DRAFT

THE HISTORIC OCCANEECHI: AN ARCHAEOLOGICAL INVESTIGATION OF CULTURE CHANGE

Final Report of 1984 Investigations

Edited by

Roy S. Dickens, Jr.
H. Trawick Ward
and
R. P. Stephen Davis, Jr.

with contributions by

Linda F. Carnes
R.P. Stephen Davis, Jr.
Roy S. Dickens, Jr.
Kristen Johnson Gremillion
Julia E. Hammett
Mary Ann Holm
James H. Merrell
Gary L. Petherick
Bryan P. Sorohan
V. Ann Tippitt
H. Trawick Ward
Homes Hogue Wilson

Research Laboratories of Anthropology
University of North Carolina
Chapel Hill

July, 1985

Report prepared under grants from the National Geographic Society and the University of North Carolina.

ACKNOWLEDGMENTS

The editors and authors of this report wish to acknowledge with great appreciation the following people for their contributions to the analysis phase of the Siouan Project:

John Bivins
Jean Black
John Braxton
Leslie Bright
Robert Butler
Joffre Coe
Gayle Fritz
Michael Hartley
George Holcomb
Merry Outlaw
Brad Rauschenburg
Elizabeth Reitz
Estella Stansbury
Jack Weaver
Jack Wilson, Jr.
Peter Wood
Richard Yarnell

Field crews for the two seasons reported herein were:

1983

Graduate Students	Undergraduates
Kristen Gremillion	John Boldt
Mary Ann Holm	Patricia Curry
Janet Hightower	Suzanne DePalma
Gary Petherick	Dale Hamby
Daniel Simpkins	William Jurgelski
Beverly Sizemore	Bryan Sorohan
Homes Wilson	Copper Wilson

1984

Graduate Students	Undergraduates
Linda Carnes	Giles Bissonette
Kristen Gremillion	John Boldt
Julia Hammett	Deanne Boisvert
Mary Ann Holm	Nathan Holiday
Gary Petherick	Scott Kehoe
Daniel Simpkins	Ann Long
Ann Tippitt	Jane McManus
	Lauren Murphy
	Teresa Rutherford
	Dunja Schelper
	Andrea Sharpe
	Bryan Sorohan
	Esther White
	Susan Yarnell

A special thanks is due Frank Fredricks, owner of the Wall and Fredricks sites, for his interest and assistance throughout the project.

TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS. ii

LIST OF FIGURES. vii

LIST OF TABLES xvii

CHAPTER I. INTRODUCTION, by Roy S. Dickens, Jr., H. Trawick Ward, and R.P. Stephen Davis, Jr. 1

Historical Background. 3

Archaeological Background. 6

Siouan Project 10

1984 Fieldwork 13

Preface to the Report. 21

CHAPTER II. "THIS WESTERN WORLD": THE EVOLUTION OF THE PIEDMONT, 1525-1725, by James H. Merrell. 28

CHAPTER III. ARCHITECTURE AND FEATURES AT THE FREDRICKS, WALL, AND MITCHUM SITES, by Gary L. Petherick 53

Introduction 53

Wall Site. 56

Mitchum Site 105

Fredricks Site 126

Comparisons and Conclusions. 168

CHAPTER IV. MORTUARY PATTERNS AT THE FREDRICKS, WALL, AND MITCHUM SITES, by H. Trawick Ward 179

Introduction 179

Approaches to Mortuary Analysis. 180

Ethnohistoric Background 183

Archaeological Background. 192

The Susquehannock Connection 202

Fredricks Site Burials 206

Page

Discussion of Fredricks Site Burials 235

Wall Site Burials (1938, 1940-41). 246

Wall Site Burials (1983) 247

Discussion of Wall Site Burials. 251

The Mitchum Site Burial. 252

Summary of Mortuary Data 253

Socio-Political Implications of the Fredricks Site Burials 255

CHAPTER V. HUMAN SKELETAL REMAINS FROM THE WALL AND FREDRICKS SITES, by Homes Hogue Wilson. 260

Introduction 260

Demographic Analysis 262

Pathologies. 292

Diet, Health, and Trace Element Analysis 310

Biological Distance and Diversity. 322

Conclusions. 335

CHAPTER VI. EUROAMERICAN ARTIFACTS FROM THE FREDRICKS, WALL, AND MITCHUM SITES, by Linda F. Carnes 340

Introduction 340

Methods. 341

Euroamerican Artifacts by Functional Group 344

Interpretations. 391

Conclusions. 413

CHAPTER VII. SHELL ARTIFACTS FROM THE CAROLINA PIEDMONT, by Julia E. Hammett. 416

Introduction 416

Beadmaking Technology. 417

Ornaments from the Siouan Project. 421

Page

A Regional Perspective 445

Serrated Shells. 448

Conclusions. 450

CHAPTER VIII. POTTERY FROM THE FREDRICKS, WALL, AND MITCHUM SITES, by R. P. Stephen Davis, Jr. 451

Introduction 451

Analytic Methods 454

Fredricks Site Ceramic Sample. 465

Wall Site Ceramic Sample 493

Mitchum Site Ceramic Sample. 509

Intersite Comparisons. 520

Summary and Conclusions. 531

CHAPTER IX. LITHIC ARTIFACTS FROM THE FREDRICKS, WALL, AND MITCHUM SITES, by V. Ann Tippitt. 535

Research Questions 535

Analytic Methods 536

Results. 543

Interpretations. 566

Summary and Conclusions. 577

CHAPTER X. FAUNAL REMAINS FROM THE WALL AND FREDRICKS SITES, by Mary Ann Holm 578

Research Questions 578

Ethnohistoric References to the Use of Faunal Resources. 585

Excavation and Recovery Techniques Affecting Faunal Remains 591

Sampling and Analytic Techniques 592

Results of Analysis: Wall Site. 599

Results of Analysis: Fredricks Site 608

Page

Comparison of the Two Assemblages. 621

Habitat Preferences and Seasonality. 631

Diversity. 633

Conclusions. 636

CHAPTER XI. PLANT FOODS AT THE FREDRICKS, WALL, AND MITCHUM SITES, by Kristen Johnson Gremillion 642

Introduction 642

Methodological Issues. 643

Comparison of Plant Remains Assemblages. 655

A Cost-Benefit Approach to Change and Contact. 670

Summary and Conclusions. 676

REFERENCES CITED 678

APPENDICES 705

A. INVENTORY OF THE SKELETAL REMAINS 706

B. NON-DENTAL PATHOLOGIES. 718

C. DENTAL INVENTORY AND PATHOLOGIES. 724

D. LITHIC RAW MATERIAL DESCRIPTIONS. 730

LIST OF FIGURES

Figure		Page
1.	Hillsborough locality showing the Wall and Fredricks sites . .	2
2.	Edward Moseley's 1733 map locating "Acconeechy" on Eno River .	5
3.	Archaeological sites in the Siouan Project area.	7
4.	1938 excavations at the Wall site.	8
5.	Areal view of 1983 test excavation at the Fredricks site showing rectangular burial pits.	8
6.	Hillsborough archaeological district	14
7.	Aerial view of 1984 excavations at the Wall site (foreground) and Fredricks site (background).	15
8.	Removing plowzone at the Fredricks site.	15
9.	Trowelling at top of subsoil to expose archaeological features at the Fredricks site	17
10.	Overview of the 1984 excavation at the Fredricks site showing palisade and village cemetery.	17
11.	Plan of 1983-84 excavations at the Fredricks site.	19
12.	1938, 1940-41, and 1983-84 excavation areas at the Wall site .	57
13.	Excavation plan at the Wall site, 1938-1984.	58
14.	Plan of architecture and features at the Wall site	60
15.	Areal extent of the midden at the Wall site.	61
16.	Site stratigraphy at the Wall site, N-S sections	62
17.	Sq. 370R530 at the Wall site showing midden preserved beneath plowzone, and a portion of the posthole pattern of Palisade E	65
18.	Plan and profile of Feature 32, a small shallow basin, at the Wall site.	69
19.	Plan and profile of Feature 54, a large shallow basin, at the Wall site.	69
20.	Plan and profile of Feature 45, a large, amorphous shallow basin located within Structure J, at the Wall site	71

Figure		Page
21.	Plan and profiles of Feature 23 and 3-84, small deep pits, at the Wall site.	73
22.	Plan and profile of Feature 4-84, an irregular trench-like feature associated with Structure G, at the Wall site.	77
23.	Structure G at the Wall site after excavation of postholes and pits	88
24.	SYMAP of daub in the vicinity of Structures G and H at the Wall site.	93
25.	Excavation plan of the Mitchum site, 1983.	106
26.	Feature 1, a deep basin-shaped pit (shown in profile), at the Mitchum site	109
27.	Feature 6 (Mitchum site), a deep pit, shown in profile	109
28.	Plan and profile of Feature 1 at the Mitchum site.	110
29.	Plan and profile of Feature 6 at the Mitchum site.	110
30.	Feature 8, a large shallow basin, after excavation, at the Mitchum site	113
31.	Feature 14, a small shallow basin, after excavation, at the Mitchum site	113
32.	Plan and profile of Feature 8 at the Mitchum site.	114
33.	Plan and profile of Feature 14 at the Mitchum site	114
34.	Structure 1 at the Mitchum site after excavation of postholes.	122
35.	Excavation plan of the Fredricks site, 1983-1984	127
36.	SYMAP of aboriginal historic ceramics in the plowzone at the Fredricks site	129
37.	Overview of the 1984 excavations at the Fredricks site showing portions of the palisade and cemetery.	131
38.	Feature 9 at the Fredricks site, prior to excavation	134
39.	Feature 9 at the Fredricks site, after excavation.	134
40.	Plan and profile of Feature 9 at the Fredricks site.	135
41.	Feature 9 at the Fredricks site, showing stratigraphy of pit fill	136

Figure Page

42. Bottom of Feature 9 at the Fredricks site, showing rock clusters and charred plant remains on pit floor. 136

43. Feature 10 at the Fredricks site, after excavation 142

44. Feature 13 at the Fredricks site, after excavation 142

45. Plan and profile of Feature 10 at the Fredricks site 143

46. Plan and profile of Feature 13 Fredricks site. 143

47. Feature 11 at the Fredricks site, after excavation 145

48. Feature 12 at the Fredricks site, after excavation 145

49. Plan and profile of Feature 11 at the Fredricks site 146

50. Plan and profile of Feature 12 at the Fredricks site 146

51. Plan of architecture and features at the Fredricks site. . . . 150

52. Structure 1 and Feature 9 at the Fredricks site, prior to excavation 153

53. Structure 1 and Feature 9 at the Fredricks site, after excavation 153

54. SYMAP of daub in the plowzone at the Fredricks site. 157

55. Map showing the results of soil auger testing at the Fredricks site 160

56. SYMAP of features at the Fredricks site, based on the results of the auger testing 161

57. Excavation plan of the Fredricks site showing activity areas . 164

58. Relative frequency histogram of feature classes at the Wall, Mitchum, and Fredricks sites 169

59. Histogram showing the floor area of structures at the Wall, Mitchum, and Fredricks sites, and their associated storage pit volumes. 173

60. Results of soil auger testing at the Fredricks site showing the cemetery 207

61. Burial 1 at the Fredricks site 209

62. Plan and profile of Burial 1 at the Fredricks site. 209

63. Artifact cluster from Burial 1 at the Fredricks site 210

Figure		Page
64.	Burial 2 at the Fredricks site	213
65.	Plan and profile of Burial 2 at the Fredricks site	213
66.	Artifact cluster from Burial 2 at the Fredricks site	214
67.	Small check-stamped pottery vessel from Burial 2 at the Fredricks site	214
68.	Burial 3 at the Fredricks site	216
69.	Plan and profile of Burial 3 at the Fredricks site	216
70.	Artifact cluster from Burial 3 at the Fredricks site	217
71.	Smoking kit from Burial 3 at the Fredricks site.	218
72.	Burial 4 at the Fredricks site	221
73.	Plan and profile of Burial 4 at the Fredricks site	221
74.	Burial 5 at the Fredricks site	223
75.	Plan and profile of Burial 5 at the Fredricks site	223
76.	Artifact cluster from Burial 5 at the Fredricks site	224
77.	Bells associated with Burial 7 at the Fredricks site	224
78.	Burial 6 at the Fredricks site	225
79.	Plan and profile of Burial 6 at the Fredricks site	225
80.	Burial 8 at the Fredricks site	230
81.	Plan and profile of Burial 8 at the Fredricks site	230
82.	Artifact cluster from Burial 8 at the Fredricks site	231
83.	Pot with artifact cluster from Burial 8 at the Fredricks site.	232
84.	Burial 9 at the Fredricks site	234
85.	Plan and profile of Burial 9 at the Fredricks site	234
86.	Fill profiles of Burial Groups 1 (below) and 2 (above) at the Fredricks site	236
87.	Fill profiles of Burial Groups 3 (below) and 4 (above) at the Fredricks site	238
88.	Burial 1-83 at the Wall site	248

