Iowa	7
Figure 4. Map of a Portion of Polk Township, Marion County, Iowa	8
Figure 5. Map of Polk Township, Marion County, Iowa	9
Figure 6. Map of Red Rock Dam and Reservoir, Des Moines River, Iowa	11
Figure 7. Worthen's Coalport Section	14
Figure 8. Section at Coalport	15
Figure 9. Geological Map of Polk Township	17
Figure 10. Land Sales in Coalport Area (Selected)	37
Figure 11. Map of Red Rock Reservoir Howell Site	59
Figure 12. West Dump Area	63
Figure 13. 13MA103: Kiln Floor	65
Figure 14. Numbering of the Removed Portions of the Vertical Transept Face of the First D-shaped Understructure	67
Figure 15. Vertical Stratigraphy at 13MA103	69
Figure 16. Stratigraphic Profile	72
Figure 17. Stratigraphic Profile	75
Figure 18. Stratigraphic Profile	76
Figure 19. Stratigraphic Profile	78
Figure 20. Stratigraphic Profile	80
Figure 21. Stratigraphic Profile of the Vertical Transept Face of the First D-shaped Understructure	82

Title	Page Number
Figure 22. 13MA103: Internal Face of Second (incomplete) D-shaped Area	83
Figure 23. 13MA103: Coalport Kiln Reconstruction	93
Figure 24. Updraft Kilns	94
Figure 25. Downdraft Kilns	95
Figure 26. Brick Shapes	99
Figure 27. Crossbedded Bricks	99
Figure 28. 13MA103: Side View of a Displaced Kiln Floor Fragment	101
Figure 29. 13MA103: Horizontal Extent of Kiln	104
Figure 30. Vessel Handle Forms	116
Figure 31. Rim Categories	122
Figure 32. Jug or Small Necked Bottle Rim Profiles (Category 1)	125
Figure 33. Covered Container Rim Profiles (Category 2)	126
Figure 34. Straight Rim Profiles (Plain--Category 3)	127
Figure 35. Folded Rim Profiles (Category 4)	128
Figure 36. Reserve Rim Profiles (Category 5)	130
Figure 37. Feeder or Watering Pan Rim Profiles (Category 6)	131
Figure 38. Template Rims	132
Figure 39. Simple Bowl Form Category	139
Figure 40. Bowl Rim Forms	140
Figure 41. Straight-sided Crock Form Category	142
Figure 42. Straight-sided Crock Rim Categories	143
Figure 43. Straight-sided Angled-shoulder Crock Form Category	145

Title	Page Number
Figure 44. Straight-sided Angled shoulder Crock Rim Categories	146
Figure 45. Rounded Shoulder Crock Form Category	147
Figure 46. Glaze Occurrence on Round-shouldered Crocks	148
Figure 47. Round-shouldered Crock Rim Categories	149
Figure 48. Angled Shoulder Jar Form Category	152
Figure 49. Rounded Shoulder Jar Form Category	153
Figure 50. Small Mouthed Jar Rim Categories	154
Figure 51. Large Covered Storage Jar Rim Categories	156
Figure 52. Churn Form Category	157
Figure 53. Butter Churn Rim Categories	158
Figure 54. Jug Form Category	160
Figure 55. Jug Rim Categories	161
Figure 56. Fat or Grease Lamp Form Category	162
Figure 57. Kiln Furniture Cutter	169
Figure 58. 13MA103: Metal Kick Wheel Shaft	176
Figure 59. St. Ives Kick Wheel	177
Figure 60. Rim Categories at 13MA106A	183
Figure 61. Rim Categories at 13MA106B	186
Figure 62. Rim Categories at 13MA106C	190
Figure 63. Rim Categories Present at 13MA106C but Rare or Non-existent at 13MA103	191

## LIST OF PLATES

Title	Page Number
Plate 1. Aerial Photographs of Coalport Area	221
Plate 2. Maps of Coalport Area	223
Plate 3. 13MA103: Kiln Drawings	225
Plate 4. 13MA103: Kiln Structure	227
Plate 5. 13MA103: Kiln Structure	229
Plate 6. 13MA103: Kiln Structure	231
Plate 7. 13MA103: Kiln Structure	233
Plate 8. 13MA103: Kiln Structure after the Removal of the Kiln Floor	235
Plate 9. 13MA103: Kiln Structure after Removal of Kiln Floor and Portions of the D-shaped Understructure	237
Plate 10. 13MA103: Artifacts <u>in situ</u>	239
Plate 11. 13MA103: Bowl Forms	241
Plate 12. 13MA103: Crocks	243
Plate 13. 13MA103: Jars, Jar Lids, Fat or Grease Lamp	245
Plate 14. 13MA103: Jugs and Butter Churns	247
Plate 15. 13MA103: Water Jar	249
Plate 16. 13MA103: Numbered Sherds, Possible Churn Lid, Draw Trial Pieces	251
Plate 17. 13MA103: Vessel Handles and Vessel Decoration	253
Plate 18. 13MA103: Kiln Furniture	255
Plate 19. 13MA103: Kiln Furniture	257
Plate 20. 13MA103: Kiln Furniture	259
Plate 21. 13MA103: Kiln Furniture	261
Plate 22. 13MA103: Evidence of Kiln Setting Methods	263

Title	Page Number
Plate 23. 13MA103: Evidence of Kiln Setting Methods	265
Plate 24. 13MA103: Non-stoneware Artifacts	267
Plate 25. 13MA106: Stoneware Vessels	269
Plate 26. 13MA106: Stoneware Ceramics	271
Plate 27. 13MA106: Kiln Furniture and Metal Artifacts	273
Plate 28. 13MA106: Metal, China, Pottery, Slate Artifacts	275
Plate 29. 13MA103: Thomas Smith Signed Pot	277



## INTRODUCTION

The United States federal government has sponsored many dam construction projects in Iowa and in other states. The Red Rock Reservoir, located south-east of Des Moines, Iowa, is now completed and Red Rock Lake is filled to capacity with the 1969 spring runoff waters. Saylorville Dam, located northwest of Des Moines, is still under construction and will be completed sometime in the 1970's. All of these construction projects entail the potential destruction of archaeological sites. The purpose of this thesis is to describe the archaeological investigation of an historic site in central Iowa that was threatened and eventually engulfed by the waters of Lake Red Rock. A secondary purpose of the thesis is to discuss the significance of this cultural-historical information in terms of Iowa history and prehistory and in terms of the settlement of the American frontier.

The archaeological site that was investigated, the Coalport Kiln (13MA103), is located in the Des Moines River Valley southeast of the present city of Des Moines and dates from the middle of the nineteenth century up to nearly the end of the nineteenth century. The Coalport Kiln is an important archaeological site because it provides artifactual and structural evidence for the reconstruction of the early historic stoneware ceramic industry in Iowa. There is a relative lack of information about this industry in the written history of Iowa and, in fact, in the written history of the American frontier. Yet, as will be shown in this thesis, this was one of the most important pioneer industries for it provided durable containers to a largely agrarian population that could obtain containers in no other way.

At the Coalport Kiln, over one-half of the floor and understructure of

a nineteenth century salt glazing stoneware pottery kiln was uncovered, as well as tools, broken pottery, and manufacturing debris that were found in several distinct stratigraphic zones around the kiln. The site was excavated as a part of the salvage archaeology program of the Iowa State University-National Park Service Archaeological Crew during the years 1966, 1967, and 1968.

The general framework of this report is an ecological one. That is, the report is concerned with the combination of biome, habitat, and culture at the Coalport Kiln. An ecological approach to the nineteenth century pottery industry in Iowa should provide a framework for reconstructing the socio-cultural activities at the kiln. It should also provide a framework for viewing this pottery in relation to other pottery kilns in Iowa and in surrounding states and thereby add to knowledge of the frontier culture in this area. One focus here is on the environmental resources that had the greatest effect on the pottery industry--clay, coal, timber, and water. At the same time, this report attempts to correlate archaeological and historic information into some coherent pattern. Thus, it has been necessary to briefly trace the settlement of the Des Moines River Valley by white settlers during the last century and to trace the historical development of a town that was associated with the Coalport Kiln, the town of Coalport.

The following discussion is organized into four main sections. The first deals with the geology, geomorphology, flora, fauna, etc. of the area in which the Coalport Kiln is located. The second is concerned with the history of the Coalport Kiln and of this section of Marion County, Iowa. The third section is the archaeological site report for the Coalport

Kiln and for another kiln in the immediate vicinity of the Coalport kiln and for the abandoned town of Coalport. This section is by far the longest and most detailed in the thesis, at least in part because of the scarcity of good site reports on this subject. Thus, the site report has to include attempts by the author to set up consistent terminology for the pottery industry, a useful way of assigning rims to categories for comparisons with other sites, the establishment of functional vessel categories, and a description and classification of the manufacturing debris left behind at a stoneware pottery industry. The fourth section correlates the ecology, history, and archaeology of the kiln area in an attempt to reconstruct some of the patterns of activities of the men who operated the Coalport Kiln.

It should be noted that this kiln site is only one of the many human occupation sites located by the Iowa State University-National Park Service Crew and by other archaeological crews in the central Des Moines Valley. The evidence suggests that human occupation of the valley began well before the Christian era and continued up into the historic (period of written records) era. (Gradwohl 1969)

## FIRST SECTION: ECOLOGY

## Location and Geomorphology

Coalport was located on an oxbow of the Des Moines River in the south-central part of the Des Moines River Valley. The Des Moines, the largest river in Iowa, provides a constantly flowing source of water in Marion County (Heusinkveld 1958:12). It starts in northeastern Iowa and southern Minnesota and traverses nearly the entire state, emerging into the Mississippi in southeastern Iowa and northeastern Missouri.

In the area which includes Marion County, the broad valley of the Des Moines

. . . shows all the phenomena of maturity. The excessively flat, broad flood plain across which the river winds is bordered by slopes which for the most part rise gently to the uplands, although the line between flood plain and slope is well marked. In places the wall is steep and rugged . . . . In such places the walls and the neighboring region are much cut up by ravines and are heavily wooded. (Lees 1916:559-560)

The flood plain of the Des Moines Valley in Marion County ranges from one and one-half to three miles or more in width (Heusinkveld 1958:16; Lees 1916). The south bluffs of the Des Moines River Valley tend to be much steeper than the bluffs on the north side (Miller 1901:133). Coalport, located on the south side of the river, was below the high southern bluffs. In fact, the Coalport Pottery Kiln was dug back into the bluffs.

Numerous writers (Heusinkveld 1958; Miller 1901; Lees 1916 and others) have remarked on the apparent age of the Des Moines River Valley. Lees notes that

Numerous oxbows scattered over the flood plain mark old meanders of the channel and show that the stream is practically at grade. It long ago ceased cutting downward and has since been devoting its energies to side

cutting and widening its valley. (Lees 1916:564)

Miller says that the complete development of the drainage system in Marion County accounts for the fact that there are no standing bodies of water in the uplands and only a few small ones down in the river valleys (Miller 1901:136). He also says that the valley of the Des Moines is undoubtedly preglacial in part if not in full (Miller 1901:137).

The town of Coalport was located on just such an oxbow. On the earliest known map of the area (Plate 2) the Des Moines River is shown cutting through Section 14 of Marion County. Other maps of the Coalport area (Figs. 1-5) indicate that the oxbow on which Coalport was located was abandoned by the river sometime after 1880. During the last decade, the river was over one-half mile from the Coalport area (Fig. 6).

The valley of the Des Moines River has been drastically changed in the last few years because of the construction of the Red Rock Reservoir. The Red Rock Dam provides a pool length about 15 miles long with a water surface area of approximately 8,950 acres (U. S. Army Corps of Engineers 1959). Consequently, the drainage patterns of the area have been much disrupted and changed now that the dam is completed and the reservoir filled, as of spring 1969.

Geomorphologically, Marion County is a broad and rolling plateau into which the Des Moines and other rivers and tributaries have cut valleys (Miller 1901:131). The topography of Marion County is

. . . gently rolling, except near the steep bluffs, and there are numerous long ravines and valleys, most of them with gentle gradients and with slopes rising easily to the uplands from very wide bottom lands. (Lees 1916:560)

The uplands display no prominent topographic features but everywhere present rolling surfaces with just



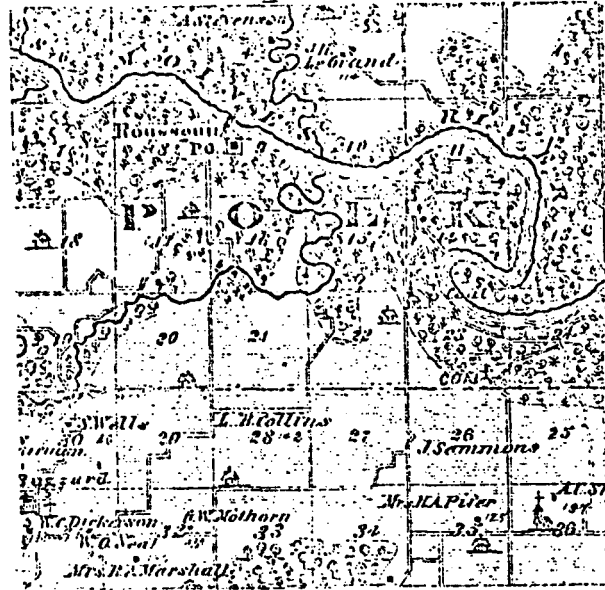


Figure 2. Map of Polk Township, Marion County, Iowa (from Andreas 1875)

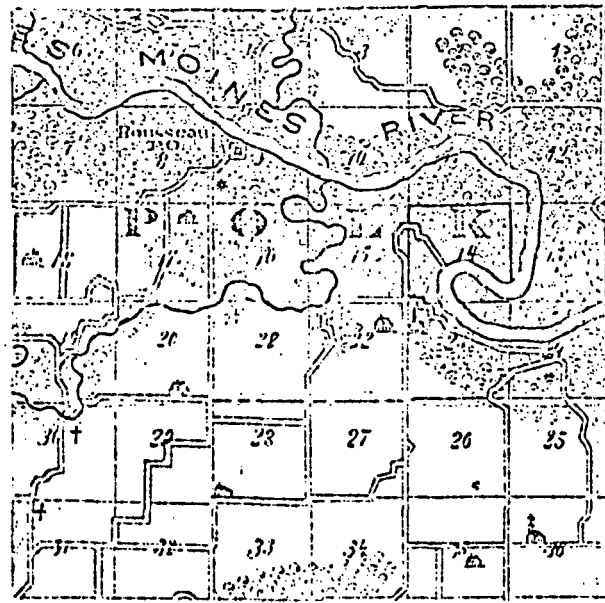
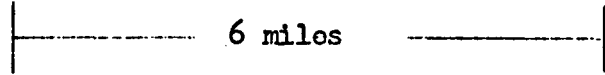
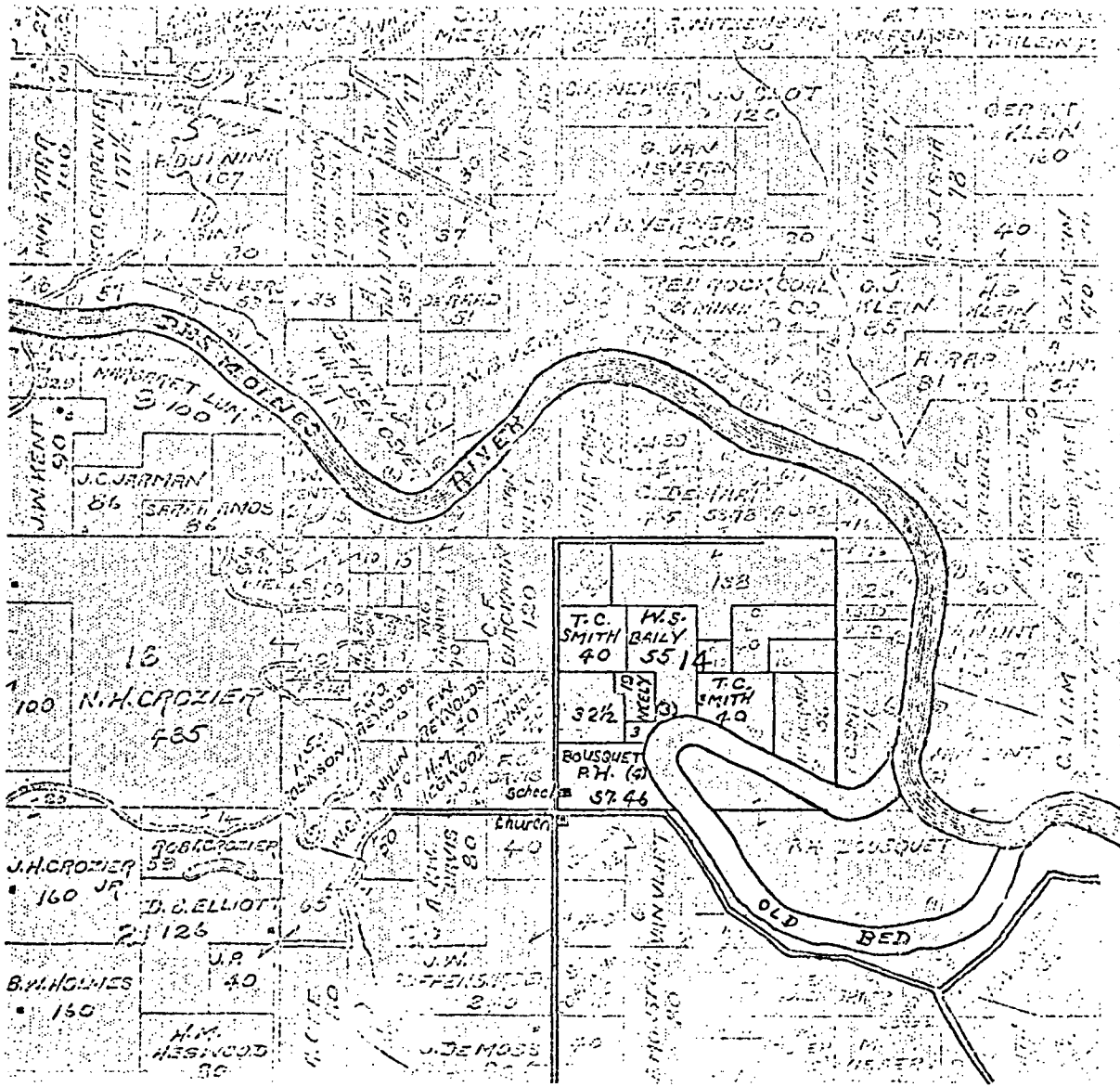


Figure 3. Map of Polk Township, Marion County, Iowa (from Union Historical Company 1881)



← 1 mile →

Figure 4. Map of a Portion of Polk Township, Marion County, Iowa (from Hovey 1901:15)



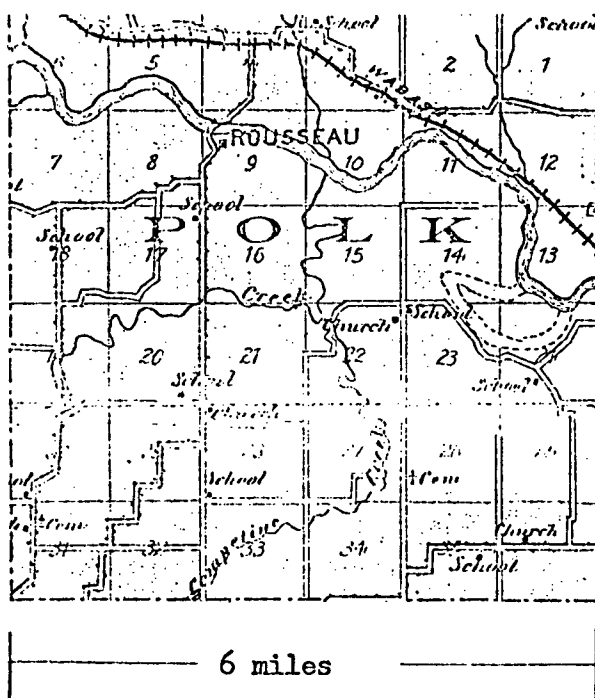
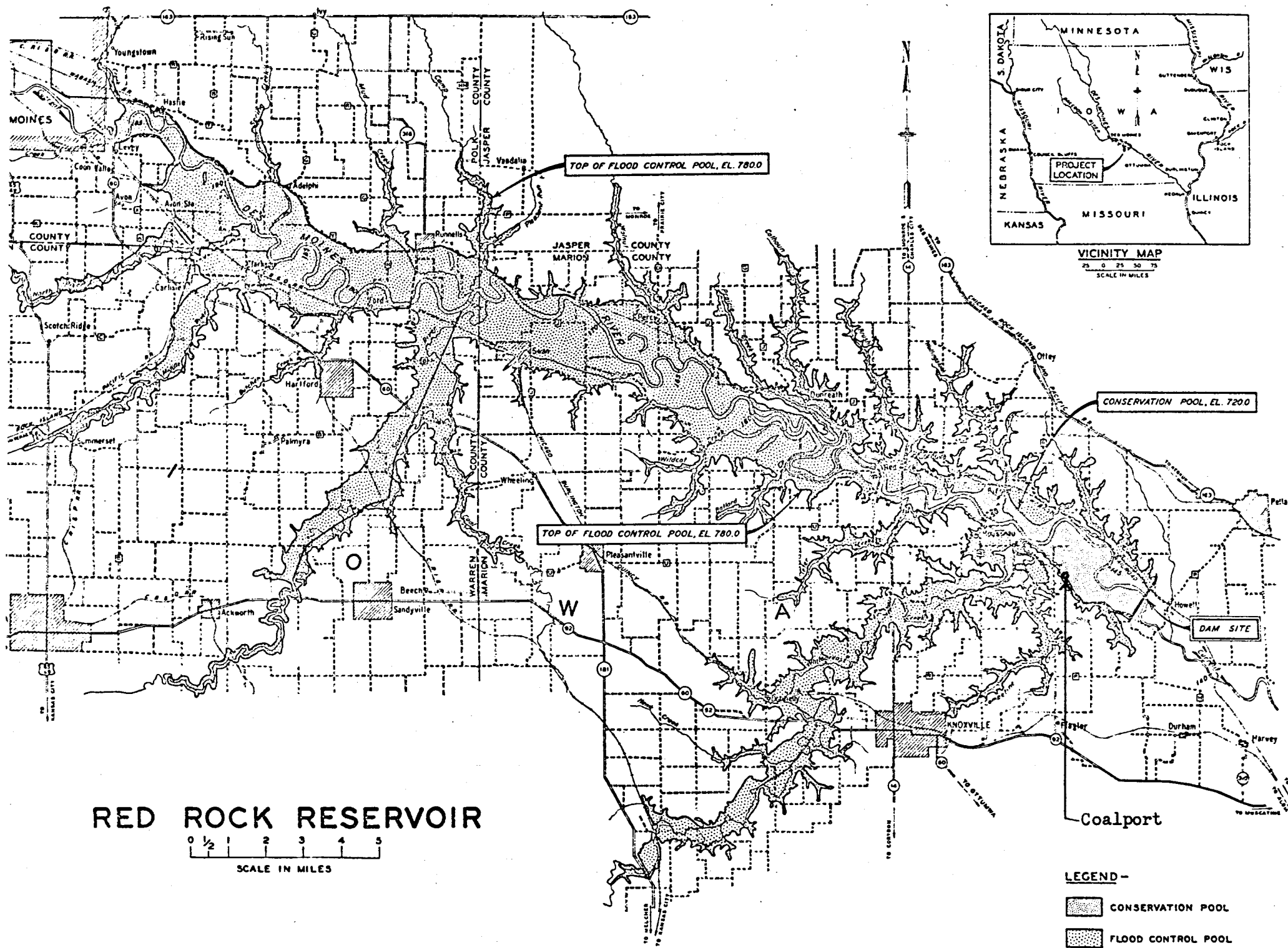


Figure 5. Map of Polk Township, Marion County, Iowa  
(from Huebinger 1904)



Figure 6. Map of Red Rock Dam and Reservoir, Des Moines River, Iowa  
(U. S. Army Corps of Engineers 1959)



enough slope to secure good drainage. (Miller 1901:132)

Polk Township, in which Coalport is located, had a slightly different topography than the rest of Marion County because it largely lacked prairie lands. Donnel (1872:253) says of Polk Township that

The Des Moines and White Brest rivers run through [Polk Township], the first from north-west to south-east, and the latter from south-west to north-east. The township being mostly within the margin of these streams, is timbered and uneven in surface; but the bottom lands are level, and are noted for their great depth and fertility of soil.

The geology of Marion County has been extensively studied beginning in 1849 (Owen 1852; Worthen 1858; White 1870; Keyes 1894; Miller 1901; Lees 1916; Anderson and Welp 1960). Our concern with this subject will be with the geology of the Des Moines River Valley and with the geology of coal and clay, since these played such an important part in the growth of Coalport.

The Coal Measures (or The Des Moines Series of the Pennsylvanian Formation) forms the surface rock of Marion County, except for small sections in the eastern part of the county (Miller 1901:146; Lees 1916:444). They are deposited on the eroded surface of the Saint Louis Stratum (Miller 1901:147). On the uplands the bedrocks are covered by loess and glacial drift but they are exposed in the bluffs of the Des Moines River Valley (Miller 1901:147). They consist of shale, coal, sandstone, limestone, and conglomerate, according to Miller (1901:147), or sandstone, shale, and seams of coal, according to Lees (1916:444-445). According to Lees (1916:444-445)

These coal beds form the basis of Iowa's greatest mineral industry, and because of the fact that the

Des Moines River has cut into the beds and exposed the coals, the mining industry of the state has always centered along the valley.

The last, and perhaps only, glacier to reach Marion County was the Kansan (Miller 1901:163). Nearly the entire county was originally covered by Kansan drift and it is still exposed on almost all hillsides on the county, although it is covered in the valleys by alluvial deposits and on the uplands by loess (Miller 1901:163). Miller (1901:164) says that "The drift consists chiefly of boulder [sic] clay of a blue or yellowish color, containing many glaciated pebbles." Lees (1916:452) notes that it is ". . . typically a bluish pebbly clay becoming yellow and even reddish on exposure."

Miller (1901) and Lees (1916) both consider the loess to be typical of that found in other counties of the state. Miller (1901:165-166) says that it is

. . . a fine, dull gray, homogeneous deposit found everywhere over the uplands and occasionally extending down the slopes of the valleys and connecting with the alluvium.

According to Miller (1901:166)

The alluvial deposits are the most recent ones and are represented by the black alluvial soils of the river valleys. They have been derived principally from the loess of the uplands.

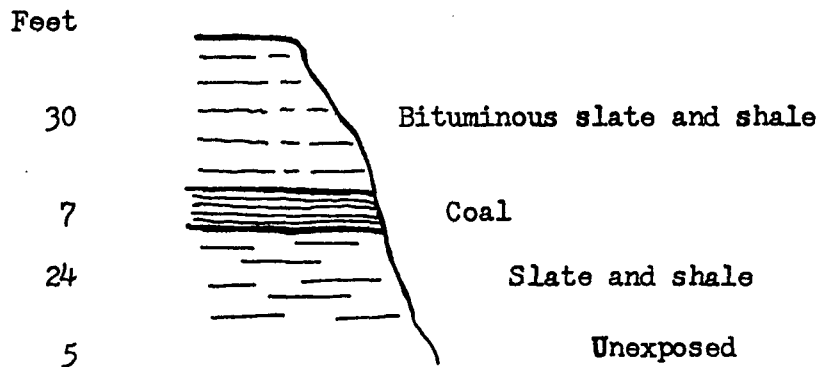
#### Coal Resources

The coal and clay deposits of the Pennsylvanian Coal Measures that are found in the bluffs south of Coalport were of economic importance to settlers in the Coalport area, coal as fuel and clay for pottery. Lysander W. Babbitt may have been the first white settler to realize the importance

of the coal beds in the Coalport area (Donnel 1872). As has been chronicled elsewhere in this report, Babbitt first came to the Coalport area in 1843 and staked a claim which included the coal banks to the south. Other settlers, particularly William Welch and H. F. Bousquet, also exploited the coal in these bluffs (Worthen 1858; White and St. John 1868).

The first report of these coal beds by a trained geologist was published in 1858. In discussing the coal of Marion County, A. H. Worthen (1858:167-168) reported that

At Coalport, on the southwest quarter of S.14, T.76, R.19, on the south side of the river, a heavy coal seam outcrops in the face of the bluff, in connection with the following beds:



The coal in this seam appears somewhat slaty, especially in the upper part; but it has only been penetrated for a few feet, and it is probable the quality may improve after reaching a point beyond the influence of atmospheric agencies.

Mr. Welch, the owner of this bank, informed me that another coal seam is sometimes exposed in the river bed, below the rocks in the above section; but at this time it was entirely hidden, either by the water or the debris from the overlying beds.

Figure 7. Worthen's Coalport Section

White and St. John revisited this area ca. 1867 and they reported the following:

At Coalport, some four or five miles from Pella, Messr. Bosquet[sic] & Thompson have opened a mine in the face of the bluff immediately upon the right

bank of the Des Moines river, the coal of which measures from six to seven feet in thickness. There is a band of cannel coal of several inches in thickness associated with the bituminous coal of this mine, but which the water prevented me from seeing at the time it was visited. This bed of coal appears in the face of the bluff as a broad black band; and about ten feet beneath it is a similar band about two feet wide, which represents another bed of coal of that thickness. (1868:100)

White (1870:263-264) again mentioned this coal in his publication of 1870 on "Geology of the Coal Counties," and in the same volume of the Iowa Geological Survey, Rush Emery (1870:364-365) reported on the chemistry of two coal samples taken from "Bousquet's Mine, Coalport."

In 1894 Keyes (1894:331-332) reported that coal had been mined at Coalport for 40 years and that coal was still being mined there and that some of it was hauled by wagons to Flagler and Pella. He also included a stratigraphic section of a Coalport mine which is reproduced below.

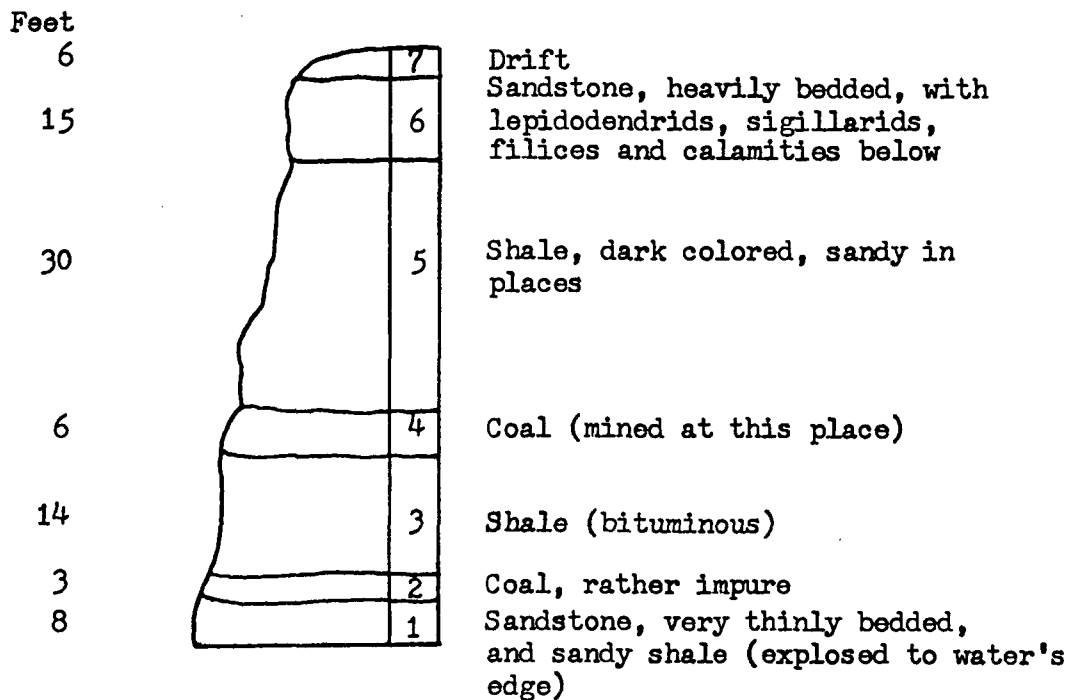


Figure 8. Section at Coalport



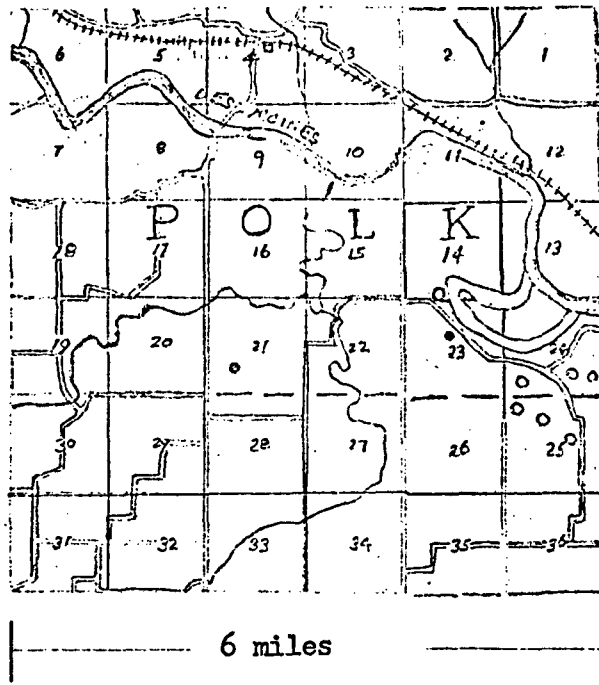
Miller (1901:179) claims that the first mines in Marion County were opened at Coalport. He also records that all of the mines were worked by slope mining and that the coal was quite soft (Miller 1901:179). A map in Miller's article (after page 197) shows an abandoned slope mine (coal) in the southeast 1/4 of Section 14, Township 76 North, Range 19 West (Fig 9). Calvin and Lees (1909:193) report mining still going on in the Coalport area as late as 1909 with some of the coal being hauled to Howell and shipped from there.

In the spring of 1968 the Iowa State University archaeological crew found one abandoned slope mine evidenced by a slag heap along the south bluff of the Des Moines River about one-eighth to one-quarter of a mile southeast of the Coalport Kiln.

Coal mining is still going on in Polk Township but it is all done by strip mining techniques on the uplands south of Coalridge.

#### Clay Resources

The most important raw material for the pottery industry is, of course, suitable clay. Many different types of clay occur but only a few of these are useful to the pottery industry. The maker of stoneware vessels has an even narrower choice of clays. According to Rhodes (1959: 33) good stoneware clays do not occur in all parts of North America. In fact, large portions of the East Coast are without stoneware clays and eastern potters had to make earthenware vessels and cover these with elaborate glazes to make them vitreous and thus impermeable to liquids (Ramsey 1939). However, suitable stoneware clays occur in the Midwest and in Iowa in particular.



Coal mines

Shaft ●

Slope ■

Abandoned mines ○ □

Figure 9. Geological Map of Polk Township  
(from Miller 1901)

Several detailed studies of Iowa clays have been published in the Iowa Geological Survey and in other publications (Iowa Geological Survey Vol. 14; Gwynne 1943; Galpin 1924; Staley and Beecher 1916). The principal stoneware clays in Iowa are "fire clays" that occur in the Des Moines Series of the Pennsylvanian deposits that form the bedrock in many areas of the state (White 1870:327-328; Miller 1901:191; Beyer and Williams 1904c:411, 453; Galpin 1924:64, 76; Gwynne 1943:299). These stoneware clays are highly plastic (Beyer and Williams 1904c:411) but they are not sufficiently refractory and have too many impurities to be used for firebrick and china (Gwynne 1943:273, 298; White 1870:327-328). These clays are suitable, however, for stoneware pottery (Gwynne 1943:269), although they are not highly laminated (Galpin 1924:64; Beyer and Williams 1904c:411).

The clays can be found over or under shale, sandstone, coal or limestone (Galpin 1924:64). However, they most frequently occur between coal deposits or underlying coal deposits (Galpin 1924:64; Beyer and Williams 1904c:411, 453; Gwynne 1943:298). Galpin (1924:76) states that the only known refractory clays found in Marion County lie under the coal beds of the Des Moines Series of the Pennsylvanian deposits.

It has already been noted that coal occurred in Pennsylvanian deposits near the town of Coalport in the south bluffs of the Des Moines River Valley. It seems quite likely that this was the area from which the clay was gathered for use at the Coalport Kiln and perhaps at the Gidel Kiln. There is no known primary evidence to prove that clay was mined from these bluffs for local use in the Coalport pottery but there is quite a bit of secondary evidence. William Welch, the first potter in the Coalport

area, also owned a coal mine in Lot 4, Section 14 (the area containing the Coalport Kiln), and it is likely that he mined coal for use as a fuel in his kiln and that he also mined clay as the raw material for his pottery. Unfortunately, the stratigraphic sections from Welch's mine and Bousquet's mine do not show any strains of clay (Worthen 1858:168; White and St. John 1868:100; White 1870:263-264; Keyes 1894:334). However, a section from a coal mine in the SW $\frac{1}{4}$  of NE $\frac{1}{4}$  of Sec. 23, T. 76N, R. 19W, yielded the following stratigraphy:

6. Drift.....30 feet
5. Coal..... 6 feet
4. Fire clay.....10 feet
3. Shale, light colored.....10 feet
2. Coal..... 3 feet
1. Fire clay to bed of river.. 5 feet  
(Miller 1901:179)

That this mine was within one-quarter of a mile or less of the Coalport Kiln clearly demonstrates that there were quantities of fire clay available in the bluffs in which the kiln was embedded. Further, Wright (1915:14) says that

Pottery was formerly made at the King brickyard, at Coalport, and at Attica, where potter's clay of good quality for the manufacturing of the common grades of earthenware [sic: earthenware and stoneware] is found in abundance in the Coal Measures.

Because of statements like Wright's above, it is necessary to distinguish between stoneware and earthenware, both as the terms are applied to clays and to the finished products of the potter. There is a difference between the two and it seems apparent that many potters made both earthenware and stoneware products and were aware of the difference between the two terms. First, these terms come from the ceramic industry and they

are not geological terms. The primary difference between stoneware and earthenware (for our purposes) is the amount of heat that they can withstand before they begin to melt, and the type of body which the fired clay achieves. Stoneware clay can withstand much higher temperatures than earthenware clay. Nelson (1966:121-122) states that stoneware clays fire in the range from cones 6 to 10 (1200 to 1300°C) while earthenwares fire in the range from cones 08 to 2 (940 to 1060°C). According to Rhodes (1959:34) most nineteenth century stoneware made in America was fired at about cone 8. Fired stoneware clay has a hard and almost vitreous body while fired earthenware clay absorbs water freely. Galpin (1924:64) says that "Most of the Iowa 'fire clays' reach minimum porosity between cones 6 and 10 and soften at cones 12 to 24." Thus, there can be little question that Iowa has perfectly acceptable stoneware clay. The situation becomes clearer at the Coalport Kiln. The potters who worked at the Coalport Kiln worked with stoneware clays. Nearly all of their wares were salt glazed, a high firing technique that cannot be done on earthenware clays (Rhodes 1959).

It sometimes becomes difficult to distinguish between stoneware and earthenware on the basis of the types of pottery that are produced. As Ramsey illustrates (1939), many potters made essentially the same form of pots with either stoneware or earthenware. In particular, potters in the eastern states often had to make vessels in earthenware that were of a type that were made in stoneware in other parts of the United States (Ramsey 1939). It is apparently because of this overlap of types that confusion occurs in the literature of stoneware and earthenware pottery.

Good stoneware clay should contain enough flux material (impurities) so that at least partial vitrification occurs in the fired wares (Beyer and William 1904d:233). However, it should not contain such quantities of impurities as to create uneven or discolored surfaces when fired. The stoneware "fire clays" of Iowa vary in the amount of flux. In particular, the stoneware clay from Coalport seems to be quite high in some impurities. Many of the recovered sherds from 13MA103 are covered with lime or calcium deposits and this may indicate that the raw clay was high in lime content. A large percentage of the sherds from this site also display brown spots on their surfaces which may indicate that they have a high quantity of finely divided pyrite which, according to Gwynne, ". . . produce brown or 'iron' spots of low melting point in the product." (Gwynne 1943:298)

So far we have assumed that the Coalport Kiln potters used local clays mined from the Coal Measures deposits. However, Gwynne (1943:284) says that ". . . ceramic plants using surface clays were once widespread in Iowa . . . ." According to Gwynne (1943:283)

Surface clays, in a ceramic sense, are clays which lie below the top soil and which can be used in the manufacture of ceramic ware. Geologically, such clays are the products of the weathering of the underlying clayey mantle, which may be alluvium, glacial clay or loess.

It is possible, though not likely, in the author's opinion, that the Coalport potters utilized deposits of secondarily deposited surface clays for their pottery. White (1870:327-328) said that "Our coal-measure clays are, however, the best and almost the only important pottery clays in the State." It is hard to believe that the Coalport potters passed up the rich clay resources of the Coal Measures in favor of spotty surface deposits.

Very few of the early potters in Iowa were equipped to spend a great deal of time and labor securing clay. According to Beyer and Williams (1904d:151, 156) most of the early potters in Iowa acquired their clay either by surface digging with shovel and wheelbarrow or as a subsidiary activity to coal mining. It is probable that the clay for the Coalport Kiln was secured as a byproduct of the coal mining in the area.

The Iowa State University-National Park Service Archaeological Crew located one clay deposit while excavating a midden area northwest of the actual Coalport Kiln structure. This clay layer of grey clay with yellow ferruginous stains occurred under a midden of broken pottery, kiln furniture and ash and it appeared to be a natural deposit. It was not possible to determine whether this clay was an original deposit associated with the Coal Measures or a secondarily deposited clay. However, unlike the typical Coal Measure "fire clay," it was partially laminated. Superficial examination indicated that it was high in iron and possibly lime. Samples of the clay were tested by Mrs. Mary Miller, a potter in Boone, Iowa, on October 18, 1968. She assigned these samples numbers 85-1, 85-2, and 85-3 in her own cataloguing system. All of her samples were fired to cone 4, 1093°C. The clay seemed quite refractory and, although only fired to cone 4 rather than the cone 6 required for stoneware firing, it seemed capable of higher firing. It was adequate as a potter's clay, as was demonstrated by small pinch pots made from each sample and fired to cone 4 by Mrs. Miller.

## SECOND SECTION: SETTLEMENT OF MARION COUNTY AND OF COALPORT

## Survey and Original Settlement

The tract of land which was eventually to become Marion County, Iowa, was ceded to the United States by the Sac and Fox Indians at a treaty held in Agency, Iowa, in 1842 (Donnel 1872:7). According to the terms of the treaty, one-half of the area was to be opened for White settlement on May 1, 1843, and the other half on October 10, 1845 (Illustrated Historical Atlas of the State of Iowa 1875:394). Several trading posts were established in this area prior to 1843 and according to Donnel many white settlers entered the area before 1843 to choose their homestead lands (Donnel 1872:11-16). Because these Whites were breaking the treaty that had been made in 1842 with Keokuk and other Sac and Fox, the United States Dragoons attempted to keep them out of the area until the land was officially opened (Donnel 1872:12).

Although the area which includes Marion County was first opened for settlement in 1843, settlers could not file on this land until the official government survey had been completed. The survey of Marion County lands, conducted by a deputy United States surveyor, was begun in 1845 and completed in 1848 (Union Historical Company 1881:330-332). Many settlers lived in Marion County prior to the official survey and they made informal agreements as to the extent of their claims which they observed when the official survey was completed and the land officially opened for sale (Donnel 1872:26).

Marion County was officially made a county in 1845 (Union Historical Company 1881:339). Prior to this time, it had been a part of Washington and Mahaska Counties and was subject to their political authority. In



1845 Knoxville was chosen as the county seat and the first county officials were elected during the next year. It was about this time that the small settlements that had been established by the earliest pioneers began forming into communities and villages. After original settlement, the county maintained a fairly steady and unchanging population from 1870 to the late 1950's (Heusinkveld 1958:1). The establishment or sectioning of the townships of Marion County was carried out somewhat later than the county formation. Polk Township, the township which would later contain Coalport, was not established until 1848 (Union Historical Company 1881:752).

#### Economy and Subsistence

Early pioneer life in Iowa was associated chiefly with agriculture. The early settlers practiced a subsistence type of agriculture. Advanced tools and techniques were practically nonexistent (Harding 1942:18). One source says that

The only plows they had at first were what they styled 'bull plows.' The mould-boards were generally of wood, but in some cases they were half wood and half iron.  
(Union Historical Company 1881:314)

Harding mentions that in some areas corn planting was done by hand (1942:19).

Although corn was the staple crop of the early settlers of Marion County, these farms also raised potatoes, wheat, oats, turnips, etc. (Donnel 1872:30).

Most of the early agriculture was not conducted on the broad and fertile prairies of Marion County but, instead, followed the pattern of some of the early Indian occupants of the area. That is, the relatively soft soil down in the river valleys was broken first. As Donnel (1872:30) says,

The next important duty of the settler was to prepare some ground and plant what he could at that advanced season for cropping. This was generally done in the edge of the timber, where most of the very earliest settlers located. Here the sod was easily broken, not requiring the heavy teams and plows needed to break the prairie sod. Perhaps we might add, as another reason for first settling in and about the timber, convenience to fuel and building timber. It may be supposed that the timber afforded some protection against those terrible conflagrations that occasionally swept across the prairies.

The earliest concentrations of people were thus located in the valleys close to timber and water. Eventually, many of these concentrations became small villages and towns.

The most prevalent occupation in Marion County during its formative years was farming of one sort or another. Some people restricted themselves pretty much to crops while others, like the Hollanders, relied heavily on domesticated livestock. Nevertheless, even in its infancy, Marion County had men and women of many different occupations living within her borders. The 1856 Marion County Census lists 75 different occupations for the inhabitants of Marion County (Iowa Official Census 1857:283-287). There are indications that many of the individuals who listed occupations other than farming also farmed. In fact, many of the occupational specializations at this time were not full-time occupations. They might be better viewed as part-time craft specializations. This will become clearer when we look closely at the pottery industry in Coalport.

#### Transportation

Transportation was difficult for these early settlers. One of their more important reasons for travel was to get to mills where they could have their corn and wheat milled. Mills were far apart and Donnel says

that it was not uncommon for a farmer to spend an entire month on the road getting to and from the nearest mill. The pioneer might have to make this trip three or four times a year (Donnel 1872:31-36). Given these circumstances, it is not surprising that many settlers chose to grind their own corn. Although the particular artifacts are different, the same principle was used by these pioneers as had been used by prehistoric Indians in the same area at an earlier date. That is, they both ground their corn manually. According to Donnel (1872:30):

When corn could be obtained, the absence or inconvenience of mills for grinding it, forced the necessity of grating it on an implement made by punching small holes through a piece of tin or sheetiron and fastening it on a board in a concave shape, with the rough side out. Upon this implement the ear was rubbed to produce meal. . . .  
 . . . a very common substitute for bread was hominy, a palatable and wholesome diet, made by boiling corn in weak lye till the hull or bran peals off, after which it was well washed to cleanse it of the lye, then boiled again to soften it, when it was ready for use as occasion required, by frying and seasoning it to suit the taste. Another method of preparing hominy was by pestling. A mortar was made by burning a bowl-shaped cavity in the even end of an upright block of wood. After thoroughly clearing it of charcoal, the corn could be put in, hot water teemed upon it, and subjected to a severe pestling by a club of sufficient length and thickness, in the larger end of which was inserted an iron wedge banded to keep it there. The hot water would soften the corn and loosen the hull, and the pestle would crush it.

### Roads

The early roads in Marion County were incredibly poor. Old Indian trails were not sufficiently wide to allow the ox carts passage, so the pioneer often had to make his own trail to the mills or to the supply posts. The first legally established county road was established in 1845 (Donnel 1872:34). Donnel says of this early period that

. . . when the early settlers were compelled to make those long and difficult trips to mill, a portion of the way to be traversed was on the prairie, between Oskaloosa and Blue Point, a stretch of about forty miles, where there was not a house. (1872:35)

### Rivers

Second only to the necessity of reaching the mills was the necessity of obtaining goods from the East. Prior to the introduction of railroads into Marion County in 1850-1860, the rivers provided the main highway for trade (Harding 1942:33). Harding (1942) and Hussey (1900) mention that the first boats regularly traveling the Des Moines River were keel-boats that were poled up and down the river. Later, both wood and coal burning steamboats traveled the Des Moines (Harding 1942:34). The Fort Des Moines Steamboat Company began operating steamboats regularly on the Des Moines River in 1854 (Hussey 1900) but steamboating lasted on it for only a few years. Harding believes that it was superseded by the railroads in about 1860-1862 (Harding 1942:35) In Down on the Ridge, Alfred B. McCown mentions that during the 1850's William Welch of Coalport imported from Keokuk, Iowa, by steamboat, all of the goods with which he operated a small store.

A. E. Bousquet, who bought land near Coalport from William Welch, was very much involved in the steamboat trade on the Des Moines in the 1850's (Hussey 1900:355). It seems likely that Bousquet bought the land in Coalport as an economic enterprise connected with the Des Moines River steamboats. There is no evidence that he ever lived in Coalport for any length of time, although he owned Section 14, Lot 4 for some years.

It is interesting that neither Peterson, author of "Steamboating on the Des Moines" in The Rivers of her Valleys nor Hussey (1900) mentioned the

village of Coalport in their writings. They restrict themselves generally to the larger and more important settlements. And yet, steamboating was one of Coalport's major industries. Coalport merchants and others imported goods from Keokuk by steamboat and Coalport had a steamboat landing. In fact, one source claims that in 1860 a steamboat was made in Coalport (Stoltz and Brooks 1966:333). No further substantiation for this could be found.

There may have been other attempts to exploit the steamboat trade in the area surrounding Coalport. C. S. Green and M. Reynolds both applied for patents on land in sections adjoining Section 14 under the Act of the Legislature to promote use of navigable rivers. Green's patent was issued in 1853 and Reynolds' in 1850 (Plat of Green's Coalbank 1853 and Land Deed Records of Marion County, Book 32, p. 130).

Bridges were unknown in Marion County during the early years so that streams and rivers were either ferried across or forded. The 1856 Census for Polk Township, Marion County, lists one man's occupation as "ferryman" (1856 Census of Iowa:286).

The History of Marion County, Iowa (Union Historical Company 1881:315) reports that

Supplies in those days came into this Western country entirely by river and wagon transportation. Mail was carried to and fro in the same way, and telegraph dispatches were transmitted by the memory and lips of emigrants coming in or strangers passing through.

For a number of years after the first settlement of the country, supplies of all kinds had to be procured from the towns on the Mississippi. To procure supplies of this kind required a journey of from seventy-five to one hundred miles, and that too through a country but partially settled, and where there were no roads and bridges.

An Act of Congress in 1846 entitled "An Act granting certain lands to the Territory of Iowa, to aid in the improvement of the navigation of the Desmoines [sic] River, in said Territory" may have been responsible for some of the ferries being established or it may have somehow been connected with the steamboat trade, or both (Land Deed Records of Marion County, Iowa, Book 32, p. 130).

#### Churches

Churches (and schools) closely followed the original settling of Marion County. In Polk Township the first meeting of the Coal Ridge [sic] Baptist Church was held in 1852, just a few years after the area was originally settled (Records of the Coal Ridge Baptist Church 1852:2). McCown (1909:35) mentions in Down on the Ridge that lay preachers like Day Everett preached in the area even before the church was originally formed.

#### Settlement of Coalport

The town of Coalport was not officially platted until 1857 (Deed Record Town Lots, Marion County, Book 2, p. 128). As indicated earlier, there was a sizable settlement in the area before the town was officially established. McCown (1909:59) mentions that Day Everett built a barn "away back in the 'forties'" somewhere down in the flat valley land around Coalport.