Figure		Page
89.	Burial 1 at the Mitchum site	248
90.	Schematic plan of village-burial spatial relationships	254
91.	Mortality curves for the Fredricks, Wall, Upper Saratown, and Shannon skeletal samples	270
92.	Mortality curves by sex for the Shannon and Upper Saratown skeletal samples	275
93.	Left humerus (top) compared with right humerus (bottom) of Burial 1 at the Wall site.	296
94.	Right parietal fragment of Burial 4 from the Fredricks site, showing the cut mark or traumatic injury	296
95.	Vertebral lipping of Burials 1 (left) and 3 (right) from the Wall site.	299
96.	Patella and calcaneus of Burial 3 from the Wall site, showing possible tendonitis.	299
97.	Thoracic vertebrae of Burials 4 (left) and 9 (right) from the Fredricks site, with herniated disc or Schmorl's nodes	303
98.	Closeup of Burial 4 from the Wall site, with orbits showing cribra orbitalia	303
99.	Top view of cranium of Burial 4 from the Wall site, showing frontal and parietal pitting related to spongy hyperostosis.	306
100.	Front view of crania from the Fredricks site Burial 5 (left) and Wall site Burial 1 (right)	330
101.	Top view of crania from the Wall site Burial 1 (left) and Fredricks site Burial 5 (right).	331
102.	Side view of crania from the Wall site Burial 1 (left) and Fredricks site Burial 5 (right).	331
103.	Front view of crania from Upper Saratown Burial 73 (left) and Fredricks site Burial 5 (right).	332
104.	Top view of crania from the Fredricks site Burial 5 (left) and Upper Saratown Burial 73 (right)	332
105.	Side view of crania from Upper Saratown Burial 73 (left) and the Fredricks site Burial 5 (right).	333
106.	Front view of crania from Upper Saratown Burial 73 (left) and the Wall site Burial 1 (right)	333

Figure Page

107. Top view of crania from the Wall site Burial 1 (left) and Upper Saratown Burial 73 (right) 334

108. Side view of crania from Upper Saratown Burial 73 (left) and the Wall site Burial 1 (right) 334

109. Sample of spherical lead ammunition from the Fredricks site. . 350

110. Gunflints from the Fredricks site: aboriginal (a); European spall type (b); and European "chip" style (c) 350

111. Dog-lock hammers from Upper Saratown (31Skla) that are similar in style to gun from Burial 6 at the Fredricks site. 354

112. Close-up of dog-lock firing mechanism from Burial 6 at the Fredricks site 354

113. Sample of clothing fasteners from the Fredricks site 356

114. Scissors from burials at the Fredricks site. 356

115. Wine (rum) bottle from Burial 3 at the Fredricks site. 361

116. Wine (rum) bottle from Burial 4 at the Fredricks site. 361

117. Profile of whole wine bottle from Burial 4 at the Fredricks site 362

118. Latten spoon from Burial 8 at the Fredricks site 367

119. Close-up of touch mark on Burial 8 spoon bowl. 367

120. Sample of glass (a-g) and ivory (h) beads from the Fredricks site 370

121. Sample of brass bells from Burial 7 (a,c) and Feature 13 (b) at the Fredricks site. 370

122. C-shaped wire bracelets from Burial 6 at the Fredricks site (after cleaning) 375

123. Sample of aboriginally modified metal artifacts from the Fredricks site: brass kettle fragments (a-b); brass wire fish hook (c); and brass wire coil (d). 376

124. Sample of pipes from the Fredricks site: aboriginal pipes (a-c); European kaolin pipes (d-f); and European pewter pipe (g) 376

125. Cast pewter tulip bowl style pipe from Burial 3 at the Fredricks site 381

Figure Page

126. Hand-carved pipe stem from Burial 6 (left) and pewter pipe bowl liner from Feature 13 (right) at the Fredricks site . . 381

127. Artist's reconstruction of pewter pipestem with wooden bowl and pewter bowl liner, based on artifacts from Burial 6 and Feature 13 at the Fredricks site 382

128. Iron ember tongs from Burial 3 at the Fredricks site 384

129. Cleaned and treated iron axe head from Burial 5 at the Fredricks site 384

130. Broad-bladed iron hoe from Burial 6 at the Fredricks site. . . 387

131. Narrow-bladed iron hoe from Burial 9 at the Fredricks site . . 387

132. Two bone-handled, steel-bladed case knives from Burial 1 at the Fredricks site 389

133. Spatial distribution of iron nails at the Fredricks site . . . 393

134. Spatial distribution of brick fragments at the Fredricks site. 394

135. Spatial distribution of glass artifacts at the Fredricks site. 395

136. Spatial distribution of European ceramics at the Fredricks site 396

137. Spatial distribution of metal artifacts at the Fredricks site. 397

138. Spatial distribution of gunflints at the Fredricks site. . . . 398

139. Spatial distribution of miscellaneous historic artifacts at the Fredricks site 399

140. Spatial distribution of European trade pipes at the Fredricks site 400

141. Spatial distribution of aboriginal pipes at the Fredricks site 401

142. Pendants and gorgets: plain pendants from Burial 1-83 at the Wall site (a), Virl96 (b), and Burial 2 at the Wall site (c-e); drilled dot pendants from Burial 1 at the Fredricks site (f-g); rattlesnake gorgets from Upper Saratown (h-i) . 422

143. Close-up of pendants from Burial 1 at the Fredricks site . . . 422

144. Comparison of designs on large pendant from Burial 1 and on spoon from Burial 8 at the Fredricks site. 425

Figure — Page

145. Evidence of beadmaking: pendant blank (a); ground fragments of large univalve shell (b,d-e); reground segment bead (c). 425

146. Tube beads from the Fredricks site (a-c), Vir196 (d-e), and Upper Saratown (f-g); tube blank from Upper Saratown (h) . . 428

147. Bead types from the Wall site: columella segments from Burial 1-83 (a); medium-sized (b) and small (c) loose segments; marginellas (from top to bottom: shoulder ground, spire ground, and spire and base ground) (d); and disks (e) . . . 428

148. Bead types from the Fredricks site: tube bead (a); runtees (b); barrel/cylinders (c); spheres (d); wampum (e); and disks (f). 432

149. Shell disk beads from the Wall site (top) and Fredricks site (bottom) 435

150. Frequency distribution of shell disk beads by screen size. . . 437

151. Serrated shells from the Wall site showing similarity of edge form to scrape marks on inside of pottery sherd. 449

152. Definition of vessel portion attribute states. 455

153. Definition of rim and lip form attribute states. 457

154. Relative frequency distributions and statistical evaluation of selected attributes for medium sand-tempered plain, check-stamped, and net-impressed sherds from the Fredricks site. . 480

155. Selected plain (a-e), brushed (f-h), and cord-marked (i-j) sherds from the Fredricks site 486

156. Selected check-stamped sherds from the Fredricks site. 487

157. Selected net-impressed (a-e), brushed (f), simple-stamped (g-j), check-stamped (k-l), and cob-impressed (m-n) sherds from the Fredricks site. 488

158. Whole vessels from Burial 2 (a), Burial 8 (b), and Burial 6 (c) at the Fredricks site. 489

159. Profiles of vessels and selected vessel fragments from the Fredricks site 491

160. Selected simple-stamped sherds from the Wall site. 499

161. Selected check-stamped (a-h) and plain (i-q) sherds from the Wall site. 500

Figure		Page
162.	Undecorated (a) and decorated (b) plain vessel sections from the Wall site.	501
163.	Whole vessels from Burial 3-83 (a-b) and Burial 1-83 (c-d) at the Wall site.	502
164.	Relative frequency distributions and statistical evaluation of selected attributes for plain, simple-stamped, and check-stamped sherds from the Wall site.	503
165.	Profiles of vessels and selected vessel fragments from the Wall site.	507
166.	Selected plain (a-c), simple-stamped (d-i), brushed (j-l), and cob-impressed (m) sherds from the Mitchum site	515
167.	Selected net-impressed sherds from the Mitchum site.	516
168.	Relative frequency distributions and statistical evaluation of selected attributes for plain, brushed, simple-stamped, and net-impressed sherds from the Mitchum site	517
169.	Map locating sites used in the comparative ceramic analysis.	522
170.	Dendrogram showing results of ceramic cluster analysis	529
171.	Chipped-stone drills from the Fredricks site (a-b) and Wall site (c-d)	550
172.	Chipped-stone gravers and perforators from the Wall site (a-d) and Fredricks site (e-g)	550
173.	Random and bipolar cores from the Fredricks site (a-c) and Wall site (d-e).	553
174.	Triangular projectile points from the Fredricks site	553
175.	Woodland and Archaic projectile points from the Fredricks site	557
176.	SYMAP of chipped-stone tools at the Fredricks site	559
177.	SYMAP of flakes at the Fredricks site.	560
178.	Triangular projectile points from the Wall site.	562
179.	Archaic and Paleo-Indian projectile points from the Wall site.	562
180.	SYMAP of flakes at the Wall site	564
181.	SYMAP of chipped-stone tools at the Wall site.	564

Figure Page

182. Triangular projectile points from the Mitchum site 568

183. Chipped-stone tools from the Mitchum site. 568

184. Bone beamer and awls from the Wall site. 609

185. Bivariate plots of rank values for 12 animal species at the Wall site and Fredricks site 629

LIST OF TABLES

Table		Page
1.	Summary of feature attributes for pits and basins at the Wall site.	68
2.	Nonbotanical remains, wood charcoal, and plant food remains from the 1983-1984 excavations at the Wall site.	76
3.	Summary of structure attribute measurements at the Wall site .	84
4.	Selected data related to structure maintenance and placement at the Wall site	99
5.	Summary of feature attributes at the Mitchum site.	117
6.	Amounts and percentages of nonbotanical remains, wood charcoal, and plant food remains from feature fill at the Mitchum site	119
7.	Summary of feature attributes at the Fredricks site.	133
8.	Nonbotanical remains, wood charcoal, and plant food remains from the 1983-1984 excavations at the Fredricks site	140
9.	Summary of structure attribute measurements at the Fredricks site	152
10.	Pit dimensions of the Fredricks site burials	211
11.	Acculturation indices for Fredricks site burial groupings.	241
12.	Artifacts associated with the Fredricks site burials by age categories	243
13.	Age of subadults from the Wall and Fredricks sites	264
14.	Age of the adults from the Wall and Fredricks sites.	266
15.	2x2 Contingency table to test the significance of male and female mortality at the prehistoric Shannon site	277
16.	2x3 Contingency table to test the significance of male and female mortality at the prehistoric Shannon site	278
17.	2x2 Contingency table to test the significance of male and female mortality at Upper Saratown	279
18.	2x3 Contingency table to test the significance of male and female mortality at Upper Saratown	281

Table		Page
19.	2x2 Contingency table to test the significance of male mortality at the Shannon and Upper Saratown sites.	282
20.	2x3 Contingency table to test the significance of male mortality at the Shannon and Upper Saratown Sites.	283
21.	2x2 Contingency table to test the significance of female mortality at the Shannon and Upper Saratown sites.	284
22.	2x3 Contingency table to test the significance of female mortality at the Shannon and Upper Saratown sites.	285
23.	Life table for the Shannon site.	287
24.	Life table for the Wall site	288
25.	Life table for the Upper Saratown site	289
26.	Life table for the Fredricks site.	290
27.	NAA of trace elements in bones from the Wall site.	315
28.	NAA of trace elements in bones from the Fredricks site	316
29.	Mean cranial indices	327
30.	Post-cranial indices	328
31.	Euroamerican trade items from trade lists (with deerskin values) for the Fredricks, Mitchum, and Upper Saratown sites.	343
32.	Frequency of historic artifacts by site, context, and functional classification.	345
33.	Kaolin pipe stem fragments by context and bore diameter.	378
34.	Frequency of Euroamerican artifacts as burial associations and in pitfill-plowzone contexts	406
35.	Frequency of Euroamerican artifacts in burial pitfill and non-burial pitfill	412
36.	Preliminary inventory of shell artifacts from selected Southeastern sites	427
37.	Summary of marginella ornaments from the Wall site	438
38.	Inventory of shell ornaments from the Wall site.	440
39.	Summary of wampum from the Fredricks site.	442

Table		Page
40.	Inventory of shell ornaments from the Fredricks site	444
41.	Frequency of Fredricks site sherds and vessels by size	466
42.	Frequency of Fredricks site sherds by temper and exterior surface treatment	467
43.	Frequency of Fredricks site sherds from feature and burial contexts	469
44.	Summary of coarse sand-tempered sherds from the Fredricks site	470
45.	Summary of medium sand-tempered sherds from the Fredricks site	471
46.	Summary of fine sand-tempered sherds from the Fredricks site	472
47.	Summary of coarse crushed quartz-tempered sherds from the Fredricks site	473
48.	Summary of medium crushed quartz-tempered sherds from the Fredricks site	474
49.	Summary of fine crushed quartz-tempered sherds from the Fredricks site	475
50.	Summary of coarse crushed feldspar-tempered sherds from the Fredricks site	476
51.	Summary of fine crushed feldspar-tempered sherds from the Fredricks site	477
52.	Evaluation of differences in spatial distribution of selected sherd categories at the Fredricks site	483
53.	Definition of ceramic groups based on attribute similarities at the Fredricks site	485
54.	Frequency of Wall site sherds and vessels by size	494
55.	Frequency of Wall site sherds by temper and exterior surface treatment	495
56.	Summary of Wall site sherds by exterior surface treatment	497
57.	Comparison of selected attributes for plowzone and midden contexts	505
58.	Frequency of Mitchum site sherds by size	510

Table		Page
59.	Frequency of Mitchum site sherds by temper and exterior surface treatment	512
60.	Summary of selected sherd categories from the Mitchum site	514
61.	Summary of assemblages used in intersite ceramic analysis	523
62.	Surface treatment percentages for analyzed ceramic assemblages	524
63.	Correlation matrix for data used in the intersite ceramic analysis	526
64.	Factor loading matrix	527
65.	Distribution of debitage by site	545
66.	Distribution of retouched flakes by site	546
67.	Chipped-stone artifacts from the Fredricks site	547
68.	Distribution of chipped-stone tools by site	552
69.	Results of triangular projectile point cluster analysis	554
70.	Distribution of projectile point fragments by site	556
71.	Frequency of flakes from the Mitchum site	567
72.	Percent of triangular projectile point forms by site	571
73.	Percent of raw material types represented by debitage from the Wall, Fredricks, and Mitchum sites	574
74.	Percent of flakes and chipped-stone tools of local raw materials	575
75.	Animal remains from the Wall Site	601
76.	Animal remains from the Fredricks Site	610
77.	Expected and actual representation of deer skeletal elements	624
78.	Estimated meat yield in pounds	628
79.	Summary of species diversity measures	634
80.	Summary of plant remains from the Wall, Fredricks, and Mitchum sites	648
81.	Percent of plant food remains from the Wall, Fredricks, and Mitchum sites	650

Table | Page

82. Ubiquity of plant remains, as percent of flotation samples, at the Wall, Fredricks, and Mitchum sites. 651

83. Seed counts from the Fredricks site. 653

84. Seed counts from the Wall and Mitchum sites. 654

85. Percent of nutshell from the Wall, Fredricks, and Mitchum sites. 657

86. Comparison of plant remains from burials, features, and structures at the Fredricks site 660

87. Distribution of seeds from the Wall, Mitchum,and Fredricks sites 665

CHAPTER I

INTRODUCTION

by

Roy S. Dickens, Jr., H. Trawick Ward,
and R.P. Stephen Davis, Jr.

This report focuses on archaeological research conducted by the Research Laboratories of Anthropology of the University of North Carolina at Chapel Hill on three Indian village sites in the Piedmont region of North Carolina. The Fredricks site (Figure 1), which was occupied between about 1680 and 1710, represents the last major village of the Occaneechi tribe; the Wall site is a protohistoric (ca. 1545) village of an unknown group; and the Mitchum site is a village, probably of the Saxapahaw tribe, that was occupied between about 1660 and 1680.

Data for the Fredricks site were obtained from excavations conducted in 1983 and 1984; the 1984 season was sponsored by a grant from the Committee for Research and Explorations of the National Geographic Society. Information obtained during 1983 and 1984 from the Wall site was supplemented in some categories by data from work done in 1938, 1940, and 1941. Information on the Mitchum site was collected in 1983.

Investigations at these three sites are part of a larger project--the Siouan Project--which has as its goal the elucidation of culture change among Indian groups of the North Carolina-southern Virginia Piedmont during the Historic period. The Fredricks, Wall, and Mitchum sites are important links in this research effort. The former two sites are located in the same bend of the Eno River in Orange County, North Carolina. Their spatial proximity and the fact that they are separated in time by about 150-200 years, make them excellent

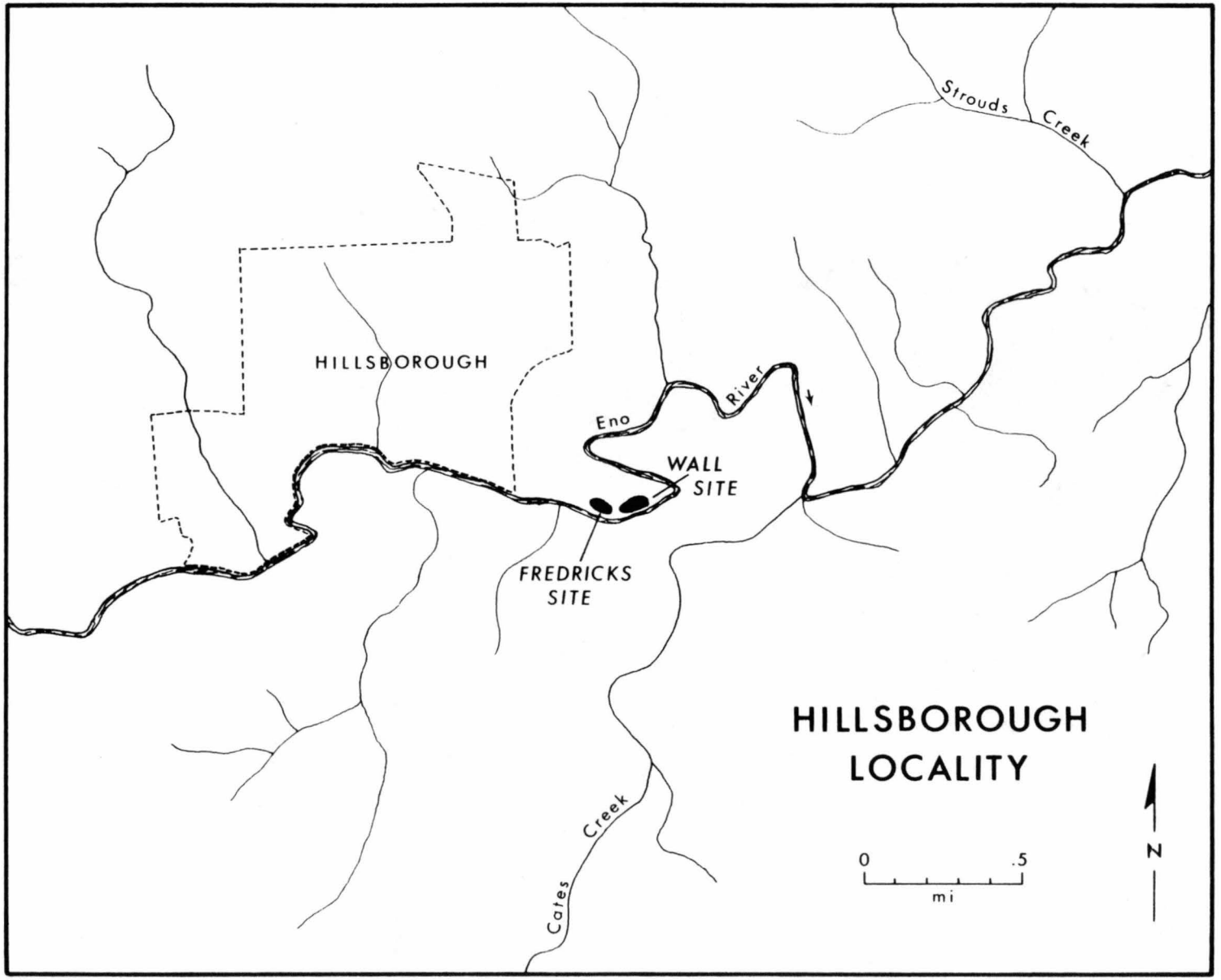


Figure 1. Hillsborough locality showing the Wall and Fredricks sites.

candidates for comparison within the culture-change theme. The Mitchum site, which lies on the Haw River in Chatham County only a short distance from the previous two sites and which represents a point in time intermediate to the other two, also fits well into this research theme.

When information from these three closely-spaced sites is complemented by information from other excavated sites in the larger research area, a basis is obtained for examining specific questions about changes in technology, settlement patterns, social organization, mortuary practices, subsistence activities, and physical conditions on the Piedmont during a time that spans initial European contact to the disintegration of many of the Indian societies. As the reader will see, however, only preliminary interpretations can be offered by most of the researchers. Nevertheless, some productive results have been obtained, and there is good reason to believe that additional data from these and other sites will contribute to secure answers in the near future.

HISTORICAL BACKGROUND

When European explorers first entered the Virginia and North Carolina Piedmont, they found it occupied by several small Indian tribes who shared a common culture and a similar language. These Siouan tribes also shared a mixed subsistence of hunting, gathering, and agriculture, and a social system regulated by ties of kinship and reciprocity.

As the colonial frontier was pushed into the Piedmont and as Indian and European interaction was intensified, the Occaneechi tribe became prominant among the Siouan groups. The Occaneechi controlled much of the deerskin trade, and their language became the lingua franca of the Piedmont. Their pivotal role in the fur trade came about partly because

one of their villages, on an island in the Roanoke River, was astride the Great Trading Path from Virginia to Georgia.

The island village of the Occaneechi was visited by John Lederer in 1670 (Cumming 1958). After the Occaneechis "barbarously murthered" six Cherokees who were attempting to establish trade relations with the Virginia colonists, Lederer, fearing for his life, cut short his visit. James Needham and Gabriel Arthur, who traveled through the same territory in 1673, observed that the Occaneechis controlled the colonial trade, which endowed them with an importance that far exceeded their numbers (Alvord and Bidgood 1912). They seem to have maintained and reinforced their role in the trade network through warfare and intimidation. Thus, the Occaneechi tribe earned a fierce and pugnacious reputation, which eventually led to an eruption of armed hostilities with Nathaniel Bacon's militia in 1676.

After pursuing a group of Susquehannock Indians into Occaneechi territory, Bacon convinced some "Manakins" and "Annalectins", who had also joined the Occaneechi, to aid his forces in defeating the Susquehannocks. After that victory was accomplished, Bacon then attacked the Occaneechi (Billings 1975:267-269).

After the battle with Bacon, the Occaneechis were so reduced in numbers that they could no longer defend their island stronghold on the Roanoke. The survivors abandoned their home territory, retreated southward, and re-established a village on the Eno River, near present Hillsborough, North Carolina (Figure 2). In 1701, English surveyor John Lawson visited the relocated Occaneechi Town where he observed that there were "no Indians having greater Plenty of Provisions than these" (Lefler 1967:61).