Coalport was located in the Southwest one-fourth of Section 14, Township 76 North, Range 19 West of the 5th Prime Meridian (SW $\frac{1}{4}$  of Sec. 14, T. 76N, R. 19W of the 5th P.M.). An oxbow of the Des Moines River cuts through Section 14 and through a portion of the SW $\frac{1}{4}$ . The quarter section is irregular in shape because of this. The quarter section is subdivided into the

NW $\frac{1}{4}$ , Lot 3 and Lot 4. Coalport was located in Lot 3, on the bank of the Des Moines River. The Coalport Kiln was located to the south of Coalport in Lot 4 abutting on the high valley bluff of the Des Moines River Valley. The Gidel Kiln was located either in the western part of Lot 3 or in the NW $\frac{1}{4}$  of the SW $\frac{1}{4}$  of Section 14. Coalridge was located in the four corners area where Sections 14, 15, 22 and 23 come together (Plate 2, top).

### First Settlers

When the treaty was made in 1842 with the Sac and Fox for the lands in and around what was to be Marion County, the Indians and settlers agreed that the half of the land that was located east of a surveyed line running through Red Rock would be opened for settlement on May 1, 1843 (Union Historical Company 1881:297). The area which was to become Coalport and Coalridge was located east of this line so that it was opened for settlement at this date. Perhaps the first settler in the area was Lysander W. Babbitt. Babbitt may have come to the Coalport area in the spring of 1843 (Illustrated Historical Atlas of the State of Iowa 1875:394). In any event, Babbitt was not able to make an official claim to this land until after it had been officially surveyed in 1846 by Samuel Jacobs (Union Historical Company 1881:331). The land was offered for sale on January 25, 1848, and Babbitt entered his claim on February 7, 1848 (Union Historical Company 1881:331 and Land Deed Record: 1848). The authors of the History of Marion County, Iowa (Union Historical Company 1881) disagree with this 1843 date for Babbitt's entry into the Coalport area. They claim that Babbitt spent the winter of 1842 and 1843 investigating and exploring land in Boone County near Boonesboro and the present town of Moingona

(Union Historical Company 1881:299). Donnel (1872:101) says that Babbitt went to the Boone area in 1842 and reached Coalport the first of May, 1843.

William Welch was another one of these first settlers. On March 23, 1848, the United States Government issued a patent to Welch for the NW $\frac{1}{4}$  of Section 14 and Lot 3 (Original Entries, Marion County, Sec. 14 T76N R19W). Welch bought Lysander W. Babbitt's claim to Lot 4 in Section 14 (Land Deed Record, Marion County Recorder's Office 1848). Welch thus owned almost all of the SW $\frac{1}{4}$  of Section 14 almost immediately after it was opened for settlement. He owned other land in this area as well. In 1852 Welch paid W. D. Everett \$200 for the south half of the NW $\frac{1}{4}$  of Section 14 (Land Deed Record, Marion County, Iowa).

### Coalridge

Up on the bluff of the Des Moines River just above Coalport the small settlement of Coalridge was being established at about this time. The Coal Ridge [sic] Baptist Church was formally established in 1852 (Original Church Records of Coal Ridge Baptist Church) and a school was established there quite early, probably before 1860 (McCown 1909). Coalridge also had a cemetery at a fairly early date. Most of the burials in the cemetery date from the 1880's and more recently. Coalridge never was a very large or complex community. One gets the idea that Coalridge and Coalport existed in a sort of symbiotic relationship. Coalport had industry (pottery, saw-mill, etc.) to provide jobs for some of the people who lived in Coalridge, and Coalport also had the steamboat landing and the only store in the area (McCown 1909:110-111). Coalridge, on the other hand, provided a



cemetery, church and schoolhouse and places for social gatherings (McCown 1909:3).

### Coalport

William Kent, the Marion County Surveyor, platted the town of Coalport on the request of William Welch on May 11, 1857. He described it as follows (Map 2):

I surveyed the town of Coalport lying on the south side of the Des Moines River in Sec. 14 Township No. 76 North of Range No. 19 west of the 5th P.M. . . . it is laid off with streets running North 50° West and South 40° East; the var. of the needle was 11° East. The Alleys run South 40° East. The streets are 60 feet wide; all but Water Street is of varied widths; the Alleys are 12 feet wide; the Blocks are numbered by Figure in the Centre of each Block and the lots which are fifty by one hundred feet are numbered by a figure in the centre of each lot. There is two stone buried one at North East corner of Block No. 1 and one at the North East corner of Block No. 2 from which to make surveyes additional. (Deed Record Town Lots, Marion County, Book 2, p. 128)

The plat drawing that accompanies Kent's description shows a town composed of seven blocks with eight lots in each and a somewhat larger "Mill Lot." Water Street fronts on the Des Moines River and the next three streets running from the northeast to the southwest are labelled First, Second, and Third Streets. Maine Street is the only other street named and it runs from the northwest to the southwest.

William Welch evidently envisioned a promising future for the town of Coalport. He saw the rich clay and coal resources and he recognized that the oxbow on which Coalport stood was a natural stopping place for steamboats running up and down the Des Moines. Welch had enough faith in this area that he bought up much of the land surrounding the eventual townsite.

He started a pottery industry, coal mining, a saw and grist mill, a shingle factory, and a small store in Coalport. He built a house down in Coalport where he and his family lived for several years.

Alfred B. McCown moved to the Coalport locale in 1856 with his family (McCown 1909:25). His father worked as a shingle maker in the town of Coalport and McCown spent his childhood in the area. He apparently left to travel as a miner sometime in the 1860's. McCown has this to say about the town of Coalport.

In those good old days we had Coalport in the valley and Coal Ridge on the hill. The former was a little steamboat town situated on the west bank of the Des Moines River, as at that time it pursued its course seaward [sic] bearing upon its silvery bosom the burdens of men . . . .

Coalport was a famous village. It had one little store, a saw and grist mill, a potter shop and a blacksmith shop. It had no postoffice, because of the strange stories that had reached the department at Washington that wild Indians were still in the neighborhood and that an occasional white man was burned at the stake. So the rural delivery man, like the priest and Levite, passed by on the other side.

The notoriety of this little town was a matter of pride to its population, which consisted of about a half-dozen families, each of which boasted its large accumulation of children; for in those good old days, there was little else to do. (McCown 1909:2-3)

According to McCown, Coalport provided coal for the steamboats that traveled the Des Moines River in the 1850's and 1860's. Calvin and Lees (1909:193) support McCown. They say that

At one time Coalport was an important town, supplying coal to the numerous steamboats then plying between the cities located on the navigable portion of the Des Moines River.

It is interesting to note that "Steamboat Bill" Peterson in "Steamboating on the Des Moines River" makes no mention of Coalport. He does, however,

list steamboats that McCown remembers stopping at Coalport. Calvin and Lees felt that Coalport was of considerable importance as a coaling town. They remark that ". . . in these days when steamers passed up the river this village was one of the most important coaling stations between Eddyville and Des Moines" (1909:561). Calvin and Lees are apparently basing their assumptions on the earlier work of B. L. Miller (1901). Miller says that

When boats passed up the Des Moines River in the early history of the state, Coalport was one of the most important places between Eddyville and Des Moines. At this place they usually took coal which was mined near by. (1901:179)

As mentioned above, and reflected in the town names of Coalport and Coalridge, the coal resources of the area were exploited at a very early date. William Welch may have been the first coal miner in the area. Welch mentions that he mined coal in Lot 4 of the SW $\frac{1}{4}$  of Section 14 in his partial diary in the Pella Chronicle. Worthen (1858:167-168) mentioned Welch as the owner of a coal bank in the SW $\frac{1}{4}$  of Section 14 but he did not tell the extent to which Welch had mined the area. White and St. John (1868:100) mentioned that

Messr. Bosquet and Thompson have opened a mine in the face of the bluff immediately upon the right bank of the Des Moines River, the coal of which measures from six to seven feet in thickness.

They assert that this was at the town of Coalport. Welch sold Lot 4 to Bousquet in 1865 and it is thus possible that Bousquet and Thompson were working the same mine that Welch had worked at an earlier date (Town Lot Deed Record, Marion County Recorder's Office, Book 4, p. 228). White (1870:263-264) also mentions that "Mr. H. F. Bousquet has opened a mine" in Coalport. Apparently the mines kept in operation after the steamboats

had ceased to travel the Des Moines. Keyes in 1894 (331-332) described mining operations in this area:

At Coalport, five miles southwest of Pella, on the west side of the river, coal has been mined for more than forty years. There are two veins; one three feet thick, eight feet above water level in the Des Moines river, and the other vein six feet thick, fifteen feet higher up. The coal is loaded on wagons and hauled to Flagler or Pella for transportation.

The Des Moines River had not yet changed its course at this time, although it appears to have been dropping in volume or shifting channel slightly. When Worthen visited the area in the 1850's, he was unable to see the lower bed of coal because it was covered by water.

Calvin and Lees (1909:193) mention that soft coal was still being mined in the bluff south of Coalport in 1909 and that ". . . a little is hauled to Howell and shipped from that point."

The Iowa State University Archaeological Crew found evidence of only one abandoned slope mine in the bank of the Des Moines River near Coalport. This was located approximately in either the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 14 or in the NE $\frac{1}{4}$  of the NE $\frac{1}{4}$  of Section 23.

It would appear that Welch sold the lots and blocks of Coalport in two operations. The first major sale was of Lots 1-5 and 8 in Block 2 to the Bousquets and to Joseph Thompson. Later, he sold the rest of the town to Wm. S. Bailey and Thomas H. Smith. It is impossible to tell how many people lived in Coalport; however, a quitclaim deed from 1897 may be very important as it indicates that all of those people sold out to Bailey (presumably so that he could farm the entire tract). The earlier occupants probably had already gone or they would not have given him a quitclaim. If

the town had not already been abandoned the land would have been worth hanging onto. Merely as farm land, it would have little value to the several earlier occupants since these people had only very small land claims.

It is not possible to find all of the records concerning land ownership in Coalport, but perhaps to do so is not necessary. The present concern is to determine when Coalport was farmed and when it was abandoned. Figure 1 shows this quite clearly. Figure 1 lists some of the early land exchanges in Coalport, including the later quitclaim deed. Concerning Lot 4, Section 14, records indicate that this land, which William Welch bought from Lysander W. Babbitt (who was the original government enteree), was sold by Welch to A. E. Dudok Bousquet in 1853 (Original Deed, Marion County Recorder's Office, filed for record July 16, 1855). The land then changed ownership and was parceled many times, until it was finally purchased by the federal government for construction of the Red Rock Reservoir.

#### Ceramic Industry

Few authorities on ceramics have concerned themselves with the very early American frontier pottery industry that produced mainly plain utilitarian wares for local consumption. Daniel Rhodes (1957, 1959) devotes a portion of one chapter to them, but most of the ceramic historians are more concerned with "art pottery" than they are with these relatively crude wares.

And yet, these pottery industries were important for the pioneers in Iowa and in other areas of North America. Rhodes (1957, 1959) feels that the agricultural emphasis of nineteenth century America created a need for pottery; or rather, agriculture created a need for durable contain-

Grantor	Grantee	Instrument	Date	Book	Page	Description of Property
Wm. Welch	Lewis J. William- son	Mortgage	5 Oct 1855	G LDR (Land Deed Record)	92	Welches Steam Saw Mill and S $\frac{1}{4}$ of NW $\frac{1}{4}$ , Sec. 14
Jonas and Isa- bel Liter	John Welch	Warranty Deed	2 Oct 1858	M LDR	361	2 acres in NW $\frac{1}{4}$ of SW $\frac{1}{4}$ and Lot No. 3, Sec. 14 the un- divided 1/3 part
John B. and Harriet Welch	John Welch	Warranty Deed	20 Jan 1859	M LDR	362	Undivided 1/6 part 2 acres in NW $\frac{1}{2}$ of SW $\frac{1}{4}$ and Lot No. 3, Sec. 14 together with the equal 1/6 part of the steam mill formerly the property of John B. Welch, Pascal P. Hopson, and Jonas Liter
Wm. Welch and wife	Ted Davis	Warranty Deed	25 Apr 1859			15 acres maybe in Lot 3 or just in N $\frac{1}{2}$ of SW $\frac{1}{4}$ , Sec. 14-- excepts the John B. Welch Steam Saw Mill and any town lots already sold
John and Rachel Welch	William Welch	Warranty Deed	3 Jan 1861	O LDR	270	Undivided 1/2 of Mill lot-- 2 acres at least--in Lot 3 and in NW $\frac{1}{4}$ of SW $\frac{1}{4}$
William Welch	John J., Henry L., and Herman F. Bousquet	Warranty Deed	19 June 1865	4 Town Lot Deed Record	228	Undivided half lot 1, 2, 3, 4, 5 and 8 in Block 2, Coal- port

Figure 10. Land Sales in Coalport Area (Selected)

Grantor	Grantee	Instrument	Date	Book	Page	Description of Property
William Welch	Joseph Thompson	Warranty Deed	19 June 1865	4 Town Lot Deed Record	228	Undivided half of Lots 1, 2, 3, 4, 5, and 8 in Block 2, Coalport
Joseph and Ann Abraham Thompson		Warranty Deed	2 Apr 1866	P LDR	447	Undivided 1/2 of Lot 1, 2, 3, 4, 5, and 8 in Block 2, Coalport, and also land in Lot 4, Sec. 14
Abraham Thomp-son	Joseph Thompson one of the ex-ecutors of John Kee (dec.)	Mortgage	26 June 1866	P LDR	449	Equal undivided half of Lots 1, 2, 3, 4, 5, and 8, Block 2, Coalport
W. and Eliz-abeth Welch	Wm. S. Bailey and Thomas H. Smith	Warranty Deed	1 March 1869	3 LDR	503	SE $\frac{1}{2}$ of NW $\frac{1}{4}$ of Sec. 14 and a also Lot No. 3 in SW $\frac{1}{4}$ of Sec. 14, together with all the lots and blocks in town of Coalport, reserving Lots 1, 2, 3, 4, 5, and 8 in Block 2, Coalport, and also the Steam Saw Mill and appurte-nances thereto belong of Mill Lot plot and house on Lot 4, in Block 5 in Coalport.
William S. and Ethelinda Bailey and Thomas H. and Rebecca Smith	Garret Tomson	Warranty Deed	15 Feb 1871	4 LDR	630	Looks as if they sell all of their land in Coalport except one acre (kiln?)--and they also don't sell Lots 1-5, 8 which they never owned.

Figure 10 Continued

Grantor	Grantee	Instrument	Date	Book	Page	Description of Property
Allen Anderson, Eliza Anderson, T. C. Anderson, May Anderson, T. C. Smith, J. W. Anderson, Etha Anderson, Joseph Neely, Minerva Neely, Silvia Crouch, S. M. Crouch, Mattie Anderson	William S. Bailey	Quitclaim Deed	10 Aug 1897	34 LDR	176	Convey all of their interest in and to SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 14 and also Lot No. 3, Sec. 14, except 16 acres belonging to Joseph Neely off of the NW $\frac{1}{4}$ of Lot 3. Also all interests in lots and blocks and parts of lots and blocks in the town of Coalport, situated within the boundary of Lot 3, except Lots 1-5 and 8 in Block 2 in the town of Coalport

Figure 10 Continued



ers that was met by local potteries which made cheap earthenware and stoneware vessels. Early Iowa homesteaders were almost all poor (Harding 1942; Union Historical Company 1881). They could not afford to import expensive containers from the eastern states. Transportation routes were either missing or inadequate in many areas so that the problem of shipping goods was acute. Given this situation, potteries were a natural and necessary part of pioneer existence. The pioneers had many uses for these vessels: jugs were used for storing liquids (alcoholic and otherwise); crocks were used to store grain, vegetables, liquids, and even meat (Carl Johnson, personal interview); lidded jars were used to preserve jellies, jams, and pickles; small pottery grease lamps were used in pioneer homes for light when better lighting was not available (Ramsay 1939; McCown 1909). Ceramic churns were often used for making butter.

The men who made these wares were pioneers themselves. The early potters often entered frontier communities with the earliest settlers. Potters formed a class of workmen called "itinerant potters" by Rhodes (1957). By this Rhodes means that these potters were great travelers, moving from one frontier community to another with a steady movement to the west. It is significant that the man who is identified by Donnel (1872:144) as the first potter in Iowa, William Welch, was a pioneer himself. Originally from North Carolina, Welch moved through Kentucky, Indiana, Illinois, and Iowa. He arrived in Iowa about 1836 with the very earliest of the pioneers and homesteaders. In every state he lived in he established one or more potteries and took part in other industries such as milling, sawmilling, and trading. He fits Rhodes category of itinerant potter, a necessary

figure on the American frontier. From almost totally local materials, and with crude technology, he could design and build a wheel and kiln capable of producing durable stoneware vessels.

Demonstrating this need is the fact that, in the 1856 census records for Marion County, Iowa, seven potters are listed (Iowa Official Census 1857). Three of these were in Polk Township, the township within which the town of Coalport was to be established in 1857.

We can view Marion County at this time as a predominately agricultural county with some local craft specializations. Apparently, each little settlement or village had some specialists. Thus, the town of Coalport in 1856 had three potters but no blacksmith. The near townships of Lake Prairie and Knoxville had plenty of blacksmiths but only one potter. There must have been a great deal of trade and barter between the different communities in Marion County at this time. Also, there is that fact that only the full-time specialists are listed on the 1856 records. It is quite likely that there were many more people that could pot, blacksmith, or carpenter than ever showed up on the census records. For instance, we know that some individuals were potters and also farmers or carpenters--e.g., Thomas Cass Smith and William Bailey. There must also have been an exchange of personnel as well as material goods from community to community. We know from McCown's Down on the Ridge that ministers were constantly moving around and that often communities like Coalridge would be without a full-time minister and would borrow one occasionally from surrounding communities such as Pella. Also, these occupations were not year-round occupations in some cases. In the 1870 census, Smith and Bailey state that their potting operation was only a ten-month operation (Iowa Official Census 1870, unpub-

lished original--"up. orig."). They do not state what months they are not in operation but it is likely that these were farming months, perhaps one month in the spring and one in the fall.

### The potters at Coalport

A number of people worked at the potteries that were located at Coalport. The earliest of these men, and probably the man who established the first kiln and potter's shop in the area, was William Welch. It is likely that he established the Coalport Kiln located in Lot 4 of Section 14.

William Welch William Welch was an itinerant potter who was born in Huntsville, North Carolina, on January 1, 1800 (Donnel 1872:144-145). Welch learned the pottery trade in Huntsville under the supervision of Silas West, an experienced potter (Welch 1876). Welch moved to Richmond, Indiana, in 1829 (Welch 1876; Donnel 1872:144-145). In 1831 he moved to Illinois, settling in Machonoagh, Laziwell County (Welch 1876; Donnel 1872:144-145). He stayed there for only a few years and in 1836 he moved to the portion of Wisconsin Territory that would eventually become Iowa. He first settled in Iowa near Bonaparte, in Van Buren County. In a short memoir, Welch (1876) recalled this period.

I made a claim at this place and started a pottery-- a good shop and kiln--made some \$100 worth of stoneware (not yet burnt), when my shop caught fire and burned to the ground with all the contents therein and left me some #300-\$400 in debt and nothing to pay it with--with a family of seven or eight children, no income or money, nor anything to live on.

I set in anew to work at my trade (pottery) and in the course of three years made enough to pay him and all other debts due to my creditors there in Van Buren county, Iowa.

Donnel says that this was the first pottery in the territory and that the

remains were still visible in 1872 (Donnel 1872:145). Sara Nossaman, one of William Welch's daughters, states that

My father was a potter by trade. He built the first potter shop in the state, I suppose, in the year 1836. But there was but few to buy his ware so we had it hard for most of the five years of our stay in Van Buren county. (Nossaman 1940:8)

Welch next moved to Fairfield, Jefferson County, Iowa, and set up another pottery one and one-half miles southwest of Fairfield (Welch 1876; Nossaman 1940:8). Donnel fails to record this move.

Welch's next move was to Lake Prairie Township. He says that

I then sold out there (Fairfield) and on May 1, 1845, just 31 years ago, I came to this county (Marion) and made a claim some four miles south of Pella in the timber, the Indian title being extinguished there, set up another pottery, made a farm in the timber and one in the prairie where William George, Yanke Clarke and part of Theodore Thomas' place is. (Welch 1876)

Donnel says that this move was in 1844 rather than in 1845 and he also says that Welch had a partner in the pottery, a Mr. Nossaman. However, on another page, Donnel gives a somewhat different chronology.

At this early date (1846) the difficulty of obtaining breadstuffs induced Mr. N[ossaman], in connection with Wm. Welch, to put up what they called a stump mill, to grind corn . . . . During the same year ('46) and at the same place they also established a horse-power sawmill and manufactured the first lumber in the county north of the river. In addition to these temporary, though valuable enterprises, they erected a pottery there, and manufactured some pretty good ware. (Donnel 1872:141)

The History of Marion County, Iowa (Union Historical Company 1881:300) also mentions that William Welch established a pottery in Lake Prairie Township sometime around 1843.

Sometime after 1846 Welch moved to the area where he would later estab-

lish the town of Coalport and he set up another pottery in this area.

Welch (1876) says that

About 28 or 29 years ago (1847 or 1848) I sold my prairie farm to the Hollanders--100 acres broke and fenced for \$600 in gold and then with the money bought the Coal Port Claim from L. W. Babbitt and paid him \$600 for 220 acres for his claim.

An article of agreement made on August 2, 1847, describes Welch's sale of some of his Lake Prairie land to "H. G. Scholter, formerly of Holland, now of the United States of America" (Welch 1847). It is not recorded whether he sold his pottery operation at this time.

An early deed located in the Marion County Recorder's Office, Knoxville, reports that on March 17, 1848, Lysander W. Babbitt and Helena Babbitt sold Lot 4 of Section 14, containing 57 and 46/100 acres, to William Welch (Land Deed Record, Marion County, Iowa). This was the area where Welch was to set up the Coalport Pottery Kiln. On March 23 of the same year, Welch filed original entry papers for the NW $\frac{1}{4}$  SW $\frac{1}{4}$  and Lot 3 in Section 14 (Original Government Entry Certificate Number 1053). He obtained the patent to this land on April 10, 1849 (Land Deed Record, Marion County, Iowa, Book 26, p. 212). Lot 3 in Section 14 is of particular importance because this is the area that Welch later chose for the site of the town of Coalport.

Welch had some difficulty with a counterfeit land claim for some of the land surrounding Coalport. After this initial purchase he says that

I then entered the coal bank piece and balance of the claim. I then sold out my pottery and farm south of Pella and went to Coal Port, set up another pottery, run it for a few years and sold half of it to Old Mrs. Bonsquet [sic]. After awhile I sold the other half to him for \$1000, coal bank and all, which let me out of the pottery. (Welch 1876)

This was apparently the last time that Welch ever plied his pottery trade. However, he became quite active in Coalport and he set up a gristmill, a shingle factory, and for a while ran a small store in the town. He also, of course, was responsible for the town of Coalport being originally platted. The survey for the town plat was done at his request (Deed Record Town Lots, Marion County, Book 2, p. 128). Welch built a home in Coalport and later moved to the Amsberry house up in Coalridge (McCown 1909:113). Coalport was located in Polk Township but in 1850 Coalport did not exist and when the official census was conducted for 1850 for some reason the Polk Township returns were included with the Lake Prairie Township returns. In the Iowa Official Census for 1850--Lake Prairie Township--William Welch is listed and his occupation is given as potter (Iowa Official Census 1850, up. orig.) Furthermore, he is listed as owning a pottery worth \$2000 and with invested capital of \$500. The census records list clay as the material used and further say that Welch fabricated handmade (wheel-made rather than mold-made) pottery. He employed seven laborers and paid \$150 monthly wages to them, and he made "crocks, jugs and jars" at his pottery (Iowa Official Census 1850, Lake Prairie Township). Unfortunately there is no way at present to tell if this was the Coalport Kiln or whether the pottery in question is the earlier one that he owned and operated southwest of Pella. The dates suggest that it was the Coalport pottery but the size of the operation is not consonant with this.

William Welch is included in the 1856 Census of Iowa for Polk Township but he is not listed as a potter (Iowa Official Census 1856, up. orig.) Three other potters, G. W. Hardesty, Christopher Busach, and Dirk Beintema are included in the 1856 Iowa Census for Polk Township. Beintema, accord-

ing to the census, was living with Welch's family at this time. In the same census records, Welch is listed as a sawmill proprietor (Iowa Official Census 1856, up. orig., Vol. 57:702-741). We can probably assume that Welch extricated himself from the pottery industry at Coalport sometime before 1856. Added to this is the fact that Alfred B. McCown (who came to the Coalport area in 1856) says that Welch was involved in several different occupations while in Coalport--including store owner, gristmill owner, and sawmill owner, but McCown seems unaware that Welch also potted there. During the period of McCown's residence in Coalport (1856 to around 1860 or later) Welch did not work at potting, but other potters, including both Thomas H. and Thomas Cass Smith (McCown 1909) were active at this time.

Welch moved away from Coalport sometime before 1867 and bought an interest in an old mill at the head of White Breast Prairie. He stayed there for several years and even moved his old mill over from Coalport (Welch 1876). Welch retired to Pella in 1870 and lived the rest of his life there (Welch 1876).

William Welch was a potter but even more he was a pioneer. He practiced his trade on the Iowa frontier wherever he could find suitable clay. Potting was evidently not a full-time occupation for him. In 1846 he was one of the first three county commissioners of Marion County (Union Historical Company 1881:300). At various time he was involved in all sorts of different occupations. He is the best example of what Daniel Rhodes has called the "itinerant American potter" (Rhodes 1959:33-34). His potteries were of the type that we have previously described as the earliest and simplest of pioneer potteries. He had little capital invested; he manufactured very plain utilitarian pottery forms for local use; he had little

machinery; and he was not solely a potter, for at times he farmed, operated a store, a sawmill, a gristmill, and mined coal (Welch 1876).

Other potters On January 22, 1853, William Welch and Elizabeth Welch sold "the undivided half of lot number four of section 14" to A. E. Dudok Bousquet (Land Deed Record, Marion County, Iowa). Nothing is excepted from this sale so we can assume that the Coalport Kiln changed ownership at this time. In fact, Welch mentioned that he sold the kiln and Lot 4 in two parts to Bousquet (Welch 1876). No records exist to show whether Bousquet ever actually used the Coalport Kiln. It is likely that he was not an experienced potter. He did mine coal in the coal bank in Lot 4 so it is likely that he mined the clay that was used at the Coalport Kiln (White and St. John 1868:100; White 1870:264).

The next potter of importance at Coalport was Thomas H. Smith. Smith may not have owned the Coalport Kiln; in fact, according to Stoltz and Brooks (1966:342) Thomas H. Smith leased the Coalport Pottery from A. E. Dudok Bousquet in 1860. The earliest date that we can assign for Smith's work at Coalport would be sometime after 1856, unless he worked for Welch prior to this. However, he is not listed as a potter in the 1856 census for Polk Township (Iowa Official Census 1856, up. orig.). McCown (1909) says that Thomas H. Smith was the Coalport potter while he (McCown) lived there and he moved there as a boy in 1856. Thomas H. Smith was born in Delaware (Iowa Official Census 1860, up. orig.). His date of birth is somewhat uncertain, for census records are inaccurate. The 1860 census lists a 66 year old potter named Thomas Smith for Polk Township (Iowa Official Census 1860, up. orig.). This would mean that Smith was born in



1796. However, the 1870 census lists T. H. Smith's age as 58 and his occupation as "potter--blind" (Iowa Official Census 1870, up. orig.). This is almost surely the same man although there is an unlikely difference in age. The 1880 census gives Thomas H. Smith's age as 67 (Iowa Official Census 1880). To further complicate things, there is a gravestone in the Coal Ridge Baptist Church Cemetery that lists Thomas Smith's birth date as December 28, 1811, and his death date as December 5, 1893. These might be different Smiths except for the fact that they all have a wife named Rebecca and the wife's age is always given as being a few years more than Thomas H. Smith's age. Apparently, Smith aged a great deal between 1880 and 1893.

Smith may have had several assistants during the period when he potted at the Coalport Kiln. The Iowa Official Census for 1860 lists Thomas H. Healy (or Heatey) as a potter in Polk Township at this time (Iowa Official Census 1860, up. orig.). Healy (or Heatey) was 30 years old in 1860 (Iowa Official Census 1860, up. orig.). Stoltz and Brooks (1966:342) and A. B. McCown (1909) all assert that Thomas Cass Smith, son of Thomas H. Smith, learned the potter's trade while helping his father at the Coalport Kiln. Stoltz and Brooks also claim that Thomas H. Smith's sons-in-law William S. Bailey and Jacob Neely assisted Thomas H. Smith at the Coalport Kiln, but the evidence for this is not good. During three years of digging at the Coalport Kiln, the archaeological crew excavated not one sherd bearing the name or initials of either Bailey or Neely, although one pot signed Thomas Smith was recovered from a midden area just behind the kiln.

The potteries at Coalport

It would appear that during the entire time of Alfred B. McCown's stay in Coalport (1856 to perhaps 1870) the only pottery in Coalport was located where the Coalport Kiln is now located. McCown makes many references to the pottery industry at Coalport and they all support the hypothesis that the kiln was located in Lot 4, Section 14 and that it was operated mainly by Thomas H. Smith. For instance, McCown mentions that

. . . pottery under the hill, where good old uncle Tom, a friend to every boy, fashioned tiny jugs for us, to add to the gladness of our boy life. (1909:4)

Frequently in McCown's account the pottery is a landmark beneath what he calls "the hill," as in the following passage:

There was the Bodine family, who came to that community about 1857, when they took up their temporary residence in a little house at the foot of the hill near the old potter shop. (1909:135)

The old Des Moines River was out of its banks most of the summer of 1857, and the consequence was my father's family had to live among the "scholars," or roost on top of Mt. Arrarat, which stood just over against the potter shop. (1909:57)

How the boys, big and little, used to run the old path from the schoolhouse over the hill and down the beaten trail, passing the old potter shop on the way to the landing when they heard the "steamboat blow." (1909:3)

Since the Gidel Kiln is located out in the plain of the Des Moines River Valley and the Coalport Kiln is located under the bluffs, he must be referring to the Coalport Kiln.

It is impossible to tell exactly when Alfred B. McCown left the Coalport area but it must have been after 1865 because he talks about welcoming soldiers back from the Civil War, and he was too young to take part in this

war. One feels that McCown must have been in his early teens while the Civil War was in progress, and this would have meant that he was born some-time around 1850.

The story of the Coalport Pottery becomes quite cloudy at this point. On March 1, 1869, William and Elizabeth Welch sold the SE $\frac{1}{4}$  of the NW $\frac{1}{4}$  of Section 14 and also Lot 3--all the lots and blocks and parts of lots and blocks in the town of Coalport, except 1, 2, 3, 4, 5 and 8 in Block 2 in Coalport, but including the house on Lot 4 in Block 2 and the Mill Lot in Coalport. They sold all of this to William S. Bailey and Thomas H. Smith (Land Deed Record, Marion County, Iowa, Book 3, p. 503). In 1870 census records, four potters are listed for Polk Township. These are T. H. Smith, T. C. Smith, W. S. Bailey, and Joseph S. Runyan (Iowa Official Census 1870, Polk Township, Marion County, Vol. 126, up. orig.). It is probable, then, in this year, that the Smiths and Thomas H. Smith's son-in-law, William S. Bailey, were all potting together. Runyan may have been a helper of some kind in the kiln--perhaps a glazer or stacker. In the list of industries in Polk Township in the 1870 census is found a Smith and Bailey Pottery. The description places a value on the pottery of \$1200 with \$500 invested in capital. They made hand-powered pottery and had two wheels. According to these records, three workers worked at the kiln, but the records do not specify whether this number includes the two Smiths and Bailey. Materials used include pottery clay. According to the census, the pottery was in operation for only ten months of every year. The wares produced consisted of jugs, jars, pans, and tiling (Iowa Official Census, Polk Township, Marion County, Iowa, 1870, up. orig.).

Several things make me suggest that this Smith and Bailey pottery was

what is now called the Gidel Kiln, rather than the Coalport Kiln. First, the Gidel wares are more regularly and better made than those from Coalport. This superior quality suggests a later date for this pottery, namely a date contemporary with the Smith and Bailey operation. Second, we have found absolutely no tile at the Coalport Kiln, although the 1870 census indicates that Smith and Bailey were making tile. Next, an 1875 Atlas of Marion County, Iowa (1875:27) locates a pottery on William S. Bailey's land in Lot 3 of Section 14. Measurements by the Iowa State University archaeological crew indicate that the kiln debris marking the Gidel Kiln was located either in the extreme eastern part of the NW $\frac{1}{4}$  of Section 14 or in the western part of Lot 3. The 1885 Iowa Official Census (up. orig.) for Polk Township lists two potters: William S. Bailey and Thomas H. Smith. It also lists Thomas H. Smith as the owner of a pottery business in the NE $\frac{1}{4}$  of the SW $\frac{1}{4}$  of Section 14. This would put it within Lot 3. The use of the quarter section rather than the lot number to designate this area may indicate that the river had shifted courses sufficiently by 1885 so that the entire quarter section was freed for ownership and occupation.

Thomas Cass Smith may never have had any ownership rights in either of the two kilns. However, he probably worked at both of the potteries under his father (Stoltz and Brooks 1966; McCown 1909). McCown (1909:48) says that

Cass was the son of a potter, and in due time followed the trade himself. It was a caution to see him make a jug. I imagine he found few, if any one, who could turn out as many pieces of ware as he could. Before he took up the potter trade he, among other odd jobs, baled shingles at the Welch factory, and he was the swiftest peddler of shingles I ever ran up against.

One other piece of historical information that may be of concern here

is an Internal Revenue License issued to Bailey and Green, of the town of Coalport, ". . . to carry on the business or occupation Peddler 2nd c[lass] 2 wares" (Internal Revenue License Number 3232). The license was to be in force from September 1, 1865, to May 1, 1866. The record of license itself does not establish any direct connection with the pottery industry at Coalport but the document may be an indication that the Coalport potters were trying to peddle their wares.

## THIRD SECTION: ARCHAEOLOGICAL INVESTIGATIONS

## Location and Description of the Sites and Surroundings

Archaeological sites 13MA103 (Coalport Kiln) and 13MA106 (Coalport Bottoms) are located in the Des Moines River Valley about two and one-half miles upriver from the Red Rock Dam. Both of these sites are on the right south bank of the Des Moines River and both sites are now covered by the permanent flooding of Lake Red Rock. The valley at this point is two to three miles wide and numerous old oxbows of the Des Moines River cut across it. Site 13MA106 is located to the west of one of these abandoned oxbows on a low alluvial terrace of the Des Moines River in the N $\frac{1}{2}$ , Section 14, T76N R19W. This area contains the remains of the historic white settlement of Coalport as well as a few scattered remains of a much earlier Woodland Indian occupation. A few scattered fences and cement foundations dotted this bottomland when it was first visited by the Iowa State University-National Park Service (ISU-NPS) Archaeological Crew but these appeared to be of a more recent date than the Coalport settlement, since these few remaining structures were evidently connected with the more recent farming of the area. At the time that this site was first visited, it was covered by heavy grasses, willows, and poplars. The area had been acquired by the U. S. Army Corps of Engineers sometime before this so that farming had not been practiced there for some time. In some areas huge and ancient oaks and elms were still standing.

Site 13MA103 was located in the southern bluffs of the Des Moines River Valley to the south and east of 13MA106 in the NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Section 14, T76N R19W. These bluffs have a mixed surface composed of Pennsylvanian, loess and glacial deposits. The Coalport Kiln was dug back into a Pennsyl-

varian shale deposit on a small hill in the bluff. Two fairly recent erosional cuts ran on either side of the kiln structure. The whole side of the bluff was heavily covered with forest vegetation composed of oaks, elms, hickories, and poison ivy. The remains of a road which may have been used during the period of Coalport's existence were visible to the west of the kiln structure. The road connects Coalridge on the top of the bluffs south of Coalport with the area on which the town of Coalport presumably stood.

#### History of the Investigation

During the years 1964-1968, Iowa State University and the National Park Service (ISU-NPS) jointly sponsored a program of salvage archaeology in the Red Rock Reservoir area extending from a dam between Pella and Knoxville to the southeast limits of Des Moines. The purpose of this joint project was to locate and investigate archaeological sites which were threatened by dam construction or related activities. Dr. David M. Gradwohl, Associate Professor of Anthropology at Iowa State University, was the director of this project.

On November 21, 1965, the Des Moines Sunday Register contained an article titled "They Dig It!" Two staff members of the State Department of History and Archives in Des Moines had located the remains of four pottery kilns in Marion County, Iowa. One of these, which they partially excavated, was the Coalport Kiln. Their findings were later briefly published in The Annals of Iowa (Stoltz and Brooks 1966).

Correspondence by Gradwohl with the Resident Engineer at Red Rock Dam, Mr. Elmer Gidel, and with the National Park Service established that the Coalport Kiln was on land that was soon to be acquired for Lake Red Rock.

Gradwohl and this writer visited the site in the spring of 1966 and made a small surface collection. Following the Smithsonian trinomial method of site numbering, Gradwohl designated the site as 13MA103. This first reconnaissance work revealed the fact that the Coalport Kiln was definitely threatened by the proposed Lake Red Rock. The site was also threatened by two recent erosion cuts that ran to either side of the kiln structure. Gradwohl decided to investigate the site more completely at a later date when the land had been acquired by the federal government.

By the summer of 1966 the land on which the Coalport Kiln was located had been acquired. On July 6, 1966, the ISU-NPS Archaeological Crew visited the Coalport locale with Mr. William Monster, long time resident of the area. The crew attempted to locate the now extinct town of Coalport and revisited the Coalport Kiln site. Locating Coalport proved to be a more difficult job than had been anticipated. None of the roads or buildings of the original town were visible and the area where Mr. Monster claimed that the town of Coalport had stood had been plowed and farmed for many years.

On July 21, 1966, a small contingent of the ISU-NPS Crew returned to the Coalport area and worked at sites 13MA103 (Coalport Kiln) and 13MA106 (Coalport Bottoms) for a total of five days. Excavation at the Coalport Kiln was designed to document the existing portions of the kiln and to partially test suspected sherd midden areas around the kiln. Another goal of this work was to obtain a large and controlled type collection of pottery sherds from the site. The remaining portion of the kiln floor was cleaned, mapped, and photographed; and portions of the structure under the floor were excavated and documented. It was difficult to establish an adequate



horizontal grid at this time because of the lack of surveying equipment and because of the extremely heavy underbrush. The D-shaped remains of the kiln floor and the areas immediately around it were arbitrarily divided into four pie-shaped segments and dug accordingly.

A 5' x 20' trench (designated Trench A and running northeast to southwest) was dug through a 6' high mound directly behind the kiln floor on the west. This trench established that the suspicious-looking mound was composed of orange glacial sand and gravel overlain by cultural deposits on the east. Another Trench (Trench B) was excavated through the heavy concentration of cultural material at a 90° angle to Trench A.

Vertical and horizontal controls within the site were established at the site by arbitrarily placing a nail in a tree and then measuring from this datum with a hand level, line levels, and 100' steel tapes. A preliminary topographic and site map was made at the site although it was impossible at this time to determine the actual spatial coordinates in relation to Coalridge and Coalport Bottoms, because there were no points of permanent reference in the immediate locale.

Small tests were made at other points within about a fifty foot radius of the kiln floor and these points were also included on the preliminary map.

Reconnaissance work at site 13MA106 at this time consisted of surface collecting and small, widely-spaced shovel tests. Surface collections were made in the areas that were later designated 13MA106A and 13MA106B and shovel testing was limited to the 13MA106A area.

Work was halted at 13MA103 and 13MA106 on July 25, 1966.

A small surfacing party revisited the Coalport Bottoms in the spring

of 1967 and it was at this time that areas A and B of 13MA106 were distinguished from one another. Our boundary line between the two, a band of poplars, was rather arbitrary, but it expressed the growing conviction of the investigators that the town of Coalport (presumably 13MA106B) could be distinguished from the more general settlement of the Coalport Bottoms (13MA106A).

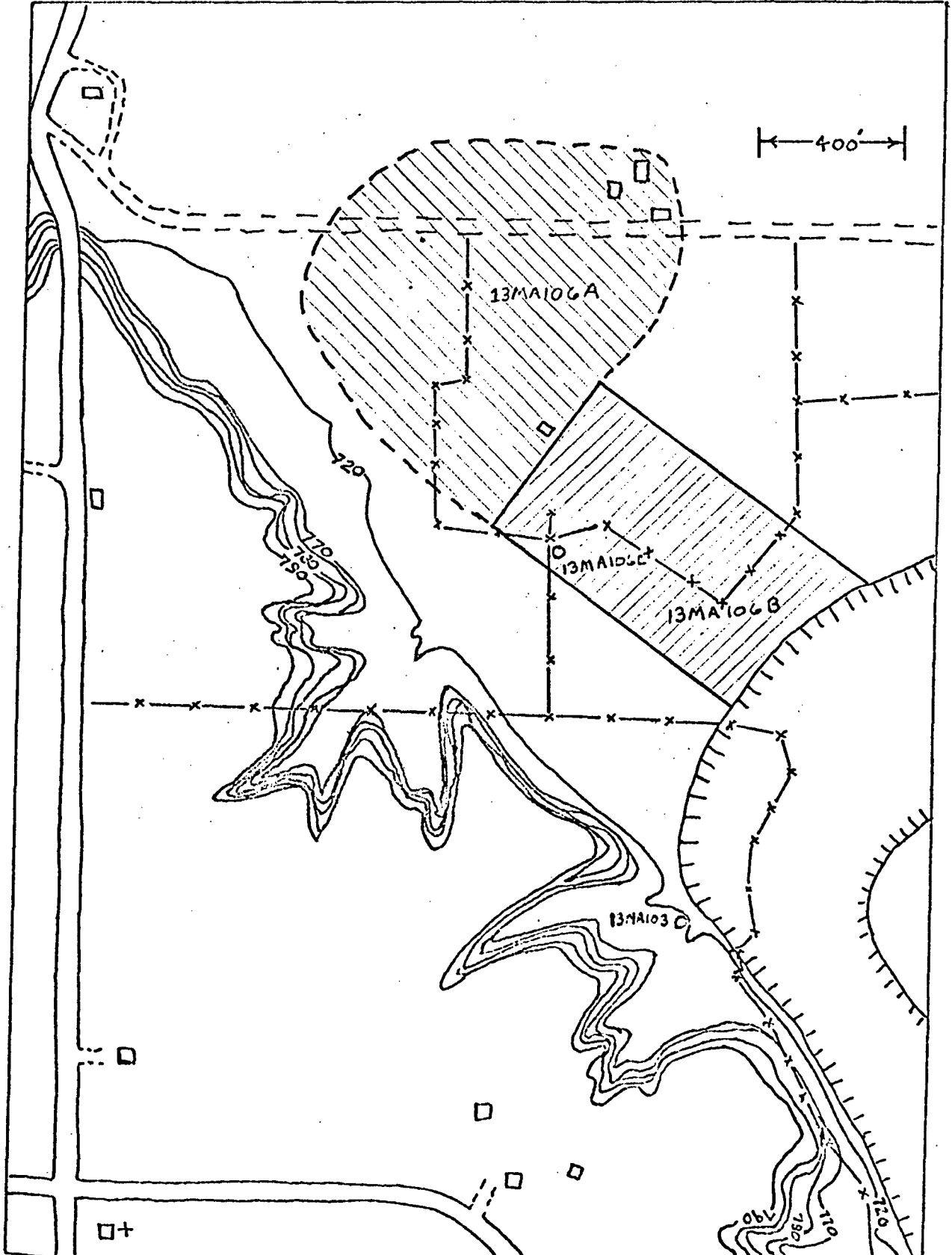
During the fall of 1967, Gradwohl and the writer returned to the Coalport Kiln site with students from the introductory archaeology course offered at Iowa State University. The investigation during the fall was limited to four available weekends and was hindered by rain. During this time a new datum was established from the old one and the earlier map was revised and improved. A new and more usable grid system was also established. The area was gridded into 5' x 5' squares. Meanwhile, the Army Corps of Engineers had surveyed in the location of the kiln and we were now able to tie the site map into larger maps of the locality (Fig. 11, Plate 2).

The U. S. Army Corps of Engineers hired contractors to clear the permanent flood pool area of all vegetation during the spring of 1968. With the vegetation gone, the relationship between 13MA103 and 13MA106 became much clearer. Aerial photographs were taken by Gradwohl and the writer at this time in the hope that they would reveal the actual location of the town of Coalport. Color slides, black and white prints, and off-color or infra-red photographs were taken. Unfortunately, these proved of little value in establishing the location of the town because of the disturbance caused by the clearing of the area (Plate 1).

We returned with members of the introductory archaeology class to the two sites in the fall of 1968 and spent a total of six weekends in the



Figure 11. Map of Red Rock Reservoir Howell Site  
(tracing from United States Corps of Engineers Map 1949)



area. Again heavy rains hindered excavations. We continued digging the squares that had been opened during the previous fall at 13MA103 and we opened new squares to the northwest of the kiln to test another refuse area. Late in October of 1968 we succeeded in salvaging portions of the kiln structure. The U. S. Army Corps of Engineers provided additional men and equipment and we lifted off the remaining portions of the kiln floor and part of the understructure. These were transported to an area just south of the Southern Red Rock Dam Overlook where they are being stored in the hope that they will become part of a permanent archaeological display.

Gidel found site 13MA106C in the fall of 1968. This concentration of ceramics was encircled by the area that had been designated 13MA106A. It is located in the Coalport Bottoms and was marked by an abundance of sherds, glazed brick which may have been portions of a kiln structure, and kiln furniture. The site of this presumed kiln forms a slight hill on the low terrace where it is located. We located the site so late in the season that we were not able to test it thoroughly. At our request the U. S. Army Corps of Engineers dug two trenches with power machinery through the southern and western limits of the small rise and these revealed a large amount of ceramics and some glazed bricks. We were not able to locate any kiln structure in situ. The test was quite valuable, however, because it yielded enough material to make meaningful comparisons with the Coalport Kiln material.

The flood gates of the Red Rock Dam were closed in late February of 1969 and in four days the waters of Lake Red Rock rose high enough to completely cover sites 13MA103 and 13MA106.

## Investigation and Excavation at 13MA103

Excavation at 13MA103 was designed to obtain a large controlled type collection of ceramic materials and to determine the limits of and to test theories about the kiln structure. The area was eventually gridded in 5' x 5' squares and these were dug selectively. A total of 150 square feet was opened up in the area containing the kiln structure and a total of 225 square feet was opened in the hill west of the kiln. Another area of 75 square feet was opened up 46' to the northwest of the kiln structure to test another dump or midden area of sherds and kiln furniture and other historic refuse. An attempt was made to follow stratigraphic levels in all of the excavation units. The excavated areas and the method of numbering the squares are shown in Figure 12. Unfortunately, limits of time prevented us from completely excavating all opened squares. Where squares were not completely excavated, we attempted to follow individual stratigraphic zones to completion.

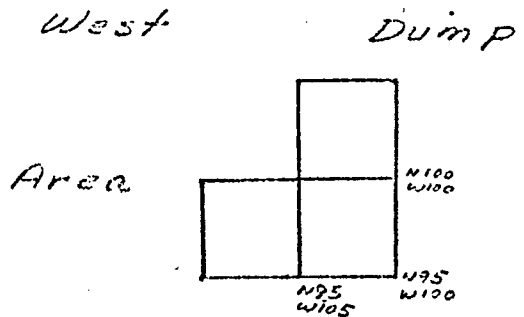
In the final days of excavation at the site, the crew moved a large portion of the remaining kiln structure up out of the flood pool limit of the reservoir. The portions that were removed were numbered, photographed, and mapped before removal (Figures 13 and 14). In preparing the material for removal, it was necessary to grade a road up to the kiln with power equipment. This cut opened a new cross section which showed the stratigraphy on which a portion of the kiln had once stood. With the addition of this profile, a cross section of the site 30' long approximately northeast to southwest was obtained which cut through nearly the entire area of the site.

The dump area to the northwest of the kiln structure was numbered from





Figure 12. West Dump Area



13 MA 103

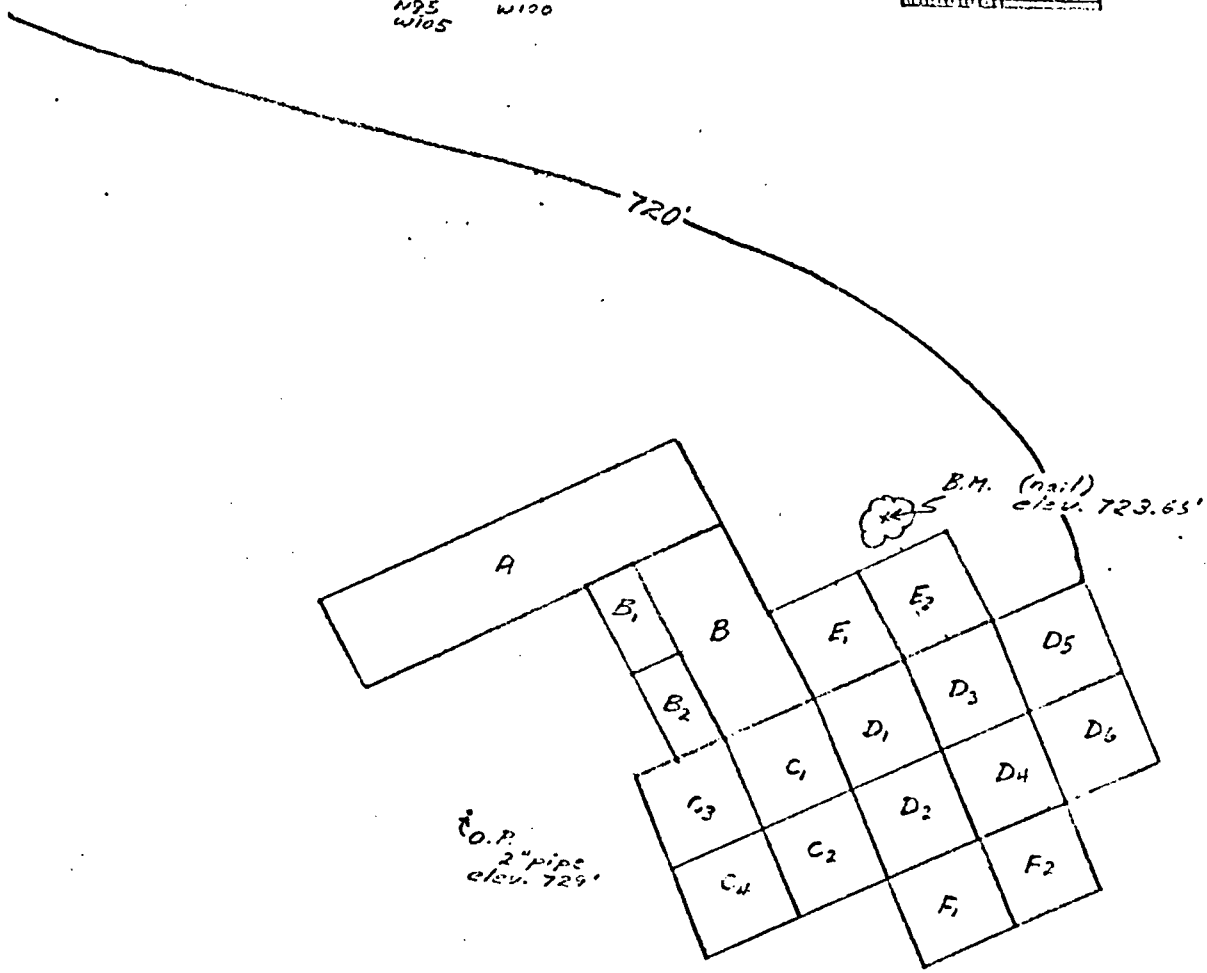
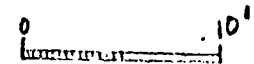




Figure 13. 13MA103: Kiln Floor  
with removed pieces numbered for possible later  
reconstruction

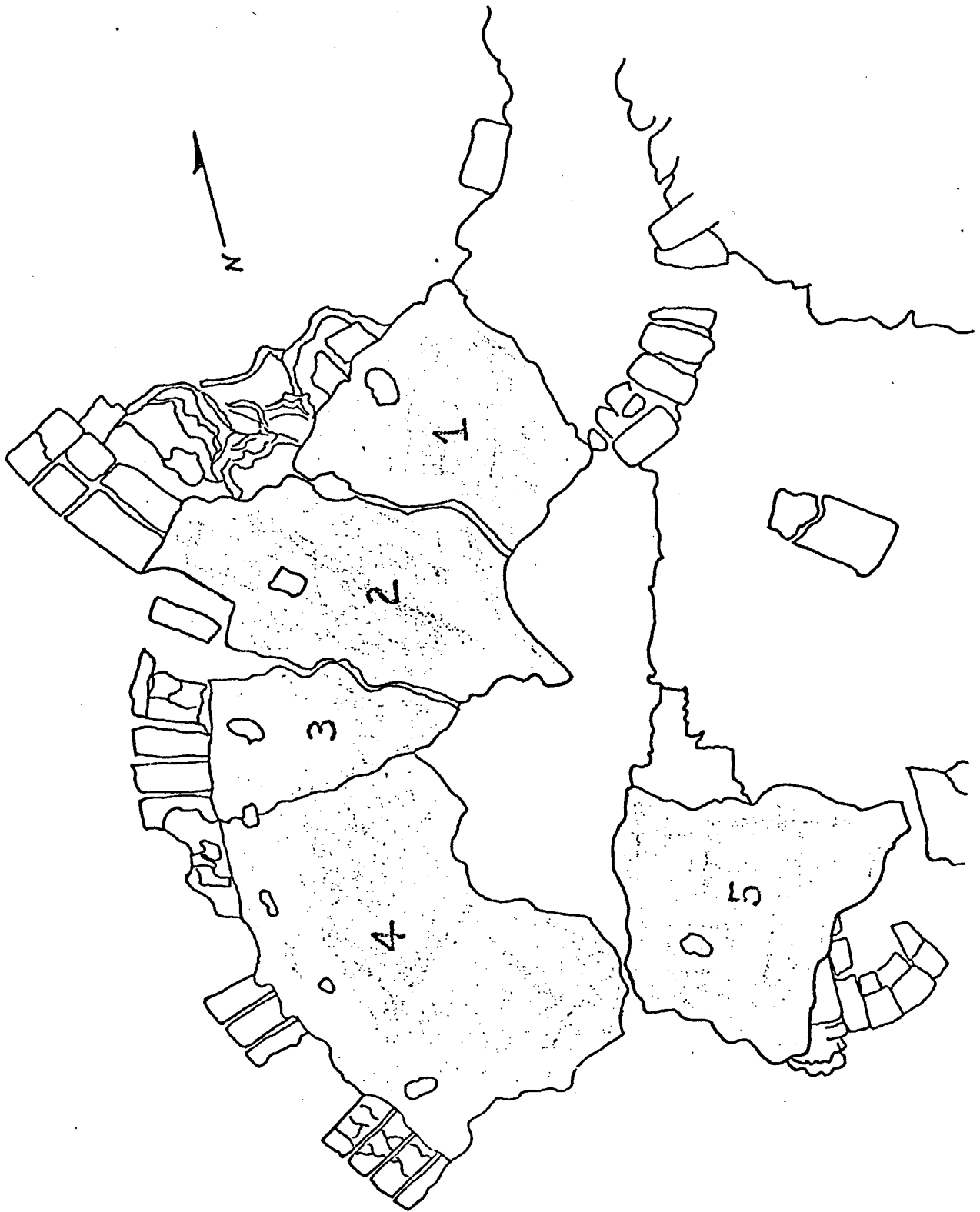
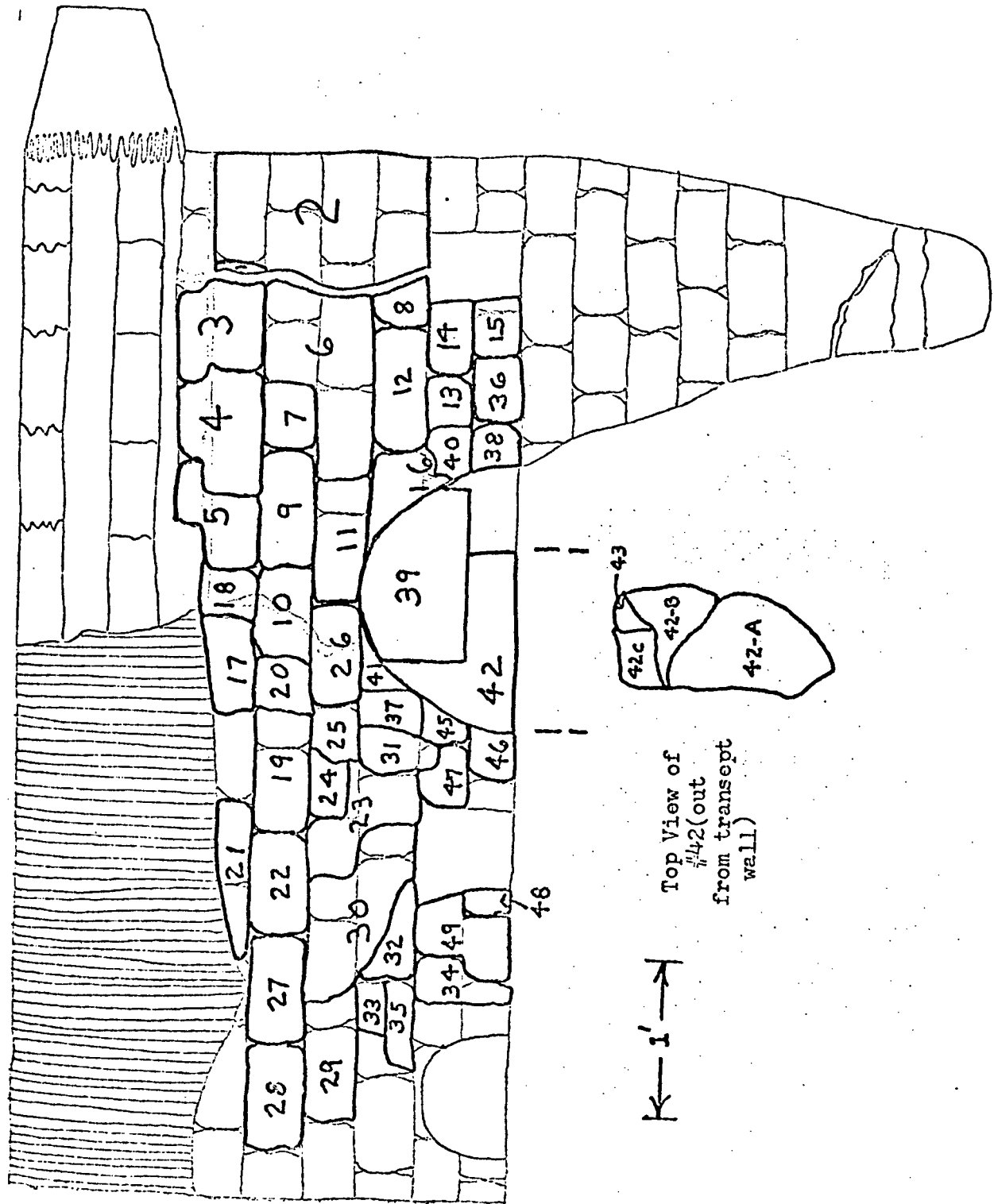




Figure 14. Numbering of the Removed Portions of the Vertical Transept  
Face of the First D-shaped Understructure



Top View of  
#42(out  
from transept  
wall)

1'



the 1967 origin with all squares being in the northwest quadrant of the arbitrarily established grid system.

Twenty-nine stratigraphic zones were designated at the site and they were numbered in the order of their appearance in the excavations (Figs. 15-22). Later they were partially renumbered in the laboratory.

### Stratigraphy at 13MA103

The vertical stratigraphy at 13MA103 was quite complex. Twenty-nine stratigraphic zones were identified of which 17 yielded cultural materials. Some of these zones were extensive, covering nearly the entire site, while some were very limited and isolated. The kiln itself was dug back into Pennsylvanian or "Coal Measures" shale (Zone 20). The hill containing the midden area directly west of the kiln was composed of Pleistocene sand and gravel (Zone 6). The midden area located northwest of the kiln structure was underlain by two layers of clay, one with ferruginous yellow stains (Zone 26) and one with uniform grey colored clay (Zone 27). The origin of this clay could not be determined. It could have been a part of the Pennsylvanian deposits of the bluff, glacial clay, or even clay deposited by the Coalport potters for preparation as potting clay. The beds appeared to be natural deposits, so this last hypothesis is unlikely. The entire site was overlain by a humic deposit that ranged in depth from one inch to several inches (Zone 1).

Interpretation of the stratigraphy around the kiln structure itself was made more difficult because of the great amounts of redeposited refuse, the backdirt piles of previous excavators (apparently pothunters or interested amateurs), and the recent stream cuts through the kiln structure.

Stratum Number	Description
1.	Thin layer of dark humic soil overlying entire site
2.	Grey and white clay--with some brick rubble
3.	Grey and white clay mixed with some orange sand
4.	Black carbonaceous zone
5.	Mixed brown and grey clay
6.	Bright orange sand and gravel
7.	Brick rubble layer with ceramics
8.	Yellow clay
9.	Mixed grey and brown soil
10.	Mixed brown and red soil with brick rubble
11.	Mixed red and grey clay
12.	Backdirt from previous excavations
13.	Sandy fine greenish grey clay with brick and artifact rubble
14.	Mixed white clay, charcoal, ash and brick
15.	Grey and yellow clay
16.	Grey clay
17.	Post-kiln operation rubble
18.	Burned red clay
19.	Grey and white ash with charcoal
20.	Shale liner around and partially under kiln
21.	Sand turned red, possibly by contact with crumbling brick or heat
22.	Orange sand

Figure 15. Vertical Stratigraphy at 13MA103

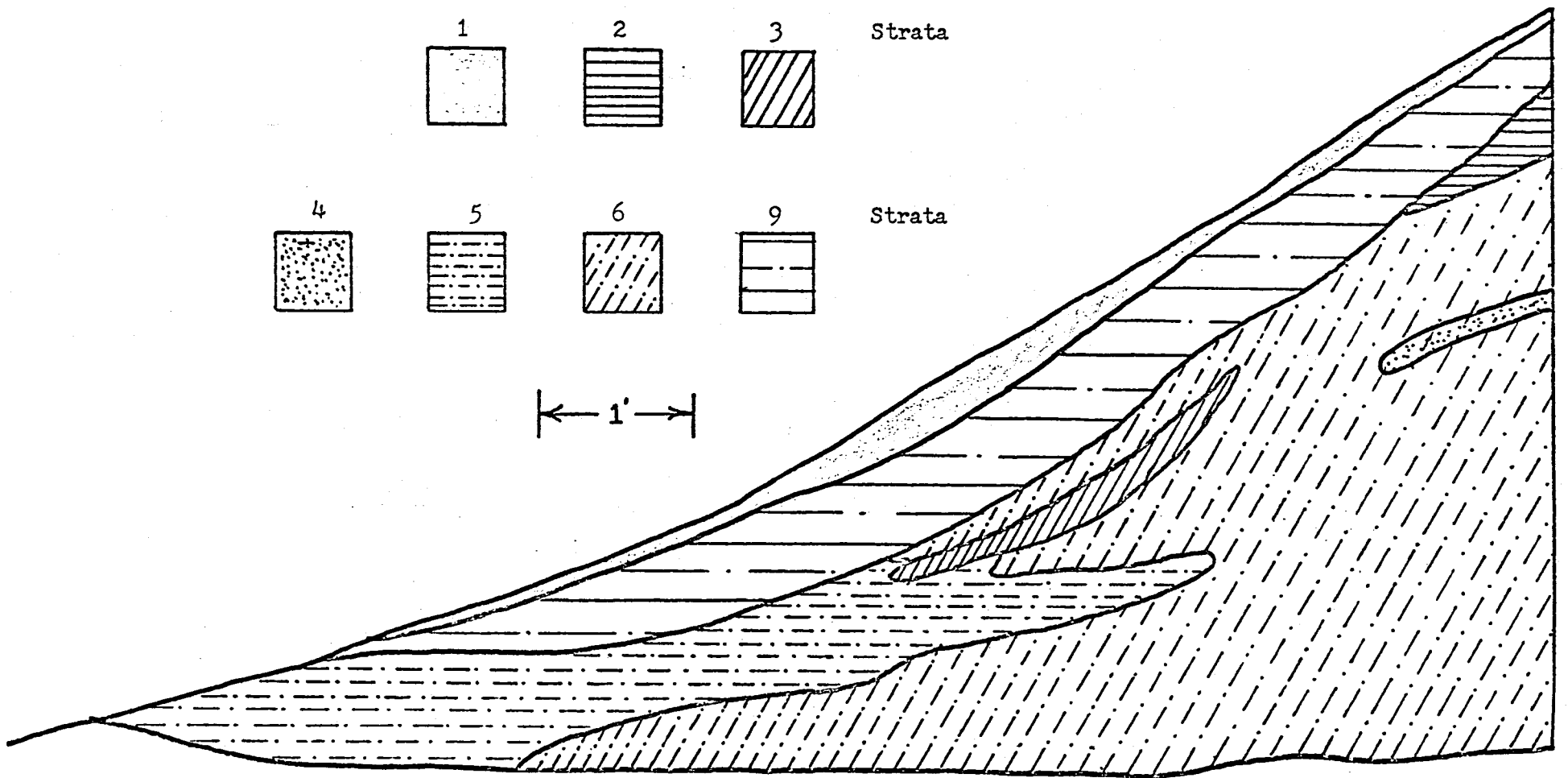
Stratum Number	Description
23.	Mixed cultural fill
24.	Grey and yellow very mixed clay
25.	Kiln furniture and broken pottery dump area
26.	Grey clay with ferruginous yellow stains and carbonaceous stains
27.	Grey clay
28-29.	Cultural rubble in vertical flues along transept

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Figure 15 Continued



Figure 16. Stratigraphic Profile  
Through southeast vertical face, Trench A  
(the following two pages)



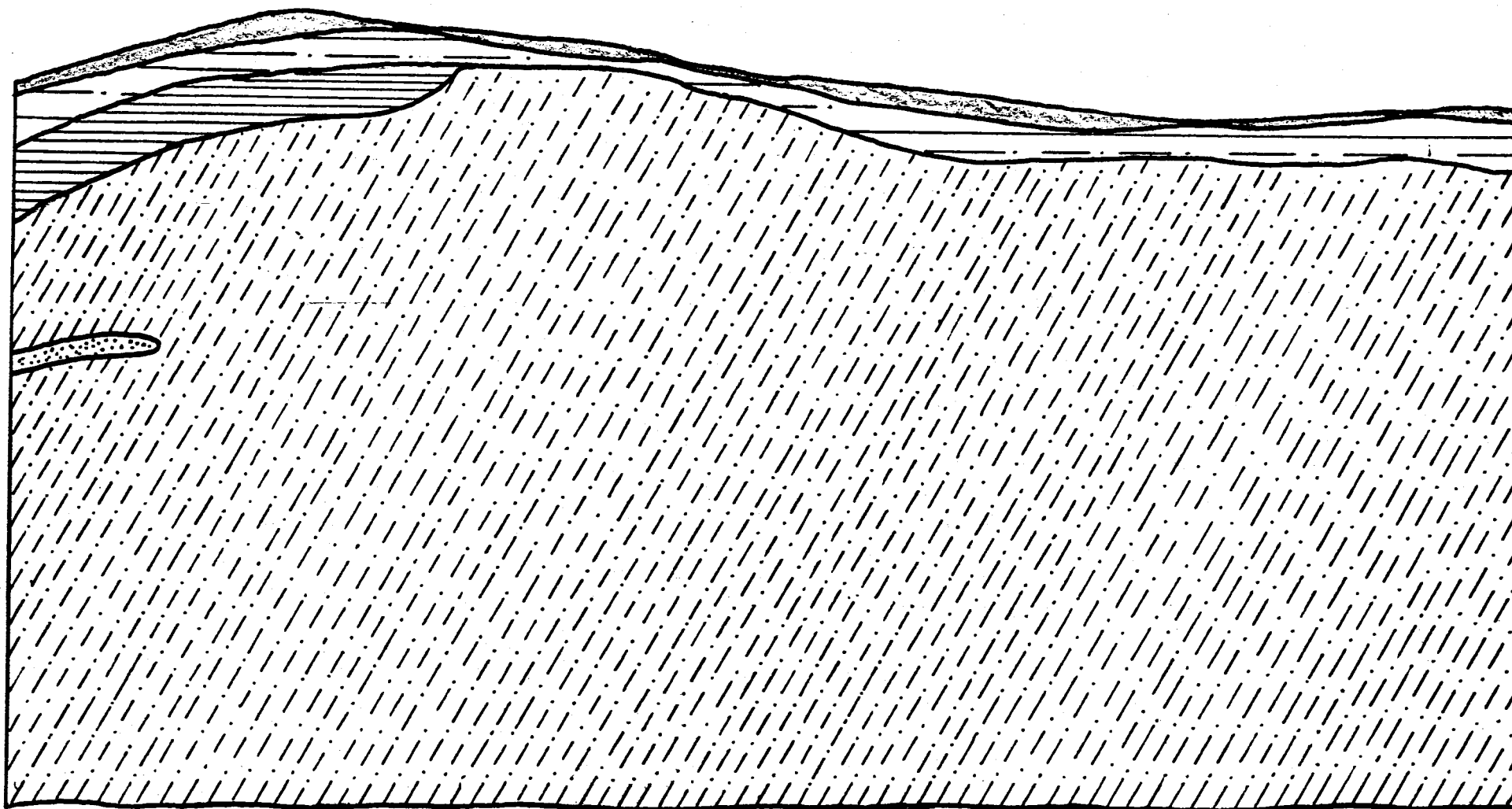


Figure 16 Continued

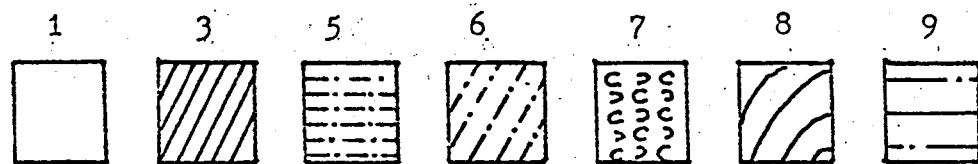




Figure 17. Stratigraphic Profile  
Southwest vertical face, Trench B



1'



Kiln shelves



Brick



Pottery



Stone

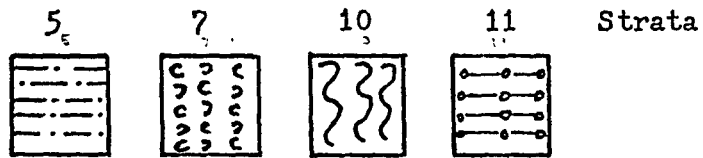
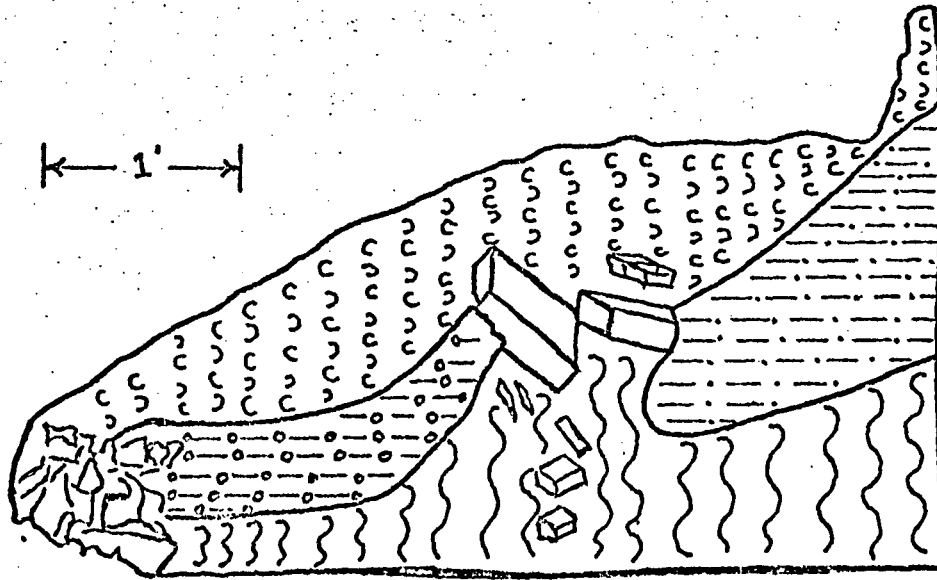


Figure 18. Stratigraphic Profile  
Southeast vertical face, Trench B



Figure 19. Stratigraphic Profile  
Southwest vertical face, Squares B<sub>1</sub> and B<sub>2</sub>

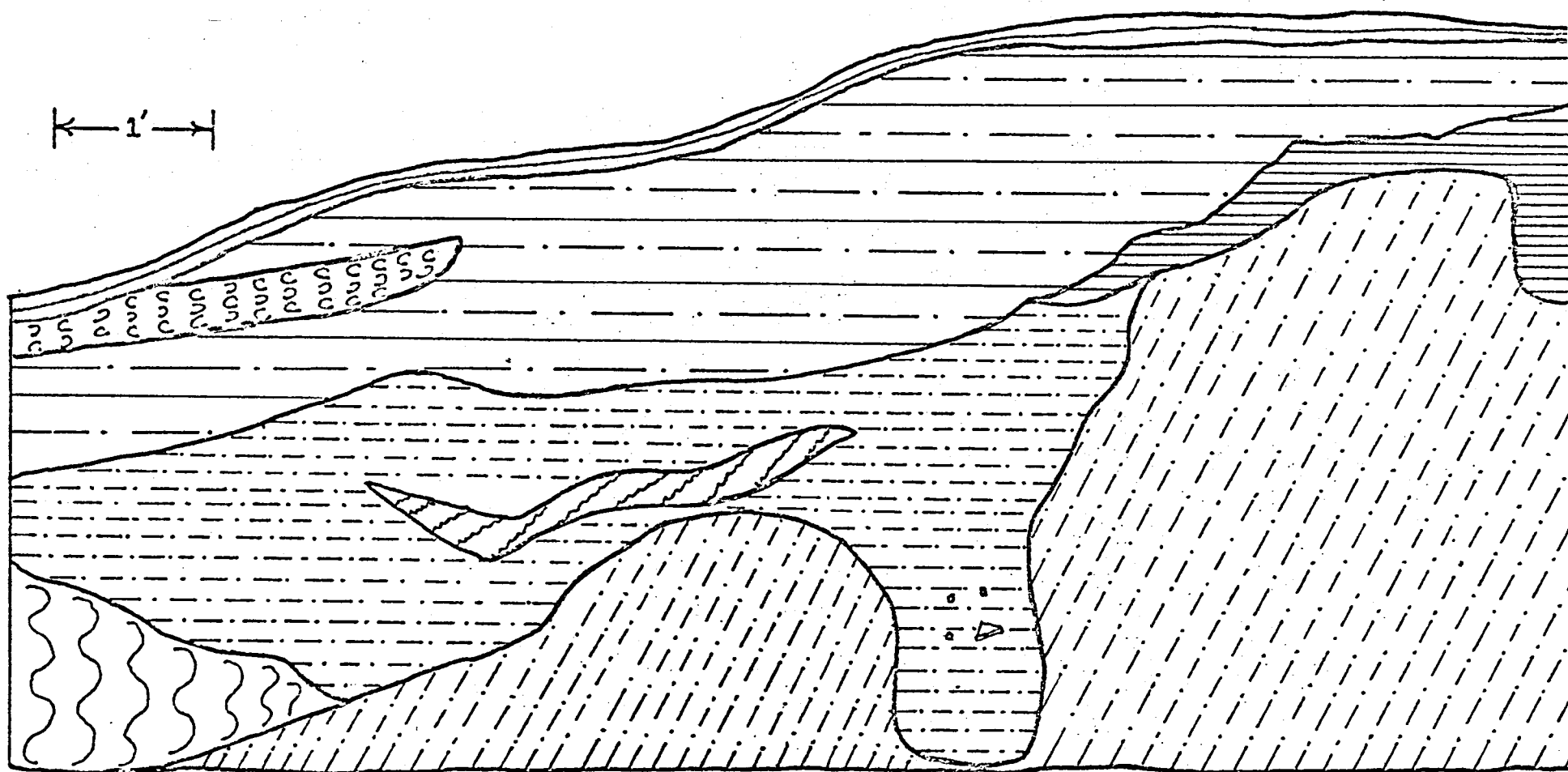
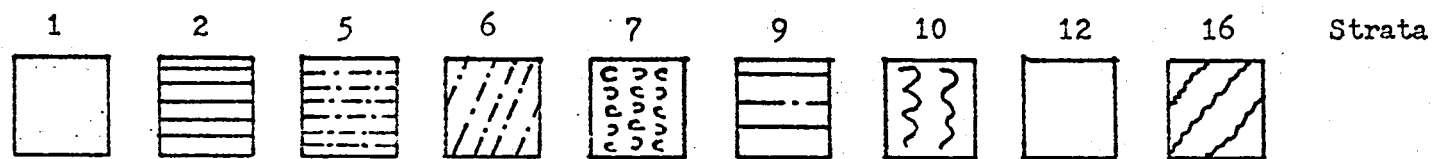




Figure 20. Stratigraphic Profile  
South vertical face of grader cut



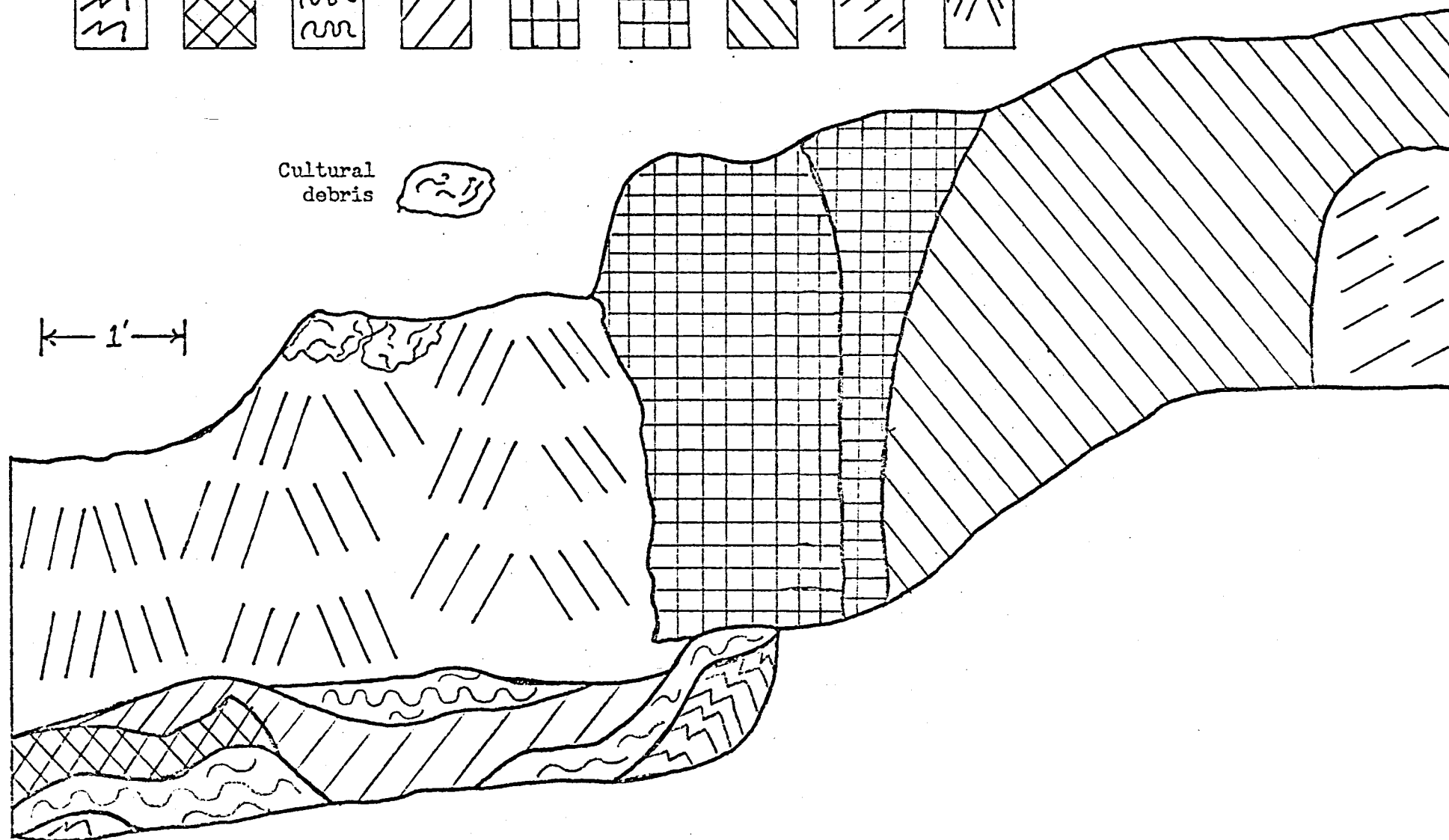
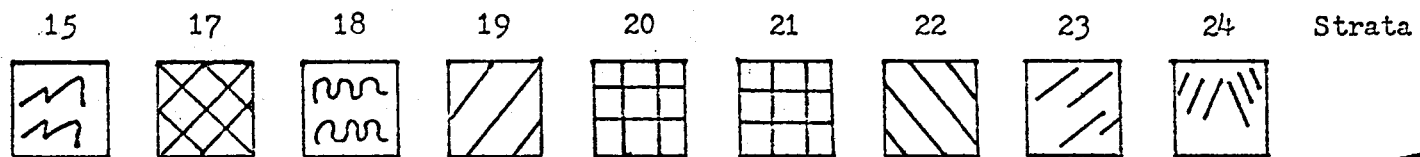
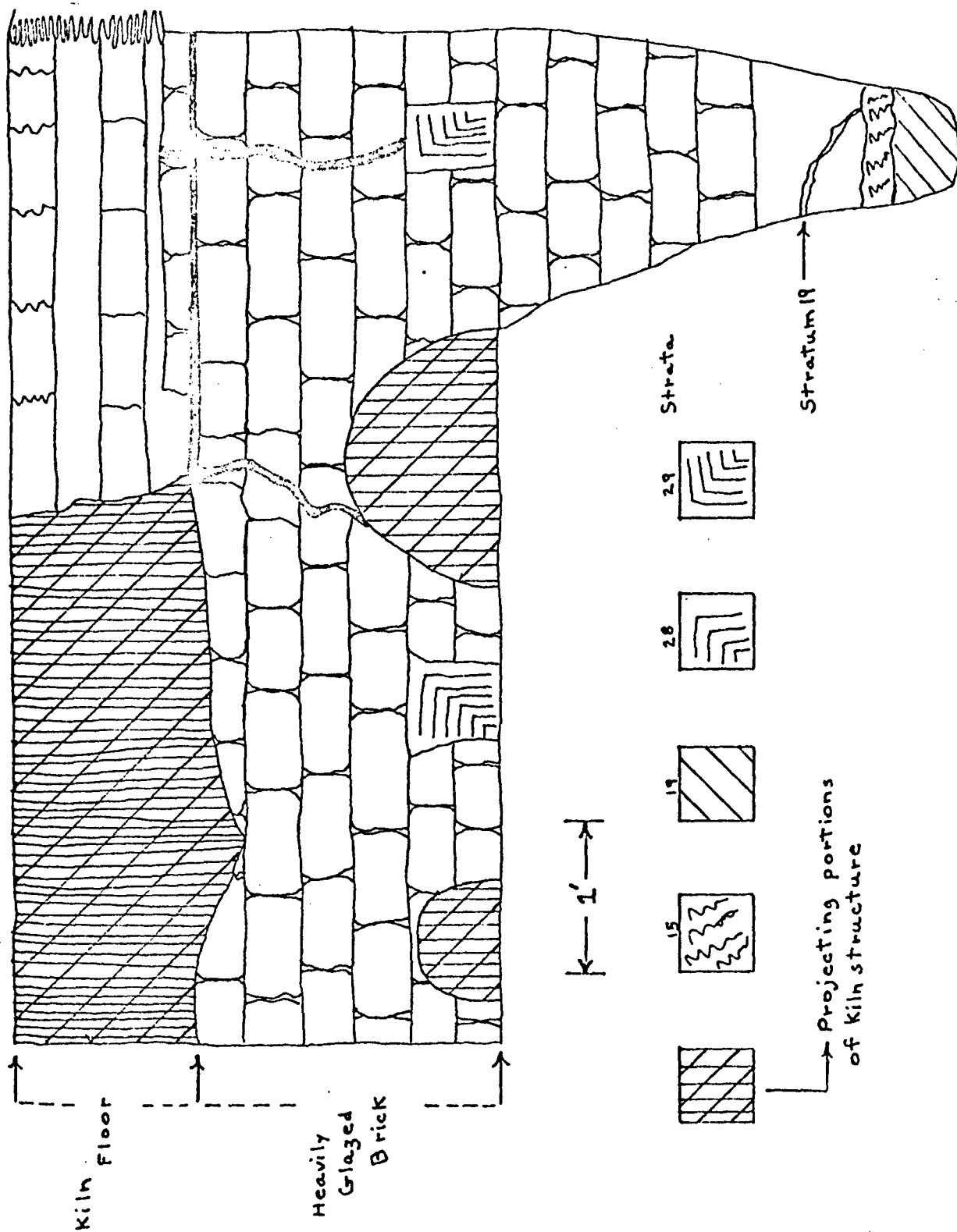


Figure 21. Stratigraphic Profile of the Vertical Transept Face of  
the First D-shaped Understructure



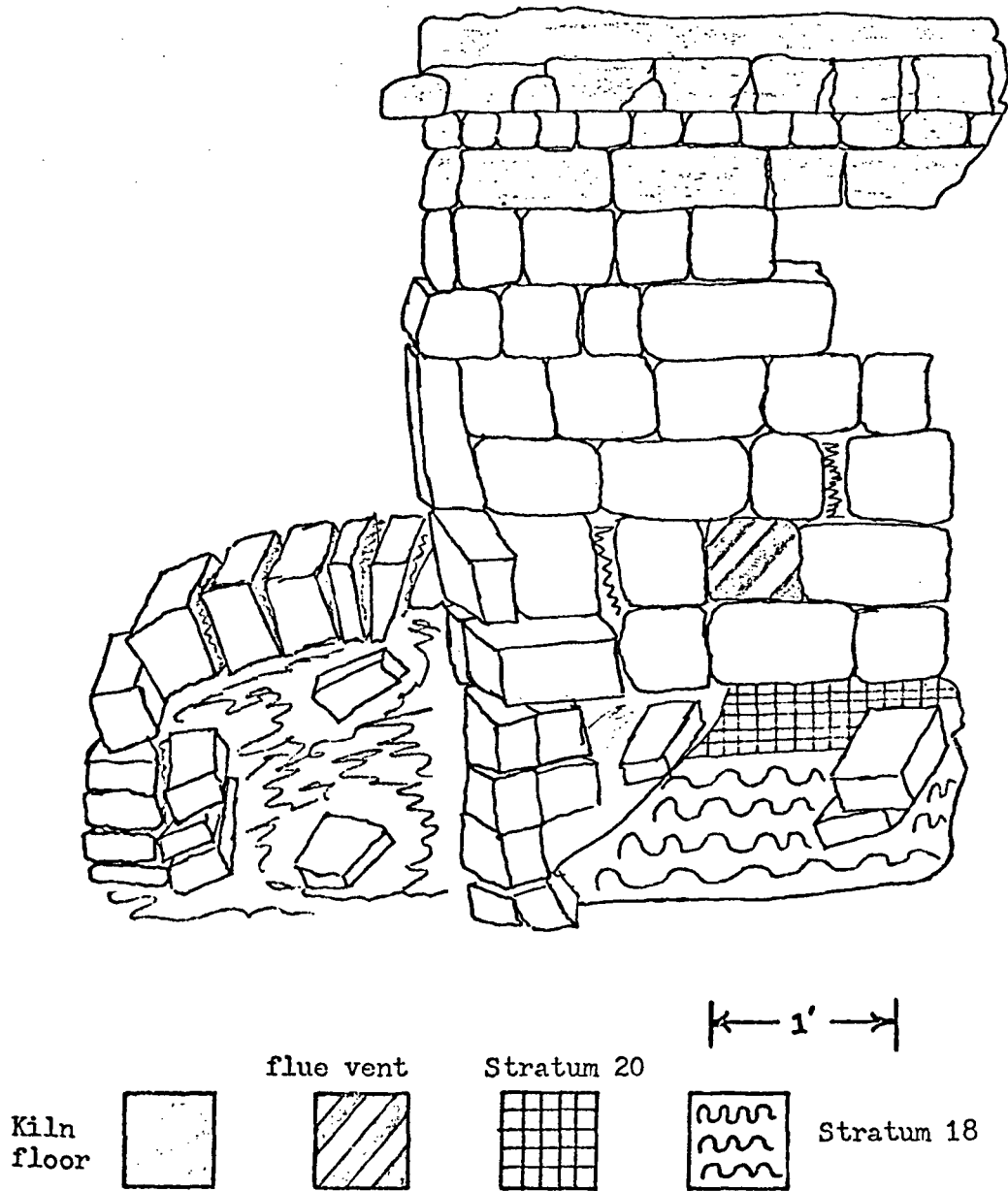


Figure 22. 13MA103: Internal Face of Second (incomplete) D-shaped Area

Nearly all of the exposed portions of the flues that were under the kiln floor were filled with rubble that included pottery, kiln furniture, occasional metal artifacts, a few bird and animal bones, and brick rubble. They also included portions of the kiln floor and portions of the interior brick buttressing. This intrusive material was designated Zone 24.

More detailed information on the stratigraphy of the area directly around the kiln was obtained by digging below the extant kiln structure in two areas: one pit was located within the transept flue and the other was located under the eastern of the two supporting D-shaped area. The 1969 road construction exposed a vertical face on the northeast side of the kiln. The vertical profile of the western face of the transept flue (Fig. 21) revealed that the kiln structure was composed of several inches of thick glass-like glaze (undoubtedly firing deposit) overlying about one foot of brick floor. Under this, more brick layers formed a supporting understructure for this very heavy floor. All of the brick on the interior of this D-shaped supporting structure was covered with a heavy green salt glaze. Two small flues (Zones 28 and 29) had originally been passages for hot air from the transept flue to the firing chamber of the kiln. When investigated, these were choked with kiln furniture and broken pottery. Layers of ash and burned earth were found below the brick structure in this area (Zones 18 and 19).

The profile through the interior of the partially extant second D-shaped supporting structure revealed essentially the same information on brick construction. However, the inside bricks of this D-shaped structure were not glazed. This indicated that these areas were protected from the salt fumes while the outer walls of both D-shaped areas--the portions that

faced on the transept and circumferential flues--were exposed to the salt fumes. Another of the small flues was found in the side wall of this second D-shaped structure. No ash layer was found underlying this area but a layer of shale (Zone 20) underlay the brick and a layer of burned earth or clay (Zone 18) was found below the shale.

The grader cut      The shale lining of the kiln (Zone 20) showed up clearly in the profile of the grader cut. Behind this burned shale lining was glacial sand of the same type as was found in the first midden area. Part of this sand liner (Zone 21) was reddened, apparently by contact with crumbling brick and by firing of the kiln, and part (Zone 22) was of the same orange color as Zone 6 in the midden area. The portion of the grader cut profile that was in line with the transept flue showed essentially the same stratigraphy as we observed in the transept flue profile. Layers of burned clay, ash, and mixed grey and yellow clay lay under a heavy deposit of post-kiln debris. The ash layer was peculiar because it looked like the remains of a fire or possibly an ash pit (Fig. 20, Plate 4).

First midden area      The midden located directly west of the kiln structure was composed of a hill of orange glacial sand and gravel (Zone 6) with successive deposits of cultural material thrown up against it on the east side of the hill. This midden appeared to be thickest close to the kiln on the east and on the southeast. The materials recovered from these cultural deposits included common red bricks, broken ceramics of mixed glaze color, large quantities of kiln furniture, what may be a metal kick wheel shaft from a potting wheel, several large ceramic discs, and assorted small quantities of broken china. Zone 7 in Excavation Units B, B<sub>1</sub>, C<sub>1</sub> and

C<sub>2</sub> yielded large quantities of broken ceramics and kiln furniture and Zone 5 yielded the same plus a large amount of brick, a number of ceramic discs, and the metal kick wheel part. Zone 10 was primarily filled with broken and decomposing common red brick.

Second midden area In the second midden area, only one layer of cultural material was found (Zone 25). This was an extremely heavy concentration of kiln furniture and broken pottery that lay over what appeared to be natural clay deposits (Zones 26 and 27). The pottery from this midden was remarkably consistent in color and amount of glaze. It was much more uniform than that found in any of the cultural deposits of the first midden area. This suggests that all of the material in this area may have been the result of only one firing, since different firings yield different colorations. There was a correlation between this cultural deposit and Zone 7 in the first midden area. In several cases, pieces of the same pot were found in these two deposits. In addition to the ceramic artifacts found in this midden, metal objects, broken china, and broken glass were found.

#### Archaeological remains at 13MA103

Structural remains The evidence of structures at Coalport consisted primarily of portions of the floor, flues, firing chambers, and buttresses of the kiln. No archaeological evidence was found to confirm that there were other structures associated with the kiln, although documentary evidence (McCown 1909) indicates that there was at least one cabin located very close to the kiln, which may have been the potter's shed. Rhodes (1957) maintains that all of these early pottery operations needed certain

other structures, such as a shed where the potter made his wares and kept his wheel, a drying shed for the green, freshly made wares, and a pug mill for preparing the clay.

An unusual thing about the Coalport Kiln was the fact that a large portion of the kiln structure was still intact when the ISU-NPS Crew first visited the site. This is not typical for these early pottery kilns. The Gidel Kiln (13MA106) illustrates the fate of most of the nineteenth century pottery kilns in central Iowa. The area on which the Gidel Kiln once stood has been plowed and farmed since the late 1800's or early 1900's. None of the structure of the kiln remains in place. Noel Hume (1969:172) mentions that another common fate of these early kilns is that they were robbed to provide building material for other kilns and for other structures.

The Coalport Kiln probably escaped complete destruction because it was located on a bluff above the tillable area of the Coalport Bottoms. Local informants mentioned that the entire kiln was covered by a mound of earth for many years after 1900. For some reason unknown to us, the kiln was not robbed for building materials for the presumably later Gidel Kiln. Possible explanations for this will be given later. In spite of these circumstances which combined to preserve much of the kiln intact, less than one-half of the original floor of the kiln was still standing when the ISU-NPS Crew first visited the site in 1966. The dome was missing and the under-structure was incomplete.

The portion of the kiln structure which remained provided very important data on the methods and materials of early kiln construction, on the techniques of firing and glazing, and on the techniques of stacking or setting the kiln with green or unfired wares.



Background on salt glazing kilns

The primary purpose of firing

in making pottery is to harden the clay. A secondary and very important purpose of firing is to insure that the pottery is impermeable. This is done by somehow attaching a glaze to the external surface of the pot.

Beyer and Williams (1904d:218) say that

The object in glazing stoneware is primarily protection. The body of the ware is seldom vitrified and the glaze, being thoroughly vitreous and non-porous, renders possible the use of stoneware articles for containing liquids.

The method used for glazing the exterior surfaces and sometimes the interiors of pots at Coalport Kiln was of a type that is called salt glazing. According to Ramsay (1939), Rhodes (1957, 1959:33-34), and Nelson (c1966) salt glazing was one of the earliest and simplest glazing methods used by American potters and salt glazing kilns were common in the Midwest in the nineteenth century. Nelson (c1966:172-173) describes the salt glazing process as follows:

The ware in the kiln is fired to its body-maturing temperature at which time common salt (sodium chloride) is thrown into the firebox or through ports entering the kiln chamber. The sodium combines with the silica in the clay to form a glassy silicate.

More detailed descriptions of the salt glazing process can be found in Rhodes (1957), Parmelee (1951), and Searle (c1929). The great advantage of salt glazing over other types of glazing is that it cuts down on the amount of handling of the green or unfired ware. Other types of glazes require the potter to apply the glaze before the ware is stacked in the kiln. But in salt glazing, the glaze is applied by vapors which build up in the kiln. One disadvantage of salt glazing is that the salt vapors can only reach those portions of the pot which are openly exposed. Thus, if wares

are stacked one on top of another, the salt glaze will not reach the interior of the pots. The Coalport potters evidently faced this problem for they generally used another glaze, a natural brown slip glaze, on the interior of vessels.

Salt glazing lost popularity sometime late in the nineteenth century and it was replaced with types of glazes that were more regular in appearance. According to Beyer and Williams (1904d:219), by 1904

Salt glazing is not practiced to any extent at present in stoneware manufacture, but it is the only glaze employed in the sewer pipe industry.

Nelson (c1966) and Rhodes (1959) note that the salt glazing process leaves a very heavy glass-like residue on the inside of the kiln. This was very noticeable at the Coalport Kiln, for this residue was more than two inches thick in some areas. Every place in the kiln that was directly exposed to the salt vapors received this glassy deposit. At the Coalport Kiln, the floor and the sides and tops of the flues and firing chambers were all heavily glazed with a greenish deposit. The greenish color was imparted by impurities in the clay, for the salt glaze itself is colorless (Rhodes 1957:184).

Salt glazing kilns vary between oxidizing and reducing atmospheres because of the necessity of opening the sealed kiln to throw salt in at various times during firing (Rhodes 1957:185-186). According to Rhodes, this is the reason that salt glazed wares exhibit a wide range of color--sometimes on the same pot. Rhodes also claims that an open-fire kiln is needed in salt glazing (Rhodes 1957:185-186). That is, the fumes from the fire must have direct access to the chamber in which the pottery is placed. The open fire apparently helps to vaporize the salt crystals. Coalport pottery

exhibits the characteristics of pottery that has been fired in an open-fire reducing-oxidizing atmosphere. As will be discussed later, the Coalport wares show evidence of flashing--the flames of the fire actually touched some of the wares. The wares from Coalport exhibit a wide range of colors running from browns to tans, creams, oranges, pinks, yellows, yellow-greens, greens, grey-greens, blue-grey, and greys. Sometimes the same pot has several different colors of salt glaze. Several authorities note the same sort of irregularities on salt glazed ware in general, but they do not mention this irregularity as a characteristic of other glazes (i.e., Ramsay 1939:18; Beyer and Williams 1904d:290; Noel Hume 1969:167; Rhodes 1957:184, and 1959:33).

There is little question that the Coalport Kiln was basically a salt glazing kiln. Its wares had the characteristic irregularities in glazing and the kiln had the heavy glass deposit on its inside surface. As will be shown in the next section, it was a type of kiln that could have been used for salt glazing. Nearly all authorities agree that a salt glazing kiln cannot be used for other types of glazing, with the exception of lead or slip glazes in conjunction with salt glazing (Rhodes 1957:185; Nelson 1966:173). Once a kiln has been used for salt glazing, the coating on the inside of the kiln will become partly vaporized as the kiln is heated and any wares stacked within the kiln will automatically receive some salt glaze. One way to avoid this is to place pots inside other pots or inside "saggers." Saggers are ceramic containers used to hold small delicate items or specially glazed items. At Coalport, there are indications that the potters used both of the above methods to protect certain wares during firing. Nevertheless, the main type of glazing at the kiln was salt glazing

and these other types show up only in very small percentages.

Type of kiln construction      The principle of kiln firing is fairly simple. The kiln acts as a large oven that retains heat and allows it to come in contact with the stacked wares. Rhodes (1959:195) says that there are three basic elements in any kiln. First, the kiln must have one or more fireboxes in which the fuel is burned. Ideally, this firebox is so constructed that only the hot gases enter the kiln ware chamber. Second, the kiln must have a chamber in which the ware is placed to be fired. Third, the kiln must have a flue or hole to allow escape for the hot gases and smoke that are developed in the kiln. Aside from these requirements, kilns can be made in a bewildering variety of shapes. These include tunnel kilns, rectangular kilns, continuous- or single-firing kilns, updraft or downdraft kilns, kilns with external chimneys, and many others (Beyer and Williams 1904d; Rhodes c1968).

The Coalport Pottery Kiln was a circular kiln (Fig. 23). Further, it had to be a high firing kiln. That is, since stoneware pottery was fired there, the kiln had to be capable of being heated to a high temperature. There is no evidence to indicate that this kiln was attached to any other kiln so it undoubtedly was a single kiln that had to be cooled after each firing and then reheated for the next firing. Probably only two general types of kilns fit the above requirements: the round, updraft kiln and the round, downdraft kiln (Figs. 24-5).

The round, updraft kiln is the simpler of the two types. In this type of kiln the fuel chamber is located below the ware chamber. The heat is drawn straight up around the pots and vented through a hole or holes in the



Figure 23. 13MA103: Coalport Kiln Reconstruction  
Showing the extant structure and a possible reconstruction of  
missing portions.

Legend

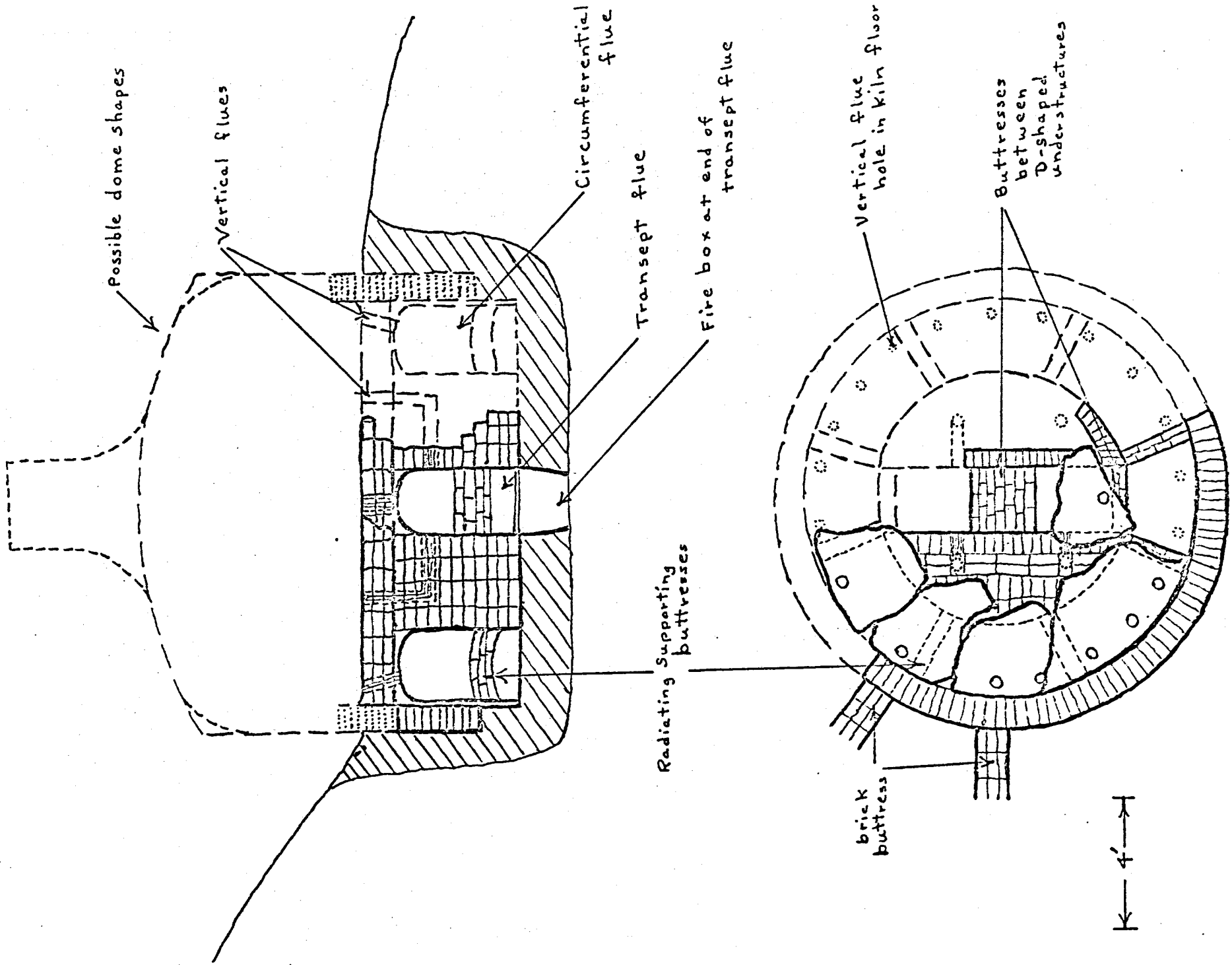
Reconstructed area

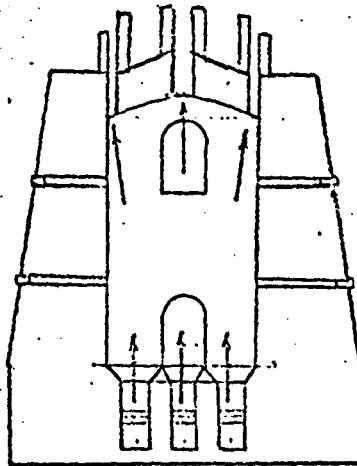
Extant structure

Shale liner

Brick structure

Missing brick outer liner

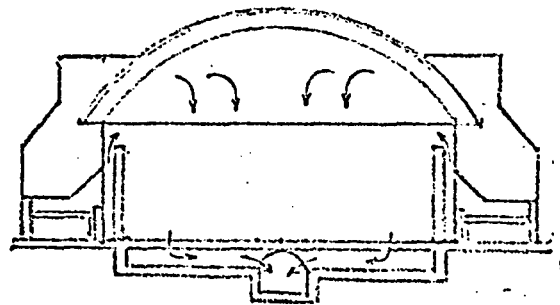
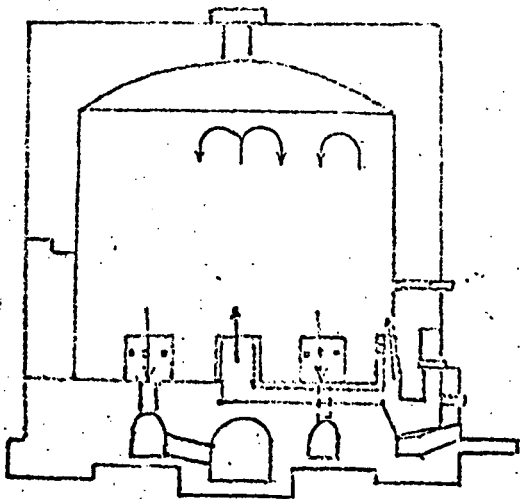




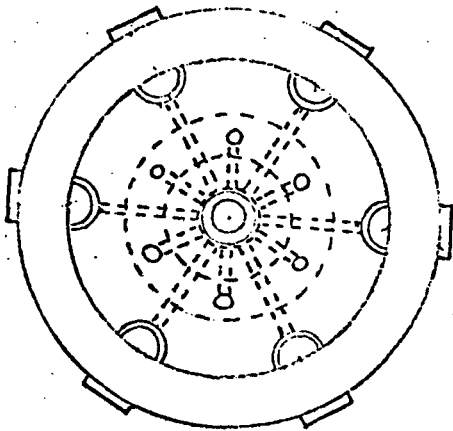
Section of Single Up-  
Draft Kiln

Figure 24. Updraft Kilns  
(from Searle c1929)





Section of Down-Draft Kiln



Plan & Section of Round Down-Draft Kiln

Figure 25. Downdraft Kilns  
(from Searle c1929)

roof of the kiln. Reisner (1966 personal communication) mentions that the one major disadvantage of this type of kiln is that the bottom of the ware chamber becomes much hotter than the top and this results in uneven firing. Beyers and Williams (1904d:290) have more to say about this type of kiln.