After Lawson's visit, conditions worsened for the Occaneechi, as

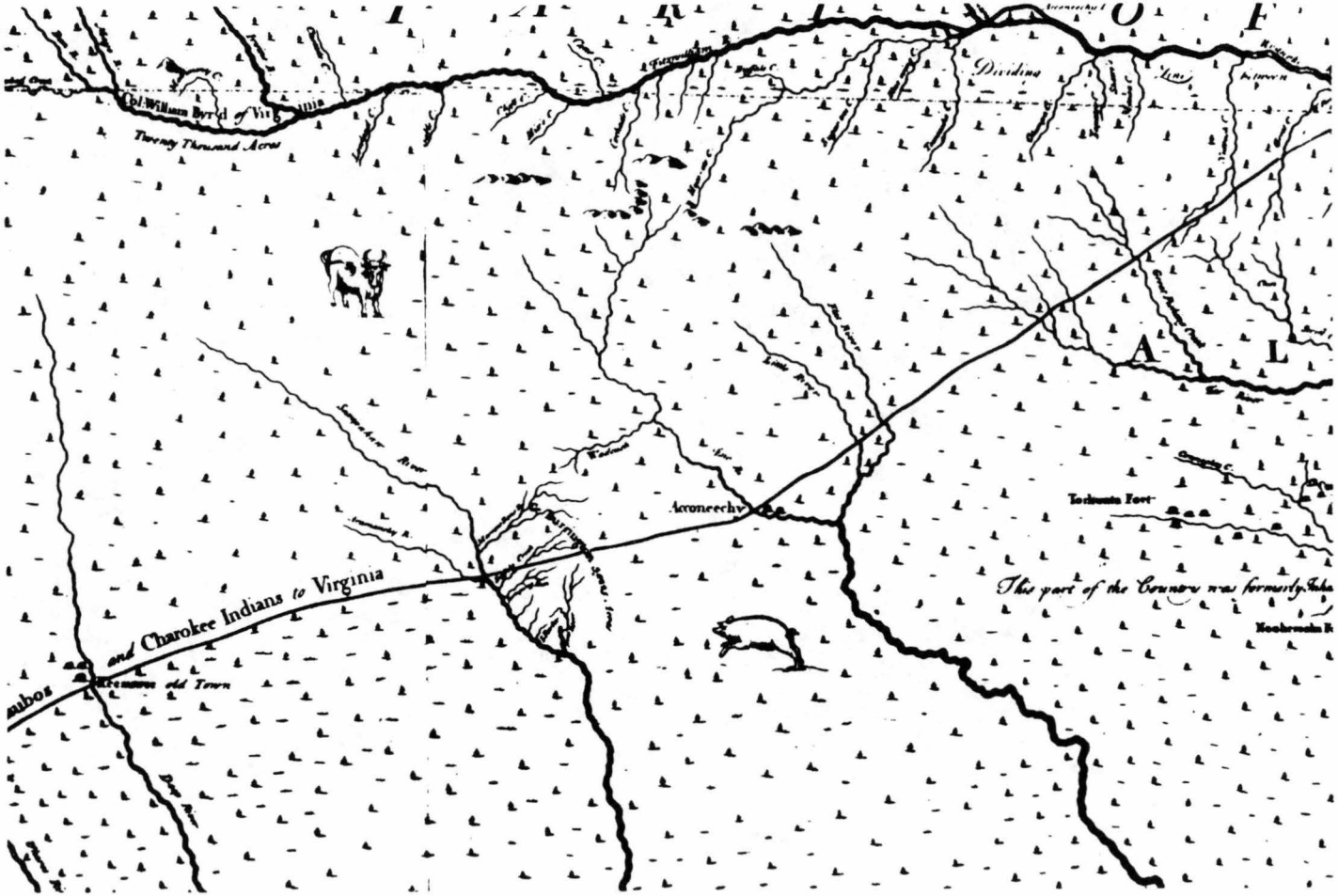


Figure 2. Edward Moseley's 1733 map locating "Acconeechy" on Eno River.

well as for the other Siouan tribes, and by 1722, disease, warfare, and rum had virtually destroyed Indian societies in the Piedmont. Remnants of once autonomous groups either huddled together around Fort Christana in Virginia or moved to join their cousins, the Catawba, in South Carolina. By 1730, except for a few isolated Indian families, the North Carolina Piedmont lay mostly vacant, awaiting the arrival of hordes of colonists from Virginia, Maryland, and Pennsylvania.

ARCHAEOLOGICAL BACKGROUND

Archaeologists first became interested in studying the remains of the Piedmont Siouans in the 1930s, when village sites thought to be associated with the Keyauwee, Sara, Saponi, and Occaneechi were subjected to excavations of varying intensity (Coe 1937; Lewis 1951). Though broad in scope, these early efforts were not focused by a structured research design. At most sites, only small areas were tested, and collections were gathered primarily with an eye toward identifying pottery types of the different tribes. As part of this early research, extensive excavations were carried out between 1938 and 1941 at the Wall site on the Eno River near Hillsborough (Figures 3 and 4). This site was thought to represent the Occaneechi village visited by Lawson in 1701.

The next archaeological research in the Siouan area was undertaken in the 1940s on the Roanoke River prior to the inundation of Kerr Reservoir in North Carolina and Virginia (Miller 1962). Under the auspices of the Smithsonian Institution's River Basin Salvage Program, extensive excavations were conducted in the reservoir area at the Clarksville site on the east bank of the river opposite "Occaneechi Island", and on the island itself at the Tollifero site (Figure 3).

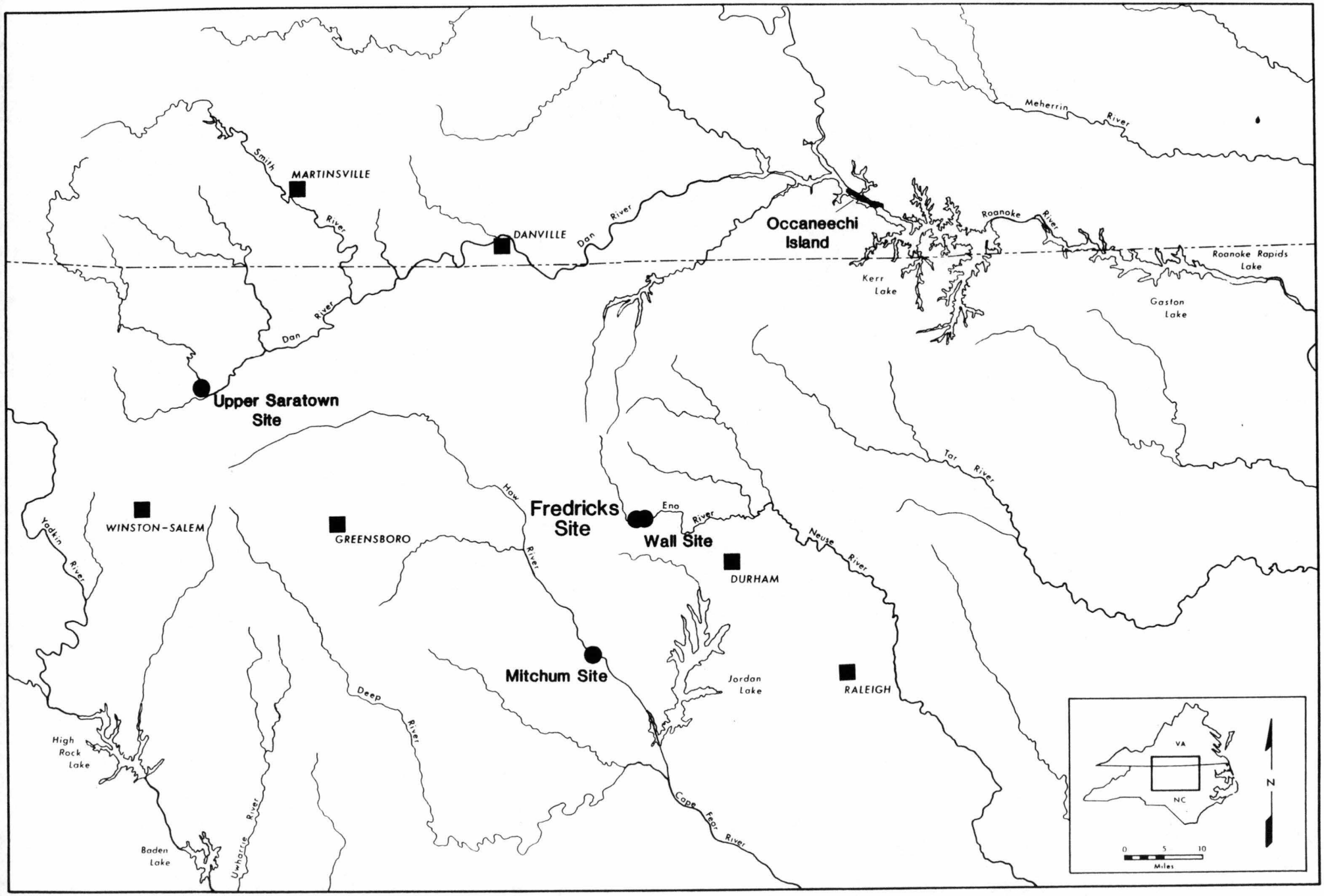


Figure 3. Archaeological sites in the Siouan Project area.



Figure 4. 1938 excavations at the Wall site.



Figure 5. Areal view of 1983 test excavations at the Fredricks site showing rectangular burial pits.

These two sites contained information on the prehistoric Siouan inhabitants of the area, but no evidence was found of the 1670 Occaneechi village visited by Lederer, Needham and Arthur, and Bacon.

In 1972, the Research Laboratories of Anthropology at the University of North Carolina began excavations at the Upper Saratown site on the Dan River in Stokes County, North Carolina (Figure 3). These investigations, which lasted for ten consecutive field seasons, exposed a group of circular houses with associated storage pits and burials, as well as a sequence of village palisades (Ward 1980; J. Wilson 1983). Most of the burials were accompanied by nonutilitarian (ornamental) European trade items. Ethnohistoric records and the recovered trade artifacts suggested that this site was occupied during the late 1600s by the Sara, one of the Piedmont Siouan tribes and neighbors of the Occaneechi.

When combined, these initial efforts to investigate the "Siouan problem" seem substantial. Each project, however, was developed as an end in itself and was not guided by an overall set of research objectives. Accordingly, archaeological coverage of the Siouan area is uneven. For example, the upper Dan River valley has been extensively investigated, whereas the Haw and Eno drainages to the southeast have received relatively little attention. Surveys have been opportunistic rather than systematic, and a few larger sites have been tested and excavated at the virtual exclusion of many small ones. Despite all of their shortcomings, these previous investigations do provide a foundation for more systematic studies of Piedmont Siouan culture.

SIOUAN PROJECT

Although the need to approach Siouan archaeology with a set of specific goals, operationalized by an overall research strategy, has been obvious, such a course of study was not formulated until the winter and spring of 1983. At that time, staff of the Research Laboratories of Anthropology of the University of North Carolina at Chapel Hill developed a research design which included a set of questions focused on Siouan culture change and the archaeological correlates of that change.

Initial archaeological investigations of the Siouan Project have focused on the Dan, Eno, and Haw River drainages, heartland of the Piedmont Siouans during the Historic period. Extant ethnohistoric and archaeological information suggest that there was considerable cultural diversity among the groups in these three river systems, reflecting possible differences in ethnicity, microenvironmental adaptation, and intensity of interaction with the English. Although the Siouan tribes seem to have commonly shifted their villages and to have even changed their territories, by 1675 the locations of their settlements were more or less stabilized within the confines of these three drainages. The Sara, Tutelo, and Saponi occupied the territory drained by the Dan and its tributaries; the Eno basin was the homeland of the Eno and Shakori, and (after 1680) the Occaneechi; and the Haw River area was occupied by the Sissipahaw and possibly others.

Since the Siouan Project is concerned with studying changes in aboriginal culture brought about by contact and interaction with English colonists, a primary goal has to be to locate and identify towns occupied by the various Indian tribes at specific temporal intervals from the Late Prehistoric period through the Contact period. These intervals are: Late Prehistoric (A.D. 1300-1525), Protohistoric

(A.D. 1526-1625), Early Contact (A.D. 1626-1675), Middle Contact (A.D. 1676-1710), Late Contact (A.D. 1711-1740), and Euroamerican (A.D. 1741-Present). Once sites representing all (or most) intervals have been located in each drainage area, it will be possible to address more specific questions concerning how the different Piedmont groups adapted within local environments to increasing exposure to European materials, ideas, and institutions.