The round up draft kiln is the early pottery kiln, and its use has continued to the present time in the stone-ware industry. The kiln consists of a lower combustion chamber in which the ware is placed. The combustion chamber occupies practically all the space beneath the ware chamber, but the bottom is solid, except those portions occupied by the grate bars of the furnace, which is a small proportion of the total space. Between this and the ware chamber above is fire brick work, perforated to allow the passage of the gases. The outlet is usually a series of little chimneys leading out through the kiln crown. The work of this kiln is in most cases characteristic. Where the gases are allowed to come into contact with pottery wares in any kiln, flashing is common, since the clays are sensitive to oxidation and reduction.

In a round, downdraft kiln, the hot air is channeled up and then back down in the ware chamber by a series of baffles and air flues. Eventually, it is exhausted from the kiln by a chimney set horizontally in the floor of the kiln. Rhodes (1959:34) says that most of the nineteenth century stone-ware potteries used downdraft kilns. In discussing the evolution of the pottery kiln from the updraft to the more efficient downdraft type, Beyer and Williams (1904d:289) comment that

In its evolution to the modern pottery kiln, the principal changes in this primitive up draft have been such as to prevent more and more the contact of the combustion gases with the ware. The passage of these gases was restricted to the center and the outermost portions of the kiln, the rest of the floor of the ware chamber being solid.

Nelson (c1966:248) maintains that salt glazing can be done only in a downdraft type of kiln because this is the only type that attains sufficient

heat. As indicated earlier. Beyer and Williams (1904d:290) do not agree with this statement. In fact, they suggest that the updraft kiln was a more common type of kiln in the early stoneware industry than the downdraft type.

In discussing the construction of the Coalport Kiln, one of the important problems is to establish whether it was an updraft or downdraft type. This decision is necessary because the Coalport Kiln furnishes important data on the early aspects of the pottery industry in Iowa. In other words, conclusions about the Coalport Kiln may be important for researchers interested in the later developments of the pottery industry in Iowa and in the Midwest. In addition to solving the above problem the following discussion of the Coalport Kiln construction also attempts to describe other factors in kiln construction and to reconstruct in drawings the missing portions of the kiln.

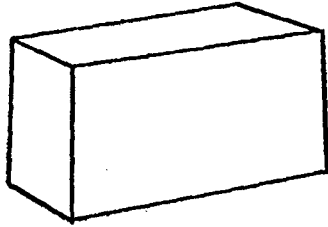
Kiln building materials      Several different building materials were used in the construction of the Coalport Kiln. Two different types of bricks made up the basic structure of the kiln: firebrick and common red brick (Rhodes c1968:85). Firebrick is clay brick which has been fired to about cone 10 and which can withstand the intense heat of a high firing kiln without melting or warping (Rhodes c1968:85). Common red brick does not have the refractory qualities of firebrick. It will melt and decompose somewhat under very intense heat. This melting temperature is dependent on the quality of the clay that was used to construct the less refractory bricks. In any event, they usually are not fired to the high temperature of firebrick (Rhodes c1968:85). Since firebrick was fired to such a high temperature, it was most likely imported from some

other area, since the Coalport potters did not have the facilities to make it.

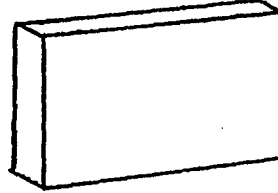
At the Coalport Kiln, firebrick was used in the floor of the firing chamber, in the partly solid D-shaped understructures, and in the supporting arches in the horizontal flues under the floor of the kiln. These firebricks are quite large (4" x 4½" x 9") and they are made of an impure clay with large particles. The bricks have a variety of shapes and sizes: straight bricks, split bricks, arch bricks, and half bricks (Rhodes c1968: 85-86 and our Fig. 26). Actually, the builders of the Coalport Kiln did not use the full variety of shapes of bricks that is given by Rhodes (c1968: 86). Apparently, the Coalport Kiln builders tried to make do with a few shapes, possibly because others were not available.

All of the firebricks used in construction of the kiln were mortared, but tests have not been made to determine what type of mortar was used. Rhodes (c1968:94) comments that suitable mortar can be made by using two parts of fireclay and one part grog or sand. The mortar used at Coalport usually had a reddish color but this was probably because of discoloration due to firing of the kiln. Much of the mortar was soft and loose although some was hard and somewhat similar in composition to the firebrick. Numerous authorities have commented that there was fireclay in the bluffs in this area so it is not unlikely that the Coalport Kiln builders used naturally occurring clay with some tempering or grog material to make their mortar (White 1870; Miller 1901; Beyer and Williams 1904c; Galpin 1924; Gwynne 1943).

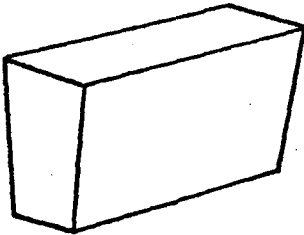
The general method of laying the firebrick for the floor and for the D-shaped understructure supports was that of "alternating patterns" of



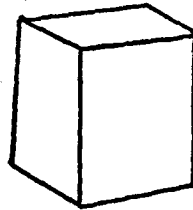
Straight brick



Split brick



Arch brick



Half brick

Figure 26. Brick Shapes

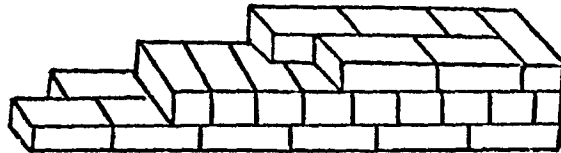


Figure 27. Crossbedded Bricks

brick (Rhodes c1968:95 and our Fig. 27). "Expansion joints" may also have been used. Rhodes (c1968:96) says that

Expansion joints must be provided in the brickwork of kilns. If no expansion space is provided for, the kiln will bulge and swell on heating due to the expansion of the bricks. In practice, a space of about  $\frac{1}{4}$  inch is allowed between the ends of every third or fourth brick. This space should not be filled with mortar.

Joints were occasionally left between firebricks at the Coalport Kiln (particularly in the bricks of the floor) and these may have been expansion joints as Rhodes describes them.

Arches, made of firebrick, were used at the Coalport Kiln in two major ways. The portion of the floor which extends over the circumferential air flue was arched on the underside (Fig. 28). The structural supports which extended from the D-shaped understructure to the walls of the flues were arched in some instances.

Common red brick was used in large quantities in the Coalport Kiln. Most of it did not endure well. Perhaps the intense heat of the kiln destroyed or decomposed it. The common red brick was found in abundance in the cultural layers of the midden located directly west of the kiln, which may indicate that these bricks wore out easily and had to be replaced often. Very little firebrick was found in this midden area.

Remnants of an outside liner of the common red brick were found circling a portion of the existing kiln structure. In most areas, there appeared to be only a single layer of bricks around the outside of the floor of the kiln. The bricks were stacked--without alternating--to a depth of at least five bricks thick, and they were oriented so that the longest surfaces radiated away from the circular kiln floor. A loose mortar of red color

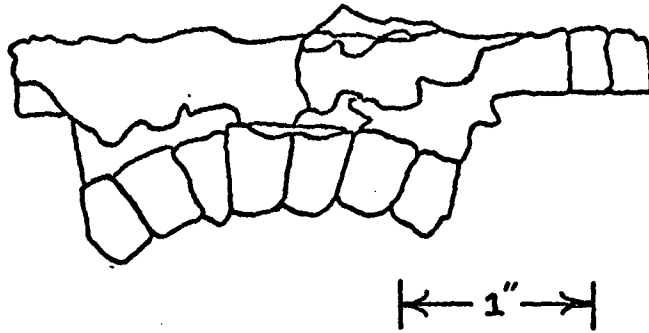


Figure 28. 13MA103: Side View of a Displaced Kiln Floor Fragment  
Shows a heavily glazed arch which was a portion of the roof of  
the circumferential flue.

was found between most of the bricks. This liner of bricks was set directly on and into the shale beds of the bluff. It would appear as if the persons who constructed the kiln tried to utilize as much of the shale deposit as possible. This shale formed a bed for the kiln and the common red brick was used as a leveling material (Fig. 23, Plates 4 and 8).

Common red brick was also used to form what appear to be two buttresses on the west side of the kiln. Here an alternating pattern of bricks was used. The two external buttresses were two brick widths wide and seven or more bricks high. It is possible that an entryway was located between these buttresses. The entryway to the kiln--for loading and unloading the kiln--might have been an area of weakness in the dome and it might have needed buttressing. This would explain why there are two buttresses located so close together (they are only  $2\frac{1}{2}$ ' apart) (Plates 5 and 8).

The missing dome of the kiln may have been constructed out of common red brick rather than firebrick and the row of bricks around the edge of the kiln floor might be the remains of a common red brick dome. A dome was probably somewhat more expendable than the understructure and since firebrick was expensive because it had to be imported, the builders may have used common red brick and simply replaced the dome fairly often.

Natural shale deposits were used in the building of the Coalport Kiln. The kiln was set back into a hill composed of beds of shale and clay. Rhodes (1959:34) mentioned that nineteenth century potters occasionally dug their kilns back into the sides of hills ". . . where earth could be piled around the kiln for insulation." Better air circulation can be induced in a kiln set on the side of a hill than in a kiln set on level ground (Rhodes 1959:34). Air circulation, or draft, is extremely important in a



kiln because it brings up the temperature of the fire and pulls the hot air quickly through the kiln before it has a chance to cool (Rhodes c1968:60). If Rhodes (c1968:85) is correct, the Coalport potters may have taken a risk in building their kiln in shale deposits because under intense heat "shales blow up as combined water violently escapes." This was apparently not too much of a problem at the Coalport Kiln for the kiln was obviously in operation for some time. The shale was only in direct contact with intense heat in a few places, for in most areas it was shielded by brick. However, shale did form part of the wall in the circumferential flue and it was also the base on which at least part of the kiln rested.

Kiln structure      Figures 23 and 29 and Plates 3 to 9 show the extent of the kiln structure that was uncovered by the ISU-NPS Crew during excavations at this site. Excavation was hindered by the large amounts of overburden--most of it apparently post-kiln operation in origin--which covered the structure. When first visited, only a small portion of the kiln floor and transept flue were exposed.

As indicated earlier, the floor of the Coalport Kiln was circular in outline. Estimated reconstructions of the missing portions of the kiln suggest that the floor was about twelve and one-half feet in diameter. Air ports or flues were located in the floor at regular intervals to allow the hot air to enter the firing chamber (Fig. 29 for surviving floor flue plan and Fig. 23 for reconstruction of missing portion). These flues were placed so that the hot air could enter the ware chamber from all over the kiln floor. There was no evidence of any sort of muffle or baffle which could have separated the wares from the initially contaminating

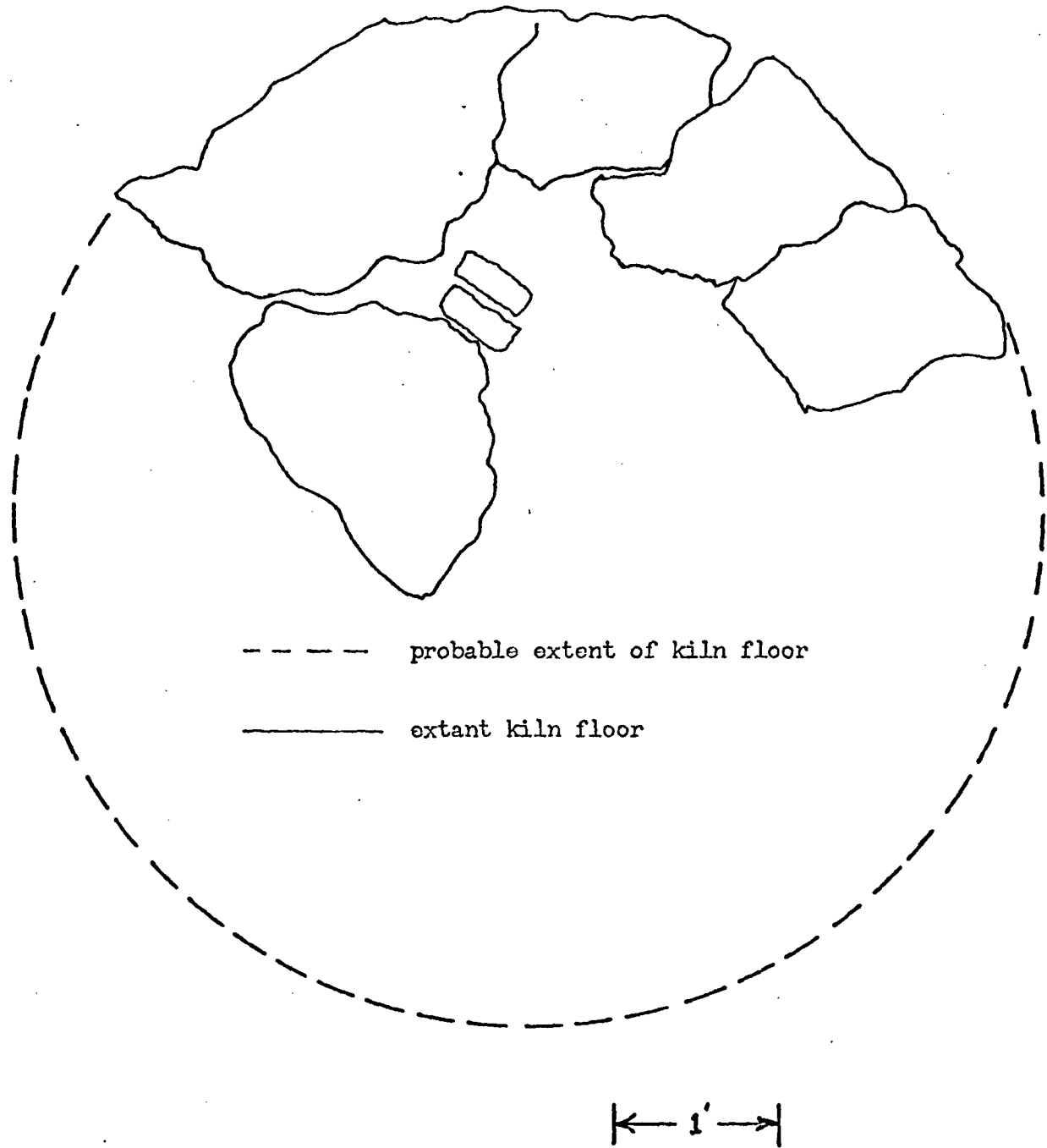


Figure 29. 13MA103: Horizontal Extent of Kiln

fumes of the fire. Of course, temporary muffles could have been built in the kiln with each firing and removed between firings (Noel Hume:1969:169).

A very heavy glaze of glassy silicate covered all remaining portions of the upper surface of the kiln floor. Embedded in this deposit were many pieces of kiln furniture and occasional broken pieces of pottery. In some cases these materials and the glassy deposit had combined to completely seal up flue holes in the floor. These pieces of kiln furniture were used in stacking wares in the kiln. They helped to level the stacked wares and they separated the wares from each other and from the kiln floor. The broken pieces of pottery that were found on the floor may have been the result of accidentally firing the kiln too long so that some pieces adhered to the floor and broke when removed, leaving a portion of the pots behind.

The primary support for the very heavy floor of the kiln was provided by two D-shaped brick structures located under the floor. One of these structures was found complete, but only fragments of the other one still existed. Each of these structures was approximately 5' tall x 7' long x 3' wide. They were built entirely of firebrick and each one was partially hollow to allow room for two air flues that connected the transept flue with the kiln chamber (Fig. 23, Plates 6 and 9).

The two D-shaped understructures were separated from each other by the transept flue which ran between them. The kiln floor over this transept area was arched to provide strength for the weight of the floor and of the stacked wares. Brick supports between the two D-shaped structures prevented these structures from buckling in. These heavily glazed supports were about one foot apart and apparently circled the entire floor of the kiln (Figs. 22

and 23). More of the arched buttresses radiated from the D-shaped areas to the outer walls of the circumferential flue and in some areas (Fig. 23) additional buttresses linked these radiating buttresses. The floor of the kiln was arched to meet the common red brick outer wall.

It appears that firing chambers with ash pits beneath them were located at the two ends of the transept chamber. Cinders and ash deposits were found in these areas and in areas just outside the outer rim of the kiln floor.

From the foregoing evidence, we conclude that the Coalport Kiln was probably a round, updraft kiln of a type that has not been described in the literature. First, the horizontal flues under the kiln floor were connected. Fires were built in two locations on opposite sides of the kiln (or possibly in only one location) and the fumes and gases were released into the horizontal flues. Then, a series of vertical flues carried the hot fumes up into the ware chamber. In the ware chamber there was no evidence of muffles, but these would be necessary to set up the cross drafts for a downdraft kiln. The hot fumes were evidently exhausted through the walls of the dome and, if so, this would indicate that the kiln used the updraft principle. Fig. 23 is the author's reconstruction of the structure and operation of the Coalport Kiln. The dome is shown as being either a beehive or bottle-necked dome because the dome was missing at Coalport. These are the two best candidates for the shape of the dome since both bottle-necked and beehive type kilns were in use in Iowa during the time when the Coalport Kiln was in operation.

Portable artifacts      The most abundant artifacts found at the Coalport Kiln were those that were connected directly with the pottery industry. The most numerous of these were potsherds and ceramic industrial waste products. In addition to the artifacts connected with the pottery industry, artifacts indicative of the more general pioneer settlement were found in and around the kiln structure. In this section, the artifacts of the ceramic industry will be discussed first and in greater detail than the other artifacts. Complete identification and analysis of the artifacts not directly associated with the kiln operation will not be made here but will be undertaken at a later date.

Pottery      One of the most characteristic features of the pottery found at Coalport is its irregularity. Every pot made at Coalport was different from every other pot. The pots recovered by the ISU-NPS Crew fall into about eight or nine different functional categories, but each pot was individually thrown on a potter's wheel and thus each pot has slightly different characteristics. Excavation at Coalport yielded 1297 rimsherds, hundreds of base sherds, and thousands of body sherds. Two hundred and fifty of these sherds could be assigned to function vessel types. Some of these are partially or wholly reconstructable. Other rims are too small to justify attribution to functional categories. The rimsherds were studied in far greater detail than any of the other artifact classes. Twenty-eight separate measurements or observations were made on each of the 1297 rimsherds to determine the following:

external rim diameter  
external neck diameter  
rim height

internal rim diameter  
external shoulder diameter  
rim type

external diameter at base	internal smoothing
wall thickness	external color
base thickness	internal color
external body glaze	clay color in cross section
internal glaze	trimming method on base
rim glaze	temper: size, color, amount
external base glaze	handles
external texture	decoration: rim, neck,
internal texture	shoulder, body, internal
external smoothing	functional vessel type

This information, along with selected observations of other vessel parts, provides the basic data for the following analysis of the Coalport pottery. This section will consist of a general discussion of the characteristics of Coalport pottery followed by a more detailed discussion of rim and vessel types.

General characteristics      The ware made at Coalport were heavy utilitarian wares with generally thick (1/4"-3/8") walls. Most were of a few standardized forms and all were wheel-made with the exception of only one or two pieces which may have been mold-made. There was apparently little experimentation with unusual forms although some unusual pieces were found. The wares were typically covered with either a salt glaze or a brown slip glaze or some combination of the two.

Glazes      As mentioned before, the Coalport Kiln was primarily a salt glazing kiln. The Coalport potters used a combination of salt glazing and slip glazing to insure that both the internal and external surfaces of the vessels were glazed. Salt glazing was used because it was probably cheaper, faster, and required less effort than other types of glazing. The only investment in materials necessary for salt glazing was that of securing common salt (NaCl). The wares did not require special

handling for applying the glaze since the salt was thrown directly into the kiln or into the firing chambers under the kiln during firing.

The interiors of pots were usually covered with a slip glaze because the salt glaze could not reach these portions of the vessels. In a few instances, exteriors were also slip glazed. The most common slip glaze used at the Coalport Kiln was a brown slip similar to the Albany slip described by Rhodes (1957:186). Both the Albany slip and the Coalport brown slip were natural clay slip glazes. That is, clays were found which glazed to a rich brown or red-brown color; then they were mixed with water to form a slip which could be applied to the surface of pots (Rhodes 1957:185). The slip was usually applied by dipping, pouring, or brushing. It is highly unlikely that the Coalport potters actually imported the true Albany slip clay from Albany, New York. However, Rhodes (1957:186) points out that this glaze did have very wide distribution in the nineteenth century (Rhodes 1957:186).

The best known clay for slip glazing is Albany slip. This clay, which is mined near Albany, New York, contains considerable iron and other impurities and melts by itself at about cone 8. At cone 11 it is a bright smooth brown or tan glaze. In reduction firing, Albany slip tends to become a reddish brown. Albany slip was widely used as a glaze on the utilitarian wares of the nineteenth century. It is the familiar brown or black which appears on the inside of salt glazed pieces, or on the bean pots, crocks and jugs.

One of the main advantages of, and reasons for, using a slip glaze on the interiors of salt glazed wares is that it frees the potter to stack the pottery kiln tightly with wares. If one attempted to use only a salt glaze, then both the interior and exterior surfaces of each pot would have to be exposed to the salt fumes. Loose stacking would not have been

practical in these early industrial pottery operations where it was necessary to make maximum use of the kiln. The firing process was long and difficult, and tight stacking of wares yielded more fired pots with each firing of the kiln.

Welch, Smith and Bailey, and the other Coalport potters probably manufactured their own brown slip glaze from clays available in the area. The census records for 1850 and 1870 list the manufacturing expenses for Welch's pottery and for Smith and Bailey's pottery, and neither of these sources lists slip clay as an expense. Mrs. Mary Miller, a potter from Boone, Iowa, has experimented with local Iowa clays and has demonstrated that they fire to produce very adequate brown slips (personal communication 1969).

Salt glazes The Coalport potters evidently had a great deal of difficulty in attaining consistent salt glazes on their wares. Thus, many of the sherds recovered from the site have only partial or incomplete salt glazes. A properly salt glazed vessel has a glass-like surface and an orange-peel texture (Rhodes 1957:185). Incomplete salt glazing could be due to a variety of reasons. First, the potters may have had difficulty in maintaining a sufficiently hot temperature to fire the vessels completely. Second, they may not have been using sufficient salt. Third, they may not have had adequate methods for determining when the wares had been fired long enough. Draw-trial pieces have been found which indicate that they made some attempt to judge when the pots were completely fired, but these may have been inadequate. In any case, only a small portion of the recovered rimsherds were completely salt glazed.



In salt glazing, it is very hard to control the color of the final glazes (Rhodes 1957:185-186). Clays with a slightly different composition will yield different colors. According to Searle (c1929:83)

Clays containing a large proportion of lime and a large proportion of silica produce greenish-yellow glazes . . . at cone 7, with more than 5.32 percent of iron oxide. If a purer, white-burning clay is salt glazed, a very pale buff or grey ware is produced.

This gives some indication of the range of colors that can occur when salt glazing. Cross sections of the Coalport pots indicate that there was much foreign material in the clay. That is, the potters made little or no attempt to clean the clay before they used it. Thus, they probably allowed many impurities that may have influenced the color of the finished ware. Salt glazing kilns vary between oxidizing and reducing atmospheres because of the necessity of opening the sealed kiln to throw salt in during firing (Rhodes 1957:185-186). According to Rhodes, this variation in atmospheric conditions is a main cause of color variations of wares in salt glazing kilns (Rhodes 1957:185-186). The potters at the Coalport Kiln utilized an open-fire method of heating the kiln, which probably introduced many impurities because of the ash and the direct fumes of the fire.

Local brown slip glaze      It is difficult to tell if the Coalport potters used more than one type of slip glaze because of the differences in color. The colors range from black to dark brown to medium brown to a light brown and also various shades of red-brown. On some pots the black slip glaze seems distinctive but the other color variations appear to be variations in the same basic type of slip glaze. Rhodes (1957:186)

indicates that this range of colors falls within the range of colors for Albany slip, and the Coalport Brown slip may thus have included all of these variations. The same factors that influenced salt glazes also influence other glazes to some extent, so the range of brown slip colors could be due to the chemical composition of the clay, to the firing temperature in the kiln, and to changes from oxidation to reduction firing. It is also possible that the Coalport potters were experimenting with different clays to find a suitable brown slip clay.

The most common texture on brown-slipped pieces was a hard mat-like finish but in these cases it is suspected that the brown slip was exposed to salt glaze fumes during firing.

Decoration Ramsay (1939) and Rhodes (1957, 1959) both say that it is difficult to decorate salt glazed stoneware pottery. The pottery is fired at such a high temperature and with so many impurities that very few other glaze materials will mix well with the salt glaze. According to Ramsay (1939:19) only cobalt blue glaze compounds can be used successfully under a salt glaze. Rhodes (1957:185) adds that lead glazes and Albany slip glaze are not adversely affected by salt glazing when they are restricted to portions of the pot that receive relatively small amounts of salt fumes. There is no evidence that the Coalport Kiln potters used either cobalt blue glazes or lead glazes.

The main decorative technique of the Coalport Kiln potters was a method that utilized the momentum of the spinning pot on the potter's wheel. The potter merely held pointed objects up to the spinning clay and allowed them to slightly penetrate the clay. This produced horizontal bands of

decoration. The two most common types of decoration applied in this manner were simple incised horizontal lines and waved or combed lines (Plates 15 and 17). The combed lines were applied by moving a toothed object vertically while a pot was spinning. Incised horizontal bands were found on over 150 different rimsherds and on a greater number of body sherds. Combed decorations were found on only about 15 rims and a few body sherds. All of these decorations were located on the external surfaces of vessels, usually on the rim, neck, or shoulder. The horizontal incised bands were usually 1/8" thick or less in width and 1/16" deep. The individual incisions of combed decorations were narrower and shallower than this. Combed decorations always consisted of five or more parallel incisions while the horizontal incised line decoration most frequently occurred as a single incised line.

The only other decorative technique utilized at Coalport was that of excising horizontal lines around the outside of a pot. This occurred on only nine vessels. Actually, the lines were probably produced by reducing the total amount of clay on a vessel surface and leaving only a single or double ridge. This may have been done unintentionally.

Some of the rim types from the site are elaborated beyond their functional use as strengtheners for the tops of pots. These will be discussed in the section on rim types.

Smoothing and trimming In keeping with the Coalport potters practice of making simple utilitarian wares, many of the sherds found during excavation were incompletely smoothed. A pot made on a wheel is left with finger impressions on both the interior and exterior surfaces

unless it is smoothed after the initial shaping. Most Coalport Kiln pots were smoothed fairly well on the exterior surfaces but broad finger ridges were left on the interiors of many vessels.

After the pots were cut from the wheel (probably with a wire passed through the base of the spinning pot), no attempt was made to trim the base. This left irregular cutting marks on the base and on the bottom part of the body of the pots. If one wishes to trim a pot, the pot must be removed from the wheel, allowed to dry, and then placed on the wheel again for the trimming. This is time consuming and the Coalport potters evidently preferred to make their pots all in one operation.

Signing of wares Webster (1968:41) claims as a characteristic of nineteenth century potters that, "following universal practice," they invariably stamped their wares with "either the name of the pottery proprietor or, on special order, an individual merchant's or quantity purchaser's mark." This was certainly not the case at Coalport. Only one vessel from the excavation at the Coalport Kiln was signed, and this was a written, rather than a stamped, signature. The Des Moines Historical Museum has several stamped sherds which reportedly came from the Coalport Kiln area but these were collected before anyone knew about the existence of a second kiln (the Gidel Kiln) in the area. Thus, they loosely designated a very large area as the "Coalport Kiln" and these stamped sherds may not be from the vicinity of the Coalport Kiln. One stamped sherd (T. H. Smith) was also located by the ISU-NPS Crew while investigating 13MA106A. Local people report that Welch, the Smiths, and Bailey occasionally signed their pots, and these old residents even have signed examples of some of these.

However, the author has not been able to examine this material except in some small photographs, and therefore cannot conclude that these wares were actually made at the Coalport Kiln rather than at the Gidel Kiln or at other kilns in Marion County (Stoltz and Brooks 1966). In any case, of the thousands of sherds recovered at the Coalport Kiln, only one was signed.

Handles      The Coalport potters attached handles to some of their pots. Handles were found on jugs, crocks, jars, and fat lamps taken from the site. All of these were applied to the wares after the pots had stopped spinning on the wheel and probably after the pots had partially dried. The handles were of three types. The first was a flat or strap handle which was found on jugs and on one jar (Fig. 30b). The second was a handle made by bending a coil of clay into a "U" shape and then attaching it to the side of a vessel with the open part of the "U" pointing down (Fig. 30a). The third handle type was simply a bent coil of clay attached to a vessel at both ends and set perpendicular to the vessel body (Fig. 30c). On a number of vessels the handles were not applied securely and they thus popped off, leaving only the handle impressions.

Clay color and structure in cross section      The clay used in making the Coalport pots was quite variable in structure. Apparently, no tempering material was added to the clay. The clay had many natural impurities in it and some of these were quite large--up to 1/4" in diameter. Fired pots consistently had a cross section color of buff, light buff, or grey. In some cases, the same vessel had one or more of these colors in cross section. The grey color seemed to be a product of higher firing

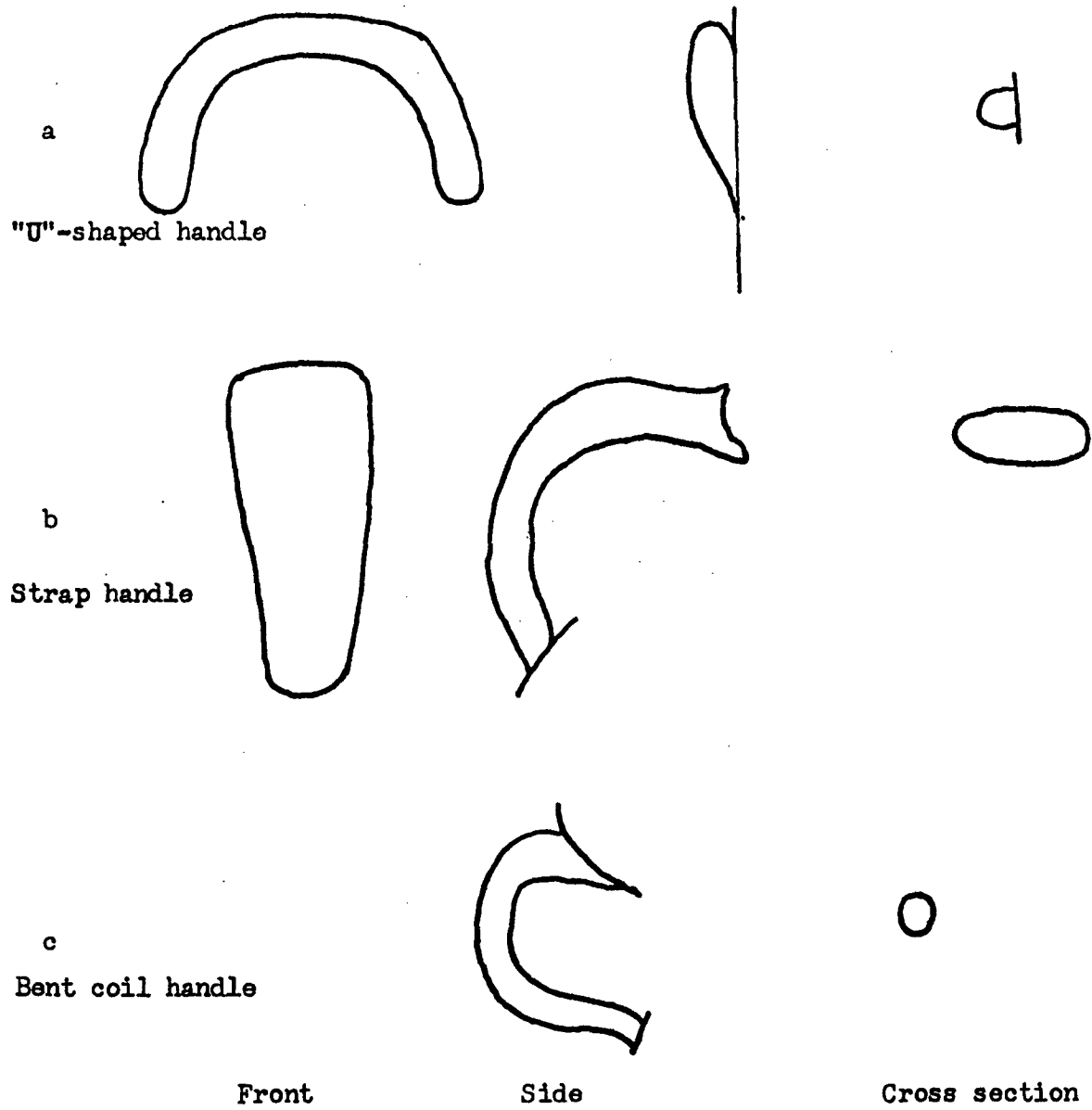


Figure 30. Vessel Handle Forms

than either of the other colors because it occurs most often on potsherds which exhibit a mature salt glaze. A characteristic of the Coalport clay was apparently high lime and iron content. Lime and iron (explosions) appear frequently on the surfaces of vessels. These are usually about 1/8" to 1/4" in diameter. The total range of clay cross section color on fired sherds includes pinks and greens, but these occur in much smaller percentages than the buff, light buff, and grey.

Rim profiles In the following discussion of rim profiles, a number of different rim categories have been described. These rim categories have been established as an aid in viewing the amount of variation in rim forms found on the rimsherds from 13MA103 and 13MA106. They are thus set up as categories that include a range of variations. These categories were observed by the author but they were not necessarily of importance to the makers of the wares. In some cases the categories are completely arbitrary and based solely on observable form while in other cases the categories are derived from the method by which the rims were manufactured.

While the Coalport potters had an almost unlimited choice of possible rim styles, they limited themselves to only a few basic types. Leach (1940: 76) suggests that the main function of thickened rims on nineteenth century stoneware was to add strength to the vessels while they were being dried and fired. Perhaps the various rim forms were intended primarily as functional (strengthening) additions rather than as aesthetic additions. Nevertheless, many of the rims are elaborated beyond a purely function nature.

According to Noel Hume (1969:166)

It has been said that a potter is known by his rims and

handles, for having learned to make them he would in all probability continue to employ the same technique throughout his working life. The potter who pinched the ends of his handles or who undercut his rolled rim would do so regardless of whether he was producing a porringer or a chamber pot. The potter who rolled his rims would never fold them; one who ridged them on the top would never cut them square. These were simple idiosyncracies and, like fingerprints, they did not change.

The study of rim types, then, may be very important for identifying the ware of a particular potter or of a particular pottery operation. At the same time, stoneware potters worked generally with only a few vessel forms and not all possible rim styles could be used on these (Webster 1968:41). For instance, perfectly straight rims of the same thickness as the vessel walls might be wholly inappropriate on very large crocks or bowls. Straight walls might not provide sufficient strength to stabilize the rim of the pot.

This author feels that it is necessary to establish the variations in rim forms found on the Coalport Kiln rimsherds since this information might prove valuable in the future in cross-dating sites where the same potters reportedly worked. Also, it is hoped that a close study of rim variations will help in the study of functional vessel types.

In setting up the following rim categories materials were studied from both sites 13MA103 and 13MA106. There was a great deal of overlap of rim categories between the two sites, with some important differences. For convenience, the rim types have all been presented in this section, although not all of these types are found at 13MA103.

Descriptions of utilitarian pottery in the literature were not uniformly applicable as classificatory units for the rim forms of the Coalport ceramics. Webster (1968:40, 48) set up five rim types for the vessels



found at the Brantford Pottery. These include the following categories: necked vessels, single rib open containers, double rib open containers, square end and everted rib open containers, and covered containers. The rib mentioned by Webster is the lip of the rim. One of the problems with Webster's classification is that it does not include even all of the rim types which he illustrates in his monograph. For instance, he has a picture of a "milk or butter bowl" on page 21 of his monograph, which fits into a functional type also found at the Coalport Kiln and at the Gidel Kiln. However, Webster's presented rim types (pp. 40, 48) do not include this type. His distinction between open and covered containers does seem to be useful and important. In this case, he distinguishes between those rims which clearly have an internal lip for a lid and those which do not. Of course, other types of covers could be used and probably were used as lids on vessels which had no internal lips. In fact, Mrs. Ruth Armstrong, a long time resident of Iowa, clearly remembers that her mother used ordinary plates as covers for a variety of different types of stoneware vessels at some time shortly after the turn of the century (personal communication 1969).

Noel Hume (1969:166) distinguishes between rolled and folded rims. Thus, he is making a distinction on the basis of the method of rim manufacture. Leach (1940:76-77) is also concerned with the method of rim manufacture, and he provides a more adequate classification than does Noel Hume. Leach distinguishes between "thin-lipped" rims, rims made by carrying a "reserve ridge" of clay up the side of the pot while forming the vessel, and rims in which the edge is returned upon itself. Although the terminology is different, the process seems to be the same as that described by Noel

Hume.

This author will combine the above classifications and will attempt to refine them in terms of the Coalport material. Part of the difficulty in setting up rim categories for historical utilitarian wares is caused by the different methods by which these wares were manufactured: that is, historic utilitarian stonewares were made either on a potter's wheel or in some type of mold or forming device. The Coalport materials were predominately wheel-made while the Brantford wares (Webster 1968) were predominately form-or mold-made. It seems likely to the author that the presence of these two different types of wares will force rim classifiers to set up two different systems of classification which will be based on different criteria. For instance, the classification that the author uses for the Coalport wares is adapted for describing wheel-made ceramics. It involves a close study of the probable ways that the Coalport potters formed rims on pots while the vessels were spinning on the potter's wheel. Webster's classification, which appears to be based solely on observable form, was set up for wares which were mold-made. The techniques of manufacturing wheel-made pottery do not apply to mold-made pottery, in general, and this may be the reason why Webster's classification is inapplicable to the Coalport wares.

The rims from Coalport are classified into the following categories: jug, plain, reserve, folded, closed container, and feeder pan. The jug and feeder pan categories are derived from well-known functional vessel types. That is, in these two cases, the vessels of jug and feeder pan types have a very limited range of rim variations. These variations have been described as belonging to rim categories which correspond to functional types described in the section following this one. The categories of plain,

reserve, and folded rims are based on the methods of manufacturing the rims. A plain rim is a stright<sup>or</sup> walled rim with a rounded or squared lip. A reserve rim is a rim made by bringing a "reserve" ridge of clay up the side of the pot while it is spinning and then finishing this in a variety of ways at the top of the vessel. A folded rim is a plain rim which has been folded away from the wall of the pot. Rims with an internal lip for a cover are thought to be distinctive and they are put into one rim category--the closed container category--regardless of whether the rim is plain, rolled, or folded. All of the above rim types have variations and these will be described as subcategories of each rim category. In the following figures (Figs. 31-38) the rims from both 13MA103 and 13MA106 are categorized and subcategorized. The rims from the two sites are included together so that they may later be compared and contrasted more easily.

Functional categories Rim categories such as those given above have their utility. In the case of the Coalport Kiln and the Gidel Kiln, differences in rim categories and in frequency of rim categories was one of the main criteria for viewing the two as separate kilns (Fourth section). However, rim types alone do not necessarily reflect different vessel types, nor do they tell us everything about the shapes and functions of the different wares. For this reason an attempt is now made to separate the Coalport wares into functional vessel categories. In doing this, we are attempting to distinguish the categories which the Coalport potters and pioneers recognized.

It is likely that the Coalport potters had very few names for the different wares which they produced. The literature suggests such names as

		13MA103	13MA106A	13MA106B	13MA106C
Type 1	Jug				
	subtype a	5			
	b	3			
	c	6			
	<u>d</u>	<u>        </u>			<u>2</u>
	Total:	14			2
Type 2	Covered Containers				
	subtype a	2		1	
	b	9			
	c	1			
	d	6			
	e	1			
	f	1			
	g	0			
	h	1			2
	i	0			
	j	2			
	k	7		2	
	l	1			
	<u>m</u>	<u>0</u>		<u>1</u>	<u>        </u>
	Total:	31		4	2
Type 3	Plain Rims				
	subtype a	1			
	<u>b</u>	<u>22</u>	<u>4</u>	<u>3</u>	
	Total:	23	4	3	
Type 4	Folded Rims				
	subtype: right angle				
	a	58		3	
	b	77		3	4

Figure 31. Rim Categories

Type 4	Folded Rims	13MA103	13MA106A	13MA106B	13MA106C
	subtype: right angle				
	c	60	1		4
	d	42		4	4
	e	29			1
	f	13			
	g	34		2	
	h	46			1
	i	19		3	4
	j	1			
	k	1			
	subtype: right angle ribbed				
		2			
	m	34		2	
	n	3			
	o	7			
	p	5			
	q	2			
	subtype: partial fold				
	r	1			
	s	1			
	subtype: doubled				
	t	1			
	u	1			
	v	2	15	26	41
	w	0			4
	x	0			1
	subtype: more than right angle				
	y	13			
	<u>z</u>	<u>1</u>	<u>    </u>	<u>    </u>	<u>    </u>
	Total:	453	16	43	64

## Type 5 Reserve Rims

subtype	a	262	1	6	3
	b	175		5	4
	c	1		1	
	d	1			
	e	20		1	
	f	5			

Figure 31 Continued

Type 5 Reserve Rims	13MA103	13MA106A	13MA106B	13MA106C
subtype g	1			
h	4			
i	49			
j	0	1	3	5
k	0	1	4	8
l	4			
m	0			
n	4		2	3
o	48			
p	0	1	1	
q	38		1	
<u>r</u>	<u>16</u>	<u>1</u>	<u>1</u>	<u>1</u>
Total:	628	5	24	23

## Type 6 Feeder or Watering Pans

subtype a			1
b			6
c			3
d			3
<u>e</u>			<u>1</u>
Total:			14

---

Figure 31 Continued

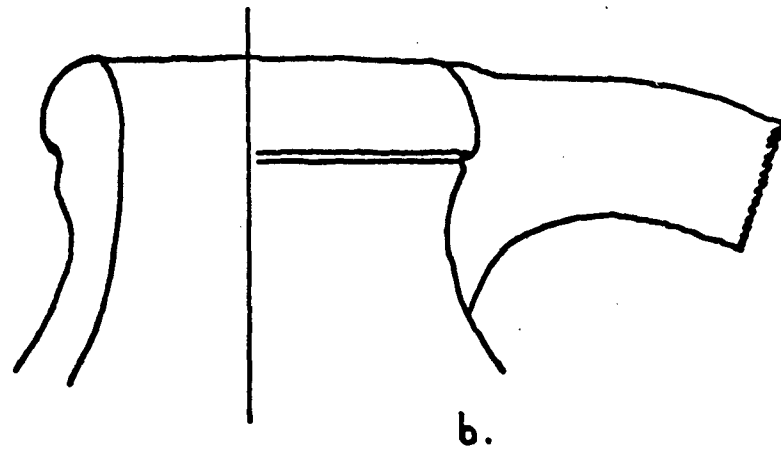
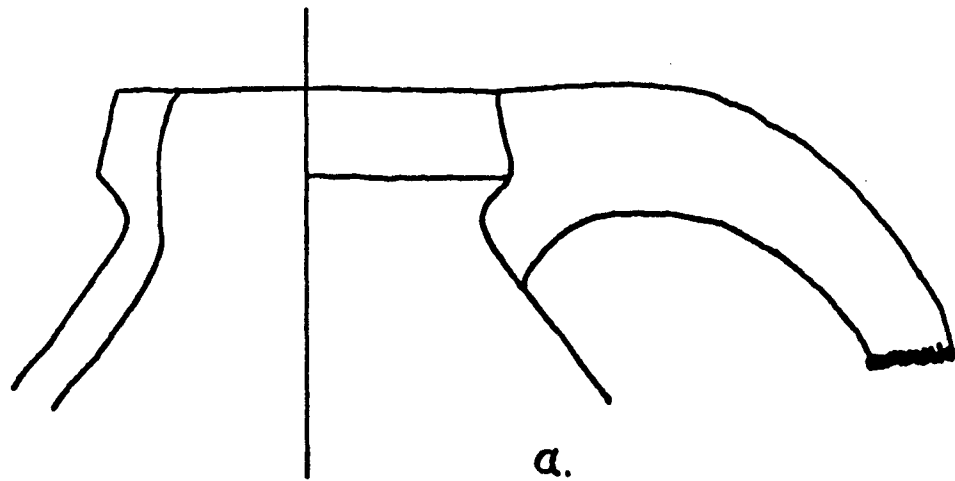


Figure 32. Jug or Small Necked Bottle Rim Profiles (Category 1)  
"d" not shown

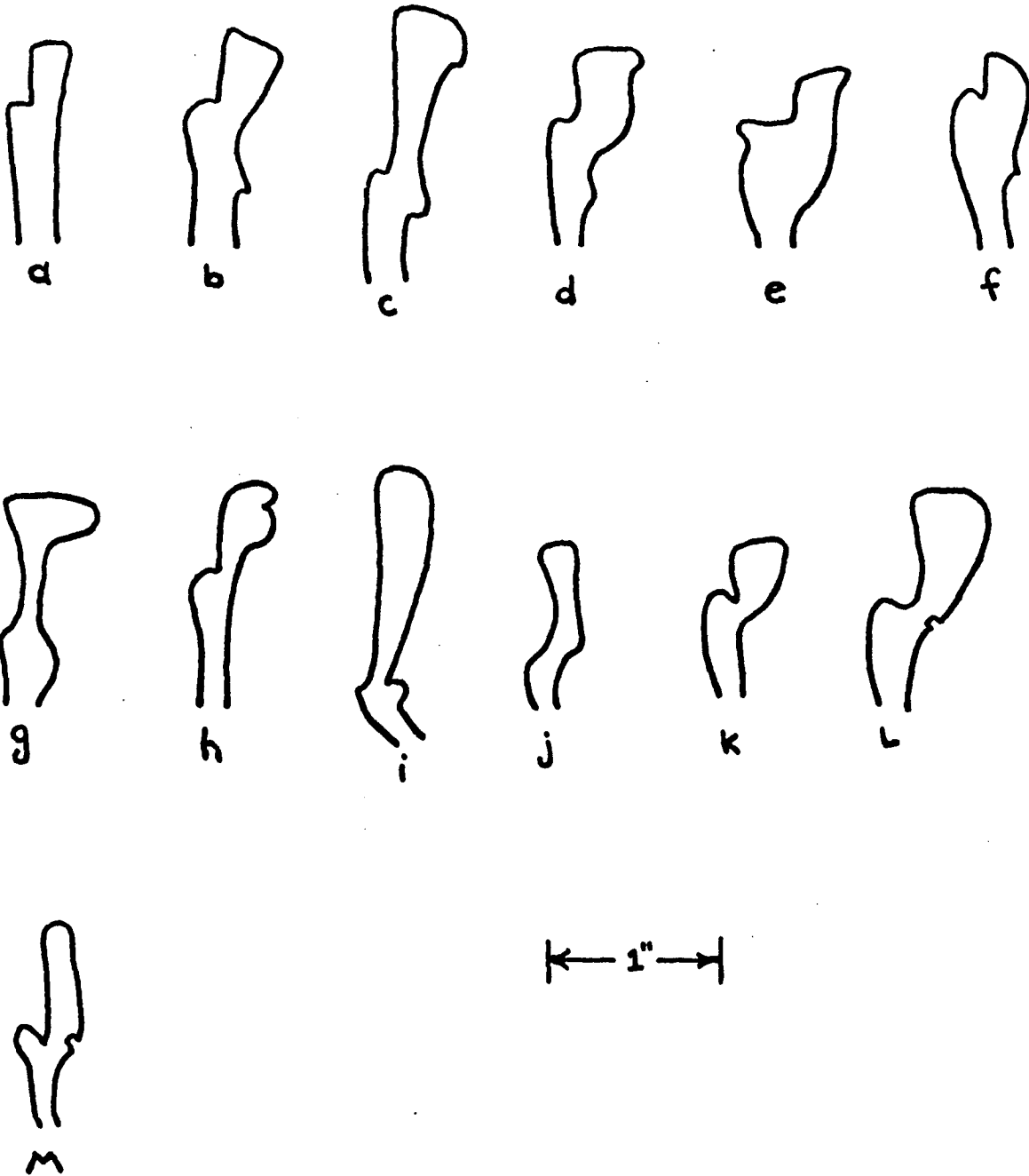


Figure 33. Covered Container Rim Profiles (Category 2)



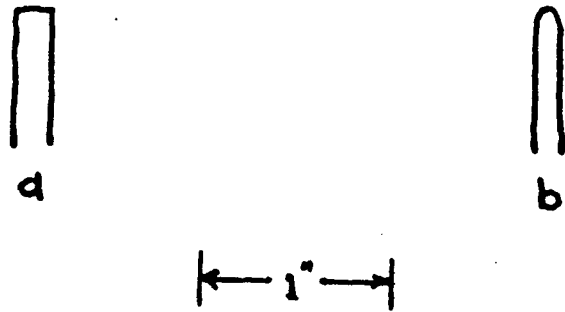


Figure 34. Straight Rim Profiles (Plain--Category 3)

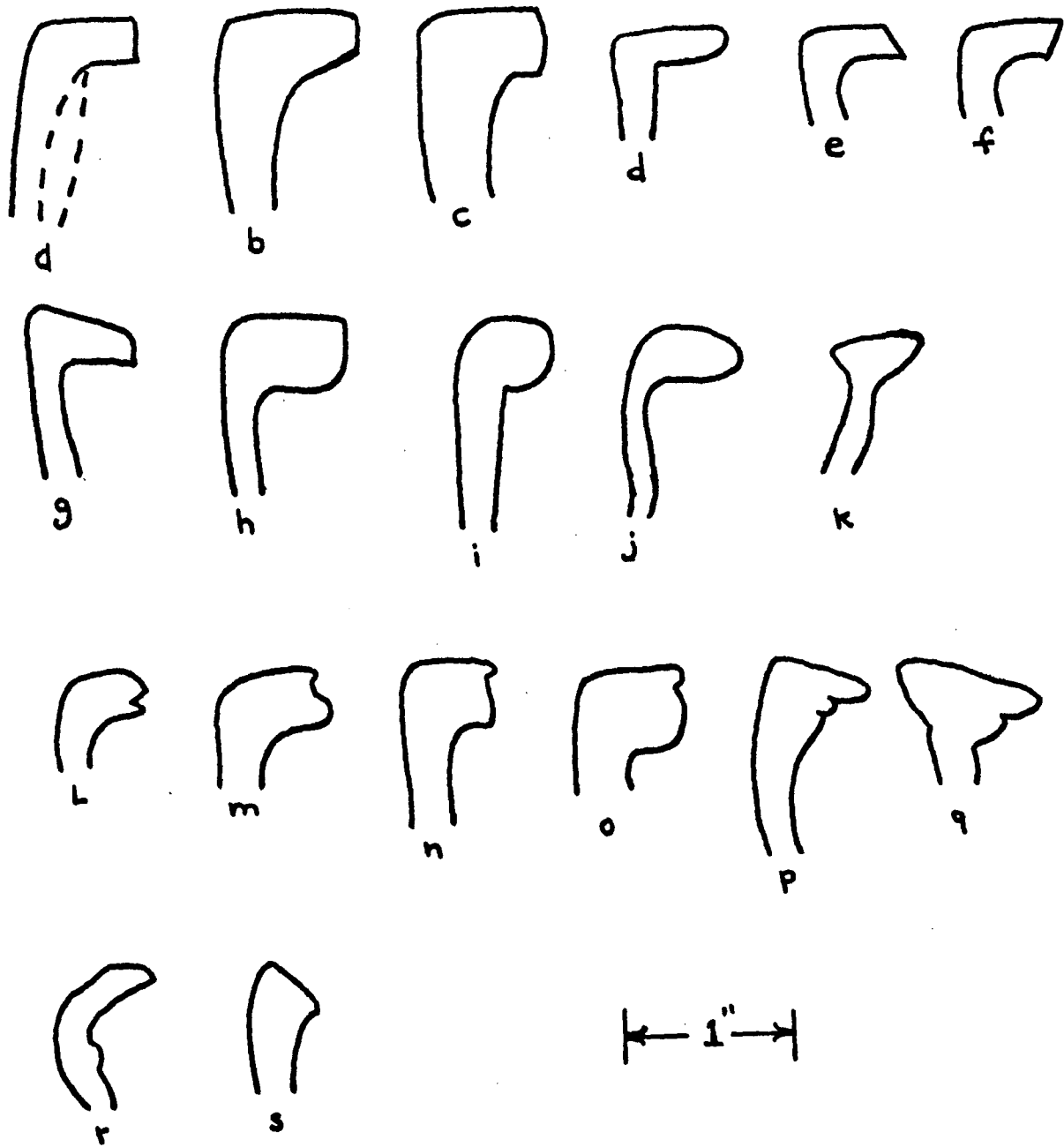


Figure 35. Folded Rim Profiles (Category 4)

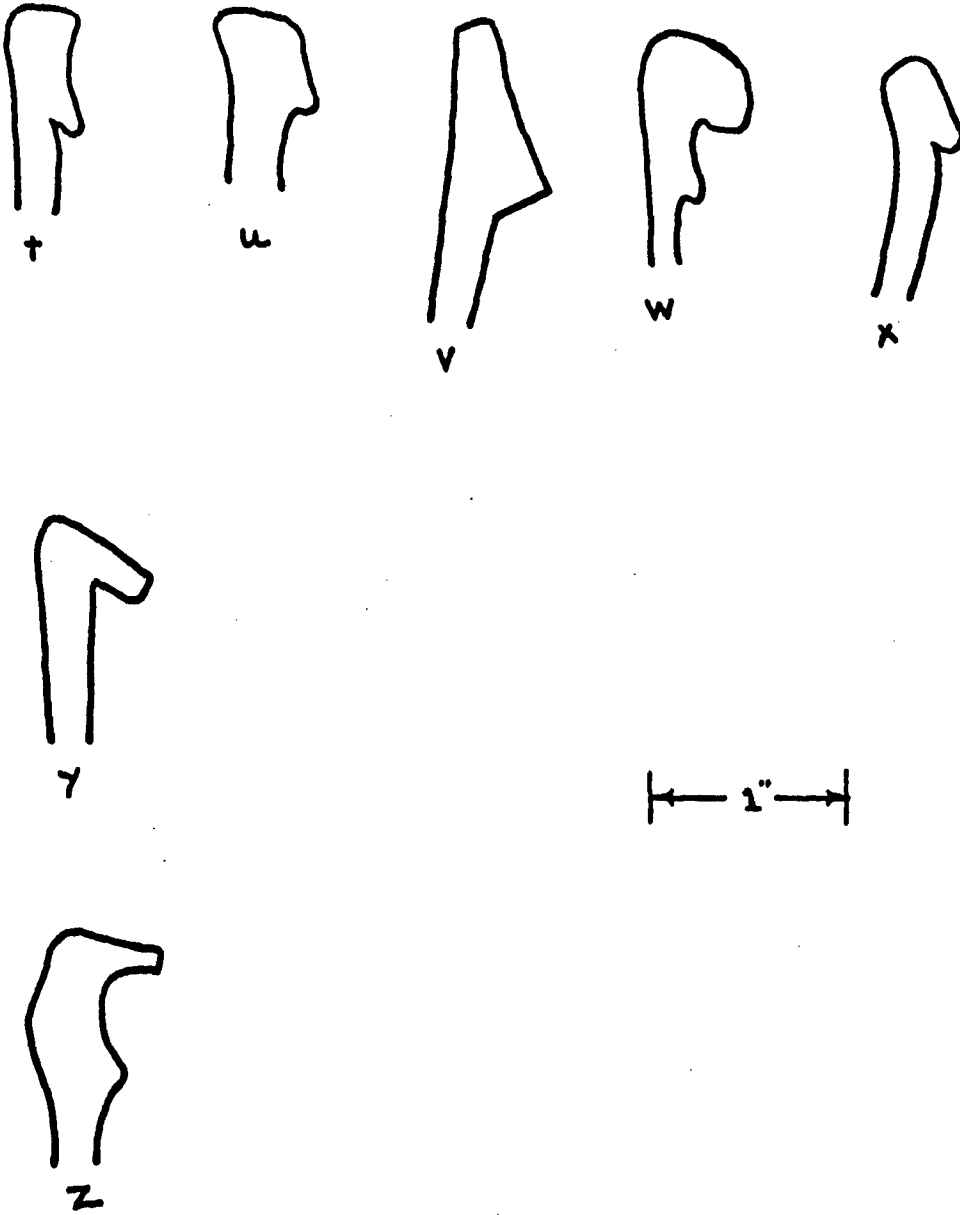


Figure 35 Continued

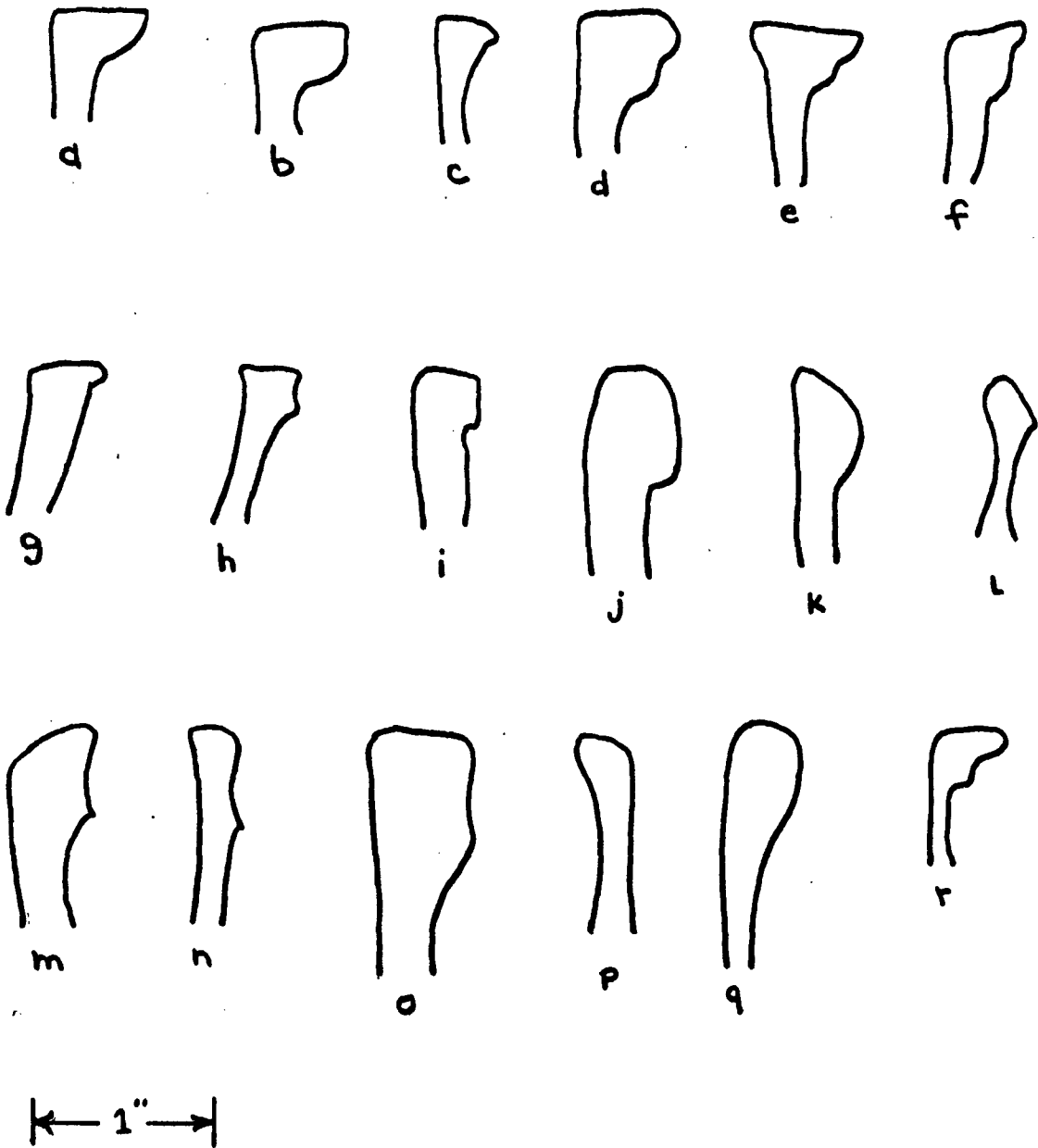


Figure 36. Reserve Rim Profiles (Category 5)

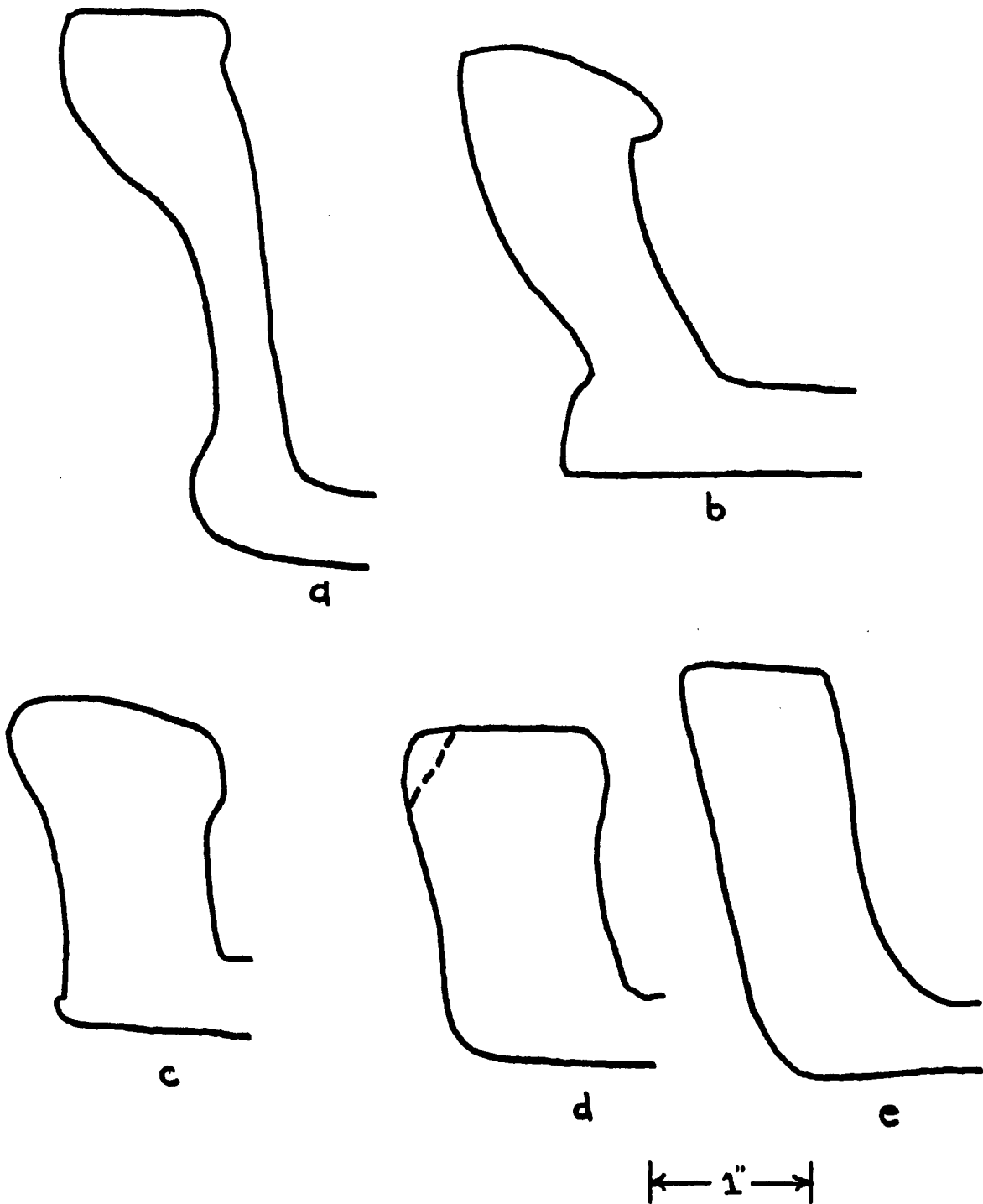


Figure 37. Feeder or Watering Pan Rim Profiles (Category 6)

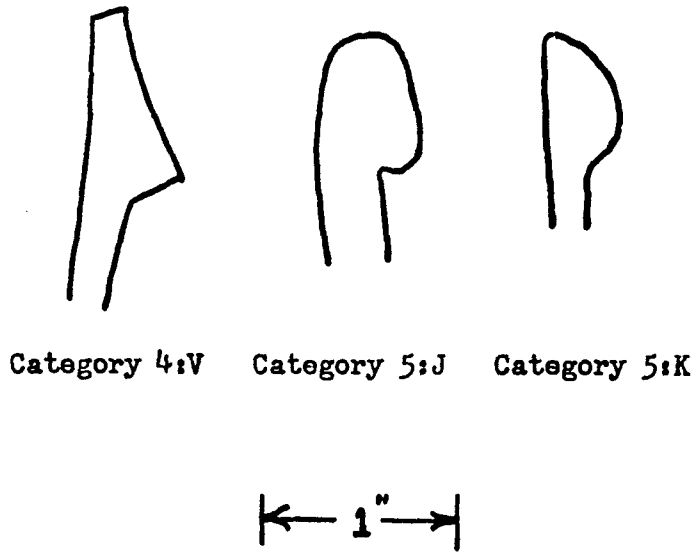


Figure 38. Template Rims

Previously categorized rims which may have been manufactured by holding a template to the rim of a pot while it was spinning on a potter's wheel.

crocks, jugs, bowls, jars, fat or grease lamps, etc. The types that we have isolated are types that were probably recognized by Coalport potters but the names are an attempt to follow the literature on nineteenth century ceramics and are not necessarily the Coalport potters' names for these vessels.

The major source on vessel types for the writer is Ramsey, although he is not descriptive enough for the writer's purpose.

The only native categories mentioned by Alfred B. McCown in Down on the Ridge are jugs and "grease lamps" and clay pipes. In a very sentimental paragraph on the joys of youth, McCown (1909:48) mentions that

. . . another of the older set was Cass Smith. If I should leave off the Christian name you would all know whom I mean. Cass was the son of a potter, and in due time followed the trade himself. It was a caution to see him make a jug. I imagine he found few, if any one, who could turn out as many pieces of ware as he could.

This last paragraph is important for two reasons. It not only mentions the jug category and names a potter who made jugs at Coalport but also assigns a term for the whole class of ceramic products made at Coalport-- "wares."

Grease lamps are mentioned three times by McCown (1909). In describing a typical night scene in Coalport, McCown says that

And then when all is still the cricket under the big warm stone sends forth his rasping song. The little tallow dip is still struggling away, while in the farther recesses of that little room all is darkness and desolation [sic]. But don't you know we thought it was light because it beat the grease lamp and old pine-knot? (McCown 1909:16)

McCown's mother used grease lamps while their family lived in Coalport.

. . . and away after the supper hour, down by the old grease lamp, she stich after stich made our stockings

and our clothes, humming the while some sweet little song telling of heaven and rest in the spring and summer land of God. (McCown 1909:26)

According to McCown, grease lamps provided enough light to read by.

We remember having gone to Knoxville on day where Mont bought a little juvenile book entitled, "Lord Bateman," and how that night, in the little old log cabin in the lane, seated around the old grease lamp, Mont read to Sandy and John, which was Mead and Lala, the wonderful story of that celebrated lord. (McCown 1909:58)

Women, as well as men, apparently smoked clay pipes at this time.

McCown's description (1909) of a dance held at the "English Settlement" south of the "Whitebreast Prairie" sometime during the period of his stay in Coalport describes this:

I remember one of you boys with one, went to a dance down there one time at which there were only about eight women, all of whom were married, grass or soil widows (mostly grass), and old maids, seventy-five per cent of whom smoked "long green" in clay pipes. (McCown 1909:53)

There is no archaeological evidence that clay pipes were ever made at the Coalport Kiln, although surface collections from other pioneer sites in both Saylorville and Red Rock Reservoirs indicate that they were a common item of the day. In fact, a fragment of a clay pipe was found at 13MA106 (Plate 28). Most of the collected pipes from these sites were mold-made and thus probably not made at Coalport.

The Iowa Official Census records of 1850 and 1870 provide other clues to the type of wares made at Coalport. The 1850 census lists "crocks," "jars," and "jugs" as being manufactured by Wm. Welch. It also lists "20,000 Gillin quant. (annual)" for the quantity of production at the site. The 1870 Iowa Official Census lists "jugs," "jars," "pans," and "tiling" as production items in the Smith and Bailey Kiln. Unfortunately, no de-



scriptions of these various forms are given.

Ramsay (1939:128-157) devotes a long section in American Potters and Pottery to types of stoneware and pottery vessels. His Type 13 and possibly Type 14 correspond to our jug forms from the Coalport Kiln and his Type 17 corresponds to our "narrow orifice jar" form (Fig. 48). Similarities between his crock forms and ours are also possible--his Type 20, and others. However, Ramsay's descriptions are neither accurate enough nor detailed enough to be of much help in assigning pottery types to the Coalport Kiln vessels. His Plate 61 has a picture of a fat lamp which is nearly identical stylistically to our grease lamp. The only major observable differences are in the place of attachment of the handle and the type of glaze.

Watkins (1953) discusses this fat or grease lamp in an article devoted entirely to them, and there is no question that the Coalport fat lamps are of the same type.

Two potters, Durk and Levi Beintema, are reported to have made "earthenware jars," "milk pans," and "grease lamps" for the early colonists of Pella (Nossaman 1940). One of these men, Durk Beintema, lived with William Welch in 1850 (Iowa Official Census 1850, up. orig.) and listed his occupation as "potter." It is possible that this man made the fat lamps found at Coalport.

In a discussion of Redware vessel forms, Watkins (c1950) lists several forms which may be analogous to the Coalport functional types. These include "pot" or "common pot," "pans," "jugs," "bowls," "jars," "churns," and "crock for butter or preserves." Some of these names are unfortunate and not very useful. For instance, the "pot" listed above is similar to our straight-walled crock and has been called a "crock" by numerous author-

ities (Ramsey 1939 and others).

Watkins (c1950:234) describes his "pot" form as follows:

It was straight-sided, rounding in towards the base, was unglazed outside, and usually had a plain rim but no cover.

It is doubtful if this form is the same as our straight-sided crock which is salt glazed externally, brown slip glazed internally, lacks a cover, occasionally has handles, and sometimes has fairly elaborate rims.

The "pans" mentioned by Watkins (c1950:235) are described as ". . . shallow receptacles with sloping sides . . ." which include "milk pans" of up to 18" in diameter. This may correspond roughly to the two "milk skimming bowls" found at Coalport Kiln and to the numerous examples obtained at the Gidel Kiln.

Watkins (c1950:235-236) mentions two main distinguishable types of jugs, one with the handle attached directly to the rim and another with the handle attached to the neck or body of the vessel.

Watkins (c1950:236) says that "In nineteenth-century potteries large bowls were made for use in the kitchens." All of his illustrations of bowl forms show them as round-bottomed while our bowl form is straight-sided and flat-bottomed.

According to Watkins (c1950:238) the use of the term "jar" is of recent vintage.

The word jar does not appear in any early potter's list that I have seen. Undoubtedly the vessels that we call jars were simply termed 'pots.' Nevertheless, the word connotes something to modern ears that the expression pot does not. I refer to those containers, covered or uncovered, with an allover [sic] glaze, that were used not so much for cooking as for the storage of food.

This term "jar" will be used to describe vessels from the Coalport area

which have narrow orifices--with an internal shelf for a lid. The other forms listed by Watkins and mentioned above are not described in sufficient detail to be useful to this study.

The Brantford Pottery in Canada--a salt glazing stoneware pottery--manufactured some types of wares similar to those found at Coalport (Webster 1968). Webster's churn form (Figs. 29 and 66), deep rimmed milk skimming pans (Fig. 35), jars and jar lids (Figs. 14 and 15), milk or butter bowl (Fig. 10), etc. are all forms similar to those from the Coalport area.

Mr. Carl Johnson, who worked at the Fort Dodge Stoneware Company from approximately 1897 to 1909, has provided insights into the naming of pottery ware types in a taped interview (Carl Johnson 1969). This interview is part of an undergraduate Honors project at Iowa State University undertaken by Miss Susan Peet. According to Mr. Johnson, who was a glazer and kiln setter at the Fort Dodge Stoneware Company, the men making the pots had very few names for their products. He mentioned crock, spittoon, churn, water crock, milk skimming bowl, and jug as the names of some of the Fort Dodge wares. Our conversations with Mr. Johnson clarified the fact that few of these vessels were named: what seemed of much greater significance was the size of the vessel. Whenever Mr. Johnson discussed Fort Dodge wares, he was careful to include the size in gallons, quarts, or pints. His constant references to the size of pots suggests that size rather than type (other than very generalized types) may have been of greatest importance in determining the pot's name. Mr. Johnson mentioned that crocks were used to store both vegetable and meat products. Since uses were variable according to size, that, instead of function, might have provided the impetus for naming.

The following vessel categories (i.e., bowl, crock, jar, jug, etc.) are attempts at a functional classification. The subcategories of these functional types, however, involve mainly descriptive traits (i.e., straight-sided crock) and factors related to the method of manufacture (i.e., reserve rim).

Vessel category: simple bowl      The simple bowl form (Fig. 39) was the most common vessel form found during excavation at the Coalport Kiln. The 152 partial or complete bowls recovered are typically straight-walled, less than eight inches high, and wider at the rim than at the base. They range in size from one to two gallons with by far the largest number in the one gallon category. All of them have slightly different dimensions and slightly different capacities. All of the bowls exhibit the characteristic spinning marks of wheel-made pottery. They have a variety of rim types, all of which are in the general category of open container rims (Figs. 34-36). None of the recovered sherds of this form have either internal lips for lids or handles. All of the bowls are flat-bottomed and the bases tend to be thinner in cross section than the walls. Vessel heights range from 3-1/2" to 7-1/2" and vessel diameters at the rim range from 8" to 14". The walls are 1/4" to 1/2" thick and the bases 3/16" to 1/2" thick. Ninety-two percent of the bowls are externally salt glazed and only six percent are internally salt glazed. The most common internal glaze is the natural brown slip glaze, which occurs on the interiors of almost ninety percent of the bowls. Over twice as many bowl interiors are unglazed as exterior (Plate 11).

The bowl form is a very simple form with little or no decoration. Fif-

← 2" →

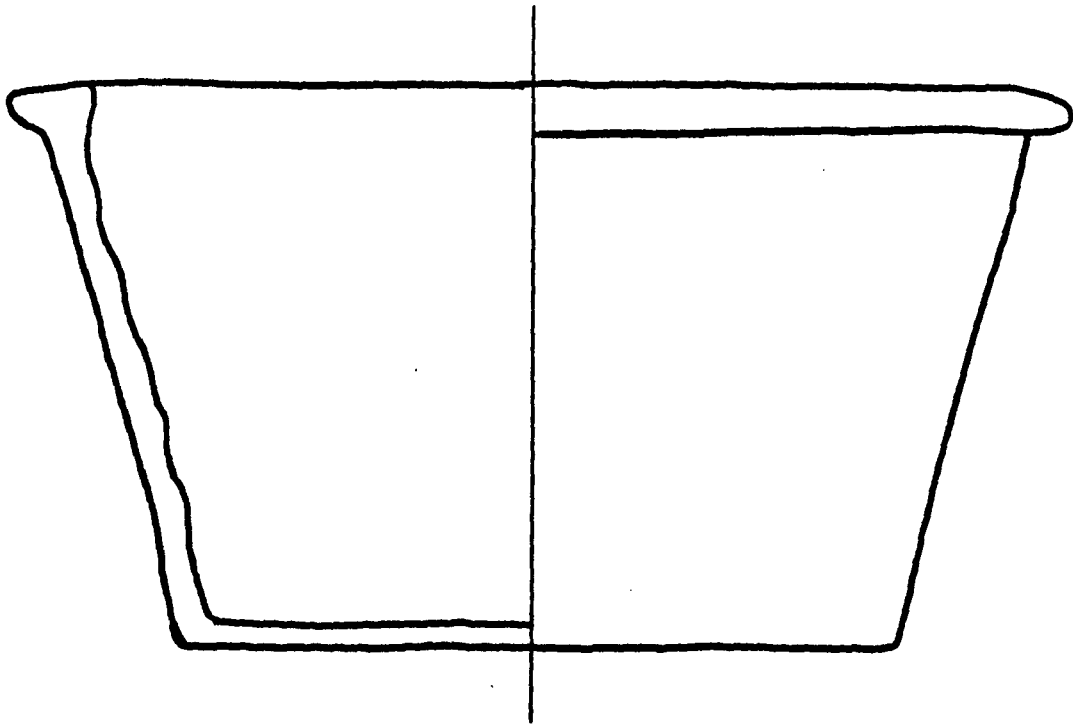


Figure 39. Simple Bowl Form Category

teen vessels have horizontal incised lines circling the bodies of the pots. Only one bowl exhibits horizontal excised lines and only one bowl has combed decoration. None of the bowl forms is stamped or marked with any writing or numbers.

Bowls have rims of the open containers variety in folded and in reserve and plain types. The following figure summarizes this information. Nearly all of the rims are modified in some way. Only two rims are straight-walled. The rest of the rims are about equally divided between reserve and folded rims.

---

Type 3: Plain	Type 4: Folded	Type 5: Reserve
subtype number	subtype number	subtype number
b            2	a            2	a            28
	b            7	b            33
	c            8	e            3
	d            16	g            5
	e            2	h            1
	g            12	i            2
	h            9	l            1
	i            6	o            2
	m            9	r            1
	n            1	
	y            2	
<hr/>	<hr/>	<hr/>
Total:        2	74	76

---

Figure 40. Bowl Rim Types

The bowl form made at Coalport was probably widely used locally as both a kitchen utensil--i.e., milking bowl--and storage vessel. Suggested uses for the bowl form include milk skimming, mixing, milk storage, etc. It is possible that this form was also used as a cooking vessel. It lacks handles but the rims generally stick out 1/4" or more from the sides of the

vessels. Also, being stoneware, it could easily withstand the temperature of a wood burning or coal burning stove.

Vessel category: crock Three types of crocks were made at Coalport: the straight-sided crock, the straight-sided angled-shoulder crock, and the rounded-shoulder crock. All of these were probably primarily storage containers for vegetable and meat products. They are quite large, ranging in size from two to six gallons or more in capacity.

Straight-sided crock Only 17 straight-sided crocks (Fig. 41) could be identified. These are from 9-1/2" to 15" high and have an external rim diameter from 8-1/2" to 12-1/2". Two straight-sided crocks have numbers stamped on them. Both numbers are stamped "4"'s. One is located on the outside rim of the crock and the other on the external body of another crock. All recovered specimens have salt glazed exteriors and all but two vessels have brown slip glaze interiors. The remaining two have unglazed interiors (Plate 12).

Straight-sided crocks commonly have two lug handles located just below the rim and on opposite sides of the pot. Two vessels have no handles. This form is one of the most commonly decorated forms found at the Coalport Kiln. Thirteen of the seventeen recovered vessels have horizontal bands of incised lines located just below the vessel rims. Three vessels have incised lines on the outside of the rims. No other decorations have been found on the straight-sided crocks. One of the straight-sided crocks is signed and this is the only signed pot unearthed at the Coalport Kiln by the ISU-NPS Crew (Plate 29). The signature is located just below the rim of the vessel and it is the handwritten, rather than stamped, signature of

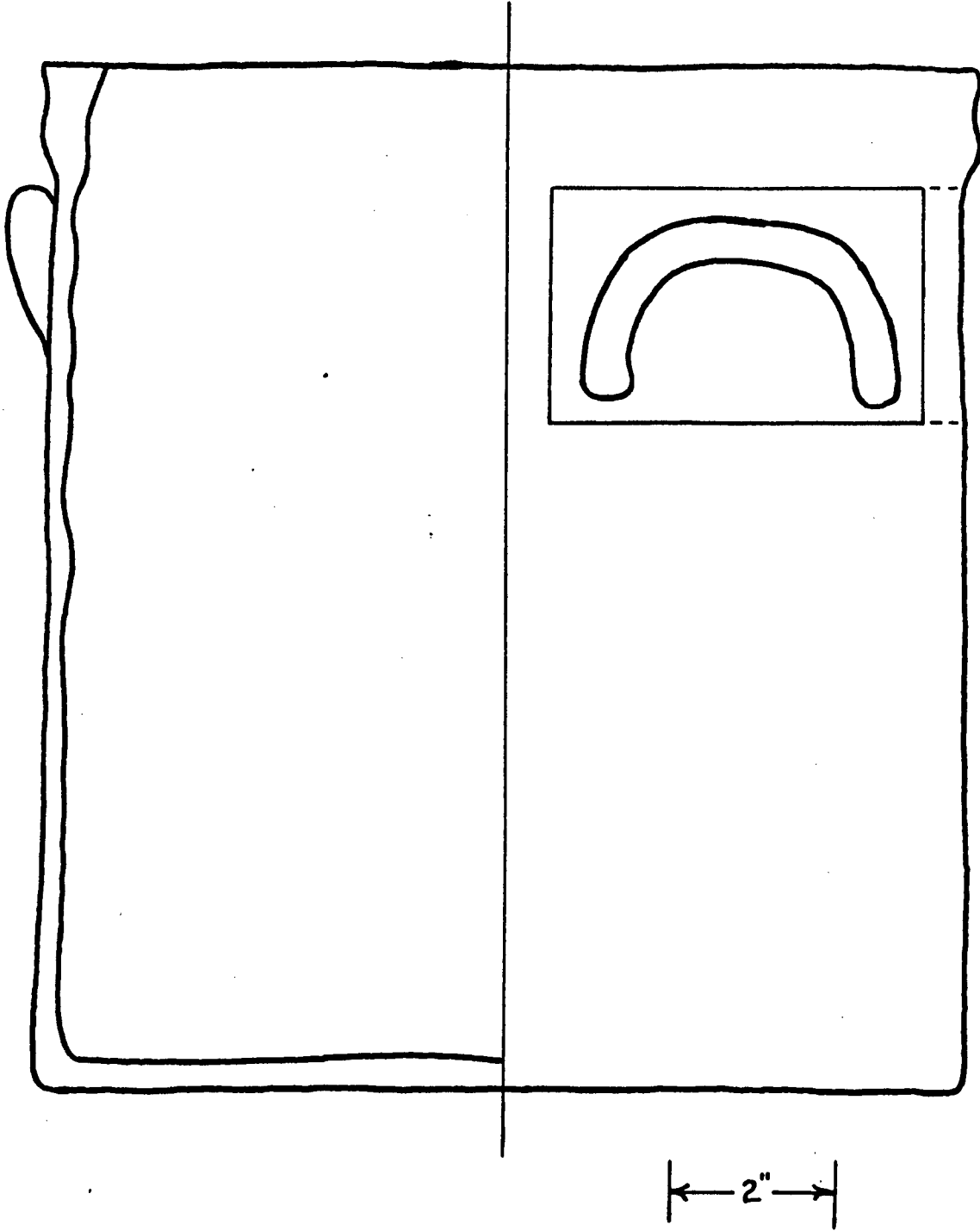


Figure 41. Straight-sided Crock Form Category



Thomas Smith.

The straight-sided crocks show much less range of rim types than does the simple bowl form. All types are of the open container rim variety and reserve rims are the most numerous. They are usually quite substantial with heights of over 1". The following figure summarizes the information on straight-sided crock rims.

---

Type 4: Folded	Type 5: Reserve
subtype number	subtype number
a            1	o            9
b            1	r            1
<u>c            1</u>	<u>            </u>
Total:        3	10

---

Figure 42. Straight-sided Crock Rim Categories

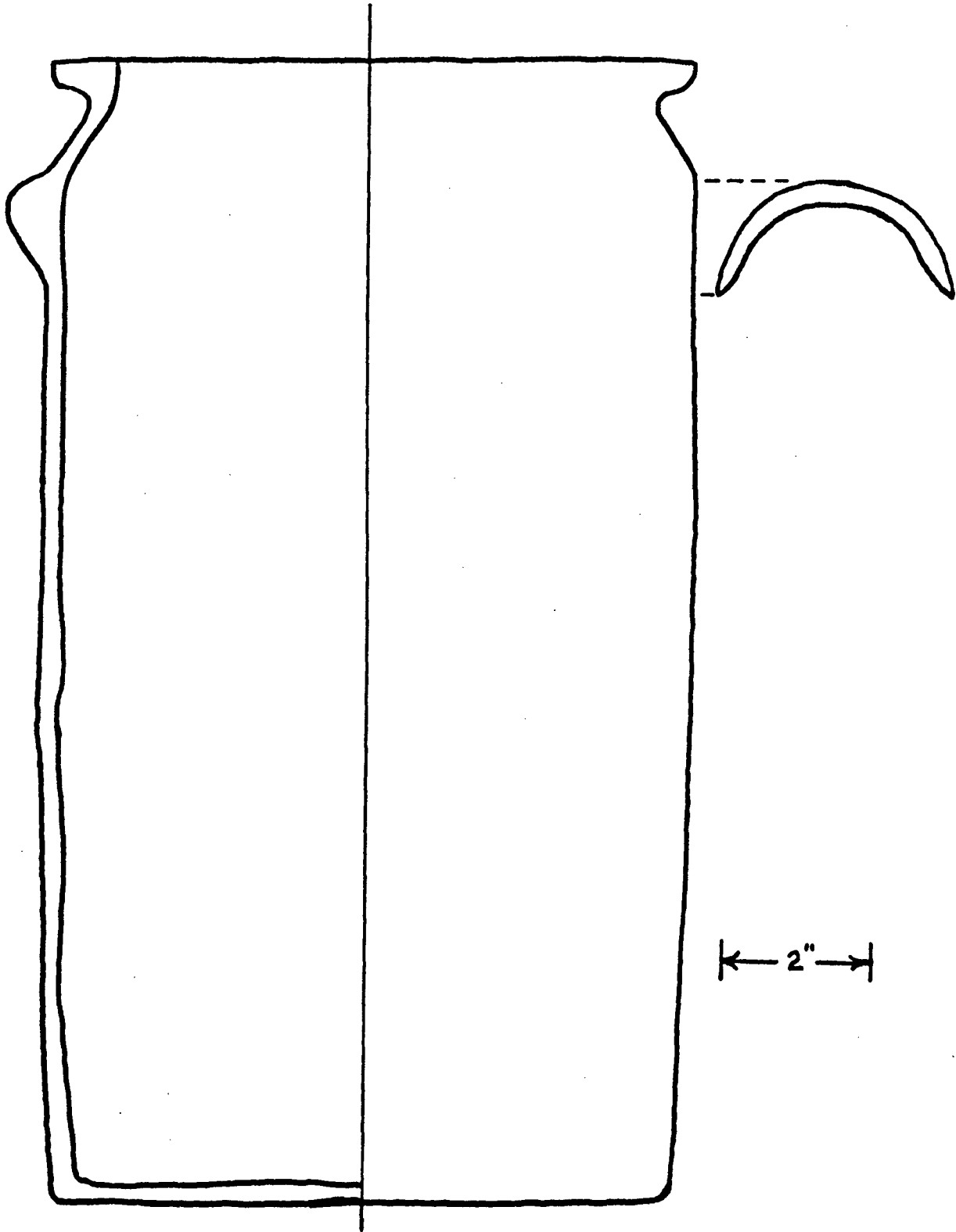
Straight-sided angled-shoulder crock      Twelve

straight-sided angled-shoulder vessels (Fig. 43) were found at the Coalport Kiln. Two nearly complete specimens have heights of 14-3/4" and 10-1/4" and external rim widths of 8-3/4" and 7-1/4". The necks measure generally 3/4" to 1" less than the external rims; the shoulders are of the same diameter as the external rim, or slightly larger. On the two most complete specimens, the base diameter is about 1/2" less than the shoulder diameter. The side walls of these vessels are fairly thin (1/4"-5/16") and the base thicknesses are about the same as the side wall thicknesses. Only two vessels are marked with numbers, and these are "3"'s incised in freehand on the shoulders of the vessels (Plate 12).

Only four straight-sided angle-shoulder crocks have decorations. One



Figure 43. Straight-sided Angled-shoulder Crock Form Category



of these crocks is decorated with a horizontal band of combing on the shoulder of the vessel. The other three decorated vessels are marked with horizontal bands of incised lines on either the shoulders or the necks.

All of the rims in this vessel category are of the open container rim variety and both rolled and reserve type rims are present. This information is summarized in the following figure.

---

Type 4: Folded		Type 5: Reserve	
subtype	number	subtype	number
b	1	a	4
e	1	b	1
		g	1
		y	2
<hr/>		<hr/>	
Total:	2		8

---

Figure 44. Straight-sided Angled-shoulder Crock Rim Categories

Round-shouldered crock      The round-shouldered crock is a fairly well represented vessel form at the Coalport Kiln. Sixty-one partial specimens were recovered during excavations at the site. These appear to have quite a large range in size. External rim diameters range from 5-1/2" to 12" and the height seems quite variable, although only two specimens are complete to the base. These two nearly complete pots have heights of 10-1/2" and 12". The noticeable thing about all of these vessels is that they are enlarged at the shoulder by as much as 2" or 3" over the external neck diameters. Stamped numbers are found on several round-shouldered crocks. Four vessels have "3"'s stamped on their shoulders while two more vessels have, respectively, "4" stamped on the neck and "6"

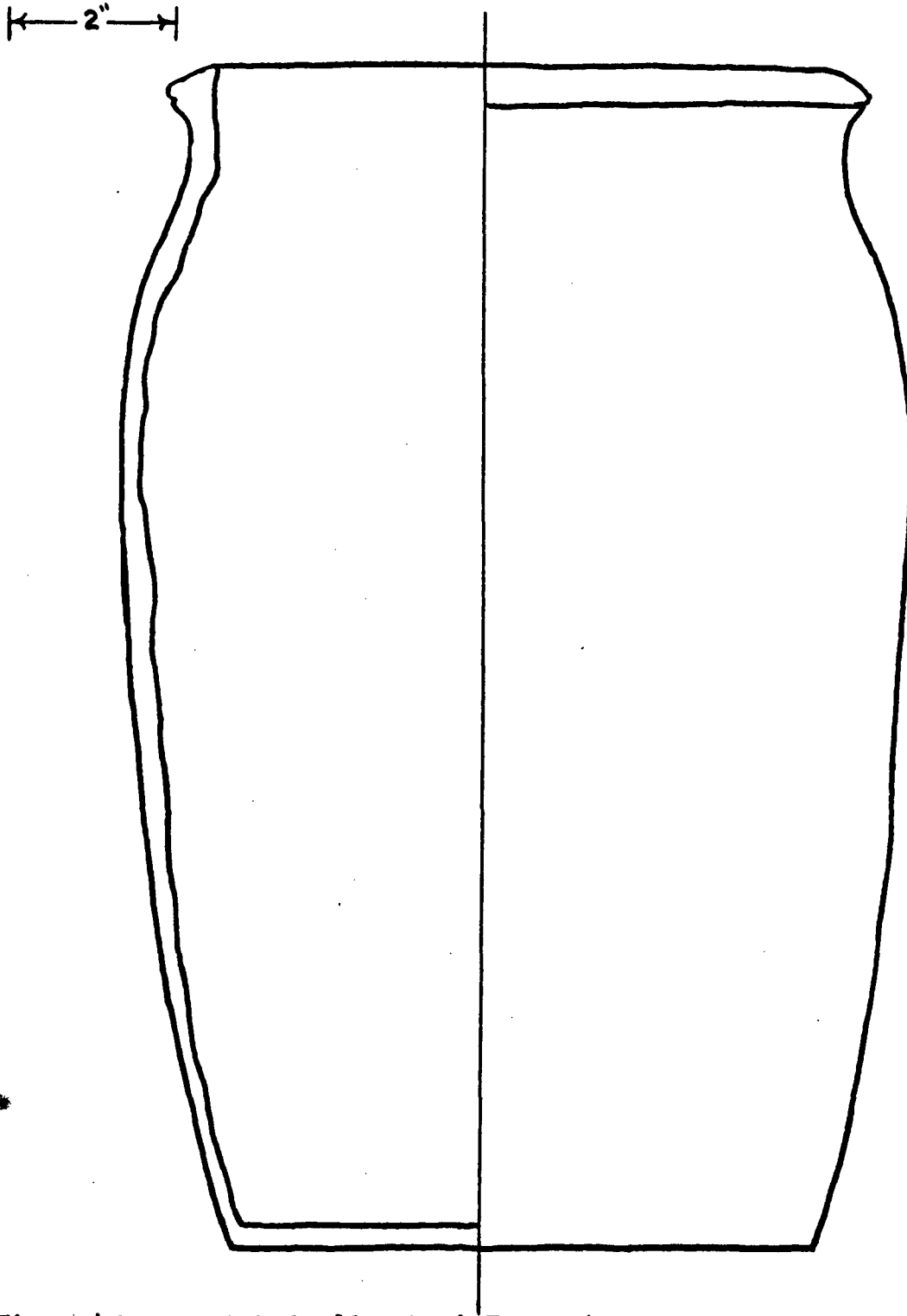


Figure 45. Rounded Shoulder Crock Form Category

stamped on the shoulder. These numbers probably refer to gallon capacity, as discussed earlier, although the vessel with "6" stamped on it does not appear large enough to be a six gallon capacity crock. Unfortunately, so much of the vessel is missing that there is no way of determining its actual size. Vessel walls are thin for such large crocks--1/2" to 3/8". Only one round-shouldered crock has handles and they are of the lug variety and are located on the neck-shoulder region of the pot (Fig. 45, Plate 12).

The glazes follow the general pattern of Coalport pottery in that salt glazes usually appear on the external surface of the crocks and brown slip glaze on the internal surface. The figure below summarizes glaze occurrence on these vessels.

---

	External Glaze	Internal Glaze
salt	50	1
brown slip	7	56
unglazed	<u>3</u>	<u>3</u>
Total:	60	60

---

Figure 46. Glaze Occurrence on Round-shouldered Crock

As in the case of the other crocks, all rim types are of the open container rim variety. However, round-shouldered crocks have rims of all three of the open container categories: plain, reserved, and folded. The following figure summarizes this data.

Type 3: Plain	Type 4: Folded	Type 5: Reserved
subtype number	subtype number	subtype number
b 1	a	a 16
	b	b 3
	c	e 5
	d	f 1
	f	i 1
	g	n 1
	h	o 2
	i	
	j 1	
	o 1	
	p 4	
	r 1	
	y 3	
<hr/>	<hr/>	<hr/>
Total: 1	30	29

Figure 47. Round-shouldered Crock Rim Categories

Vessel category: covered container Several different types of covered containers (vessels with an internal lip for a lid) were found at the Coalport Kiln. These include small jars, large jars, butter churns and one possible water jar of nine gallon capacity. None of these categories were probably made in the same quantities as the bowls and crocks discussed earlier. They were probably used as canning, preserve, or pickling containers (Plates 13-15).

Jars Jars are containers which can be effectively sealed. All of the varieties of jar forms found at Coalport have one major characteristic: they have an internal lip that was apparently used for seating a lid. In some cases, ceramic lids were found which could have been used to seal these jars (Plates 12 and 13).



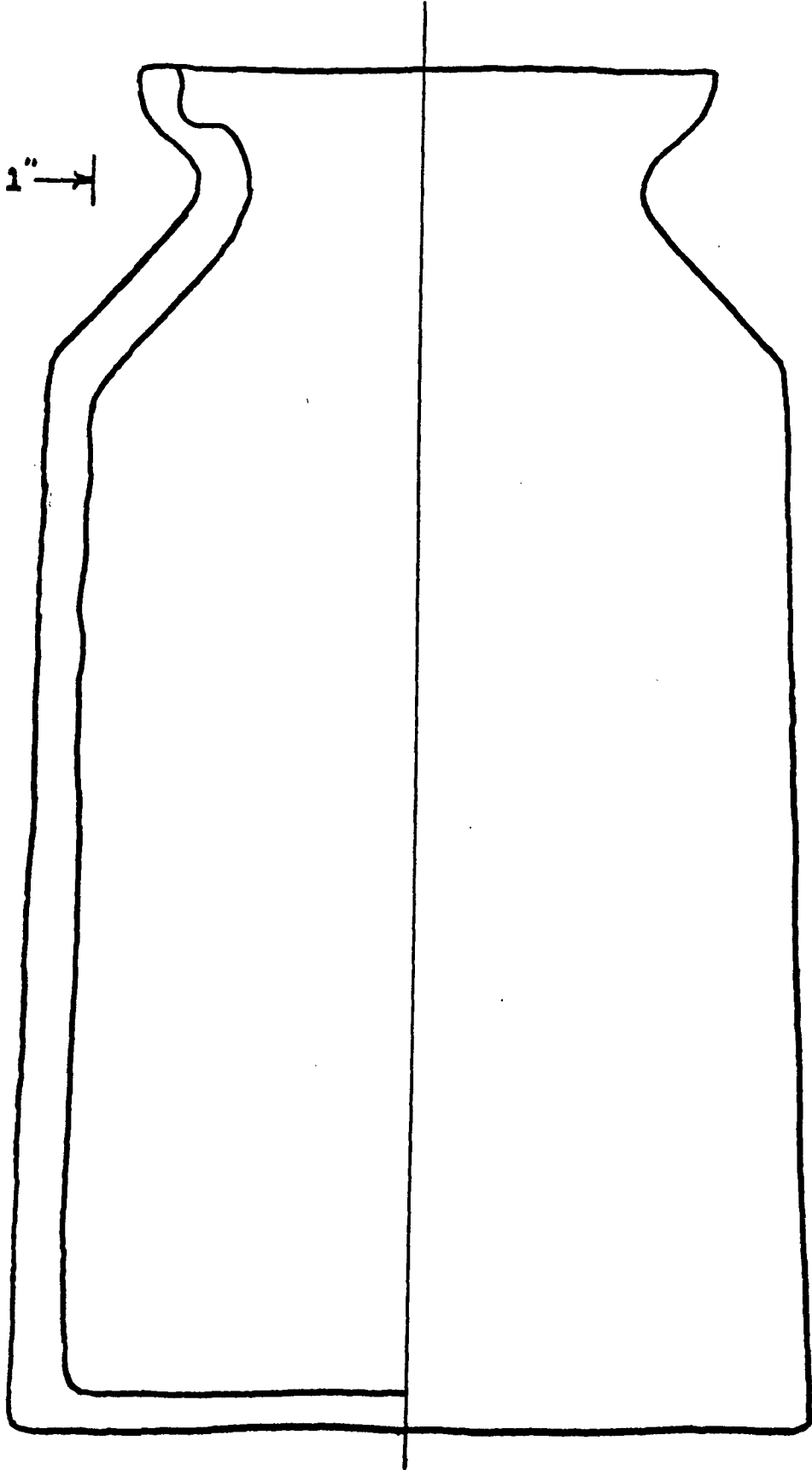
Small mouthed jars      There are two principal types of small mouthed jars found at Coalport (Figs. 48, 49; Plate 13). One is straight-sided with an angled shoulder and a flaring rim and the other is straight-sided with a rounded shoulder and a flaring rim. Unfortunately, the small mouthed jars are very rare forms at Coalport Kiln. Only five rims were recovered. Of these, two are almost complete vessels. It is primarily from these two vessels (one each of the above two subdivisions of small mouthed jars) that the following discussion arises. In addition to vessel rims, six bases were discovered which are probably small mouthed jar bases; one complete vessel missing only the rim was also discovered.