Some questions are: What were the Siouan cultures like prior to European contact? After initial European contact, what aspects of culture changed first, and with what relative intensity? As contact became protracted, did the Indians move more toward the adoption of European ways, or more toward making adjustments in their existing cultural patterns to cope with the European presence? What were the short-term and long-term effects of European epidemic diseases? What effects did the deerskin trade have on the native economy, technology, and social organization? How did man-land interactions change through time?

Although the ethnohistoric record contains little precise information on the locations of Siouan towns, a description in Lawson's journal (Lefler 1967) and the survival of "Occaneechi" as a placename provide a strong case for locating the 1701 town of Occaneechi immediately southeast of present-day Hillsborough (Rights 1957; Lefler 1967). Although the location at the Wall site is also approximately correct according to the above information, a cursory re-examination of the 1938-1941 excavation data (Coe 1952) immediately called to question identification of that site as Lawson's Occaneechi. Euroamerican artifacts from the Wall site either dated too late or had been found in disturbed contexts. Additional field investigations were needed to

clarify the temporal placement of the Wall site and to critically evaluate its identification as Occaneechi Town.

Therefore, in the summer of 1983, after a hiatus of 42 years, excavations were resumed at the Wall site. Initially, sections of the old excavations were isolated and a site grid re-established. A portion of the rich midden surrounding the village was excavated and subjected to fine-scale recovery techniques. In addition, three burials were removed and portions of two circular house patterns exposed. The few European artifacts recovered were from disturbed plowzone, and most of them dated to the latter half of the eighteenth century or early nineteenth century. Three radiocarbon samples from undisturbed contexts yielded an average corrected date of A.D. 1545±80 years. These data, in conjunction with a review of the earlier investigations, led to the irrefutable conclusion that the Wall site was too old to be historic Occaneechi Town.

During 1983, other village sites were found in the vicinity of the Wall site. At one of these, the Fredricks site, numerous European artifacts, along with aboriginal remains, were found on the surface. Test excavations were undertaken at this site late in the field season, while work was still in progress at the Wall site. These initial tests revealed five sharp-cornered rectangular pits and a line of small postholes (Figure 5). Both the posthole pattern and the pits were neatly arranged in a NW-SE direction. Four of the pits were excavated, and three contained human skeletal remains accompanied by grave goods of both European and Indian manufacture. The fourth pit, although identical in shape to the other three, appeared to represent a burial but contained no bones or grave goods. Two of the burials were the remains of children between three and eight years old at death.

Included with these burials were European trade items such as knives, scissors, and a variety of glass beads. Aboriginal artifacts included shell gorgets, shell beads, and a ceramic vessel. One adult male burial contained a wealth of European artifacts, including an intact rum bottle, scissors, knives, a pewter pipe and buttons, a pair of ember tongs, and an iron ax head.

Most of the trade artifacts from the Fredricks site dated to the late 1600s or very early 1700s, the appropriate period for Occaneechi Town. The site seemed to be well preserved, with no evidence of disturbance other than shallow plowing. From these observations, it became obvious that more intensive work was needed at the Fredricks site. Hence, plans were immediately begun for a project in 1984 that would combine a major excavation and testing program at the Fredricks site, along with continued work at the neighboring Wall site (Figures 6 and 7).

During 1983, three weeks of fieldwork were also conducted at the Mitchum site, an historic village site, on the Haw River about twenty miles southwest of the Wall and Fredricks sites. At this site, which is believed to contain remains of a seventeenth-century village of the Saxapahaw, 825 ft^2 were excavated. These excavations revealed a complete wall pattern of a house, 14 pit features, and one burial. Trade artifacts from this site were preliminarily dated to the third quarter of the 1600s.

1984 FIELDWORK

Fredricks Site

The 1984 archaeological investigations at the Fredricks site, sponsored by a grant from the National Geographic Society, were

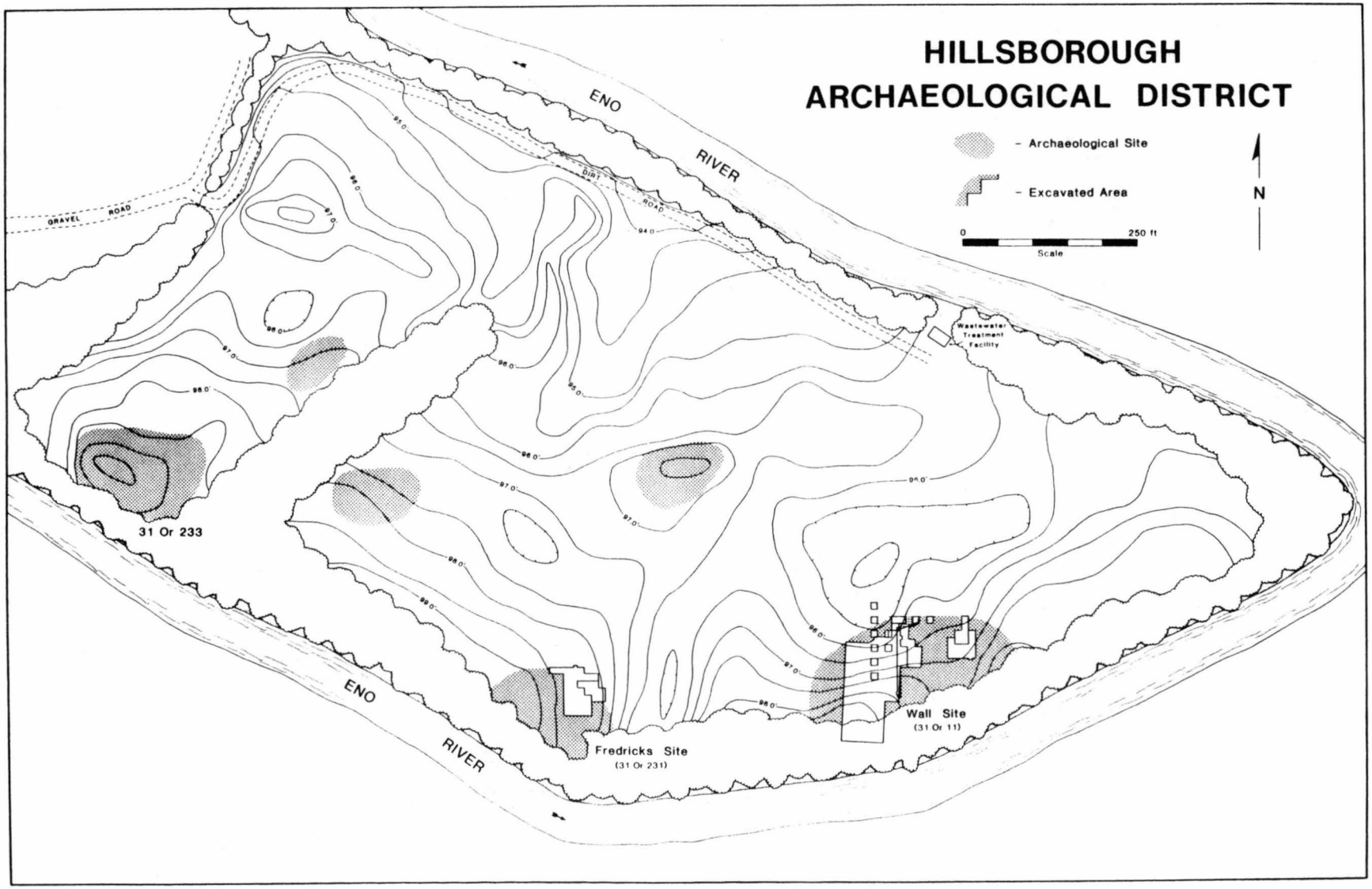


Figure 6. Hillsborough archaeological district.

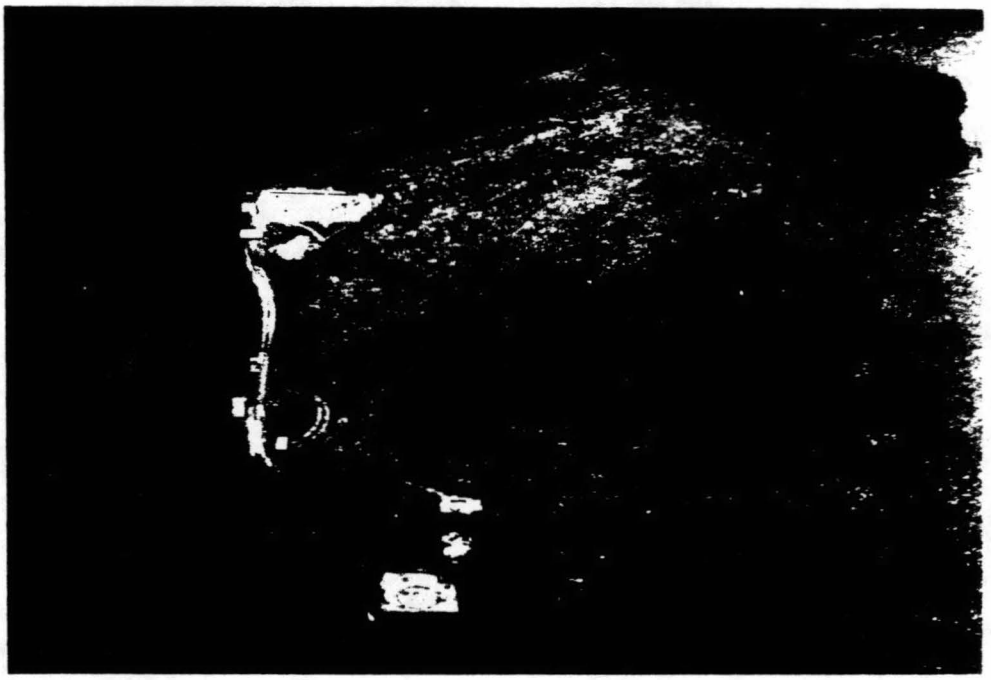


Figure 7. Aerial view of 1984 excavations at the Wall site (foreground) and Fredricks site (background).



Figure 8. Removing plowzone at the Fredricks site.

undertaken in two phases. The first phase, which consisted of the excavation of 2700 ft^2 adjacent to the 1983 excavation block, was begun on May 22 and completed on July 14. The purpose of these excavations was to obtain additional data on mortuary behavior from the previously discovered cemetery area of the site and to begin sampling adjacent domestic areas. The second phase, which consisted of systematic subsurface testing (augering) of unexcavated portions of the site, was undertaken between February 24 and October 17, as weather and time permitted. This latter phase of fieldwork provided data for delimiting probable settlement boundaries, and for making a preliminary assessment of internal site structure.

Site preparation prior to excavation consisted of bushhogging the work area (ca. 100x150 ft), establishing a site grid and a reference point for elevations, and constructing a storage shed and and sluices for waterscreening. All plowzone was excavated in 10x10-ft units, with soil being dry screened through 1/2-inch wire mesh using hand sifters (Figure 8). A 20-litre soil sample from the plowzone of each unit was waterscreened through 1/16-inch mesh to assess small artifact content.

Following the removal of plowzone, the bottom of each excavation unit was carefully trowelled in order to identify and record pits and postholes (Figure 9). The trowelled surface was documented by black-and-white and color photographs and by maps at a scale of 1 in=2 ft. The drawings of each excavation unit subsequently were combined to produce an overall plot of the excavations. Photographs were also made of all procedures and of the general progress of work. Horizontal and vertical control was maintained through reference to the site grid and by using a transit and rod to determine elevations. In addition to these excavations, six 10x10-ft units excavated in 1983 were



Figure 9. Trowelling at top of subsoil to expose archaeological features at the Fredricks site.