These vessels have external rim diameters in the range of 3" to 5" and an internal diameter ranging from 1-7/8" to 4-3/8". The two complete vessels stand less than 10" high and are 4-1/2" and 5" in diameter at the shoulder. Both vessels have slightly expanded bases, respectively 4-3/4" diameter and 5-3/4" diameter. The six base sherds which are thought to be small mouthed jar bases have an average diameter of 5-2/5" at the base. These jars have thick walls for such small vessels--1/2" to 3/8" thick. Two vessels are salt glazed on the external surface and three vessels have a brown slip glaze on the interior. The round-shouldered jar has a dark black slip both internally and externally. This may just be a variation of the normal brown slip glaze caused by burning the piece in a reduction atmosphere. This vessel has small wads of clay on the bottom, which indicate that it was placed inside another vessel for firing in the kiln. If the outside container were then sealed off completely from the air in the kiln, the jar inside it would be fired in a reducing atmosphere and this



Figure 48. Angled Shoulder Jar Form Category

1"



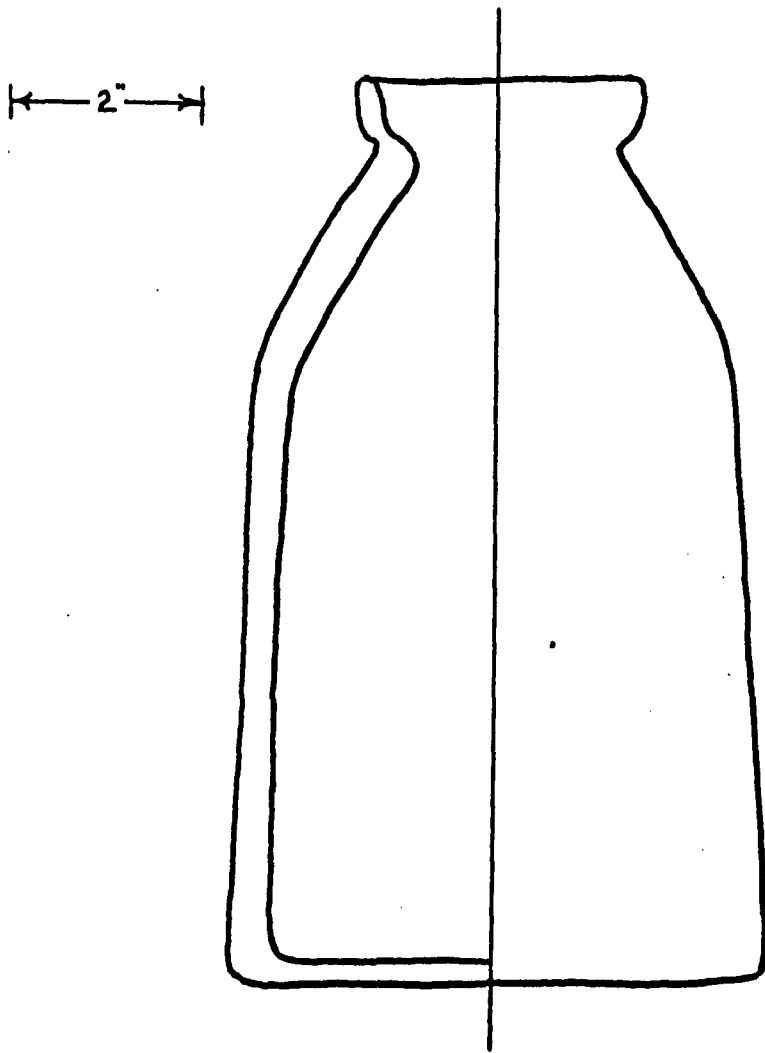


Figure 49. Rounded Shoulder Jar Form Category

would tend to make it a darker color than would firing in an open oxidizing atmosphere. One vessel appears to be unglazed both inside and out. The small mouthed jar which lacks the entire rim corresponds almost exactly to the other round-shouldered small mouthed jar. The only major difference is that one is externally salt glazed and the other has a very dark brown or black external slip.

The small mouthed jars evidently had no handles and little or no decoration. Only one sherd shows decoration and this is a single horizontal incised line around the shoulder of the vessel.

The rims are all of Category 2 (covered containers) and the information on distribution of subtypes is summarized in the figure below.

---

Type 2	
subtype	number
a	2
f	1
j	1
<u>k</u>	<u>1</u>
Total:	5

---

Figure 50. Small Mouthed Jar Rim Categories

Lids for small mouthed jars      Ten frag-

ments of small lids were found during excavation which may have been canning lids for the small mouthed jars (Plate 13). These lids range in diameter from 2-1/2" to 6" and all are 1/4" or less in thickness. Nine of these lids are salt glazed and one is unglazed. They tend to be very thin at the edges, thickening toward the center. They are flat across the bot-

tom. Five of the lids have small knurled handles on top and the others are such small fragments that the center portions are missing. The lids are fairly elaborately decorated, with from five to ten incised lines cut in circles in the top of the lids.

Large covered containers      The large covered containers present one of the more confusing problems of analysis of the Coalport Kiln ceramics. At least three different types of large covered vessels were made at Coalport. One of these forms is more or less straight sided and of several gallon capacity. Another, the butter churn, has flaring sides, a deeper internal lip, and usually big handles. The third is a type with a sharply angled shoulder and a rim much smaller in diameter than the shoulder. Only one specimen of this type was found at Coalport and it is called a water jar. It is highly decorated and is not at all like the usual plain Coalport ware in this respect. However, the glaze, clay, decorative techniques, etc. all fall into the Coalport Kiln pattern. The major problem is to distinguish between the large covered storage jars and butter churns (Plate 12, bottom left; Plates 14 and 15).

Large covered storage jars      Eleven partial vessels were tentatively classified as large covered storage jars. They have an external rim diameter ranging from 7-1/2" to 10-1/2" and an internal rim diameter ranging from 5-5/8" to 9-1/8". The shoulders are expanding and the vessel walls are from 1/4" to 5/16" thick. These were probably used as storage vessels for liquids. Seven of the eleven vessels have external salt glazes and three have external salt over brown slip glazes. One vessel has an unglazed internal surface and the rest have an internal brown

slip. This type exhibits no numbers on the surviving portion of the vessels and no handles.

Four of the large covered storage jars have decorations. Two have single line horizontal incising on the rim and one has eleven incised lines around the shoulder. A highly decorated vessel has two horizontal bands of combed decoration.

The rim types are all within the covered container rim category. The following figure summarizes these rim categories.

---

Type 2	
subtype	number
b	4
c	1
e	1
h	1
j	1
k	3
Total:	11

---

Figure 51. Large Covered Storage Jar Rim Categories

Butter churns Five large rim sherds have been positively identified as butter churns and four smaller ones have been tentatively identified as such (Fig. 52, Plate 14). Churns were evidently of quite large size; one sherd measures over 12" high and it is nowhere near complete. External rim diameters vary from 8-1/4" to 10-1/2", and internal rim diameters vary from 7" to 9-1/4". None of the recovered churns have numbers stamped or written on them. Four churns have lug handles located on the shoulder and their placement suggests that each churn had two handles



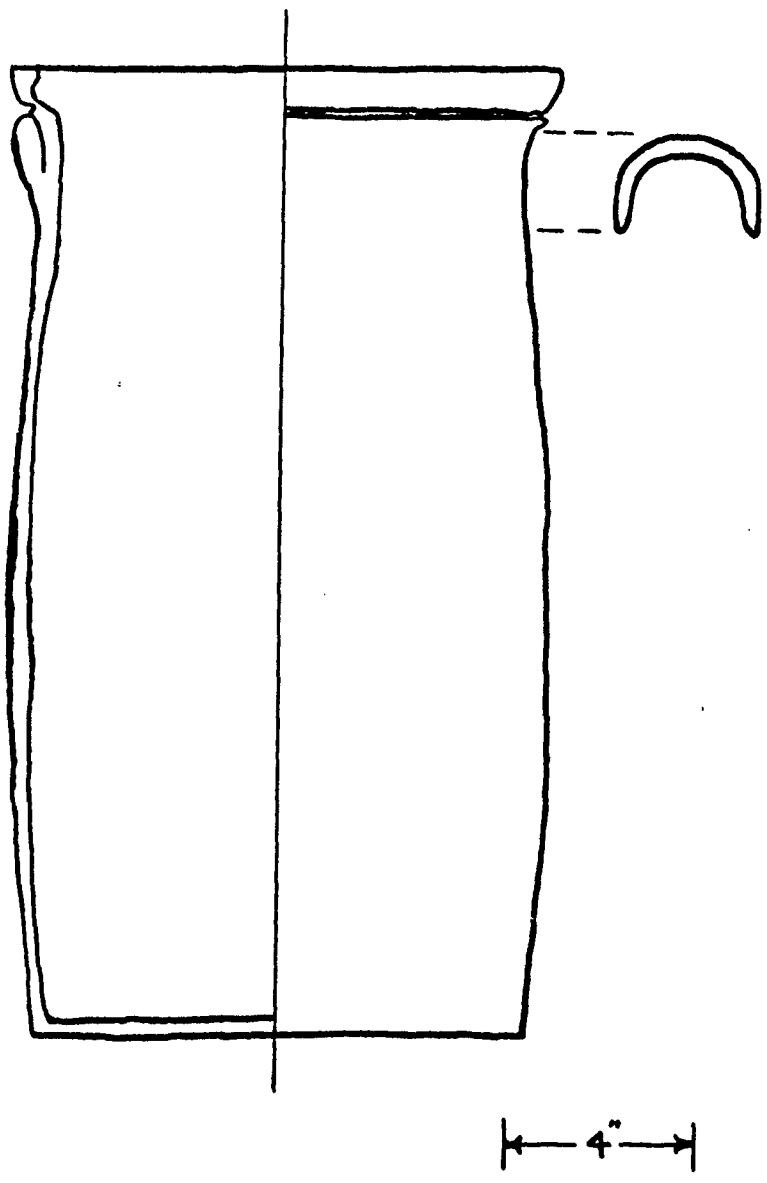


Figure 52. Churn Form Category

on opposite sides of the vessel.

Churns were very seldom decorated. One churn rim sherd has two horizontal incised lines and the other rim sherds have no decorations. Eight churns have an external salt glaze and one has an external brown slip glaze. All of them have the brown slip glaze on the interior.

All rims are of the covered container rim variety. The following figure summarizes the information on churn rim categories.

---

Type 2	
subtype	number
b	3
d	4
k	1
<u>l</u>	<u>1</u>
Total:	9

---

Figure 53. Butter Churn Rim Categories

Water jar      Only one vessel of the type

which the author calls a water jar was found during excavations at Coalport Kiln (Plate 15). The author calls this a water jar because it seems to have the same function, although not the same form, as water jars discussed by Ramsay (1939). This was such an unusual vessel for the Coalport Kiln area that the author feels it should be discussed separately from the large covered jar category. First, this vessel is by far the largest pot from the Coalport Kiln. A stamped "9" on the shoulder of the vessel indicates that it may have been of nine gallon capacity. The external rim diameter is fairly small--6-1/2"--but the shoulder is sharply angled and the vessel

is 12" in diameter at the point where the shoulder meets the body of the vessel. The vessel is missing below the shoulder but it appears as if the body was straight from the shoulder to the base. The body wall is thick-- $3/8$ "--and the entire vessel is coated with a brown slip glaze. The water jar has one handle and it is of the strap variety found on jugs. The difference is that this handle is attached to the neck and body of the jar rather than to the rim and body. The rim is of Category 2:K.

The water jar is highly decorated on the neck and shoulder with both combed and simple incised horizontal bands of lines.

Vessel category: jug      The jugs made at Coalport were of one to two gallon capacity (Fig. 54, Plate 14). Jugs were used for storing liquids. All were wheel-made and most have strap handles. They have small bases (about  $5\text{-}1/2$ " in diameter) and smoothly rounded expanding shoulders (about 7" in diameter). One gallon jugs stand around 11" high and are flat bottomed. External rim diameter ranges from  $1\text{-}3/16$ " to  $2\text{-}5/8$ " and the internal rim diameter range is from  $7/8$ " to  $1\text{-}7/8$ ".

Jugs show more diversity of glaze than other vessel forms. Eight jug rims have external salt glazes while five have an external brown slip glaze and one is unglazed. Relatively few jug vessel parts were found during excavation; however, those discovered include 14 rims, several bases, some large body sherds, and six jug handles.

All of the rims are undecorated; seven have strap handles. These are all attached to the side of the rim and then to the body. One of the jug rim categories listed below (1:C) yielded no rims with handles. This may indicate that these were actually bottles or handleless jugs, although in

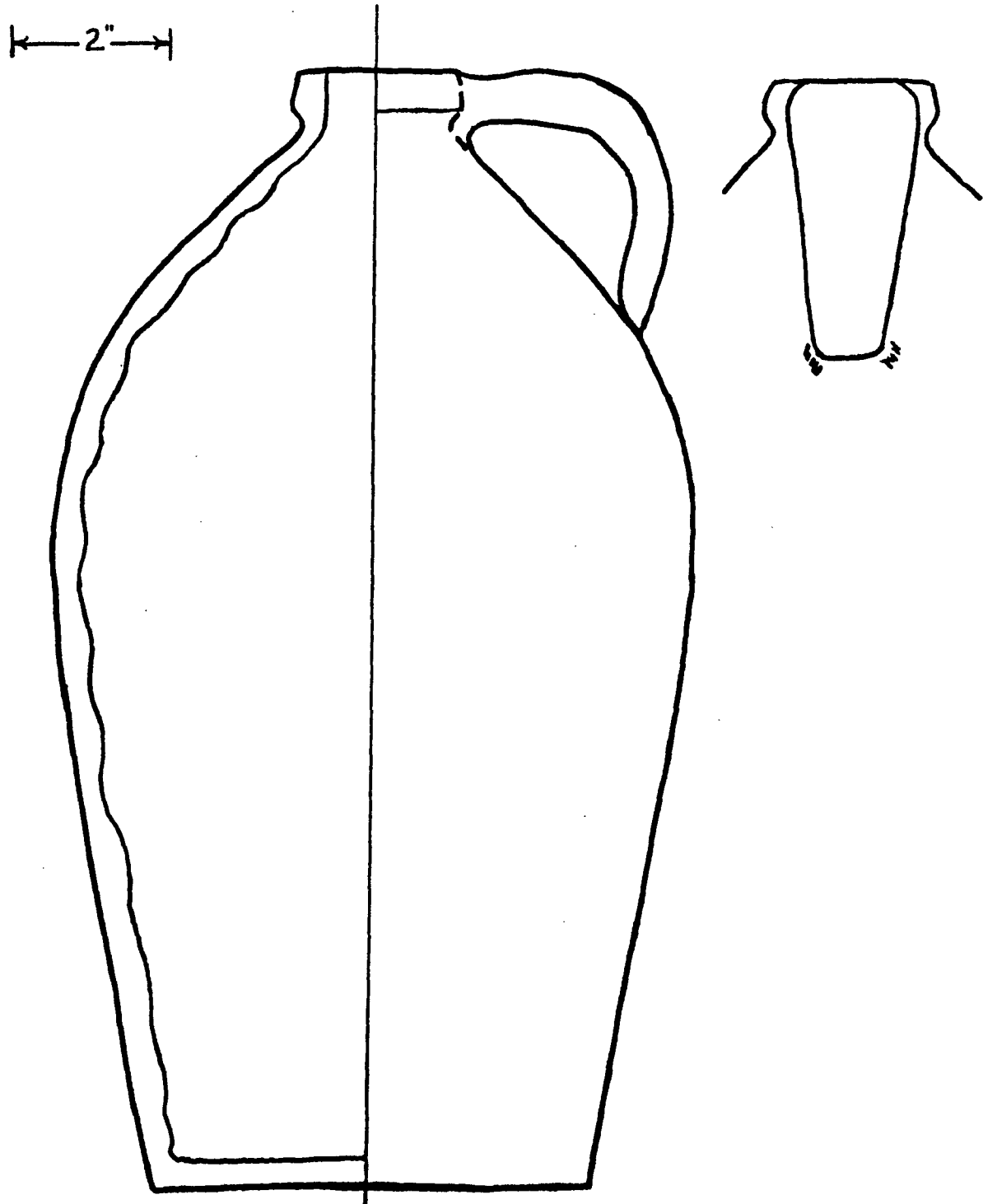


Figure 54. Jug Form Category

every case there is so much of the rim missing that there still could have been a handle. The figure below summarizes the data on jug rim categories.

---

Type 1	
subtype	number
a	5
b	3
c	<u>6</u>
Total:	14

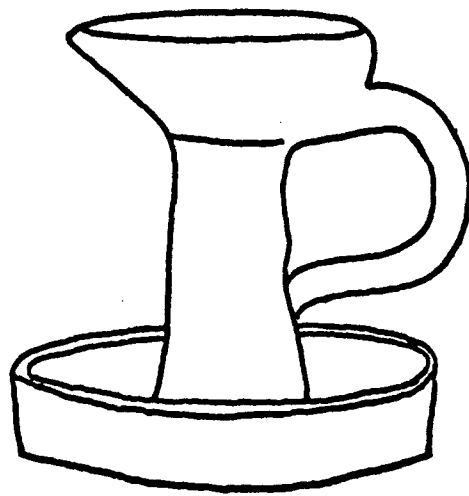
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Figure 55. Jug Rim Categories

Vessel category: fat or grease lamp      As indicated

previously, an early lighting device in the Coalport area was the fat or grease lamp (Fig. 56, Plate 13). Excavation at Coalport uncovered one almost complete fat lamp and some two dozen base and reservoir parts. The fat lamps made at the Coalport Kiln were small vessels standing about 5" high. They consisted of a base with a lip, a stem or stand, a bowl-like reservoir for the fat, and often handles for carrying the lamps. All of these were made on a potter's wheel except for the cylindrical handle.

The almost complete fat lamp has an open bowl-like reservoir with a beak for a wick (Watkins 1953). The reservoir is about 3" in diameter and 1" deep with smoothly curving sides. The reservoir rests on a tapered stem which has an average diameter of 1-3/8". The stem is attached to a circular flat base with a diameter of 5-1/2" and a thickness of 1/4". The base has a lip 3/8" high circling the edge of it. A coil of clay 3/8" thick forms a handle attached to the top part of the stem and the body of the stem. The piece looks as if it has been covered with a brown slip and then



← 2" →

Figure 56. Fat or Grease Lamp Form Category

salt glazed.

The other fat lamp parts correspond fairly well to the above example with minor variations in size. Most of them are incompletely salt glazed and a few have a brown slip glaze. One base shows evidence that it had a handle attached to it. Presumably handles were connected from stem to base as well as from the top of the stem to the middle of the stem.

Vessel category: milk skimming bowl Only two partial milk skimming bowls were found at the Coalport Kiln (Plate 11). However, this is one of the best represented vessel types from the Gidel Kiln. The one nearly complete milk skimming bowl from the Coalport Kiln is of one gallon capacity. These vessels--both from the Coalport Kiln and from the Gidel Kiln--appear to be wheel-made, but the outside and rim were probably made with some type of jig or forming device. This vessel category has been collected at several historic sites in central Iowa and in most cases it is mold-made rather than wheel-made.

Kiln furniture "Kiln furniture" is here used as a general term for the ceramic industrial waste products which were used to help "set" or stack unfired ware in kilns prior to firing. Few writers discussing the historic nineteenth century pottery industry have bothered to discuss this class of artifacts in any detail. Therefore, much terminological confusion exists in the literature. For instance, Leach (1940) and Rhodes (c1968) use the same general term--kiln furniture--that the author has used for these products. But Webster (1968) calls them "production pieces." Some writers (Watkins c1950, for example) do not use an all-inclusive term for these objects. In attempting to trace down the native categories, the author has

been unable to demonstrate that the workers in these early pottery industries had a consistent terminology for these objects, or even that they had an inclusive term for them. At Coalport there were at least nine different and distinguishable categories of kiln furniture. In naming these categories the author has tried to pick those terms which are most commonly used and accepted in the literature on the nineteenth century pottery industry.

Kiln setting      The setting of a nineteenth century stoneware kiln was a very delicate and important task. The procedure was to pack the unfired wares as tightly as possible in the firing chamber of the kiln. The various levels of stacked material had to be level so that the wares would not warp while being fired. Some space had to be maintained between the pots so that air could circulate around and between them and so that the salt fumes could reach all of the pots. Also, if wares were packed body to body, they would become fused together and ruined. At the same time, the kiln had to be tightly packed from wall to wall so that the pots could not fall or slump. The kiln setters used various types of shaped clay to help in loading and leveling the kiln. These included some materials that were made up and fired beforehand and some which were made while the kiln was being set.

Watkins (1950:9) makes clear the uses to which various sorts of kiln furniture were put. Not all of his description applies to the Coalport Kiln material but he does capture the essentials of kiln setting.

In stacking or 'setting' the kiln . . . the ware was placed directly upon the floor and then piled up closely, one piece upon another. Potters knew many ingenious tricks for burning the greatest possible num-



ber of vessels at one time. Large pots were placed upside down with smaller objects underneath them. Jugs or pitchers were set between the pots. Milk pans or plates were stood on edge, one inside the other, in rows the length of the kiln. Every available inch was occupied. Clay fashioned by hand into various shapes prevented contact between the pieces. Setting tiles, or flat slabs of clay, were perhaps the most common type of support. Laid on top of a tier of pots, they provided a resting place for the next row above . . . . Rings made of thin strips of clay were also used as supports.

Watkins is discussing the setting of an earthenware kiln, but many of the techniques for setting stoneware kilns are the same.

Kiln setting was such an important job that some areas had specialists who did nothing but set kilns. Mr. Carl Johnson was employed at the Fort Dodge Stoneware Company as a glazer and kiln setter for twelve years (Carl Johnson, personal communication). It is not known if such specialists were employed at the Coalport Kiln. However, in 1850 William Welch employed seven men at his pottery and in 1870 Smith and Bailey employed three men at their pottery (Iowa Official Census 1850, 1870). While neither of these kilns was necessarily the Coalport Kiln, this may indicate that specialists were employed by both Welch and Smith and Bailey.

Salt glazing kilns provide special difficulties for the kiln setter because the floors and walls of the kiln become uneven due to repeated deposits of glaze. The floor of the Coalport Kiln illustrates this quite well. In some areas a salt glaze deposit over 2" thick had adhered to the floor and the entire floor was very uneven.

Excavations at the Coalport Kiln yielded large amounts of kiln furniture. Most of the different categories of kiln furniture made at the kiln could only be used once. Each time the kiln was set with unfired wares, the kiln setters made new wedges, setting tiles, props, and other pieces

from raw clay. These were crudely made and then dipped in sand so that they would not stick to the wares which they supported. Some pieces were reused or accidentally refired, but by far the majority of pieces were used only once, as evidenced by the very light salt glaze found on them. At some later date these pieces of kiln furniture may prove to be very important in tracing the movement of potters and the ownership or personnel of various kilns because many of these kiln furniture pieces have clear fingerprint impressions.

In the following section, each type of kiln furniture found at Coalport is discussed and then an attempt is made to clarify how the various pieces were used in setting the Coalport Kiln.

Category A      Category A is a short squat lump of clay molded by hand at the time that the kiln was set. This is one of the largest categories of kiln furniture recovered at the Coalport excavations. Nearly one-third of the recovered kiln furniture pieces were from Category A. Webster (1968:34) calls these "base stilts for heavy vessels." Leach (1940:207) describes a similar form which he calls "props." Neither term is very good. Webster's term is inaccurate when applied to the Coalport material and Leach's term is not very descriptive. We will coin the term "leveling prop" to refer to Category A.

These pieces were apparently made by rolling out lumps of clay into cylinders 1" to 2" in diameter and then squashing the ends flat. They are flattened either on one or on both ends. Their main use was in attaining a level kiln floor and keeping the stacks of wares level. They were placed on the floor of the kiln under kiln shelves to level the kiln shelves, and

they were also used between the kiln shelves and the first row of wares and between layers of wares (Plates 18, 19).

Category B Category B is a cylinder of clay flattened slightly at each end and molded by hand and sand dipped at the time that the kiln was set. This is another very large category. Nearly one-third of the recovered kiln furniture pieces were from Category B. Many writers call this type a "wedge," but Webster modifies this and calls it a "cross-support wedge." Carl Johnson refers to this type as a "slug." The term "cross-support wedge" is indicative of function and for this reason will be used herein as the name for this category. Like the props above, these pieces were made by rolling out clay lumps into cylinders and then flattening them slightly at both ends. Cross-support wedges were made with either the right or the left hand at Coalport. Right or left handedness can be observed by placing a hand around one of the wedges, because few of them are distorted from their original shape.

Cross-support wedges were used between pots to keep the pots separate and rigid. They were also probably used between the outside row of pots and the kiln wall. The kiln setter probably placed prepared cross-support wedges in a plastic state between the pots and then squeezed them to lengthen them enough to touch both pots. They were probably used between pots and between layers of pots (Plate 18).

Category C Another large category of kiln furniture recovered at Coalport Kiln is the Category C kiln furniture pieces. These are rectangular pieces of clay that have been dipped in sand, in most cases. They are better made and more regularly shaped than are either of the previ-

ous two categories. Their size averages around 4-1/2" long x 1-1/2" wide x 5/8" high. Watkins (1950:181) calls these pieces setting tiles and Webster (1968:34) calls them "flat elongated base or rim tiles." I call them "rectangular setting tiles" since the ones made at Coalport are fairly regular in shape. These pieces were in a soft or plastic state when used in setting the kiln. Many of them show deep impressions of contact with rims.

The rectangular setting tiles were apparently made with more care than the previously described kiln furniture types. The straight edges and flat sides show that they were not merely molded by hand but were cut in some way. At the same time, there is too much individual variation for them to have been entirely machine-made. Leach (1940:209) describes a method for making "wads" and "slices" which may have been used by the Coalport potters in making these rectangular setting tiles. This involved first preparing a large lump of clay and flattening the sides and ends. Then, rectangular slices of clay were cut off with a piece of wire that was very similar to the type used to cut a pot loose from a potter's wheel (Fig. 57). This type of manufacturing method would allow the kiln setter to make his rectangular setting tiles while setting the kiln, and it would also account for the general similarity and yet individual variance of these items.

The rectangular setting tiles were used to place pots rim to rim and perhaps rim to base (Plates 18, 22, 26). They could only be used, then, when the orifice diameters of two vessels were very close to size. Yet, judging by the amount of rectangular setting tiles found at the site, this was a common method of stacking.

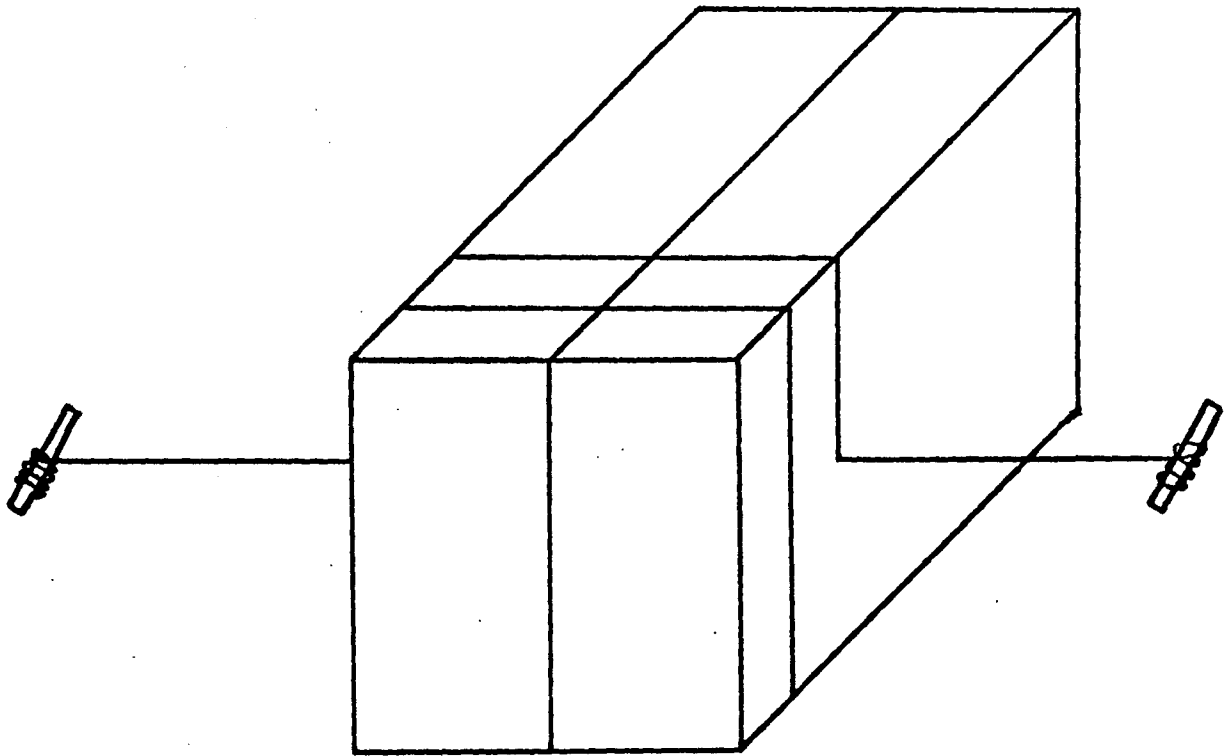


Figure 57. Kiln Furniture Cutter  
For cutting Category C (rectangular setting tiles) kiln furniture

Category D This category is similar in shape and, possibly, function to the rectangular setting tiles. The main difference is that Category D was formed by hand rather than by cutting and is very irregular. Very few of this category were found. They may have been used like the rectangular setting tiles or they may have had some other function in kiln setting. I shall call them "irregular flat elongated setting tiles."

Category E Category E is made up of annular pieces of kiln furniture. Very few of these were found at the Coalport Kiln. They were handmade, sand dipped, and were apparently used in setting pots on the lowest level of the kiln (Plate 20). They are typically about 6"-8" across and 1-1/4" high.

Category F Category F kiln furniture is the only type found at Coalport that was wheel-made and fired prior to use. In the literature, these are later broadly classified as kiln shelves (Leach, Rhodes, and others). These are circular slabs of fired clay about 1" high and about 15" in diameter. There is much variation in size. Some of these pieces have irregularly cut holes in the center and some also have a dished out area (Plate 19) in the center. Only about 30 fragments of this category were recovered and the majority of them came from one stratigraphic level (Zone 5) in the midden area directly west of the kiln (Plate 10).

Although Category F--circular wheel-made kiln shelves--is not adequately described in the literature, it is a common artifact type at the pottery kilns investigated by the ISU-NPS Crew in Red Rock and Saylorville Reservoirs. Carl Johnson remembered using kiln shelves to attain a level floor

in the Fort Dodge Stoneware Company kiln. He said that this was very important so that the succeeding layers of wares would line up properly (Carl Johnson: personal communication). However, most of the wheel-made kiln shelves found at other sites are much thicker and heavier than those found at the Coalport Kiln.

These wheel-made kiln shelves were leveled by placing squat leveling props between the shelves and the floor of the kiln. The entire kiln floor was probably covered with these. The hole found in the center of some of the kiln shelves may have been placed there so that the hot gases of the kiln fire would not be blocked. That is, these kiln shelves probably covered the vertical floor air flues and some method must have been employed to channel the air up through the kiln. The purpose of the 'dished out area in the center of some circular kiln shelves is unknown but it may have helped in circulating hot air and salt fumes. Many of the circular kiln shelves show evidence of repeated firings: they have heavy salt glazes and brown slip stains. Marks of the squat leveling props, and in some cases the actual props, are found on a number of the circular kiln shelves. Rectangular setting tiles are found adhering to the surfaces of some of these circular kiln shelves, indicating that in some cases the first level of pots was probably inverted in the kiln and placed on the kiln shelves with the rectangular setting tiles separating them (Plate 19).

Oddly, one of these pieces has bands of combed decoration on the side with the depression. The potter may have merely been experimenting with combing.

Category G      These are irregular disc-shaped pieces of

kiln furniture with a vague similarity to the circular kiln shelves. They are about 8" in diameter, 3/4" thick, and completely handmade. Some appear to have been dipped in sand. Some show evidence of more than one firing-- a thick salt glaze coating--and some have the same squat leveling prop marks that were noticed on the circular kiln shelves. It seems possible that the potters used these as makeshift kiln shelves when, for some reason, the circular kiln shelves could not be used. The small size of these irregular kiln shelves in relation to the circular kiln shelves suggests that they may have been used as filler pieces on the floor. They would not make very adequate kiln shelves because the whole idea in using kiln shelves on the floor is that they provide a hard, level, flat surface for stacking pots. Yet, these irregular pieces were obviously made just prior to firing. Perhaps they had some other function: they might have been caps or crude lids for saggars (Kiln Furniture Category J, Plate 20) or they might have been placed between pot bases that were inverted.

Category H Very small wads of clay were used to separate pots when one pot was placed inside another for firing. These small clay wads are about 1" in diameter and 1/4" thick, and they were completely handmade and sanded. Since few of these were recovered, this was evidently not a common way of stacking wares in the kiln. However, it was a common method of stacking small jars and perhaps jugs. The bases of some of these vessels still have small clay wads adhering to them, and the interior surfaces of larger vessels occasionally have small clay wads adhering to them as well (Plates 20, 23).

Category I This category is called "small irregular



cylindrical kiln furniture." These pieces are about 1/2" in diameter and 2" to 3" long. They are often flattened on the side and they are hand molded and sanded. I have been unable to establish how they were used in kiln setting, but they may have had uses similar to the two types of setting tiles described earlier (rectangular setting tiles and irregular flat elongated setting tiles, Plate 18 ).

Category J According to Rhodes (c1968:157), a sagger is

. . . a protective box made of clay, which holds the ware in the kiln. Its purpose is to support the pottery, making it possible to fill the kiln to any height, and to protect the ware from direct contact with the flame and hot gases from the fire.

Saggers were made in a great variety of shapes and this type of kiln furniture is very well established in the literature (Rhodes c1968:157-160; Searle c1929; Watkins c1950 and others).

The potters at the Coalport Kiln used one of the simplest forms of saggers. The bottoms were cut out of pots and these bottomless pots then became saggers. Only a few of these were found, three partially complete ones and perhaps a half dozen more fragments. The Coalport potters had little need of saggers because of their practice of stacking pots within pots. The saggers that they made were probably used either to protect very delicate items such as fat or grease lamps or to seal pots off from the salt glazing fumes so that other glaze effects could be achieved (Plate 21).

Category K This category is made of cylindrical to flat pieces that have been bent in the middle to an angle past a right angle. They are flattened on the edges where stress has given the pieces their widest dimension. These bent clay pieces were made during kiln setting and

some of them may have been dipped in sand. They are generally small--1/2" thick x 1-1/2" wide x 3" long--and they are handmade.

The author has not been able to establish what function these pieces had in kiln setting, but Watkins (1950:9) describes some "cockspurs" or "stilts" in a way that suggests a parallel. In discussing the use of cockspurs or stilts in early redware potteries in New England, Watkins says

Bowls were set one inside the other with three-pointed cockspurs or stilts of clay to separate them. Such tripods of burned clay are to be found in all early pottery dumps. They were hastily squeezed into shape by hand and often bear the potter's finger prints. In some later potteries, strips of clay molded in triangular form were cut to the required lengths and put together to make cockspurs--a slight advance over the hand method.

These appear to be quite similar to the Coalport materials (Plate 20).

Miscellaneous In addition to the types of kiln furniture listed above, the Coalport Kiln setters may also have occasionally used broken sherds of pottery as kiln furniture. Several potsherds were found embedded in the glaze on the floor of the kiln and one sherd was found with a squat leveling prop attached to its side (Plate 21). It is hard to imagine how these sherds could have become embedded in the floor unless by intent or by some accident in the kiln. The kiln was, we believe, covered almost completely with kiln shelves before the ware was set in the kiln, so it would have been unlikely that even broken pots could fall to the kiln floor. Similarly, it is difficult to see how a squat leveling prop could become attached to the side of a vessel. All of this suggests to the author that the kiln setters occasionally used broken pieces of already fired pottery to help level the kiln floor for the layer of kiln shelves.

Non-ceramic kiln associated artifacts: kick wheel shaft In

addition to the ceramic artifacts discussed above, one metal artifact is of particular interest because of its importance in the making of pottery. This is an iron "kick wheel" shaft recovered from Square B, Zone 5 (Fig. 58, Plate 24). It was probably a part of a potter's wheel and was quite obviously discarded deliberately, although it is not known if this was done before or after the kiln ceased operating. It is odd that it was found in such close proximity to the kiln because the potter's wheel would undoubtedly have been located in the potter's shed (Plate 10).

Both Watkins (c1950:5) and Leach (1940:68) describe potter's wheels of the type that was probably used at Coalport. Watkins says that

The old 'kick' wheel was operated by foot power. It was constructed with a heavy flywheel on the lower part, which was connected by a vertical shaft to a disc of heavy wood . . . or iron above. The lower wheel, in the most primitive apparatus, was turned by direct pressure from the potter's foot, or, in another type, by means of a treadle connected to the shaft. (Watkins c1950:5).

Judging by the shape of the Coalport kick wheel shaft, this Coalport wheel was of the treadle type. Leach describes this treadle type more fully:

The primitive kick wheel is turned by the direct action of the bare feet on the fly-wheel, but the more evolved type has a crank in the iron shaft with a kickbar attachment. (Leach 1940:68)

Leach (1940:70) has a picture of this latter type of wheel (Fig. 59).

The Coalport kick wheel shaft is apparently of this type. The shaft is 31-1/2" long and is square in cross section except for the portion which is offset, where it is round. This offset portion is the only part of the shaft that would need to be round for it is the area that attaches the shaft to the "treadle" or "kickbar attachment." One end of the Coalport shaft

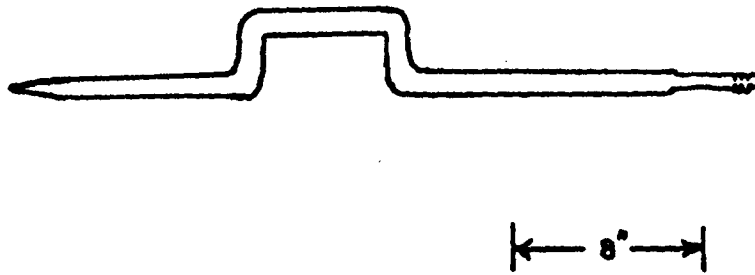


Figure 58. 13MA103: Metal Kick Wheel Shaft

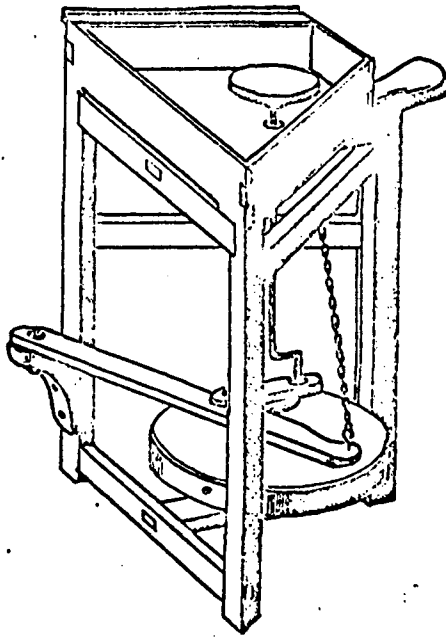


Figure 59. St. Ives Kick Wheel  
(from Leach 1940:70)

is threaded, presumably for attachment to the circular wheel disc on which the pots were thrown. The other end is pointed, but due to rust it is not possible to establish whether it was made this way or deformed by use. Leach's drawing (Fig. 59) shows a lower wheel which helped the upper wheel maintain momentum. The Coalport wheel might have lacked this lower wheel, in which case the pointed end of the kick wheel shaft would merely revolve in some orifice. Also, heavy wear could have ruined threads at this end of the shaft. This might explain why the shaft was discarded--although it is an unlikely reason, since any competent blacksmith could have repaired the shaft.

Other artifacts (bricks, mortar) associated directly with the kiln have been discussed in detail in the section on kiln structure and will not be discussed here.

Non-kiln associated artifacts      A number of artifacts were found at this site which were indicative of the general historic settlement of the area. Because of time limitations these will not be analyzed in this report. Instead, a list of these artifacts is provided, and their technical identification is planned for some later time (Plate 24).

#### Earthenware or Stoneware

- 7 potsherds - 1/4" thick - brilliant glassy glaze - mottled dark brown exterior surface and yellow-brown interior
- 2 potsherds - possibly part of a pitcher or vase - mold-made - glassy glaze. Yellow to green mottled color

## China

2 sherds of blue feather edge design - both apparently plates

5 sherds - blue transfer design on white. One has intricate floral detail and is a portion of a plate. Another has a scroll design. The three remaining pieces lack the sharp detail of the first two but they also depict floral designs.

3 sherds with painted blue designs

6 sherds with occasional flowers done in blue, black, green, and red colors. Another sherd has green, red, and blue parallel lines.

2 sherds with transfer designs in fine black and red floral patterns

1 plain white colored sherd with simple relief design

17 plain china rimsherds

39 plain china bodysherds

## Glass

1 bottle neck - clear

1 ten sided base - probably a small drinking glass - possibly a shot glass

1 glass sherd with unrecognizable relief designs - obviously pressed or molded glass

3 milky white glass sherds

2 brown colored glass fragments

fragments of clear flat glass

1 fragment of a china doll leg

Plastic(?)

portion of a plastic or tortoise shell or horn comb -  
dark brown in color

Shell(?)

1 four-holed shell or bone button

Stone

1 round stone marble - 3/4" diameter

4 flint spalls - possibly indicative of earlier Indian  
occupation

Metal artifacts

1/2 sledge hammer head - iron - machine-made

1 small donkey shoe - iron - looks hand crafted by  
blacksmith

1 cookstove lid - iron - depression for lid lifter

1 heavy iron handle - possibly to a skillet

1 iron fencepost part with flange to hold it in the  
earth

1 concave iron object 3/16" thick - possibly a pot or  
pan lid

1 iron hinge with point for embedding it in wood -  
wood fragments still adhering

1 iron hinge with screw holes

1 iron eating utensil handle with split bone handle and  
copper rivets

1 jar lid - possibly lead or lead alloy - similar to



jar lid with white glass insert found at 13MA106

2 metal buttons - both with ring for attaching to cloth -  
one has stamped floral design and the other has writing on it - looks like "Towers Wire Fastener"

14 square iron nails

1 steel bolt

miscellaneous unidentifiable metal objects and metal fragments

Non-artifactual evidence In this category would normally be included such things as coal, clay, shale deposits, etc. These have been discussed in sufficient detail in previous sections so they will not concern us further. However, mention should be made of a large log or timber found in the sand and shale deposits directly north of the kiln. The position of the log when found suggests that it could have been some kind of external support for the kiln. It was about 6'-8' long x 1' wide x 1' thick, and it was found almost projecting into the kiln.

#### Investigation and Excavation at 13MA106

Investigation at 13MA106 was designed to obtain a controlled type collection of artifacts from the early historic settlement in the area and to locate the town of Coalport and any structures or evidence which remained of this town. Methods of investigation included controlled surface collecting, small shovel testing of some areas, and bulldozer stripping of a suspected kiln site. The investigation was aided by the U. S. Army Corps of Engineers stripping the entire valley floor. (All vegetation and structures were removed from the permanent flood pool area so that this material would

not in any way interfere with the recreational uses of Lake Red Rock.)

During the investigation of 13MA106, the ISU-NPS Crew was able to delimit three separate areas: 13MA106A, 13MA106B, and 13MA106C (Fig. 11). 13MA106A is located in the NW $\frac{1}{4}$  of the SW $\frac{1}{4}$  of Sec. 14, T76N, R19W. 13MA106B (the area thought to be the location of the town of Coalport) is located predominately in the NE $\frac{1}{4}$  of the SW $\frac{1}{4}$  of Sec. 14, T76N, R19W. A portion of this area is also located in the NW $\frac{1}{4}$  of the same quarter section. 13MA106C is located within the area designated 13MA106A.

### 13MA106A

Investigation at 13MA106A (The Coalport Bottoms) consisted of repeated surface collecting and small shovel testing.

#### Archaeological remains at 13MA106A

Structural remains      The cement foundations of four structures were still standing when this site was first visited by the ISU-NPS Crew. These were the remains of what appeared to be a post-nineteenth century settlement of the area. Local inhabitants verified that these structures were built after the town of Coalport had ceased to be a functioning town (William Monster, personal communication 1966). These remains consisted of the foundations of three houses and one barn. Other evidence of this post-1900 farming settlement was also present. Several barbed wire fences and the remains of a partially overgrown road were still evident. No structures of the pre-1900 settlement of the Coalport Bottoms area were still standing.

Portable artifacts      13MA106A yielded evidence of both the historic and prehistoric settlement of the Des Moines River Valley. Some evidence indicated that this area had been inhabited by prehistoric Indians

at some time prior to the first pioneer settlement of Coalport. Nine grit tempered and cord marked potsherds were found during surfacing and shovel testing which are attributable to what Gradwohl has called a "Middle Woodland Tradition" of prehistoric Indian cultures that inhabited this area one to two thousand years ago (Gradwohl 1969; Plate 28). A few small waste spalls of flint were also found at the site.

Ceramics A number of stoneware sherds were found at 13MA106A (Plates 25 to 27). These are of particular importance in this study because they are of the same general types of ceramics that were apparently made at the Coalport and Gidel Kilns. These sherds are salt glazed and either brown slip glazed with a glaze similar to the Coalport brown slip glaze or covered with a lustrous brown slip glaze or lead brown slip glaze similar to that found on the Gidel Kiln ceramics. The figure below summarizes information on rim categories found in this area.

---

Type 3 Plain	Type 4 Folded	Type 5 Reserve
subtype number	subtype number	subtype number
b 4	c 1	a 1
	v 15	j 1
		k 1
		p 1
		r 1
<hr/>	<hr/>	<hr/>
Total: 4	Total: 16	Total: 5

---

Figure 60. Rim Categories at 13MA106A

A more complete discussion of the significance of this distribution will be included in the section on the Gidel Kiln stoneware ceramics. Dis-

cussion of the function vessel types found at this area is hindered by the fact that no complete or even partially complete vessels were recovered from the site. Thus, it is only possible to say that two functional vessel forms--jugs and milk skimming bowls--were found at the site. One of the jug fragments, a handle, has the name T. H. Smith stamped on the top of it.

In addition to the vessel parts and rims found at 13MA106A, one portion of a sagger made from a vessel was found. Also, some common red brick fragments were collected.

### 13MA106B

13MA106B is the suspected area of the town of Coalport. It is located along the old abandoned oxbow that played such an important role in Coalport's early history. Archaeological investigation in this area consisted of repeated surface collecting.

#### Archaeological remains at 13MA106B

Structural remains No buildings were standing in this area when the ISU-NPS Crew located the site. Two depressions in the bank of the oxbow may have been the remains of steamboat or ferry landings. An earthen levee was located along the western edge of the oxbow and this may have been present when Coalport was a functioning town, although it is more likely that this levee was built by farmers to protect their crops long after Coalport disappeared. The author has observed that this is still a common practice of farmers in this area. The only other structural evidence noted by the author at this site was an old abandoned roadbed which apparently joined Coalport and Coalridge at some time in the past. This roadbed starts high on the bluffs to the south of Coalport and leads out onto the

flat valley land where 13MA106B is located. Unfortunately, the author was not able to correlate the only existing plat of the town of Coalport with the few structures that still exist in the town. Thus, the exact location of the streets and buildings of the town is not known and probably never will be known since this area has now been permanently flooded by Lake Red Rock. The approximate location of the town is indicated on Figure 11.

Portable artifacts 13MA106B yielded large quantities of material indicative of the historic settlement of the Coalport area. Only one artifact of possibly earlier origin was found. This is the longitudinal half of a partially drilled catlinite pipe (Plate 28). No other archaeological sites from either the historic or prehistoric periods in Red Rock Reservoir have yielded catlinite (Gradwohl 1969). Thus, this pipe could be from either the historic or prehistoric period. The historic material consisted of broken stoneware, china, glass, wood, and a variety of metal artifacts (Plates 25-28).

Ceramics Stoneware sherds of the same type that were found at the Coalport and Gidel Kilns make up the largest single category of artifacts found at 13MA106B. These sherds are glazed with the glaze types found at both of the kilns. The figure following summarizes information on rim categories found in this area.

Type 2		Type 3		Type 4		Type 5	
subtype	number	subtype	number	subtype	number	subtype	number
a	1	b	3	a	3	a	6
k	2			b	3	b	5
m	1			d	4	c	1
				g	2	e	1
				i	3	j	3
				m	2	k	4
				v	26	n	2
						p	1
						q	1
<hr/>		<hr/>		<hr/>		<hr/>	
Total:	4	Total:	3	Total:	43	Total:	24

Figure 61. Rim Categories at 13MA106B

### 13MA106C

Evidence for the Gidel Kiln was obtained on nearly the last day possible for work in the Red Rock Reservoir area. The site was investigated late in the fall of 1968 and the reservoir was flooded in the spring of 1969. The methods of investigation used here were necessarily rather crude. These methods consisted of collecting artifacts from the surface of the earthen mound where the kiln was suspected to have stood, and the stripping and trenching of the west and south edges of this mound by bulldozers. Although excavation was hurried, a large and useful collection of ceramics was obtained from the site as well as some portions of the brick kiln structure (displaced) and kiln furniture.

### Archaeological remains at 13MA106C

Structural remains No structural evidence was found in situ at the site. However, large amounts of glazed and unglazed firebrick and

large amounts of common red brick were observed both on the surface of the small mound and in the trenches dug by the bulldozer. One complete heavily glazed buttress of the same general type that was used inside the flues at the Coalport Kiln was found in the southern trench.

### Portable artifacts

Pottery A large number of ceramic stoneware sherds was collected at the site. Over 130 rimsherds were collected and these were submitted to the same type of study as was conducted on the Coalport Kiln rimsherds and on the previously described 13MA106 rimsherds.

Many of the characteristics of the Gidel Kiln ceramics are quite similar to the Coalport Kiln ceramics. Cross sections of pottery from the two sites are nearly identical under a hand lens and it is likely that both kilns used the same or a very similar clay source. Decorative techniques used on wares from the two sites are nearly identical and they consist of simple incised and comb incised lines in horizontal bands around the exterior of pots (Plate 26). The Gidel Kiln ceramics, like the Coalport Kiln ceramics, are primarily utilitarian wares with little or no decoration and minimal smoothing and trimming. The Gidel pots also seem to be of the same general size and thickness as the Coalport pots. Salt glazing was apparently the main glazing method used at the Gidel Kiln.

The two main differences in the pottery of these two sites are the internal glaze used and the functional vessel forms produced. Both kilns produced very similar types of salt glaze and brown slip glaze, but the Gidel Kiln potters may have used an additional type of glaze. This glaze is much brighter than any of the glazes found at Coalport and it is typically

a brown glaze with a very high luster and sometimes a slightly greenish cast. It has a color range from black to brown to orange and it has a glassy texture and appearance. The writer is not aware of any Albany slip or brown slip glaze which attains this very high luster and glassy texture. Rhodes (1959) and Ramsay (1939) both mention that some lead glazes or slip glazes with lead additives can attain this high luster. This, it is possible that this Gidel Kiln glaze was either a locally made lead brown slip glaze or an imported lead glaze. In any case, this glaze is sufficiently different from the previously described glazes so that it deserves a different label and in the remainder of this report it will be referred to as the Gidel Kiln luster glaze. One other glaze difference between the ceramics of the two sites can be noted at this time. A proportionately higher number of Gidel Kiln wares were brown slip glazed on the exterior surfaces of vessels than at the Coalport Kiln. This may be the result of differences in the method of setting the two kilns. At Coalport, few wares were regular enough in size to allow for the stacking of vessels one inside of another. At the Gidel Kiln, more regular sizes of wares were produced and so the kiln setters could more easily have stacked vessels inside of one another. If this were the case, less of the vessel surfaces would be exposed to salt fumes and there would be more need for brown slip glazes to cover these portions of the pots.

The second major difference to be noted between the two kilns is in the types of wares that were produced at the two sites. One ware form (livestock feeder or watering pan) was found in large quantities at the Gidel Kiln: no examples of this form were recovered from the Coalport Kiln. Another ware type (milk skimming bowl) was the largest category of vessels



found at the Gidel Kiln. Only two rims of this type were found at the Coalport Kiln. Both of these ware categories may have been introduced to the Coalport area at a fairly late date. It is not known when livestock were introduced in large quantities to the Coalport area but Harding (1942) has noted that this usually occurred late on the Iowa frontier. Donnel (1872) notes that the earliest settlers in Marion County could not keep livestock because of the large numbers of predatory animals which infested the area, particularly wolves. Thus it seems likely that the livestock feeder and watering pans would not be an early type of pottery in the area. On the basis of survey of other pottery kilns in central Iowa conducted by the ISU-NPS Crew, the author feels that milk skimming bowls of the type found in quantity at the Gidel Kiln were characteristic of a later development of the pottery industry in Iowa than that represented at the Coalport Kiln. These vessels may have marked the transition to a new method of making pottery--molding of pots in previously prepared molds. It was not possible for the author to determine if the milk skimming bowls from the Gidel Kiln were mold-made rather than wheel-made but their regularity in size and shape would suggest this (Plates 25 and 26).

One of the clearest ways to show the similarities and the differences between the Gidel Kiln and Coalport Kiln ceramics is to compare the rim types from the two sites. The following rim categories were identified from the Gidel Kiln ceramics.

Type 1 Jugs		Type 2 Covered Containers		Type 4 Folded Rims		Type 5 Reserve Rims		Type 6 Watering pan or Livestock feeder	
subtype	number	subtype	number	subtype	number	subtype	number	subtype	number
<u>d</u>	<u>2</u>	<u>h</u>	<u>2</u>	b	4	a	3	a	1
Total:	2	Total:	2	c	4	b	4	b	6
				d	4	j	5	c	3
				e	1	k	8	d	3
				h	1	n	3	e	1
				i	4				
				v	41				
				w	4				
				<u>x</u>	<u>1</u>				
Total:	64	Total:	23	Total:	14				

Figure 62. Rim Categories at 13MA106C

While many rim types were found at both the Coalport Kiln and the Gidel Kiln, some rim types were found at only one of the sites. It was to be expected that not all of the rim types found at the Coalport Kiln would be found at the Gidel Kiln because the sample of artifacts from the Gidel Kiln was much smaller than the sample from the Coalport Kiln. Only about one-tenth as many rimsherds were recovered from the Gidel Kiln as from the Coalport Kiln. However, we would not expect the sample of rimsherds from the Gidel Kiln to yield significantly different rim types unless the two kilns were making somewhat different types of rims. This appears to be the case. The figure below lists the rim categories found at the Gidel Kiln

that were either not found in the Coalport Kiln rims or were not present in large numbers.

---

Type 1	Jugs	Type 2	Covered Containers		
subtype	d	subtype	h		
Type 4	Folded Rims	Type 5	Reserve Rims	Type 6	Watering pan or Livestock feeder
subtype	w x	subtype	j k	subtype	a b c d e

---

Figure 63. Rim Categories Present at 13MA106C but Rare or Non-existent at 13MA103

Thus, out of a total of five rim types and 21 subtypes identified at the Gidel Kiln, one type with five subtypes and six other subtypes were rim categories that were unknown or poorly represented at the Coalport Kiln. This provides strong evidence that the potters who worked at the Gidel Kiln were making different types of rims and perhaps some different types of pottery vessels than those who worked at the Coalport Kiln. It is not possible to tell at this time if this indicates a change in personnel at the two kilns or whether it merely indicates changes in the techniques of making pots.

Small lids (2"-3" diameters) sometimes with knobs for handles on top were found at the Gidel Kiln and they were of the same type found at the Coalport Kiln (Plate 26).

#### Kiln furniture

In addition to the differences noted above,

some differences can be observed in the types of kiln furniture that were found at the two kiln sites. Unfortunately, the sample of kiln furniture from the Gidel Kiln was small. This probably accounts for the fact that only five of the kiln furniture categories found at the Coalport Kiln were positively identified at the Gidel Kiln (Categories A, B, C, F, and J). Of these types, Category F was made somewhat differently at the two kilns. Category F kiln furniture pieces are the wheel-made kiln shelves. The kiln shelves from the Gidel Kiln are larger and thicker than those found at the Coalport Kiln (Plates 19, 27). While both of these types of kiln shelves appear to be wheel-made, the Gidel Kiln shelves are close in size and thickness to later, commercially manufactured types of kiln shelves such as those used at the Fort Dodge Stoneware Company around the turn of the century. Again, this suggests a later date for the Gidel Kiln than for the Coalport Kiln. In other respects, the kiln furniture from the two sites seems quite similar.

Draw trial pieces      Draw trial pieces of the same sort that were found at the Coalport Kiln were also found at the Gidel Kiln. These were testing pieces made from broken pots which had been dried before being put into the kiln, and they were presumably used to test the success of the glazing within the kiln (Plate 26).

Non-stoneware artifacts at 13MA106      Numerous non-stoneware artifacts were recovered from 13MA106. Some of these are pictured in Plates 27 and 28.

FOURTH SECTION: RECONSTRUCTION OF SOCIO-CULTURAL ACTIVITIES  
AT THE COALPORT KILN

Historic records, archaeological data, ecological and geological information all provide clues that help in reconstructing the socio-cultural activities that took place in and around the Coalport Kiln. But even taken together these do not at this time tell the complete story of this early pioneer pottery industry. In this section, all of these various types of information about the Coalport Kiln will be summarized and brought together so that it will become clear how this particular pottery operation was established, how it functioned in pioneer life, and why it was eventually abandoned. The Gidel Kiln is also important in this reconstruction, for from its remains we may be able to make some statements about changes that occurred in the pottery industry through time.

In looking at the background of the pottery industry in Iowa it is obvious that there was a certain minimum of environmental factors that had to be present in an area before this industry could be established. The main ingredients necessary from the environment were coal, clay, timber, and water. The area of Marion County where the Coalport Kiln and the Gidel Kiln were located was rich in all of these resources. Coal and clay were provided from the rich Pennsylvanian Coal Measures and timber and water from the Des Moines River Valley and from the Des Moines River.

The rapidity with which small local potteries were established in Iowa after the initial pioneer settlement indicates that there was a real need for durable containers on the Iowa frontier. Rhodes (1959) claims that this is because of the basically agrarian nature of pioneer life. That is, the first settlers in Iowa were predominately agriculturists and therefore they needed durable containers. The local potteries proved to be initially

cheaper and better able to fill this need than did trade goods from the east. These early Iowa homesteaders were almost uniformly poor (Harding 1942; Union Historical Company 1881). They could not afford to import expensive containers from the eastern states. Also, transportation routes were either missing or inadequate in many areas so that the problem of shipping goods was acute. Given this situation, pottery kilns were a natural and necessary part of pioneer existence. The pioneers had many uses for these stoneware vessels. Jugs were used for storing liquids (alcoholic and otherwise). Crocks were used to store grain, vegetables, liquids, and even meat (Carl Johnson, personal interview 1969). Lidded jars were used to preserve jellies, jams, pickles, etc. Small grease lamps were used in pioneer homes for light when better lighting was not available (Ramsay 1939; McCown 1909). Butter was often made in ceramic churns which were easier to clean than metal or wooden churns (Rhodes 1959:33).

The Coalport Kiln provided local stoneware pottery of a very durable type for the farmers and settlers of Coalport and the surrounding farming area. Nearly all of the materials recovered at the Coalport Kiln suggest that the wares that were made there were rugged utilitarian items designed for storage, cooking, and general kitchen uses. The Coalport Kiln pottery did not fill all of the needs of the Coalport citizens for containers, however. Metal, glass, china, and other types of stoneware vessels were found at the Coalport Kiln site, indicating that the Coalport settlers either traded for eastern materials or brought these with them when they came to Coalport.

There is little question that the orientation of the original settlers of the Coalport area was farming. The only other major industry in the area

was coal mining. The Iowa Official Census for 1857 (Vol. 57:702-741) lists the following occupations for Polk Township for that year: 74 farmers; 1 tailoress; 2 carders; 2 cabinet makers; 2 school teachers; 4 millers; 7 carpenters; 1 brick maker; 3 potters; 1 sash maker; 6 laborers; and 1 stone mason.

The historic records indicate that there was some sort of pottery industry in the Coalport area from about 1849 or 1850 up until at least 1885. In 1850 William Welch probably had a small pottery operation located on the site of the Coalport Kiln. In this pottery kiln, he employed seven laborers and made crocks, jars, and jugs (Iowa Official Census 1850, up. orig.). In 1885, Thomas H. Smith owned a "pottery business" in approximately the location of the Gidel Kiln (Iowa Official Census 1885, up. orig.). It is interesting that the pottery industry was of longer duration in this area than was the town of Coalport.

The Coalport Kiln was apparently owned and operated by Welch for only a few years. He then sold the pottery to A. E. Dudok Bousquet who probably was not a potter. There is no evidence that Bousquet ever operated the Coalport Kiln himself, although he may have leased the kiln to other potters. This is probably how Thomas H. Smith became associated with the kiln. There is strong evidence that Thomas H. Smith was the main potter in the Coalport area during the time that Coalport was a functioning town. He probably operated the Coalport Kiln from sometime in the 1850's up until 1869. At this time the Coalport Kiln was apparently abandoned and the Gidel Kiln was started by Thomas H. Smith and William S. Bailey. As mentioned earlier, the Gidel Kiln was probably in operation up until at least 1885. This means that the Coalport Kiln was in operation for about twenty years and

the Gidel Kiln for about fifteen or more years. Of course, there may have been long periods when neither kiln was in operation since we do not know that the kilns were continuously operated during all of this time. William Welch, Durk Beintema, Thomas H. Smith, Thomas C. Smith, William S. Bailey, and Joseph Neely are some of the names of potters or part-time potters who probably worked at the Coalport and Gidel Kilns. In addition to these, there were probably many other laborers and potters who worked at the kilns. Welch's 1856 pottery employed seven laborers and Thomas H. Smith and William S. Bailey's 1870 kiln employed three workers (Iowa Official Census 1856, up. orig.; 1870, up. orig.).

The later date that we have suggested for the Gidel Kiln as opposed to the Coalport Kiln fits fairly well with the archaeological evidence. Vessel forms that are interpreted as being of more recent types were found at the Gidel Kiln and not at the Coalport Kiln, or at least not in any appreciable quantity. Also, evidence of the methods used to manufacture the Gidel Kiln ceramics--such as possible use of molds for making vessels--indicates that the Gidel Kiln is the more recent of the two kilns. The kiln furniture from the Gidel Kiln may also have been of more recent type. It appears to be more regularly made than that from the Coalport Kiln.

One problem that arises in trying to put these two kilns into temporal sequence is the fact that the Coalport Kiln was still standing when discovered by archaeologists while the Gidel Kiln was completely destroyed. We would expect just the opposite if the Gidel Kiln were the more recent kiln since we would expect that the potters who set up the second kiln would utilize what materials they could from the first or earlier kiln. That they did not could be explained in several ways. Salt glazing kilns are



very destructive of their constructional materials and it is possible that the owners of the Gidel Kiln did not think that there was much worthwhile material in the Coalport Kiln. Also, it is possible that the owners of the Gidel Kiln did use some, but not all, of the materials from the Coalport Kiln. Or, the two kilns may have overlapped temporally. In any case, the author judges that the Coalport Kiln was probably the earlier of the two kilns although he is willing to entertain the possibility that the Gidel Kiln was contemporary or even earlier.

#### The Nature of the Activities at the Coalport Kiln

##### Kiln construction materials

Probably the only material used in the construction and operation of the Coalport Kiln that was not available locally was the fire brick that made up a substantial portion of the kiln structure. This would undoubtedly have been commercially made at some other location and brought to the Coalport Kiln--probably by boat on the Des Moines River, since this provided the most reliable transportation route at the time that the kiln was being established. The author has not been able to locate the source of this firebrick.

##### Preparation of clay for potting

Any industrial pottery operation involves a certain minimum number of operations. The clay must be obtained from some source, pugged, and wet to a consistency proper for the method used to form the pots. In some potter-ies all of the clay is wet and then mixed thoroughly to ensure that it has the same consistency throughout. The mixed clay is then carefully screened through fine mesh to remove foreign particles. The Coalport potters evi-

dently used a very minimal type of clay preparation. They probably mixed the clay in a very simple pug mill and then did not screen the clay at all. The clay cross sections from the Coalport wares show many large impurities indicating that not much was done to prepare the clay for throwing.

Many potters temper their clay after it has been cleaned. To do this they add uniformly sized particles of some foreign material such as crushed granite to the wet clay and mix it thoroughly. The tempering particles are larger than the clay granules. Tempering aids in the firing process by providing places for moisture to be released from the heating clay. Tempering also helps to strengthen the finished pot. The author could find no evidence that the Coalport potters tempered their clay. Although there are many foreign particles in the clay, these are irregularly sized and appear to be natural to the clay.

#### Throwing the wares

After the clay is prepared, it is split into lumps convenient for throwing on a potter's wheel and then it is pounded and kneaded to remove air bubbles. The throwing can be done in one or more operations. Most well finished pots are produced by first throwing the pot into fairly finished form, allowing it to dry off the wheel, and then returning the pot to the wheel in an almost dry state for further trimming and finishing. The Coalport potters threw their pots in one operation--they did not do any trimming or decorating that could not be done during the original throwing of the pot.

### Drying the unfired wares

When the pots are removed from the wheel, they must be stored in some relatively dry area until they are leathery hard. In some pottery operations, special steam heated drying rooms are used for this process (Carl Johnson, personal communication 1969). The Coalport potters probably had nothing this elaborate. Their pots were probably stacked on boards inside a wooden shed. When William Welch tried to set up a new pottery in Van Buren County after a previous one had burned down, he mentioned that one of his expenses was for lumber to serve as drying racks for his pots (Welch 1876).

### Glazing the wares

Stoneware pottery that was intended to be used for liquid containers had to be glazed in some manner. As mentioned before, the Coalport Kiln was a salt glazing kiln, thus part of the glazing operation was done while the pots were being fired. However, the brown slip glaze that is commonly found on the interiors of pots had to be applied before firing and probably while the pots were in a leathery hard state. There are several possible methods that could have been used to apply the slip glaze since the slip was undoubtedly in a liquid state (drip marks on the sides and tops of vessels prove this). The liquid slip could be brushed on the pots or poured or sprayed into the interiors of the pots and then poured out to remove the excess and leave a thin layer. Also, pots could have been dipped into a liquid solution of glaze kept in a large container. It is not possible to tell how the Coalport potters applied their slip glaze, but it was probably by one of the methods described above.

### Stacking wares in the kiln

Pots are ready for firing when they are leathery hard, but first they must be stacked carefully in the kiln. In modern pottery kilns, a number of different types of commercially made kiln furniture are available for stacking vessels in the kiln. At the Fort Dodge Stoneware Company the kiln shelves appear to have been commercially made. But at the Coalport Kiln the potters made all of their own kiln furniture from local clay. Most of these pieces were quite crude and were intended to be used only once.

### Firing the kiln

Different fuels could be used to fire a kiln. These included wood, coal, and charcoal. The Coalport potters apparently used either wood or coal or some combination of the two. Both were available in sufficient quantities in the Coalport area.

The Coalport Kiln was a salt glazing kiln, probably of the updraft type. According to Beyer et al. (1904a) and Rhodes (1959) this is one of the earliest and simplest types of stoneware pottery operations that was used in North America. It is also a fairly inefficient type of kiln and glazing method when compared to the more advanced downdraft kilns and other types of glazing.

### Testing the kiln firing

While the kiln is being fired, a process which could take four or five days, potters usually test their glazes and the completeness of the firing with either locally made draw trial pieces or with cones which bend at certain established temperatures. Draw trial pieces are pulled from the kiln at various times during firing and cones are observed through spy holes

which are opened for only a few minutes at a time. The Coalport potters tested their firing with draw trial pieces made from broken pieces of unfired but dried pots. Apparently this was one of the earliest methods used to determine whether the kiln had reached correct temperature. At the Fort Dodge Stoneware Company kilns, commercially imported seger cones were used to test for heat (Carl Johnson, personal communication 1969).

#### Cooling the kiln

Cooling of the kiln is an important operation. Too slow cooling wastes time while too rapid cooling can cause the stacked wares to crack. It is not possible to judge the effectiveness of the cooling methods used at the Coalport Kiln, but the large heaps of broken and cracked pottery surrounding the kiln suggest that, like most early stoneware kilns, the Coalport pottery suffered a fairly high degree of breakage.

#### Selling the finished wares

The fired wares are ready to be sold. We can only guess at the sales methods used at the Coalport Kiln. At some later operations in the state salesmen were employed to sell the wares all over Iowa and even other states in the Midwest (Carl Johnson, personal communication 1969). None of the historic records located for Coalport indicate that the Coalport potters used any such elaborate method for dispensing their wares. They probably merely sold or bartered their wares locally within Marion County or adjoining counties. Of course, during the 1850's, there was an easy transportation route open--the Des Moines River--and it is quite possible that some of the Coalport wares were shipped out of the area by this route.

## CONCLUSION

This investigation has been concerned with the pottery and with the evidence for the pottery industry recovered from the Coalport Kiln (13MA103). Both historic documents and archaeological information have been used in an attempt to describe and reconstruct the pottery industry at Coalport. This investigation has also been concerned with another pottery kiln located in the same general area as the Coalport Kiln, the Gidel Kiln (13MA106C) and with the evidence for the settlement of a now extinct frontier community, Coalport (13MA106A and 13MA106B). In the first portion of the paper the author attempted to describe the ecological and geological setting in which the Coalport Kiln was placed. This, then, provided a framework for looking at the Coalport Kiln as a local manifestation of a much larger phenomenon, pottery making in Iowa. At this time it was noted that although the pottery industry described in this paper was a part of the frontier settlement of the Des Moines River Valley, the same environmental conditions were present when the much earlier agricultural Indian cultures also made pottery containers for food storage and cooking.

In the third section, the author briefly traced the history of the settlement of the Marion County area and of the town of Coalport and then attempted to trace the development of the Coalport pottery industry, as known from historic records. As was indicated, these records are at this time incomplete. In fact, no historic source mentions the fact that there were apparently two separate pottery kilns operating in the Coalport area during the latter half of the nineteenth century.

The third section was the archaeological site report of 13MA103 and of

parts of 13MA106. The main emphasis in this section was, however, on the pottery industry. In the archaeological section, main emphases of the author were to set up rim categories for the Coalport Kiln stoneware, to set up useful functional vessel types for the Coalport wares, to explore the methods used to construct the Coalport Kiln, to determine what type of kiln it was and how it was operated, to explore the methods of manufacturing pottery at the Coalport Kiln, and to attempt to trace the stratigraphy within the site and between this site and other nearby sites, and to establish the relationship between the Coalport Kiln, the Gidel Kiln, and the town of Coalport.

Useful descriptive categories for rim types, vessel types, and kiln furniture types do not exist in the literature of the nineteenth century pottery industry in Iowa and surrounding states, and it was necessary for the author to devise his own categories. Historic sources from Iowa contain few references to the methods of construction and operation of stoneware pottery kilns, and it was thus necessary for the author to use mainly archaeological data in reconstructing these activities.

In addition to the investigations that were conducted at the Coalport and Gidel Kilns, the ISU-NPS Crew has located and made surface collections at a number of other presumed kiln sites in central Iowa. In the Red Rock Reservoir area and adjacent areas southeast of Des Moines, three kiln sites have been located and surface collections have been made at all three of these sites. The Pella-Welch Kiln (13MA113), located a few miles southeast of Pella, is presumably the kiln that William Welch established with Nossaman in 1844 or 1845 (Welch 1876). The author briefly reviewed this material and noted that there seems to be a similarity in both glazing and rim types

to the Coalport Kiln material. All of the material appears to be wheel-made and there are both stoneware and earthenware sherds recovered from the site. The kiln furniture is of the same general type as that found at Coalport, although there is not as large a variation in types of kiln furniture in this surface collection. Kiln furniture pieces with fingerprint impressions were found at this site and they may someday help in establishing a closer link with the Coalport Kiln materials.

Two kilns were located north of Knoxville, both within the same two acre area. The first of these, the Whitebreast Kiln (13MA104), yielded a surface collection of sherds and kiln furniture which contained some sherds with the stamped signatures of two men, Bowman and Fletcher(?). The other kiln, 13MA105, may have been operated by a man named Wright (Donnel 1872). The material from these two sites seems to have been of a later date than the Coalport Kiln material and was perhaps closer to the type of pottery that was being manufactured at the Gidel Kiln. In particular, large quantities of the livestock feeder or watering pans were found at these sites as well as milk skimming bowls of the same type found in abundance at the Gidel Kiln.

Several other pottery kilns have been investigated in the Saylorville Reservoir area northwest of Des Moines. All of these kilns yielded materials that seem to be of later date than any of the materials so far uncovered at the Red Rock Reservoir kiln sites. In particular, they are both wheel- or mold-made and they exhibit a different type of glaze, the so-called "Bristol Glaze," often with cobalt blue decorations put on under the glaze (Rhodes 1957). These kilns seem similar in operation to the kilns operated by the Fort Dodge Stoneware Company around the turn of the century.



Located west of Boone is Noah Creek Kiln (13BN111), the most intensively excavated of the kiln sites in Saylorville Reservoir. Actually, no kiln structure was ever located in situ at this site. James Meehan, the landowner and a long time resident of the area, claimed he knew the location of an old potter's shed that had stood in the now defunct town of Coal Valley. The ISU-NPS Crew conducted excavations in this area in an attempt to define the limits of this structure and to selectively test the rest of the abandoned town. Excavations yielded a hearth and irregular lines of post molds thought to represent the pole construction of the potter's shed. Great quantities of broken pottery, kiln furniture, and other artifacts were also found, indicative of a nineteenth century pottery industry. The pottery was both Bristol glazed and brown slip glazed with cobalt blue decorations under some of the Bristol glazes. The vessel forms recovered from the site were numerous and included various types of crocks, jugs, and bowls. Milk skimming bowls were a common item. Mr. Meehan thought that this pottery had been in operation sometime after 1860 but it was abandoned by the time his father came to Coal Valley in the late 1880's.

Two kiln sites were located in the town of Moingona, southwest of Boone, Iowa (13BN120 and 13BN132). A third kiln, 13BN131, is located along Stringer Creek, west of Boone, and is thought to be the pottery operation run by T. R. Franklin. 13BN138, within the limits of West Boone, is apparently the kiln operated by M. W. Griffee. Several of these kiln sites yielded very large quantities of pottery (much larger surface collections than from either the Coalport Kiln or the Gidel Kiln). These materials are of the same general type as the 13BN111 materials. A photograph of one of the pottery operations in Moingona (13BN120) exists, and it shows two

bottle-necked domed kilns and adjacent buildings.

In summary, eight kilns have been located in the Central Des Moines Valley in addition to the Coalport Kiln, the Gidel Kiln, and the Fort Dodge Stoneware Company kilns. At this time the material from these sites has not been analyzed. When completed, the analysis should provide useful data for comparison with the Coalport and Gidel Kilns material. Such comparison should prove particularly interesting because, in the author's opinion, there are at least three different types of pottery operations represented by this sample. The Coalport Kiln and the Pella-Welch Kiln probably represent the earliest phase of this continuum. These kilns operated solely with wheels and little mechanization and standardization. The Gidel Kiln, the Wright Kiln, and the Whitebreast Kiln may represent the middle stage of the developing pottery industry in Iowa. The latter three kilns show some mechanization and perhaps the beginnings of mold-made pottery. The materials from these sites appear to be more regular and standardized in terms of both size and shape than the Coalport materials. The Fort Dodge Stoneware Company kilns and the kilns from the Saylorville Reservoir area probably represent the most highly industrialized types of potteries found in Iowa in the late nineteenth and early twentieth centuries. The wares made at these kilns were very standardized, and both wheel-made and mold-made pottery can be identified in the collections of material. There is some evidence of other changes in techniques of manufacture, such as new and more regular glazing methods, importing of glazes, and commercially made manufacturing equipment.

There was a general decline in the Iowa stoneware pottery industry late in the nineteenth century and early in the twentieth century. There

were probably many different reasons for this decline. An article in the 1929 Knoxville Express attributes this decline to the fact that ". . . people found they could buy 'slicker' stoneware at a higher [sic: lower] price from bigger towns."

Miller (1901:191) says that

Formerly pottery was made at the King brickyard, at Coalport and at Attica. On account of the great reduction in prices of pottery in recent years, its manufacture has been abandoned at all three places.

Actually, the general decline was probably not responsible for the demise of the Coalport Kiln. The Coalport Kiln may have been abandoned because the men who ran it moved their operation to a new location--that of the Gidel Kiln. Nevertheless, the Coalport Kiln and the Gidel Kiln are important in looking at the general decline of the pottery industry in the state. They were probably both of the type that Rhodes (1959:33) has called the "small country pottery" which, according to him, were potteries

. . . that seemed to have been rather short-lived as businesses, and many of the throwers were itinerants who moved on to a new location every year or so.

The Gidel Kiln showed some increasing industrialization, but it was still a fairly small operation, a "small country pottery."

In tracing the development and eventual decline of the pottery stoneware industry in Iowa in the latter part of the nineteenth century and the early part of the twentieth century, two processes can be noted. First, the original potteries were typically small establishments which employed few workers and used a minimum of mechanical equipment and imported manufacturing items. Gradually these small potteries were supplanted by much more complex and much larger pottery operations, like the Fort Dodge Stoneware

Co., which used imported machines and glazes and employed many men in many different capacities. Thus, the small country potteries were very numerous in the early years of the state and were replaced gradually by larger potteries in a process of centralization. Then began the processes that led to the eventual decline of the pottery industry in the state.

It is not possible at this time for the author to determine fully why the stoneware pottery industry suffered a decline late in the nineteenth century, but certain reasons for this decline can be suggested. It is important that the stoneware vessels declined in popularity as Iowa became more settled and as the Iowa people became more sedentary. The author suspects that Iowans at around the turn of the century and later had just as much need for durable containers as the earlier settlers. However, these later settlers had better established trade routes, particularly with the Eastern states, which enabled them to obtain more decorative and probably cheaper containers from other areas. Added to this were discoveries of ways to make glass and metal containers cheaply (the mason jar, for instance). Although the early potters had little money invested in materials and equipment, they did have an enormous investment in time and labor. Even at more highly industrialized pottery kilns such as the Fort Dodge Stoneware Co., many of the operations had to be done by hand and potter's wheels were always used to make some vessels (Carl Johnson, personal communication 1969).

A prime function of stoneware pottery was food storage. As centralized stores developed with a large food surplus, the individual landowner had little need to store his own food. With the advent of refrigeration the

situation changed even more drastically. Early refrigeration probably placed emphasis on light containers which conserved space. The heavy, thick stoneware vessels were ill adapted to this use.

Although stoneware use has declined greatly since 1900, stoneware is still being produced in the United States. In the homes where stoneware vessels occur, however, they have usually lost their original utilitarian functions as food storage and preparation containers. They now are often considered too valuable as antiques to be used in this manner and more durable metal, glass, and plastic containers are used instead in kitchens.

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PLATES 1-29



Plate 1. Aerial Photographs of the Coalport Area

Top: Aerial view of Coalport-Coalridge area. Coalridge Baptist Church in right foreground. Present channel of the Des Moines River at top. Abandoned oxbow and location of the now extinct town of Coalport at top center and left.

Bottom: Aerial view of abandoned Des Moines River Valley oxbow in Section 14 (center left) with the presumed location of the town of Coalport to the right of this oxbow. Coalport Kiln is located in the forested bluffs above the oxbow.



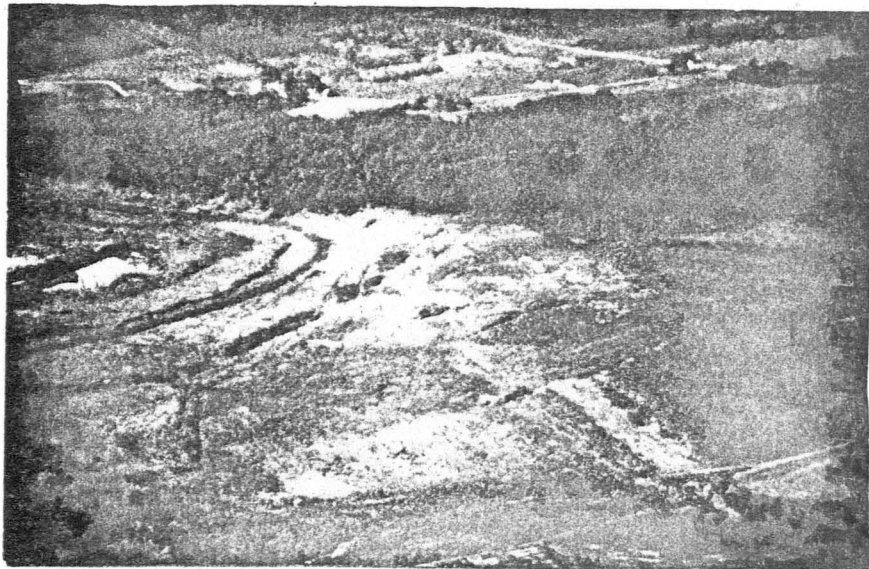
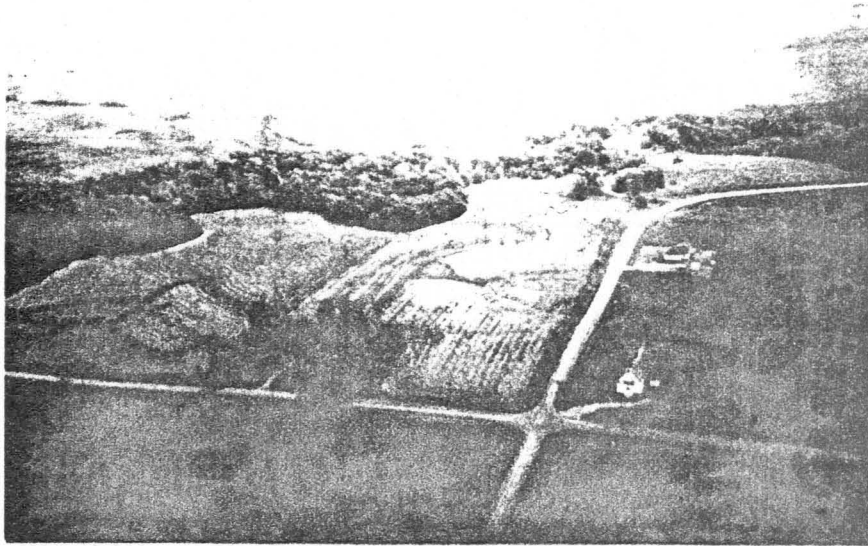


Plate 1. Aerial Photographs of Coalport Area



Plate 2. Maps of Coalport Area

Top Left: Map of T76N, R19W, 5th Mer. Samuel Jacobs, Deputy Surveyor 1847.

Top Right: Plat map of the town of Coalport. William Kent 1857.

Bottom: Coalport Kiln site map, Iowa State University, Ames, Iowa 1966. Topography, Kiln floor extent, and excavation units.





Plate 3. 13MA103: Kiln Drawings

Top: Artist's conception of the Coalport Kiln (by Jo Reisner 1966).  
View to the southeast along the transept flue.

Bottom: Artist's conception of the Coalport Kiln (by Jo Reisner  
1966). View to the southwest showing transept face of first  
D-shaped area.

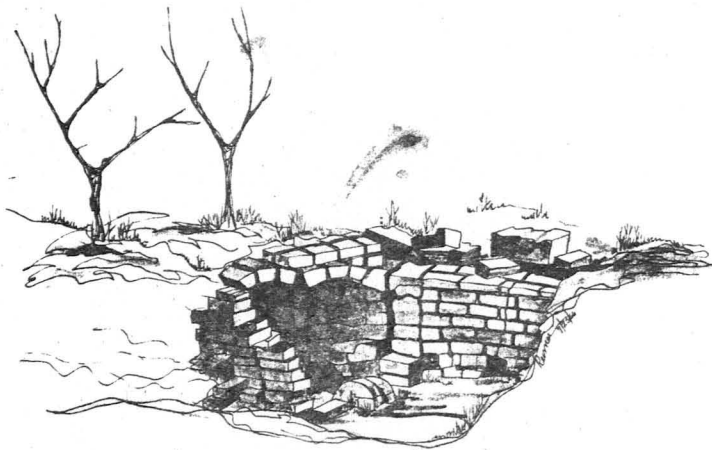


Plate 3. 13A103: Kiln Drawings





Plate 4. 13MA103: Kiln Structure

Top: View of the kiln floor. Observe the common red brick liner outside the perimeter of the kiln floor (lower left).

Bottom: View from above the kiln floor. Note the vertical flues along the edge of the kiln floor. These connected the firing chamber (above the floor and now missing the dome) with the circumferential horizontal flue which circles the perimeter of the kiln beneath the floor.

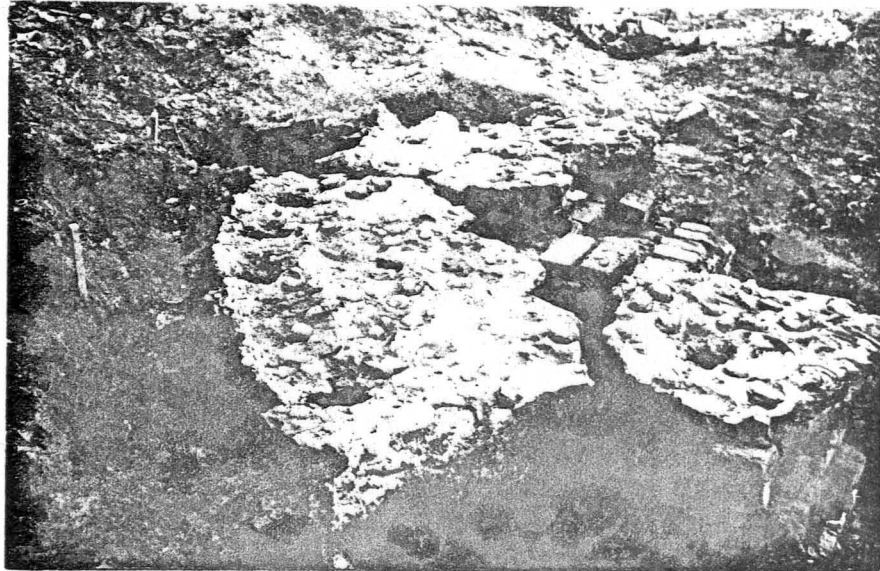


Plate 4. 13MA103: Kiln Structure



Plate 5. 13MA103: Kiln Structure

Top: Closeup view of one of the two brick buttresses on the west side of the kiln structure. Note pottery, kiln furniture, and brick rubble.

Bottom: View of the kiln floor. Note two brick buttresses (lower right hand corner) after removal of cultural fill (Stratum 24).

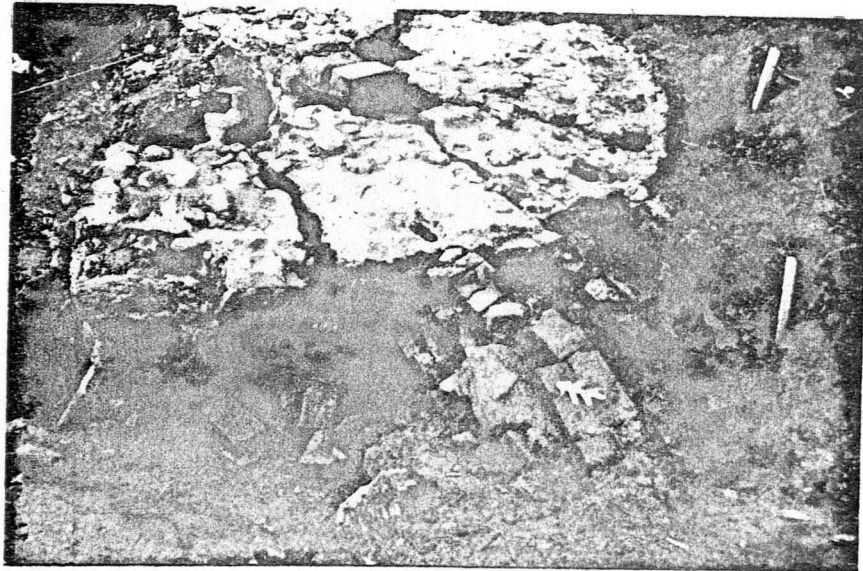


Plate 5. 13MA103/ Kiln Structure



Plate 6. 13MA103: Kiln Structure

Top: View of transept flue. Note arched underside of kiln floor over transept flue. Note heavy silicate deposit on transept wall face. Two vertical flues (Strata 28 and 29) connected the transept flue with the ware chamber above through the D-shaped supporting structure (Fig. 23).

Bottom: View showing both the transept (to the left) and circumferential (to the right) horizontal flues. Note the shale bed in the lower right corner of the photograph. The kiln structure was built into a Pennsylvanian shale deposit.



Plate 6. 13MA10/: Kiln Structure





Plate 7. 13MA103: Kiln Structure

The Coalport Kiln. The hill behind the kiln was composed of glacial sand and gravel overlain by successive cultural deposits. In the extreme foreground is the erosional cut which threatened the kiln structure when the site was first visited in 1966 by the ISU-NPS Archaeological Crew. Another erosional cut threatened the kiln from the southwest where a door was placed to turn the water away from the kiln structure.



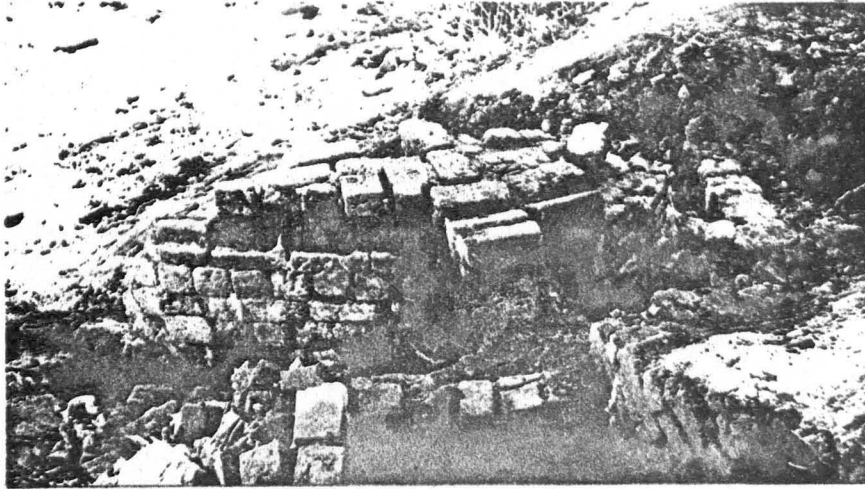
Plate 7. 13MA103: Kiln Structure



Plate 8. 13MA103: Kiln Structure after the Removal of the Kiln Floor

Top: View showing D-shaped supporting understructure (middle) and two brick buttresses (bottom) after kiln floor removal. The kiln floor and much of the understructure were removed to save a portion of the kiln from the waters of Lake Red Rock. Ten to twenty feet of water now covers the area where the Coalport Kiln once stood.

Bottom: View showing the surviving D-shaped understructure which supported the heavy kiln floor. Note the exposed horizontal circumferential flue (left) and the brick liner just outside the flue perimeter.



**Plate 8.** 13MA103: Kiln Structure after the Removal of the Kiln Floor

Plate 9. 13MA103: Kiln Structure after Removal of Kiln Floor and Portions of the D-shaped Understructure

Top: View showing remaining portion of first D-shaped understructure after the removal of the transept flue face bricks. Note shale liner (center-bottom) on the perimeter of the circumferential flue.

Bottom: View of the first D-shaped understructure after removal of the kiln floor and the transept flue face bricks. Note that this understructure was partially hollow. Two vertical flue holes in the D-shaped understructure connected the transept flue with the ware chamber.

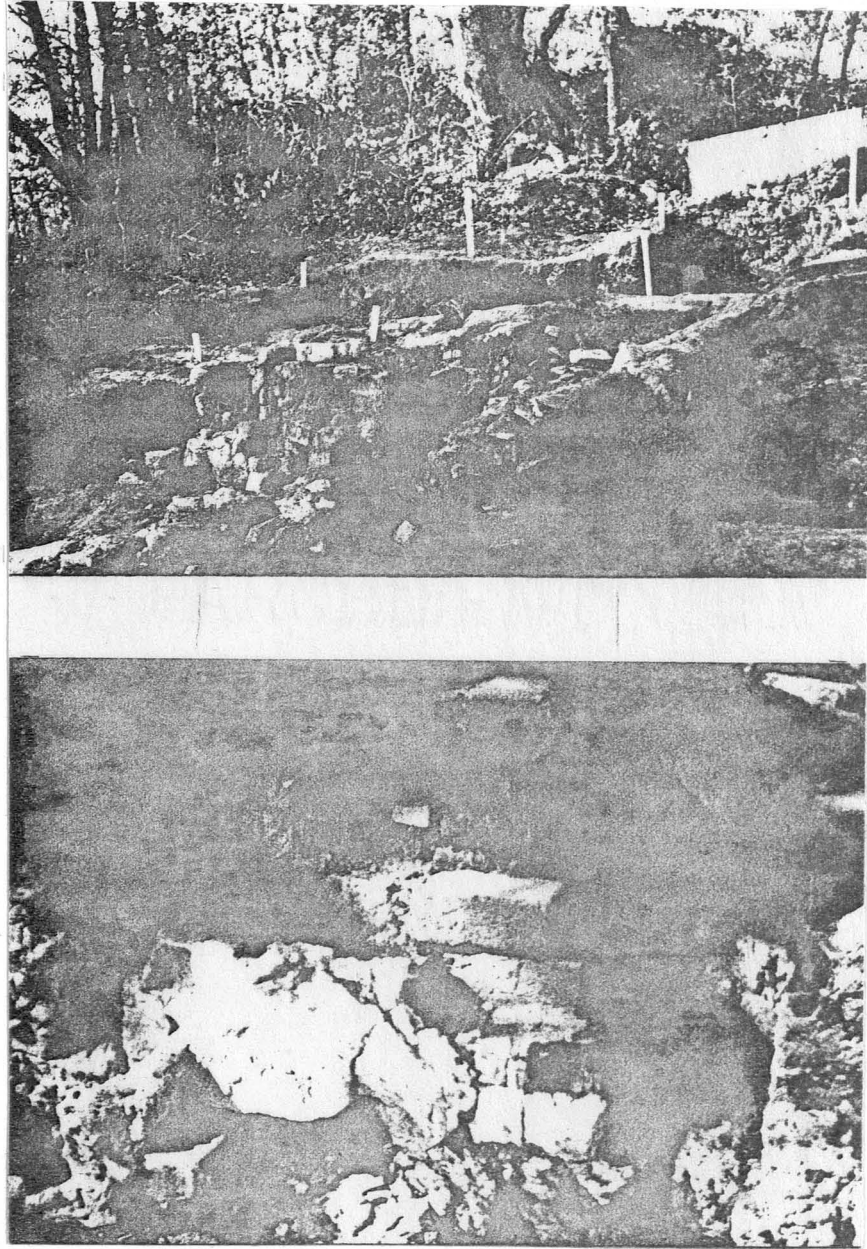


Plate 9. 13MA103: Kiln Structure after Removal of Kiln Floor and Portions of the D-shaped Understructure





Plate 10. 13MA103: Artifacts in situ

Top: Pottery Dump Area. Heavy concentration of pottery and kiln furniture in Squares C<sub>1</sub> and C<sub>2</sub>. This was probably one place where the Coalport potters threw their wares that were ruined during firing.

Middle: A straight-sided crock of two gallon capacity with an incised signature (Thomas Smith) just below the rim. Found in Trench B, Stratum 5.

Bottom: Kiln shelves and metal kick wheel shaft. Numerous kiln shelves and a metal kick wheel were found in association with broken bricks, pottery, and kiln furniture in this square.

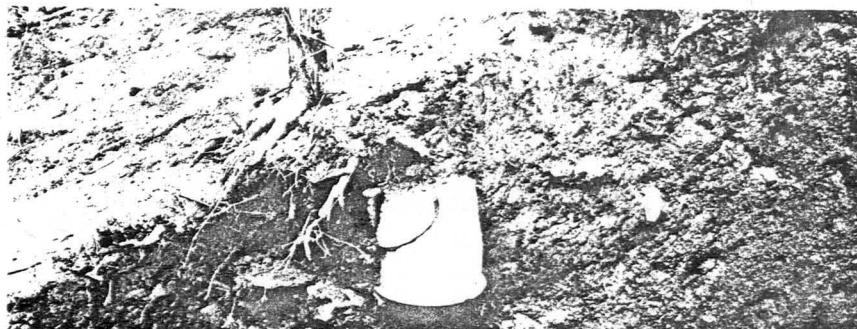


Plate 10. 13.A103: Artifacts in situ



Plate 11. 13MA103: Bowl Forms

Top: Simple Bowl Category. This was the most commonly occurring vessel form from 13MA103. This specimen is of one gallon capacity. The exterior of this vessel has a light and incomplete salt glaze while the interior is merely bisque glazed.

Center Left: Simple bowl form with single incised line.

Center Right: Simple bowl form of less than one gallon capacity with an all over brown slip--both exterior and interior.

Bottom: Milk skimming bowl. Only one other sherd of this vessel type was found at 13MA103, although this was a major vessel category at 13MA106C. This specimen has a brown slip glaze both externally and internally.

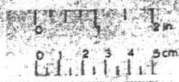
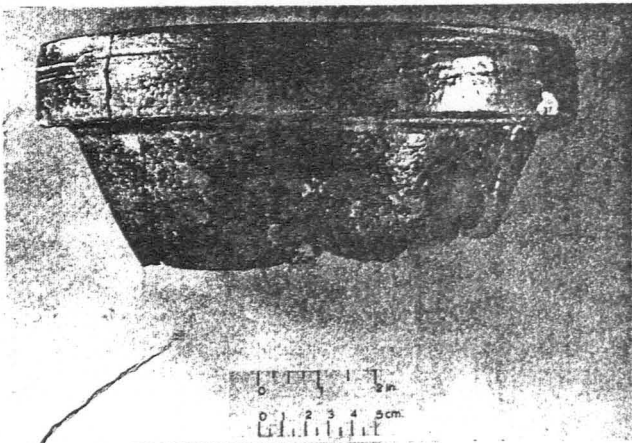
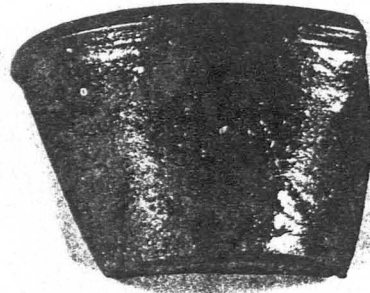
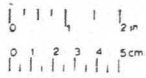
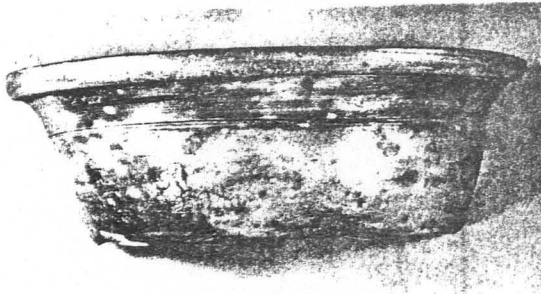
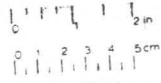
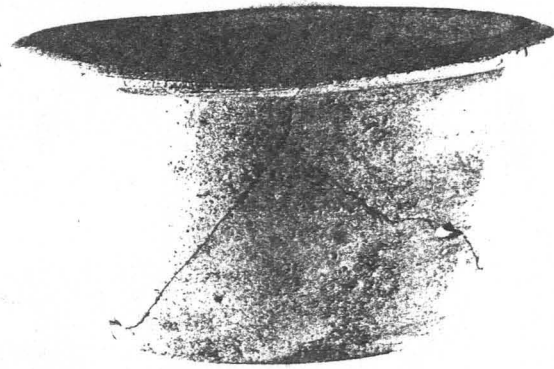


Plate 11. 13-A103: Bowl Forms



Plate 12. 13MA103: Crocks

Top Left: Straight-sided crock with attached handle. Note stamped "4" on rim. Note mature salt glaze with glassy orange-peel texture.

Top Center and Right: Two views of three gallon straight-sided angled-shoulder crock. Note etched "3" on right photo.

Bottom Left: Large covered container. Note internal lip on rim. Note bands of combed incising.

Bottom Right: Rounded-shoulder crock. Note vessel has a brown slip glaze internally and a grey-green salt glaze externally.



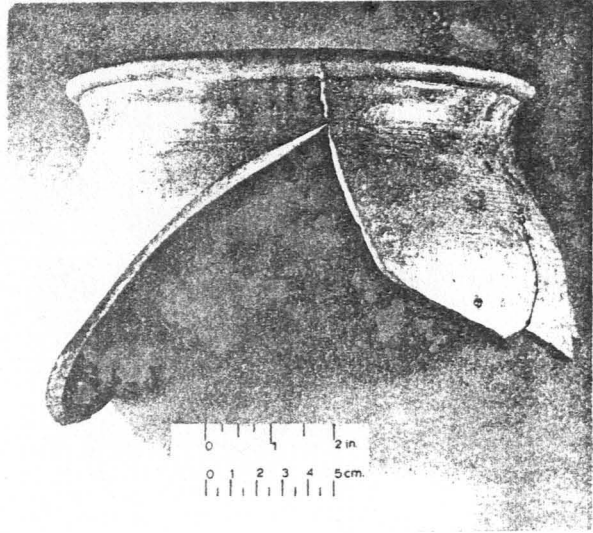
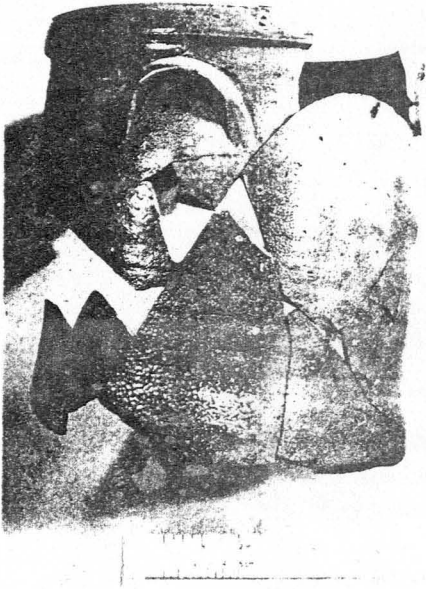


Plate 12. 13A103: Crock



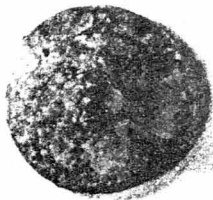
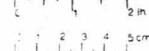
Plate 13. 13MA103: Jars, Jar Lids, Fat or Grease Lamp

Top Left: Straight-sided angled-shoulder small mouth jar. Note external surface is covered with a green-brown salt glaze. Rim has an internal lip for a lid.

Top Right: Rounded-shoulder small mouth jar. Note this vessel has a brown-black colored brown slip glaze externally. Note Category H (small clay wad) kiln furniture attached to base of vessel. This probably means that this vessel was placed inside another vessel during firing. This would explain why the jar has a uniform dark brown-black slip glaze--something which wouldn't occur if the vessel were exposed to salt fumes during firing.

Bottom Left: Small mouthed jar lids, top view. Note handles on 1, 2, and 3. Note incised line decoration on 2, 5, and 6.

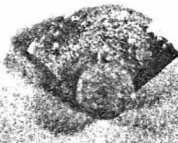
Bottom Right: Fat or grease lamp.



1



2



3



4



5



6



7

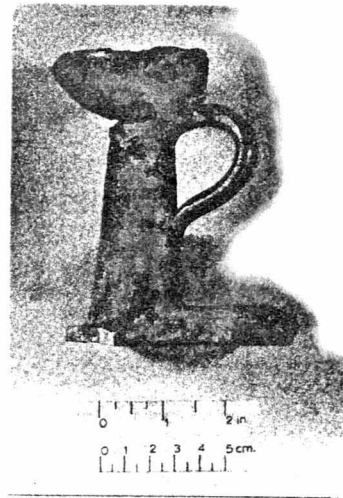


Plate 13. 13A103: Jars, Jar Lids, Fat or Grease Lamp



Plate 14. 13MA103: Jugs and Butter Churns

Top Left: Jug form. This specimen is missing the rim and no handle was found which could fit it. Note the finger striations visible on the body exterior. These indicate that this jug was wheel-made rather than mold-made. Jugs from the Fort Dodge Stoneware Co. kiln sites were mold-made (Carol Johnson, personal communication 1969).

Top Right: Jug form. The top specimen was a large jug of over one gallon capacity. The bottom specimen had been cut in an arc prior to firing but the purpose of this is not known.

Bottom: Butter churns. Note handles and internal lip for lid.