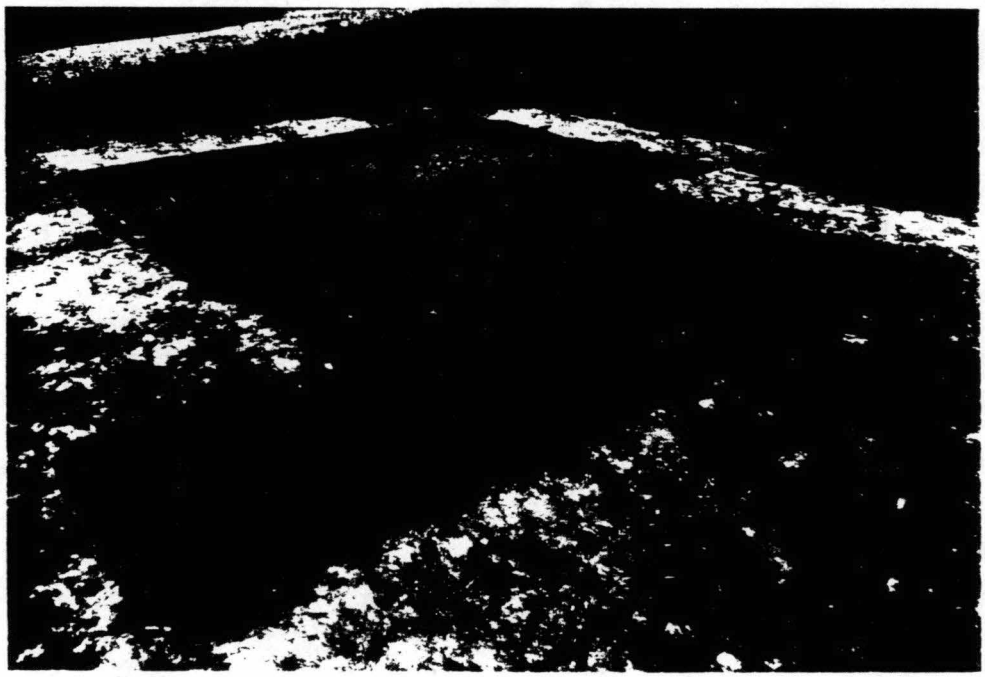


Figure 10. Overview of the 1984 excavation at the Fredricks site showing palisade and village cemetery.

re-exposed. Once accomplished, the entire excavation area was cleaned and photographed (Figure 10).

The 1983 and 1984 excavations at the Fredricks site exposed numerous archaeological features, including 10 human burials, 5 pits, a sweat house, an alignment of postholes forming a 90-ft segment of the village palisade, and approximately 800 additional postholes representing all or portions of at least five houses (Figure 11). All postholes were systematically recorded but most were not excavated. Excavation of features, burials, and the sweat house, was accomplished using trowels, grapefruit knives, brushes, and other small tools. Sunscreens, constructed of wooden frames and bedsheets, were erected over features during excavation to minimize the damage to feature contents by the summer sun. Feature fill was removed in natural zones, when evident, and all fill was waterscreened through sluice boxes having a sequence of 1/2-inch, 1/4-inch, and 1/16-inch wire mesh. This technique permitted the recovery of minute artifacts, including shell and glass beads, lead shot, small animal bones, and carbonized plant remains. Standard 10-litre soil samples from each zone of each feature were simultaneously processed by flotation to retrieve very small, extremely fragile carbonized seeds that might otherwise be lost in the waterscreening. Elevations were taken following the removal of each soil zone of a feature in order to establish precise provenience for zone contents and to permit the calculation of soil volume.

Upon completion, all features and burials were extensively documented by black-and-white and color photography, and by drawings in profile and plan at a scale of 1 in=1 ft. Also, extensive notes were kept by all excavators in both field journals and on standardized feature and burial data forms.

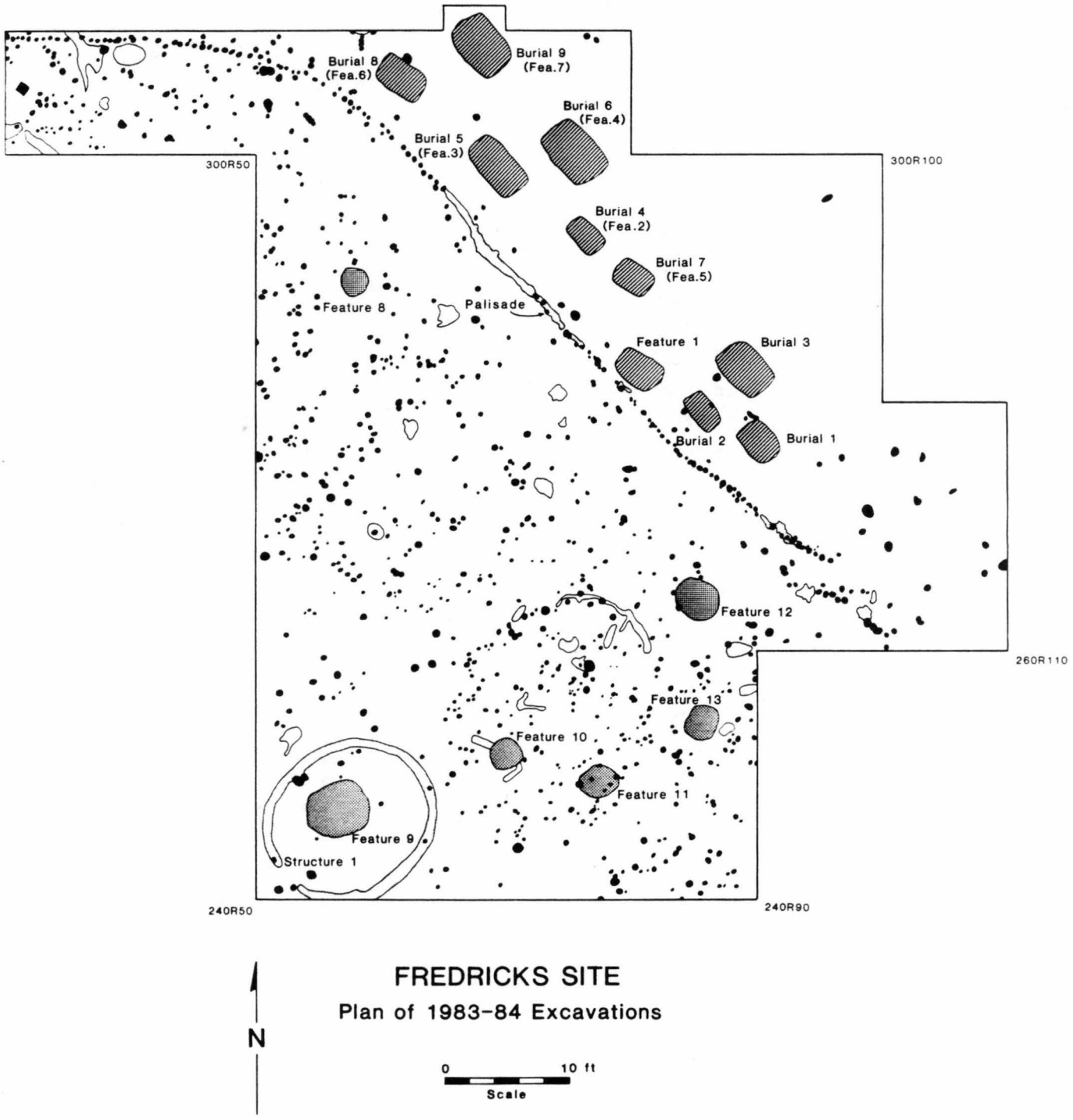


Figure 11. Plan of 1983-84 excavations at the Fredricks site.

Special care was taken with human burials to ensure that all bones and associated artifacts were kept in place during excavation. The primary objective during burial excavation was to preserve the integrity of contextual relationships among human remains and burial furniture while removing the fill dirt. In instances where burial remains (e.g., bones, bead clusters, and corroded metal artifacts) were too fragile or complex to permit thorough cleaning and full documentation in situ, the surrounding soil was cut away to form a pedestal beneath the remains. This pedestal was then wrapped with a band of fine fiberglass screen and covered with a layer of Bondo to prevent disintegration when removed from the ground. The pedestal was then removed to the conservation laboratory where the remains could be carefully cleaned, documented, and preserved.

Wall Site

During the 1984 field season, in addition to the National Geographic Society-sponsored work at the Fredricks site, 1200 ft^2 were excavated at the nearby Wall site. Funds for this work were provided by the University of North Carolina. Of the total excavation, 1100 ft^2 comprised a contiguous set of 10x10-ft units immediately south of the main 1983 excavation, on what was probably the northeast edge of the village. Also, one 10x10-ft unit was opened in an area of dense midden in the north-central part of the site near a point where the 1938, 1940-41, and 1983 excavations converged.

The same procedures of preparation, excavation, recovery, and recording described for the Fredricks site were employed at the Wall site. As a result of the 1984 investigations, the overlapping posthole patterns for two structures, which had been partly defined in 1983, were fully exposed. Also, in this same area were found two small pit

features and an irregular disturbance associated with the southern margin of one of the structures.

PREFACE TO THE REPORT

With this brief introduction to the overall Siouan Project and to the sites of primary research, the reader is now ready for a more in-depth presentation of the findings to date. The remainder of this report covers data and interpretations from the first two years of research, 1983-84, and with the exception of the historical overview in Chapter II, is organized by data category. The individual authors did not conduct their work in isolation; rather, there was ongoing interaction and information exchange throughout the planning, fieldwork, laboratory processing, analysis, and writing stages of the research. And, there were two semester-long seminars in which all project participants—director, staff archaeologists, and students—discussed and developed together the course of the investigations. Such an integrative process was essential given the culture-change theme of the project, a subject which requires discovery of interrelationships between the cultural and environmental components of the systems involved.

James H. Merrell, an historian, provides in Chapter II an historical background on the period spanned by the occupations of the Wall, Mitchum, and Fredricks sites. Using the documentary, rather than material, record, he carries us through several stages of an evolutionary process of increasingly more intensified interaction between European and Indian. His discussion serves well to set the stage for interpreting the evidence of change manifested in the archaeological record.

In Chapter III, Gary L. Petherick describes in detail the stratigraphy, features, and architecture of the three primary sites. Even though less than 40% of the Wall site and probably less than 10% of the Fredricks site have been excavated, he attempts to define patterns and relationships within these settlements and to explain these observations in social terms. He notes that the two historic sites contain more storage-type pits and less substantial architecture than the protohistoric site. These differences, according to Petherick, are indicative of decreasing permanence and increasing mobility of Piedmont groups during the Historic period. This interpretation is consistent with the ethnohistoric record and with other categories of the archaeological data.

In his section on mortuary practices (Chapter IV), H. Trawick Ward provides evidence for major differences in patterns of burial and attendant ritual between the Occaneechi people at the Fredricks site and the earlier Wall site occupants. The Mitchum and Upper Saratown burials retain mostly pre-contact characteristics, except that both have European grave goods and the Upper Saratown burials are more numerous than one would expect for a village of its size and term of occupation. The Occaneechi buried in cemeteries, similar to the Susquehannocks and other Northeastern groups, they lavished large numbers of both ornamental and utilitarian items on their dead, and they included in the fill of their burials large amounts of food and other refuse, which Ward considers to be evidence of ritual "feasting with the dead."

An analysis of the human skeletal remains by Homes Hogue Wilson (Chapter V) offers important preliminary information on differences in diet, nutrition, and health between late prehistoric/protohistoric populations and historic populations. She supplements the small samples

from the Wall and Fredricks sites with data from the previously investigated Shannon site (late prehistoric) in Virginia and Upper Saratown site (historic) in North Carolina. Wilson concludes that an increase in physical stress from warfare, long-distance hunting, food deprivations, and European diseases are reflected in increases in pathologies and disease conditions in the historic skeletal samples. The results of her efforts to determine relative biological distance among the populations, although suggestive, are inconclusive because of the small size of the primary samples.

Since the most intense involvement of the Piedmont Indians with Europeans was through the deerskin trade, careful analysis of the European artifacts from the study sites is an important aspect of the present research. In Chapter VI, Linda F. Carnes gives detailed descriptions of the Euroamerican artifacts from the three primary sites and then groups these artifacts into functional categories. She then evaluates the intrasite distributions of each category by context. At the Fredricks site, although she finds that there are no significant differences between categories from various fill contexts (feature fill vs. burial pitfill), she does encounter significant differences in categories used as burial associations and those in fill and plowzone contexts. Items selected by the Indians from their trade assemblage to place in burials included both ornamental and utilitarian items, and she notes that there is a significant increase in utilitarian items in the Fredricks site burials over those at the slightly earlier and more remote Upper Saratown site. The kinds of reworked and recycled Euroamerican items, together with contextual relationships and the nature of the overall assemblage, suggest that Euroamerican ornaments, tools, and utensils were integrated into an existing technology, to be

used alongside their aboriginal counterparts, rather than producing changes in the direction of European functions or technological innovation.