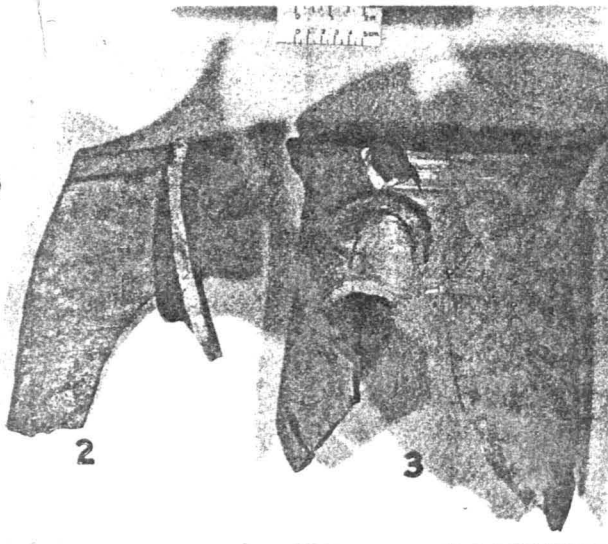
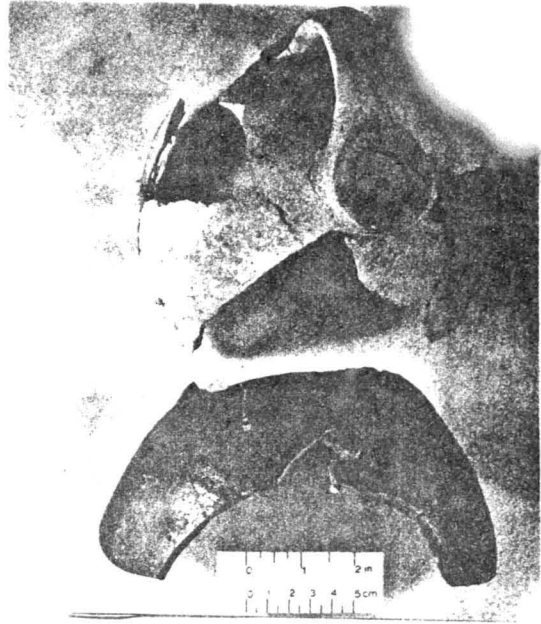
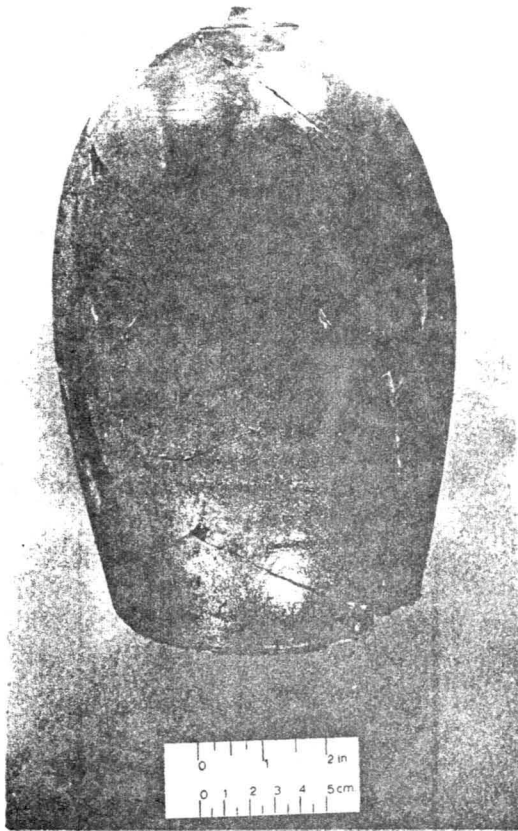


Plate 14. 131A103: Jugs and Butter Churns





Plate 15. 13MA103: Water Jar

Top: Water jar, missing all portions below shoulder. Note straight line and combed incising. Note etched "9" on vessel shoulder. Note handle on neck of vessel.

Bottom: Top view of water jar showing kiln furniture firing marks on rim.

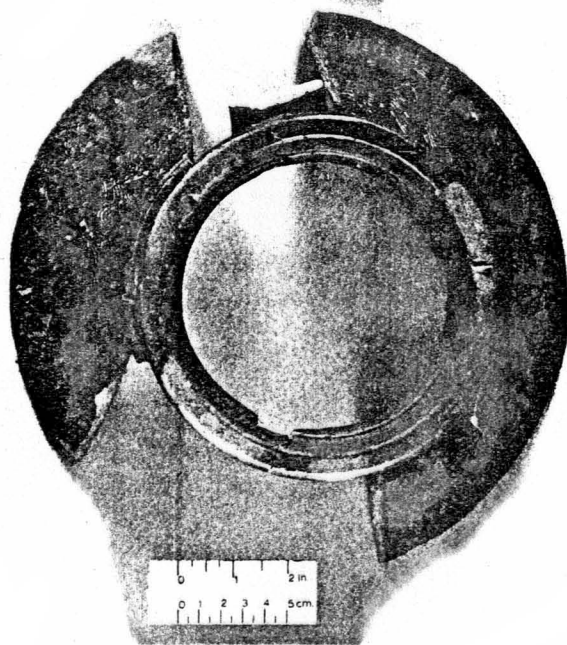
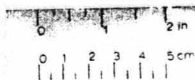
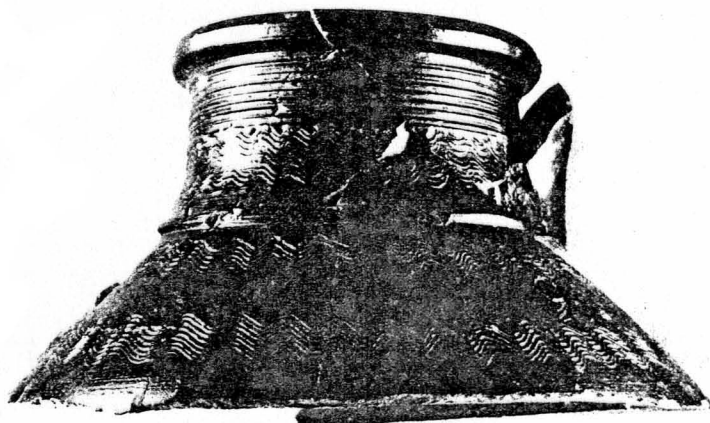


Plate 15. 13.A103: Water Jar



Plate 16. 13MA103: Numbered Sherds, Possible Churn Lid, Draw Trial Pieces  
Top: Numbered sherds (numbers indicated the size of vessels--such as "1" for one gallon, "2" for two gallon, etc.). Note (1) stamped "2"; (2) stamped "3"; (3) etched "4"; (4) two stamped "4's"; (5) stamped "5"; (6) stamped "6".

Bottom Left: Possible butter churn lid with the following etched marks, as near as can be deciphered:

P4  
3  
4/3

Bottom Right: 1-5 are draw trial pieces made from portions of pottery vessels before firing. 6 is a draw trial piece made from a section of ceramic tile and used at the extant Carlisle Brick Kiln, Carlisle, Iowa. 1966.

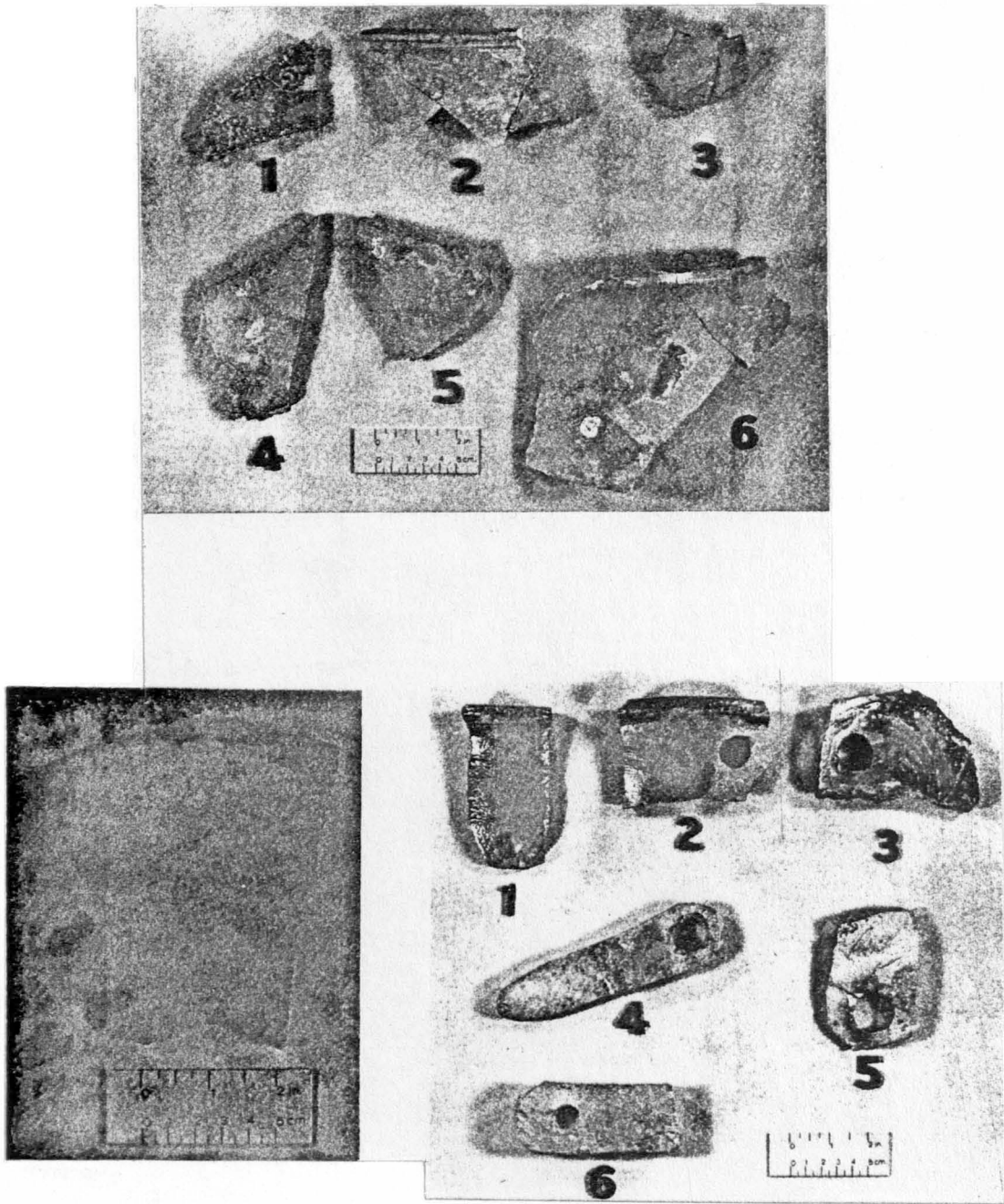


Plate 16. 13MA103: Numbered Sherds, Possible Churn Lid, Draw Trial Pieces



Plate 17. 13MA103: Vessel Handles and Vessel Decoration

Top: 1-3 are jug strap handles. 4-5 are crock lug handles. 6 is a fat lamp coil handle.

Bottom: Vessel decoration. 1-2 show combed incising and straight line incising. 3-5 show straight line incising.

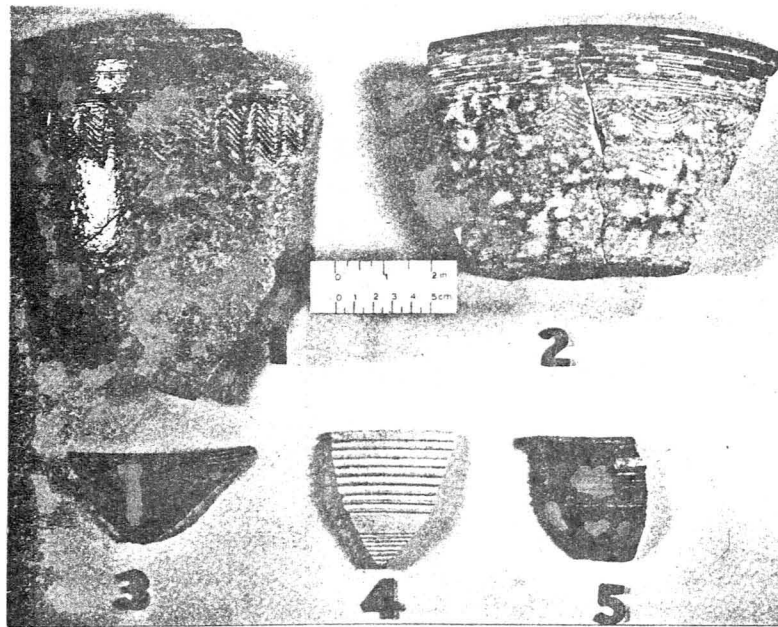
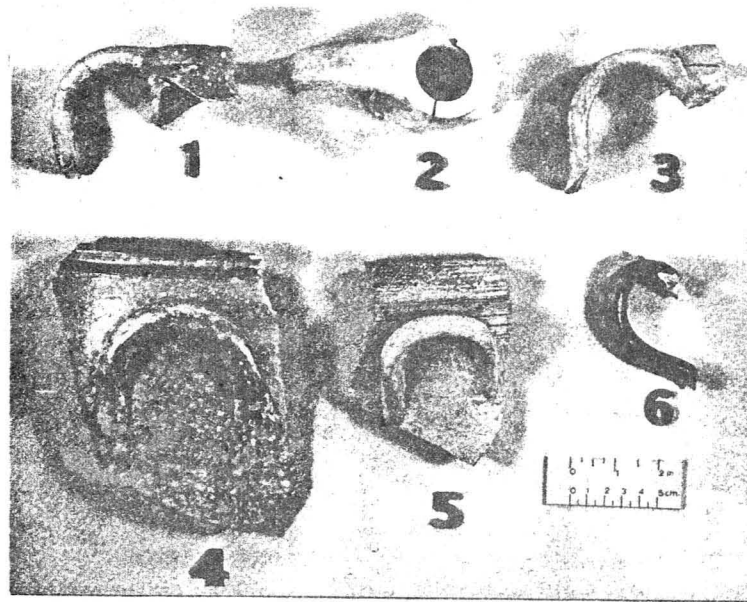


Plate 17. 13MA103: Vessel Handles and Vessel Decoration





Plate 18. 13MA103: Kiln Furniture

Top: 1-3 are Category A Kiln Furniture (leveling props). Note impressions of pottery vessels on 1 and 2. Note combed incising (probably in relief) on 3. 4-6 are Category B Kiln Furniture (cross-support wedges). Note finger impressions on 4, 5, and 6. Note impressions of pottery vessel on 5.

Bottom: 1-3 are Category C (rectangular setting tiles) Kiln Furniture with vessel rim impressions. 4-6 are Category D (flat elongated setting tiles) Kiln Furniture. Note possible jug rim impression on 4. 7-8 are Type I (small irregular cylindrical) Kiln Furniture.

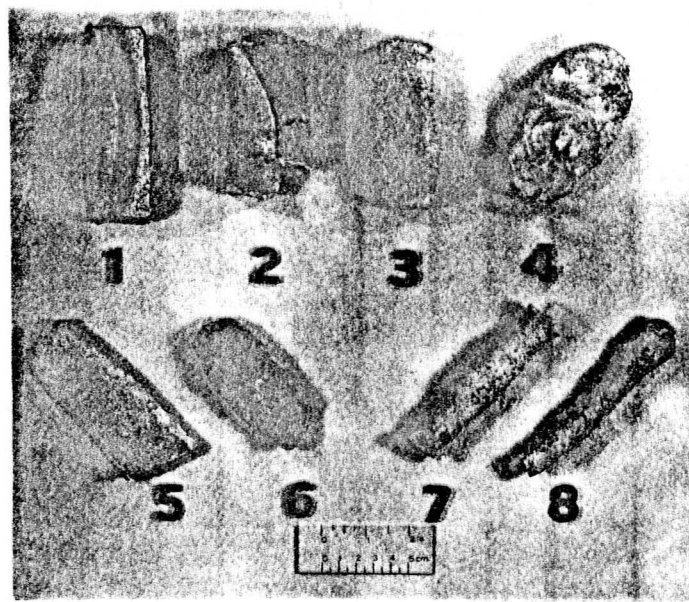
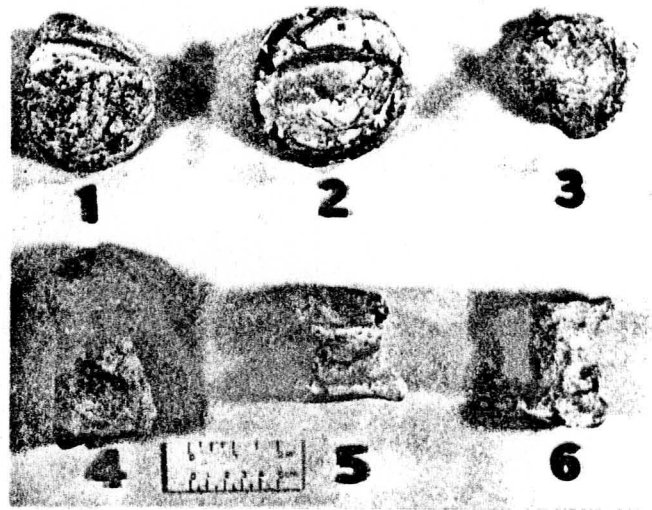


Plate 18. 13MA103: Kilm Furniture



Plate 19. 13MA103 Kiln Furniture

Top: Top view of kiln shelves (Type F Kiln Furniture). On 1 note irregularly cut hole in center, dished out central area, heavy glaze. On 2 note Category C (rectangular kiln furniture) attached. On 3 note Category C Kiln Furniture attached. Note heavy glaze indicating repeated firings. On 4 note somewhat irregular combed incisions on surface.

Bottom: Bottom view of kiln shelves (Type F Kiln Furniture). On 1 note Category A Kiln Furniture (leveling props) attached. Note lack of central hole. On 2 note circular unglazed areas where Category A Kiln Furniture was probably supporting and leveling the shelf in the kiln.

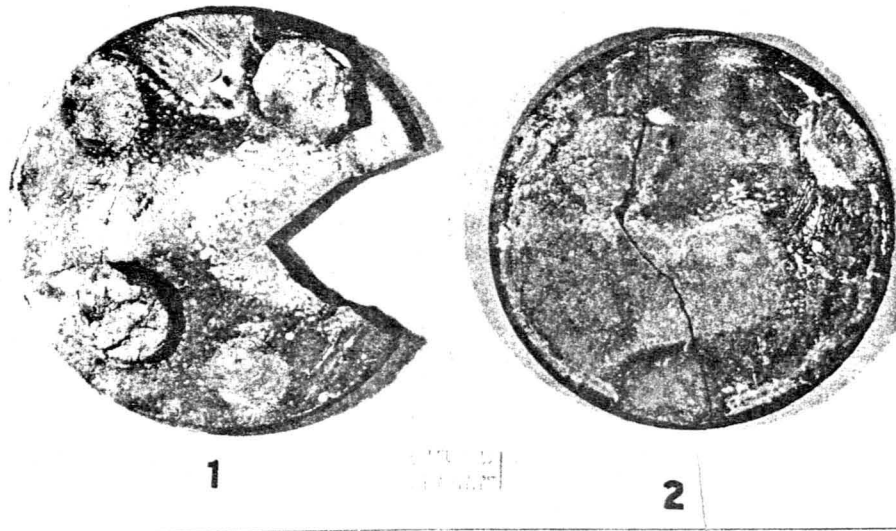
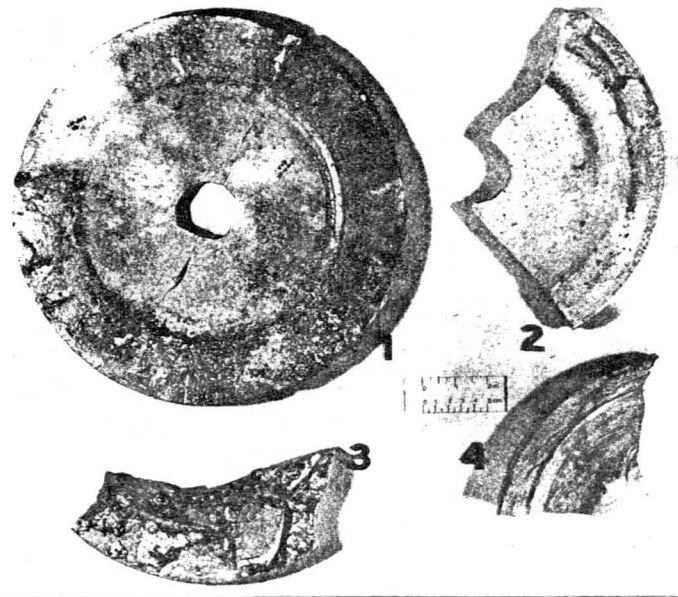


Plate 19. 13MA103 Kiln Furniture



Plate 20. 13MA103: Kiln Furniture

Top: 1-3 are Type K Kiln Furniture (stilts). 4-7 are Type H Kiln Furniture (small clay wads). 8 is Type E Kiln Furniture (annular pieces).

Bottom: Category G Kiln Furniture (irregular disc-shape).



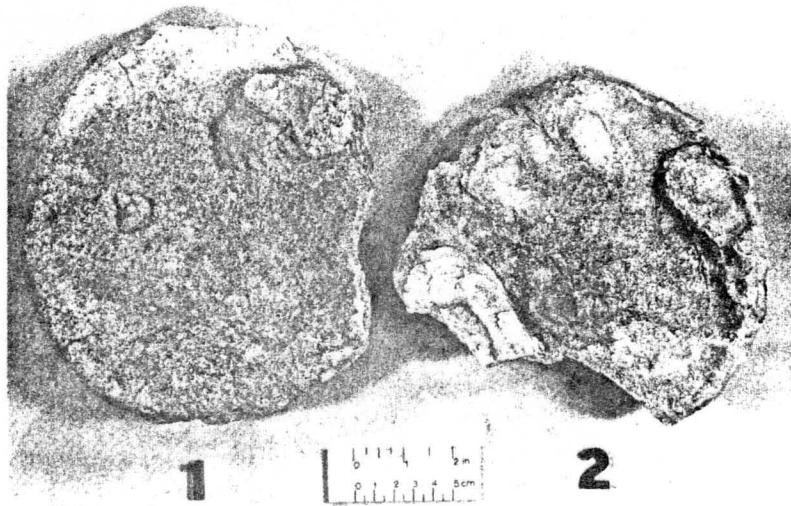
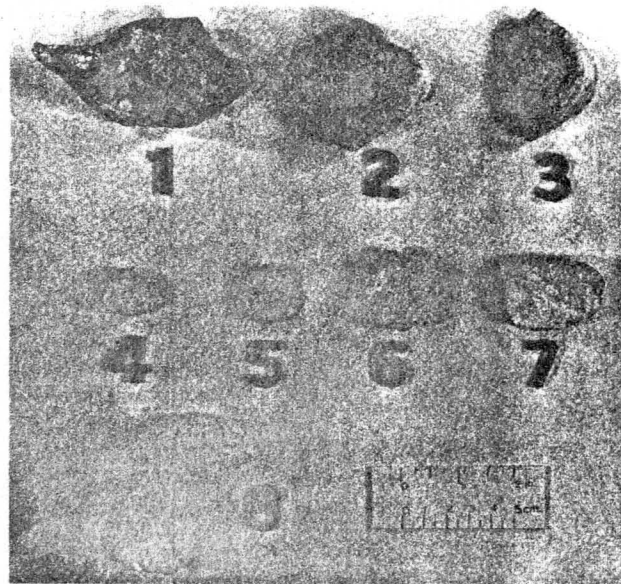


Plate 20. 13.A.103: Linn Furniture



Plate 21. 13MA103: Kiln Furniture

Top: Sagers. All three have a light salt glaze and are not fired to full maturity. Numbers 1 and 2 are straight-sided crocks converted to sagers by trimming off the base. Number 3 is a straight-sided angled-shoulder crock with the base cut off. All are Category J Kiln Furniture.

Bottom: Heavily glazed ceramic sherds with kiln furniture (leveling props) and silicate deposit firmly attached. Many more of these could be observed on the floor of the kiln. The broken sherds might have been wasters from previous firings reused to attain a level floor.

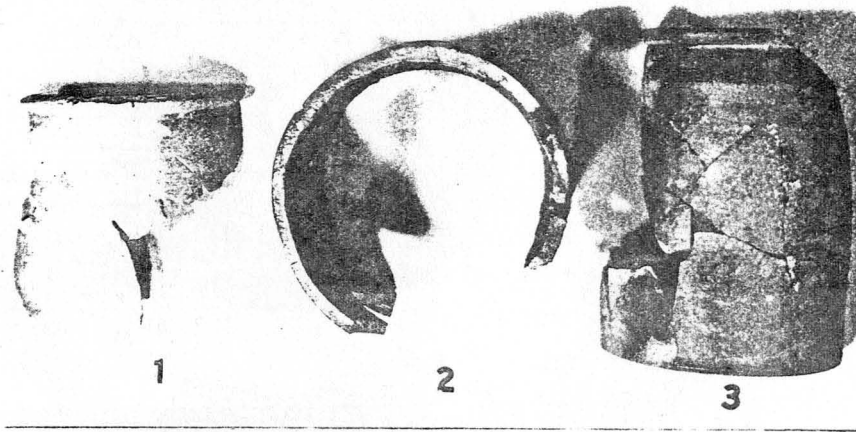


Plate 21. 13MA103: Kiln Furniture



Plate 22. 13MA103: Evidence of Kiln Setting Methods

Top Right and Left: Note the unglazed marks where kiln furniture pieces rested during firing.

Bottom: Note the unglazed marks on the base of this bowl. Apparently, Type H (small clay wads) Kiln Furniture was used in stacking this vessel in the kiln.

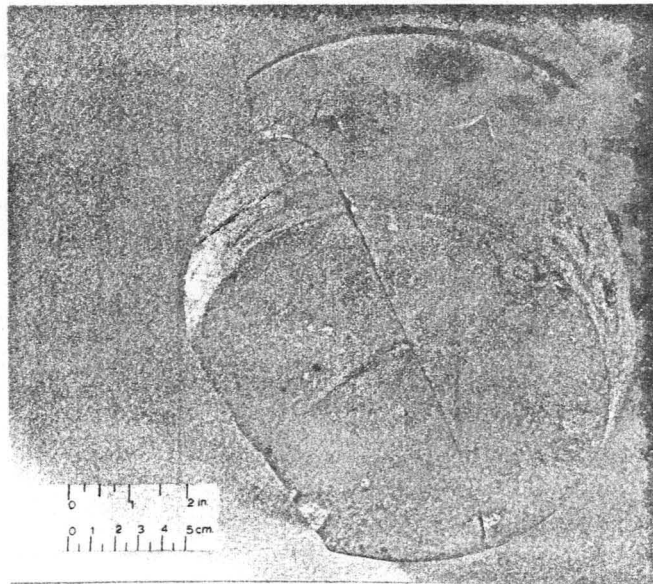
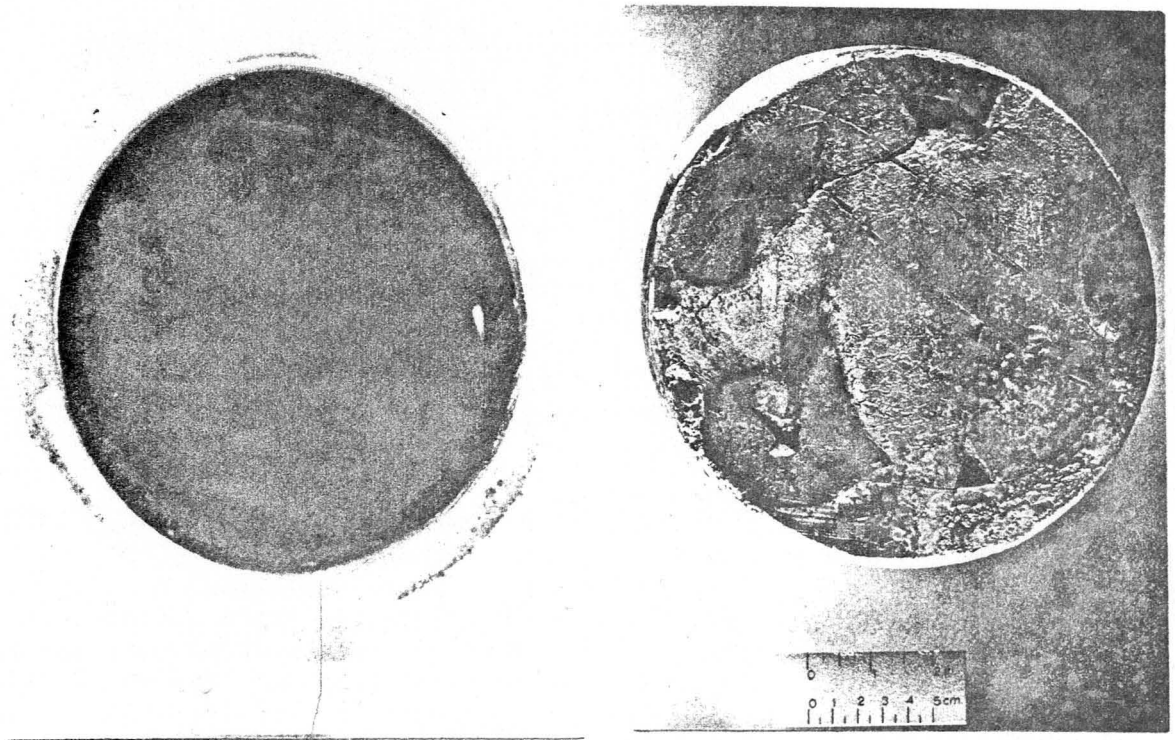


Plate 22. 13MA103: Evidence of Kiln Setting Methods





Plate 23. 13MA013: Evidence of Kiln Setting Methods

Top: Vessel bases with kiln furniture marks as evidence of kiln stacking methods. Note on 1 evidence of Category A (leveling prop) or Category B (cross-support wedge) Kiln Furniture. Note on 2 that circular area on base has a brown slip glaze while the rest of the vessel is salt glazed. This vessel (a small mouthed jar) was probably placed on top of the rim of another small mouthed jar for firing. 3-4 have kiln furniture marks on vessel bases.

Bottom: Stoneware vessel bases with Category H (small clay wad) Kiln Furniture pieces attached to both the interiors and exteriors of the sherds.

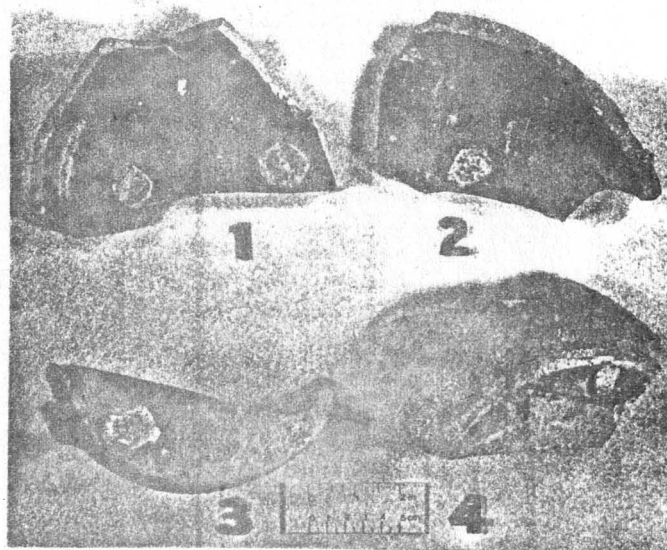
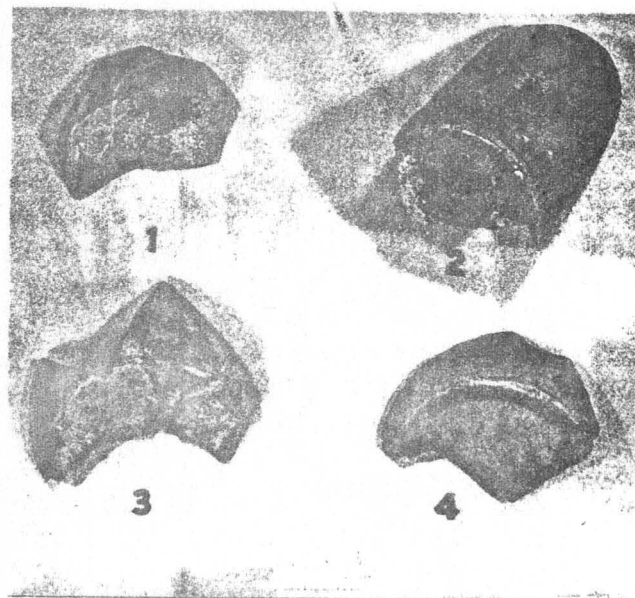


Plate 23. 131A103: Evidence of Kiln Setting Methods



Plate 24. 13MA103: Non-stoneware Artifacts

Top: Metal artifacts. (1) metal kick wheel shaft; (2) metal stove lid; (3) metal pan cover.

Middle: China artifacts. (1) Blue feather edge; (2) china with raised pattern; (3) blue sponge ware; (4) painted ware--blue, green, red, black; (5) blue transfer design; (6) blue transfer design; (7) blue transfer design; (8) purple black transfer design; (9) grey transfer design; (10) grey transfer design.

Bottom: Stone, metal, horn, glass, and ceramic artifacts. (1) Brown and green runny glaze; (2) yellow and brown glaze; (3) doll leg; (4) stone marble; (5) glass base of tumbler; (6) pressed glass; (7) "Towers Wire Fastener"; (8) metal decorative button; (9) bone button; (10) comb.

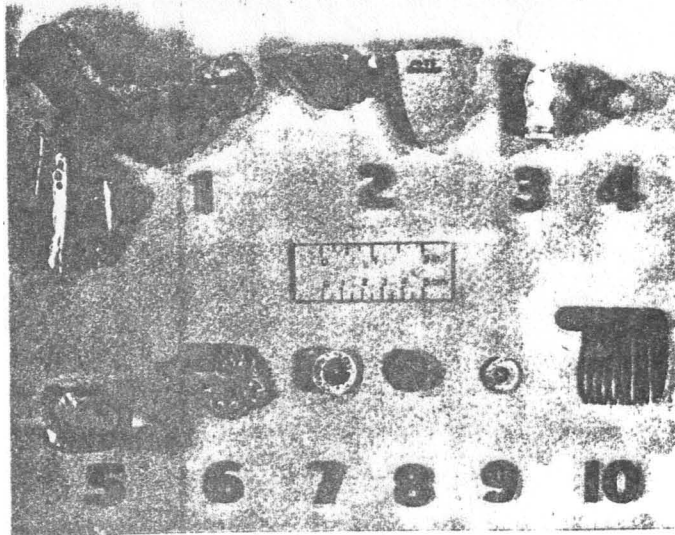
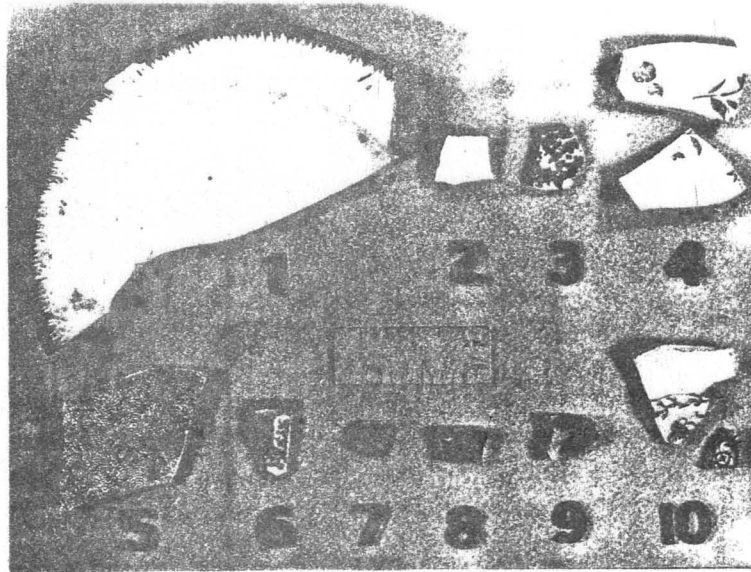
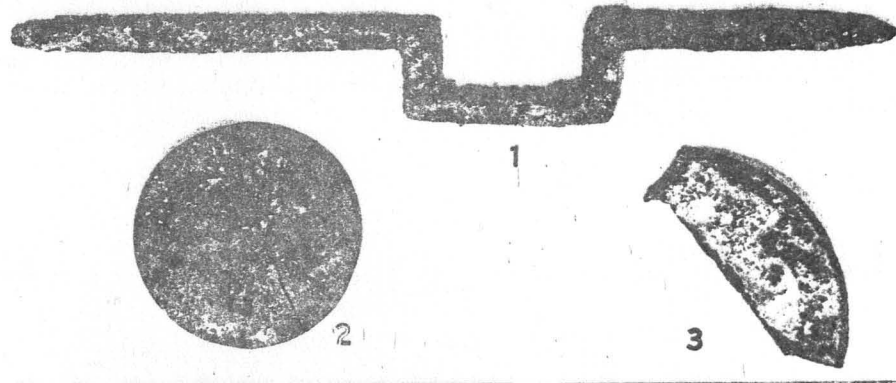


Plate 24. 13MA103: Non-stoneware Artifacts



Plate 25. 13MA106: Stoneware Vessels

Top: Milk skimming bowls. Note "2" stamped on rim of Number 2. Note occurrence of glaze. Note Type C Kiln Furniture attached to underside on Number 3. These vessels were probably stacked inside each other for firing and this kiln furniture may have kept the pots separated and allowed even heat circulation.

Middle: Feeder or watering pans.

Bottom: Circular heavy objects, similar to feeder or watering pans but shorter and with holes located in the centers.

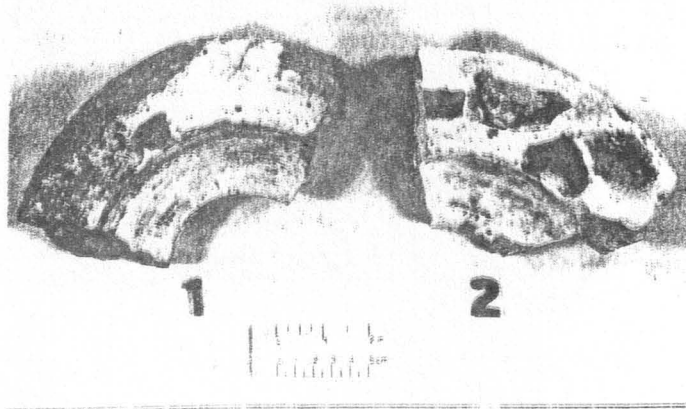
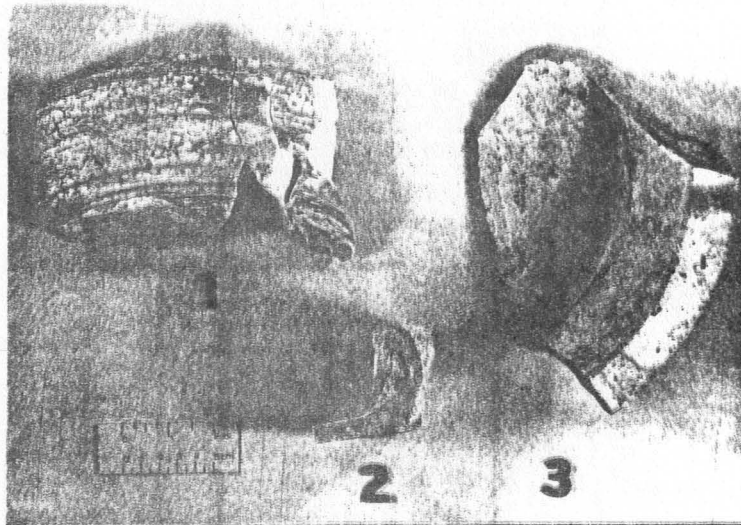
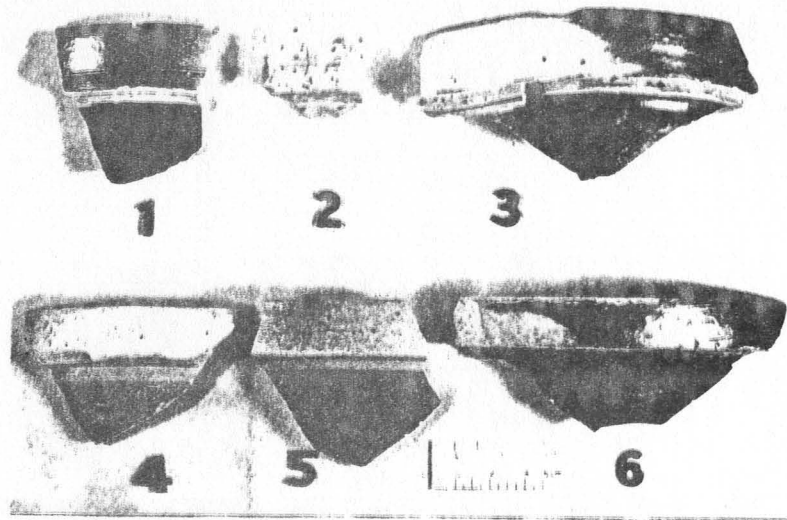


Plate 25. 13MA106: Stoneware Vessels





Plate 26. 13MA106: Stoneware Ceramics

Top: Jar lids and draw trial pieces. 1-4 are jar lids. 5-7 are draw trial pieces made from ceramic vessels.

Middle: Decorations and evidence for kiln setting. Number 1 shows combed and straight line incising. Number 2 shows small clay wad kiln furniture (Category H) on vessel base. Note rectangular setting tile (Category C Kiln Furniture) adhering to vessel rim.

Bottom: Numbered, signed, and decorated sherds. On Number 1 note stamped "2". Note stamped "4"--reversed-- on 2: "4". Note stamped "4" on 3. Note combed incising on milk skimming bowl rim, Number 4. Note combed and straight line incising on 5. Note "T. H. Smith" stamped sherd, Number 6. 7 is the base of a sagger.

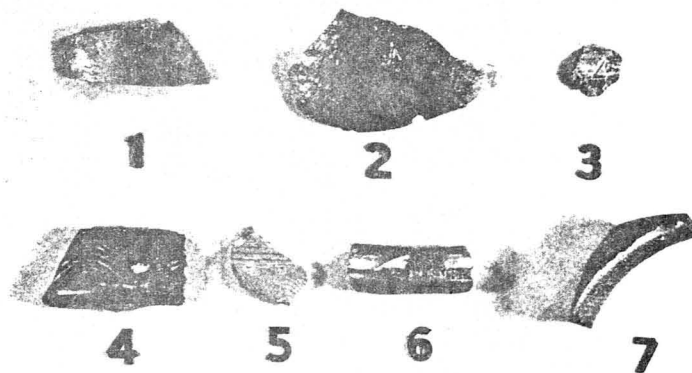
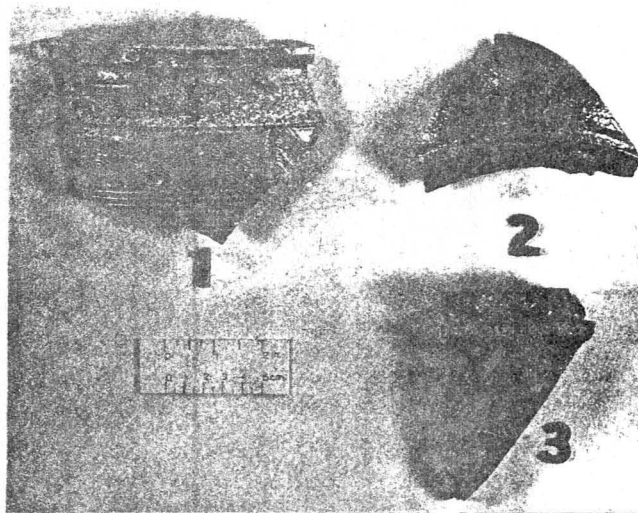


Plate 26. 13A106: Stoneware Ceramics



Plate 27. 13MA106: Kiln Furniture and Metal Artifacts

Top: Category F (kiln shelves) Kiln Furniture. These kiln shelves are about 2" thick and are thus almost twice as thick as the 13MA103 kiln shelves. Note the heavy silicate deposit on the shelves.

Bottom: (1) Pick head; (2) skillet handle; (3) fork; (4) hook; (5) fork handle; (6) auger; (7) metal lid with glass insert; (8) stove part.

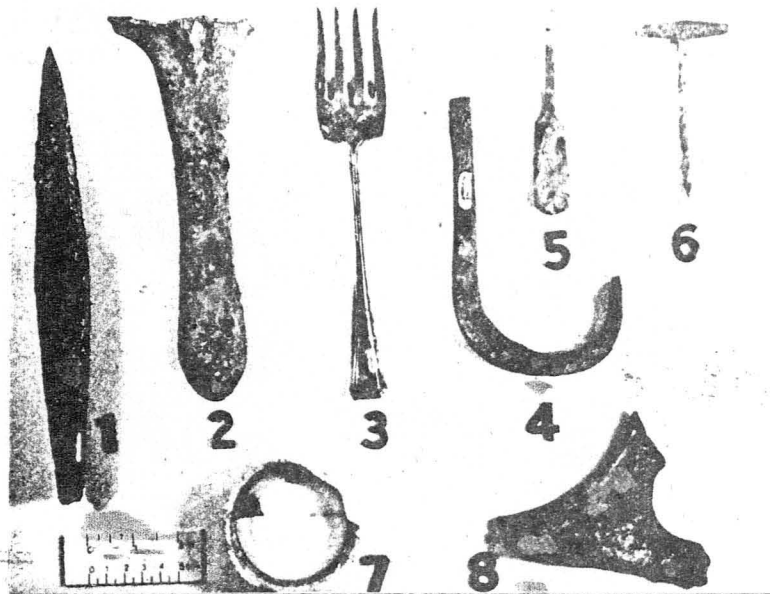
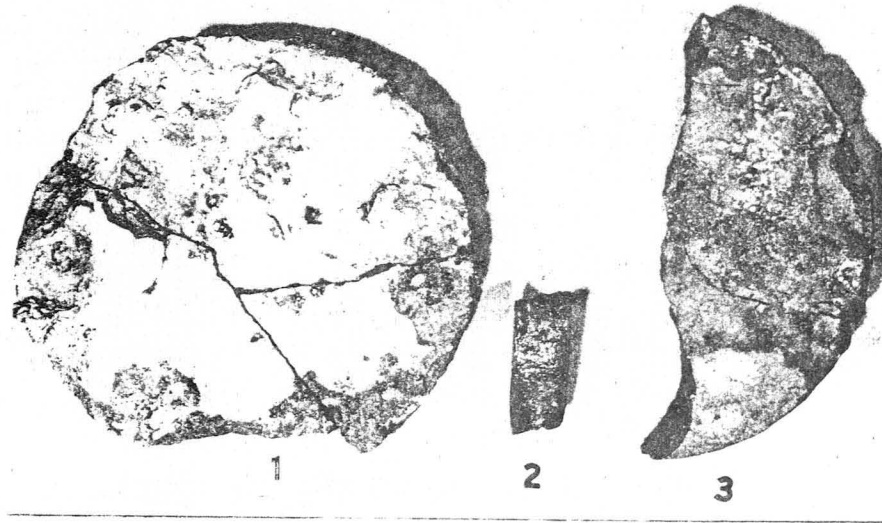


Plate 27. 13MA106: Kiln Furniture and Metal Artifacts



Plate 28. 13MA106: Metal, China, Pottery, Slate Artifacts

Top Left: Stoneware jar with a metal cap fitting.

Top Right: Prehistoric and historic artifacts. (1) Three Woodland potsherds; (2) catlinite pipe; (3) historic clay pipe; (4) ground slate fragment, possibly blackboard fragment; (5) "Ironstone" plate rim; (6) painted china--blue, green, and black; (7) blue and red sponge china; (8) blue transfer design; (9) grey transfer design; (10) china doorknob.

Bottom: Metal artifacts. (1) Sledge hammer head; (2) hinge; (3) unidentified; (4) unidentified; (5) square nail; (6) mule shoe; (7) jar lid; (8) handle; (9) fork handle with bone scales.



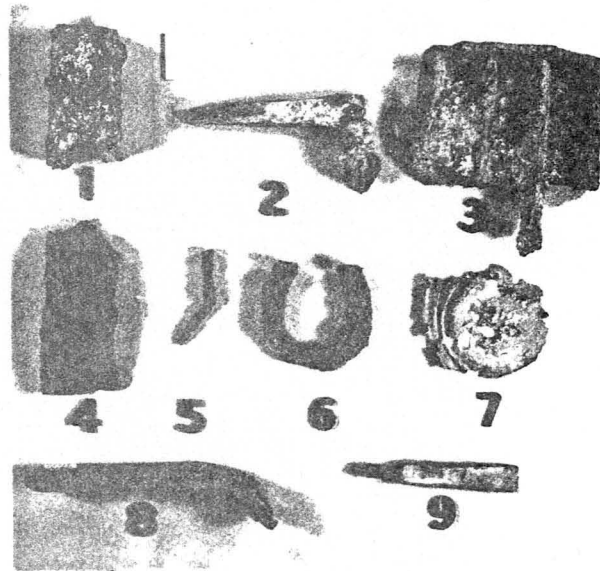
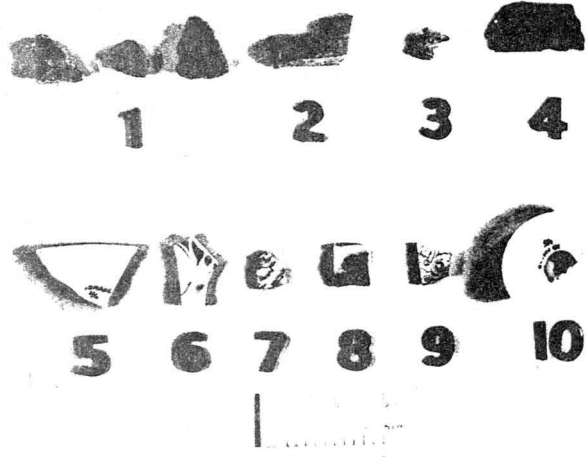


Plate 28. 13MA103: Metal, China, Pottery, Slate Artifacts



Plate 29. 13MA103: Thomas Smith Signed Pot  
The only signed pot found at 13MA103. The signature was scrawled  
and almost undecipherable.

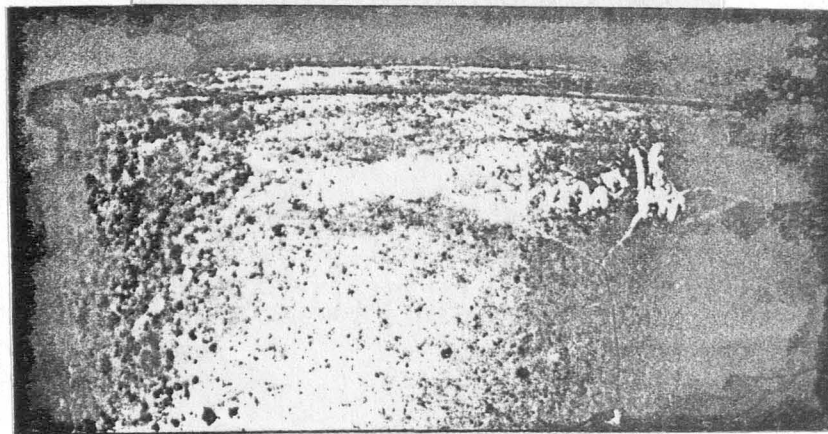
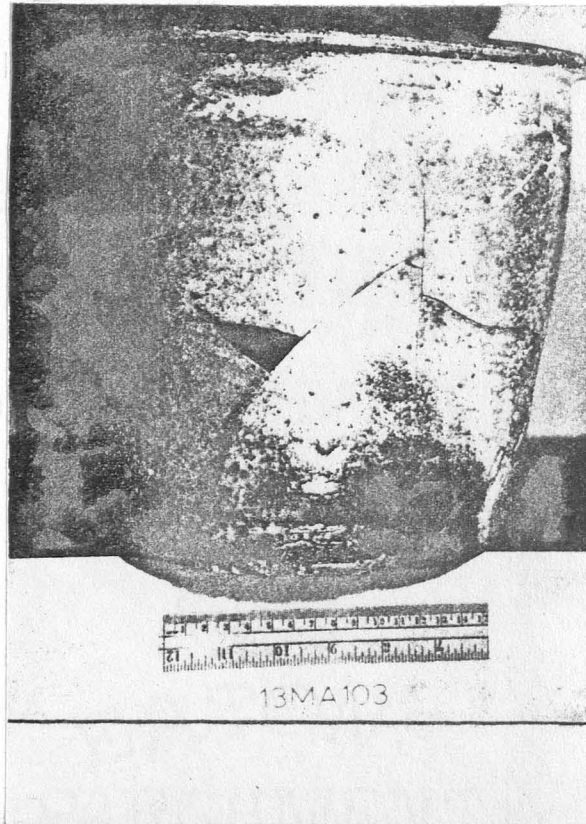


Plate 29. 13MA103: Thomas Smith Signed Pot