Julia E. Hammett's analysis of the shell artifacts from the study sites (Chapter VII) focuses on shell ornaments, which occur mostly in burial contexts. Hammett begins establishing a classification for these ornaments, a task that has been neglected by Southeastern archaeologists. She then attempts to define changes in styles, contexts, and sources through time. She concludes that, during the Historic period, a pre-existing network for trade in shell was maintained and probably extended. Not only was trade carried out over longer distances, but there was an important shift from southern to northern material sources. Some traditional forms, especially of beads, were replaced with new shell forms or with European glass forms. Replacement forms seem to have been used in contexts similar to their most comparable older forms.

For the three primary sites, pottery sherds are one of the few kinds of artifacts that occur in numbers amenable to quantitative analysis. In Chapter VIII, R. P. Stephen Davis, Jr. examines these ceramic artifacts on both intrasite and intersite levels using a computer-coded format that includes variables of context, morphology, technology, and style. These data are then statistically manipulated to determine if the pottery assemblage from each site is homogeneous and to ascertain if there are relationships between the sites. Davis concludes that the variability in ceramics from the Fredricks site is probably the result of activities of three separate occupations, rather than of a single multi-ethnic occupation. Two occupations are suggested for the Mitchum site, both with affinities in their ceramics to cultures to the

west and northwest. The Wall site pottery is attributed to a single, rather short-term occupation and is similar to pottery from the middle Roanoke drainage to the northeast. Davis concludes that the sherd assemblages from the three sites reflect a discontinuity in the spatial distribution of ceramic styles that began in late prehistoric times and persisted through the Historic period. Within their variability, however, he recognizes relative continuity from the Wall to Fredricks assemblages, possible evidence for ethnic relationships through time between the occupants of the upper Eno drainage and those of the Roanoke drainage.

V. Ann Tippitt's study of the lithic artifacts from the study sites (Chapter IX) represents one of only a few attempts to systematically analyze stone tools from late contexts in the Piedmont Southeast. Tippitt uses a computer-coded format to document the lithic tools and debitage by stage of manufacture, raw material, tool category, spatial distribution, and overall morphology. She finds no major differences between the lithic artifact assemblages from the Wall, Mitchum, and Fredricks sites, which suggests that the introduction of European metal tools did not appreciably affect the composition of the native assemblage. Such an interpretation must take into consideration, however, that variation could be masked by a lack of information on tools from sites away from the main habitations. She does find a possible trend toward slightly larger triangular points during the Historic period. Also, she notes that there is a significantly larger amount of Ridge-and-Valley chert at the Mitchum site, evidence for the same westerly connections indicated in Davis' ceramic analysis.

Mary Ann Holm's analysis in Chapter X of the faunal remains from the Wall and Fredricks sites (almost no faunal remains were found in the

limited excavations at the Mitchum site) suggests that there was very little change in animal exploitation from protohistoric to historic times. In fact, similarities in the two assemblages are far more striking than the differences. Although there is similar reliance on deer as expected, the comparable secondary use of catfish is somewhat unexpected. When one considers, however, that the large bend in the Eno where both of these sites are found, probably provided an unusually favorable habitat for sluggish-water species, such a common reliance is not surprising. The only evidence for domesticated animals at the Fredricks site is one bone each of horse and pig, which suggests that European-introduced animals were not an important food source in this area, even as late as 1700. One of Holm's most striking discoveries is a lack of differences in deer remains, and hence in hunting/butchering between the two sites. If hunting and butchering practices changed to accommodate the deerskin trade, as one would expect for a group like the Occaneechi, there should be evidence for this change in the animal bone assemblages. Since there are no such differences in the assemblages under consideration, Holm concludes that the Occaneechi either were not hunting deer for skins close to their village (i.e., most hunting for skins was conducted far enough away from the village that only the skins were brought back), that the contexts excavated thus far are not a true reflection of the total faunal assemblage at the site, or that they were not hunting at all to procure skins for the trade (i.e., they functioned mostly as "middlemen" in the trade).

Finally, Kristen Johnson Gremillion, examines the paleoethnobotanical remains from the Wall, Mitchum, and Fredricks sites (Chapter XI). Gremillion was responsible for both field recovery and laboratory analysis of these remains. As with the faunal remains, the

botanical assemblages exhibit far more similarities than differences. Corn, of major importance at all three sites, may show an increase through time. Hickory nut seems to have increased in importance relative to acorn and walnut. The only European-introduced plant, present at both Mitchum and Fredricks, is peach. Gremillion concludes that the apparent shift in nut use through time may have been associated with a trend toward expending less time and energy on certain high-cost plant foods as more time was required for trade-related hunting and hide preparation.

CHAPTER II

"THIS WESTERN WORLD": THE EVOLUTION OF THE PIEDMONT, 1525-1725

by

James H. Merrell

On January 26, 1701, an adventurous Englishman named John Lawson left an Indian village along the Catawba River and swung northeast, completing an arc through the Carolina interior that had begun in Charleston a month before and would end on the lower Pamlico River a month hence. At the halfway mark of his journey, Lawson was a seasoned traveler, having already survived cold weather, poor food, wild animals, and an occasional angry native. Yet the thrill of discovery remained as he traversed the North Carolina Piedmont, "Every Step presenting some new Object, which still adds Invitation to the Traveller in these Parts" (Lefler 1967:54). Rich soil, tall trees, abundant wildlife, pleasant streams--Lawson was so taken by the scenery in what he called "this Western World" that he considered settling in the area (Lefler 1967:52).

Fascinated as he was by the landscape, Lawson thought that the native inhabitants he encountered were more interesting still. Between the Catawba River and the Coastal Plain were the Saponi, Tutelo, Keyauwee, Eno, Shakori, and Occaneechi, and the explorer surveyed them as carefully as he did the soil or streams. The Saponi headman had lost an eye while measuring gunpowder; the Tutelo blew a special powder into their eyes to improve their sight; the Keyauwee painted their faces with a lead ore; inside their houses the Occaneechi hung bear meat and dried venison; the Eno loved to play a game they called "Chenco" (Lefler 1967:52, 54, 61, 62). At each village, Lawson found something new and different to remark upon. His observations offer a window onto

a lost world.

The English traveler was so struck by the diversity of these Indians that he failed to appreciate that they were probably related.[1] Like the Catawba he had just left, the Monacan inhabiting central Virginia, and the Sara then living on the upper Roanoke River, the Occaneechi and their neighbors in the North Carolina upcountry were descended from Siouan-speaking migrants who had come over the mountains several centuries before Columbus arrived in America. As the newcomers fanned out along the rivers slicing through the region, their cultural uniformity slowly dissolved. A "people" became one or a cluster of villages, with its own dialect, its own customs, its own identity. Still, the differences were mere variations on a common theme. All spoke different forms of Siouan, and may have used Occaneechi as "a sort of general Language" to converse across group boundaries (Beverley 1947:191).[2] All dwelt in the lands between the Coastal Plain and the Mountains, what the Europeans labeled "the Upper Country," the "hilly Parts," or "Hill-Country" (Lefler 1967:xxxi, 56, 89; see also Cumming 1958:9-10). All built villages of circular bark houses along the rivers and creeks. All followed a seasonal subsistence routine that balanced farming the bottomlands along the river, fishing the nearby waterways, hunting in the hills or canebrakes, and gathering wild plants at selected sites. Despite the barriers imposed by time, distance, and dialect, a fundamental unity underlay Piedmont life, a unity grounded in a shared cultural heritage and a common physical environment.

These Piedmont peoples also shared a common destiny once Europeans landed on America's shores. Between the 1520s, when explorers first touched the Carolina coast, and the 1740s, when most Indians had left the region, inhabitants of the upcountry went through four different

stages of development. The first era, covering roughly the years from 1525 to 1625, was characterized primarily by indirect contacts with the visitors from the Old World. Material goods and lethal bacteria must have been carried into the interior by coastal Indians who had visited Spanish outposts to the south or later English settlements at Roanoke and Jamestown. Any face-to-face encounters that did occur probably were fleeting. During the mid-sixteenth century Spanish armies commanded by Hernando De Soto and Juan Pardo marched up the Catawba River valley before swinging west toward the mountains (Hudson et al. 1984:72-74, Figure 1; Depratter et al. 1983). From the east came tentative English probes up the Roanoke and the James (Quinn 1977:332-333, 451-452; Barbour 1964:222-225, 237-239). Some Piedmont Indians may have headed in the opposite direction, drawn to the lowcountry by a desire to see the strange new beings for themselves (Barbour 1969:300-301).

Direct contact became much more frequent in the second stage of historical development, which began in the 1620s with the defeat of the Powhatan Confederacy and a concomitant increase in Virginia's interest in lands beyond the falls of the James. A series of English explorers--some famous, most obscure--ventured inland to search for valuable mines or a westward passage (Cumming 1958:15-41; Alvord and Bidgood 1912:183-205, 209-226; Morrison 1921:217-236). Close on their heels came other men eager to trade with the Indians. While natives welcomed the traders, this expanded contact was not without risk. In the 1650s and again in the 1670s there were bitter clashes between Piedmont warriors and colonial forces, with the Indians generally the losers. Nonetheless, by the time the Virginia rebel Nathaniel Bacon and his followers destroyed the Occaneechis' Roanoke River trading center in 1676, Virginians had penetrated to the far corners of the Southern

Piedmont, and natives there had at least occasional encounters with an alien culture (Cumming 1958:16, 22; Washburn 1957:42-46; Wright 1981:87-90; Michel 1916:30).

The destruction of the Occaneechi stronghold ushered in a new age on the Piedmont. With the Occaneechi no longer blocking the principal route into the upcountry, intercultural exchange flourished. The Indians Lawson saw in 1701 were accustomed to regular visits by Virginia traders, who often stayed for months at a time before heading home. Thus colonists had at last become a familiar sight in the upcountry, and the marvelous goods they brought had become a part of everyday life.

This period ended in the early years of the eighteenth century. Soon after Lawson passed through the area, incessant raids by powerful native foes combined with the lure of English trade goods to pull peoples from the interior toward the coast. By 1711, when Carolina began a decade of intercultural conflict with the Tuscarora and Yamasee, the Saponi had joined the Tutelo, Occaneechi, and Monacan under Virginia's protective umbrella. To the south, the Sara, Eno, and Keyauwee had drifted into South Carolina's orbit, later to merge with peoples in the Catawba valley to form the polyglot Catawba Nation. North of that isolated native island--an island that remains to this day--the Piedmont was mostly empty of human settlements until the first European colonists moved into the area during the middle decades of the eighteenth century. Before these permanent intruders arrived, the silence was broken only by an occasional hunting party, a band of Iroquois warriors after a Catawba scalp, a colonial packhorse train bound for Cherokee villages, or an isolated Indian farmstead.

A world that vanished in the space of two centuries is easier to mourn than to study. Few American Indian groups have left as little

trace of themselves in the historical record as the peoples of the Carolina-Virginia Piedmont. Distant from initial European settlements, overshadowed by more prominent neighbors like the Powhatan and Cherokee, the upcountry Indian attracted little attention from observers willing and able to put their impresions down on paper for the benefit of posterity. With no chronicler like John Smith or James Adair to tell their tale, these peoples lived and died in obscurity, an obscurity that, for the most part, has continued to this day.[2] Nonetheless, it is possible to shed some light on this shadowy world beyond the skeletal chronology of its demise offered above. Careful digging in the documents, when combined with equally careful digging in the Piedmont soil currently being carried out by the Research Laboratories of Anthropology at the University of North Carolina, enables us to piece together a fragmentary sketch of these peoples in historic times. The story that emerges is one of societies that adapted to dramatic change while remaining securely anchored to past ways.[3]

By far the most drastic upheavals were caused by invisible invaders, the foreign bacteria introduced from the Old World. Native populations cut off from Europe, Africa, and Asia for millenia were utterly without immunity to smallpox, measles, and other ailments the newcomers unwittingly brought across the seas. These maladies may have reached the Piedmont well before the first European. Spanish explorers who marched through what is now central South Carolina in 1540 came upon villages abandoned during an epidemic that had struck the area two years before (Bourne 1904:66). Did natives living farther north suffer similar devastation? Did illnesses that swept through the aboriginal population near the English settlement on Roanoke Island in the 1580s find their way upriver (Harriot 1972:27-28)? The answers require

further archaeological research. But it seems unlikely, even impossible, that inhabitants of the uplands managed to escape all of the epidemics raging through eastern North America during these years. Certainly by Lawson's day Piedmont Indians were all too familiar with the lethal consequences of contact. The Sewee along the South Carolina coast were "now very much decreas'd...," he reported, "and all other Nations of Indians are observ'd to partake of the same Fate, where the Europeans come, the Indians being a People very apt to catch any Distemper they are afflicted withal..." (Lefler 1967:17).

Precisely how "apt" upcountry natives were to succumb to alien infections remains unclear, but by any standard of measurement the devastation was severe. Lawson talked of entire communities being wiped out by smallpox and estimated that since 1660 only one Indian in six living within two hundred miles of English settlements had survived (Lefler 1967:232). Archaeological evidence from a Sara settlement on the Dan River offers grim confirmation of Lawson's claim. The site, occupied for a single generation in the latter half of the seventeenth century, contained so many bodies in such a short span of time that few could have escaped the terrible scourge (Ward 1980:182; Navey 1982:83).

Those who did manage to survive had to pick up the pieces of their lives. It was not an easy task amidst the despair that followed in the wake of demographic disaster. One village along the Pee Dee River yielded mute testimony of the psychological havoc natives may have suffered. The area contained a markedly higher proportion of infant burials, suggesting a sharp increase in infant mortality due to disease. Moreover, the strikingly more elaborate ornamentation interred with each body hints at a heightened sense of loss among the survivors (Lewis 1951:328-329).

There was little opportunity to dwell on the past, however. Survival demanded that people cope with the present and think of the future. A village that had been reduced from 600 to 100, or 300 to fifty, could no longer carry on alone. Thus the tattered remnants of Piedmont peoples began to merge with others to create new communities. Most of these unions went unseen or unrecorded by Europeans, and their documentation therefore must await further archaeological inquiry. But the first step was probably to join kinfolk from a nearby town or hamlet. In this manner a "people" that had once comprised a whole series of settlements scattered through a particular region or river valley now collapsed into a single town (Simpkins 1984). That "people" would still be set off from the world outside by language, customs, appearance, a kinship network—in short, by all of the characteristics that had always combined to create a distinct identify. But it would now occupy one site rather than many. The Monacan living along the James River in 1700, for example, were probably descendants of the entire cluster of villages John Smith had recorded for the lands above the falls almost a century before (Mooney 1894:18-22; McCary 1957; Bushnell 1920; Michel 1916:29-30, 122-123). Similarly, it seems likely that the Occaneechi, Saponi, Keyauwee, Tutelo, and others Lawson visited were remnants, mere shadows, of more populous and more complex societies.

Lawson himself arrived on the scene in the midst of the second stage of the native response to depopulation. Continued visitations by alien diseases (the most recent smallpox epidemic had occurred only three years before) eventually reduced native numbers so drastically that survivors were compelled to look further afield for others with whom to unite. This process may have been underway in some areas by

1600 (Benthall 1969:45-48). By the time Lawson penetrated the Carolina interior, the Eno, Shakori, and Adshusheer had already come together to form a single community, and the Saponi, Tutelo, and Keyauwee were about to do the same (Lefler 1967:61, 53). None of these particular combinations endured. In 1708, the Saponi--alone--moved to the Virginia frontier, and during the next few years the Tutelo, Occaneechi (themselves a collection of groups as early as the 1670s [Alvord and Bidgood 1912:225]), and the Monacan remnants followed them during the next few years (Merrell 1982a:107, 113; Mooney 1894:18-19, 21). Meanwhile, the Shakori applied to South Carolina for protection, and the Keyauwee, Eno, and Sara combined forces and headed in the same southerly direction (Merrell 1982a:107-108, 113).

It is virtually impossible to retrace the steps of each native group, to reconstruct the shuffling and reshuffling that became almost routine as Indians sought to adjust to a new disease environment. It is even more difficult to gauge the impact of these stresses on the people involved. We can surmise, however, that the effect was profound. All of the available evidence suggests that inhabitants of the Piedmont, although culturally related, were intensely localistic, focusing their existence within a tightly circumscribed cultural and geographical range. This localism found expression in a number of ways. Lawson was astonished to find "a strange Difference in the Proportion and Beauty of these Heathens. Altho' their Tribes or Nations border one upon another, yet you may discern as great an Alteration in their Features and Dispositions, as you can in their Speech, which generally proves quite different from each other, though their Nations be not above 10 or 20 Miles in Distance" (Lefler 1967:35). Thus the Keyauwee had whiskers, the Tutelo were "tall, likely Men," while the Eno were of "mean stature"

(Lefler 1967:58, 54; Cumming 1958:27). Cultural differences were equally clear. In 1670 the explorer John Lederer learned that Occaneechis were ruled by two headmen, Eno society was "Democratick," while the Saponi were governed by "an absolute Monarch" (Cumming 1958:25, 27, 24). Lederer also learned to distinguish among neighboring groups by their signs: the Occaneechi marked themselves with a serpent, the Saponi with three arrows, symbolic embodiments of their separate identities (Cumming 1958:13; Beverley 1947:161).

Natural boundaries--rivers, swamps, upland ridges, areas of poor soil--had long served to reinforce localism. Buffer zones, or "deserts" in English parlance, clearly divided Piedmont from Coastal Plain, and within the upcountry itself less obvious "deserts" set peoples off from another (Arber and Bradley 1910:1:59, 70; Baker 1975:25-36; Turner 1978:42-46; MacCord 1983:9-10; Simpkins 1984). Tales of the evils awaiting those who dared venture beyond local boundaries strengthened environmental barriers. A common story about a fierce creature inhabiting the headwaters of Neuse River frightened hunters away and may have been designed to keep people out of a border region (Lefler 1967:130). Explorers who traveled through uninhabited areas and had to live off the land rather than off the natives were unwittingly charting the ancient physical and cultural boundaries dividing peoples (Varner and Varner 1951:283-284, 331; Bourne 1904:1:59-62).

In the aftermath of an epidemic, Indians had to cross these boundaries as never before. Strangers became friends, the tall and the short lived side by side, necessity invented a common language and a common council of leaders from different groups. Those involved made the difficult process of adjustment less painful by keeping their old identity as much as possible. The Saponi, Tutelo, Occaneechi, and

Stuckanock (Monacan), who collected in a single village at Fort Christanna on the Meherrin River, were considered "one Nation" by Virginia authorities (Great Britain, Public Record Office, Colonial Office, Series 5, 1714:1316:622). The Indians thought differently. Even after merging, each group continued to choose its own headmen and to adhere to its own customs (Brock 1885:2:88; Wright 1966:315-316). The Sara in the Catawba Nation did the same, not only heeding their own chiefs more than a generation after joining the Catawba but also living in their own village (Merrell 1982a:311, 400-401).

Archaeological evidence indicates that segregation extended from this world to the next. In aboriginal times Piedmont folk buried their dead at random in the village, in effect making the entire community a graveyard and suggesting that everyone in the settlement possessed a common identity. During the Historic period, on the other hand, interments were made in clusters, creating a handful of discrete cemeteries. Did several hitherto independent groups now occupy one town and, still acutely conscious of their own identities, express that consciousness by creating distinct burial grounds (Ward 1984)? At this point the pattern unearthed is suggestive rather than conclusive. But it fits well with the other habits recorded by European observers. Piedmont peoples did not shed their ancient identities overnight or even over a generation. The Saponi, Occaneechi, and Tutelo had a common destiny but separate identities until the era of the American Revolution, and as late as the mid-nineteenth century the Sara among the Catawba still spoke their own language at home (Hale 1883:10; Pearson 1842:5). Eroded by disease and by time, ethnic feelings nonetheless endured for generations.

Piedmont peoples' attachment to the past extended well beyond

maintaining ancient loyalties to embrace many aspects of traditional life. The result of demographic disaster could have been profound despair and cultural ruin, stemming from a feeling that the supernatural forces protecting a society had failed and should be abandoned. Evidence turned up in the archives and in the earth suggests otherwise. Even the burials uncovered along the Dan and the Pee Dee, which speak so poignantly of the devastation wrought by an epidemic, also testigy to a faith unshaken by recent events. Orientation of the body, positioning of the remains, inclusion of burial goods to accompany the soul into the afterlife—all suggest careful attention to time-honored customs designed to meet the demands of the supernatural. Recently discovered hints of feasts that took place at the burial site after interment only strengthen the idea that the old ways still endured in a Piedmont world periodically wracked by inexplicable disaster (Navey 1982; Dickens et al. 1984:30-37, 52).

If these burial feasts did persist, they were only part of a regular round of ceremonies that stretched across the generations into Lawson's time. Lawson himself ran across many more examples of rituals with roots in the remote past. "All the Indians hereabouts," he wrote while among the Keyauwee, "carefully preserve the Bones of the Flesh they eat, and burn them, as being of Opinion, that if they omitted that Custom, the Game would leave their Country, and they should not be able to maintain themselves by their Hunting" (Lefler 1967:58). Native travelers were no less cautious about propitiating the gods by adding a stone to a pile at a sacred site or placing some tobacco in the hollow of a large rock beside the trail (Lefler 1967:50, 63). Nor could time erase the fear of breaking customary rules. While exploring the interior in 1728, William Byrd II discovered that his Indian companion,

a Saponi named Ned Bearskin, vehemently objected when the Englishmen in the party tried to cook venison and turkey in the same pot. No amount of cajoling or ridicule could make Bearskin drop the subject. He knew--as Southeastern Indians had always known (Hudson 1976:148, 165, 302)--that mixing inhabitants of the earth and the sky would bring disaster. Byrd considered it the silliest superstition; to the Saponi it was very real and very frightening indeed (Wright 1966:116-117, 243-244).

Bearskin believed because he, like other Piedmont Indians, had seen sufficient proof that the old magic still worked. The priests were powerless to stop the new diseases sweeping through their villages, but experience was teaching them how not to respond when smallpox struck. "Now they are become a little wiser" about the best means of treating it, Lawson reported (Lefler 1967:232). Moreover, in other cures their wisdom was still unsurpassed. Using local herbs and ancient skills, natives astonished Lawson again and again with their abilities (Lefler 1967:17, 27, 48, 49). At the Saponi town, an Indian "Doctor" ushered the English traveler into his dwelling and proudly "shew'd me a great Quantity of medicinal Drugs, the Produce of those Parts; Relating their Qualities..., and what great Maladies he had heal'd by them" (Lefler 1967:54). Near the village stood several stone sweatlodges which "they make such Use of" as a cure for a wide variety of symptoms, and archaeological research reveals that the Occaneechi also retired to sweat lodges when they felt ill (Lefler 1967:55; Ewan and Ewan 1971:379; Alexander 1972:97; Dickens et al. 1984:3, 39, 42). Nor were priestly powers confined to healing. When a fierce wind struck the Saponi settlement the day after Lawson had admired the "Doctor's" pharmacy, the frightened Englishman rushed from his bed to find the

headman in the center of the community busy with "his Necromantick Practice." Lawson's initial skepticism faded rapidly, for "in two Minutes, the Wind was ceas'd, and it became as great a Calm, as ever I knew in my Life" (Lefler 1967:55). If Lawson were converted, for others this merely confirmed what they already knew: the gods lived.

Given the continuing power of the ancient system of belief and behavior, it is not surprising that traditional authority figures continued to exert enormous influence. The elderly, customarily the repositories of secret skills and ancient lore, had been depleted by disease; but their authority remained. "Old Age [is] held in as great Veneration amongst these Heathens, as amongst any People you shall meet withal in any Part of the World," Lawson wrote (Lefler 1967:43). Piedmont society set off old from young by different titles, secret languages, and special access to temples or other sacred places. They took precedence in welcoming visitors, speaking in council, and making decisions (Lefler 1967:43, 177-178, 210, 219, 231; Lederer 1958:14, 27, 41). Were the aged also differentiated by special burial customs, more elaborate burial goods, or some other distinguishing features? The answer awaits further archaeological inquiry (Navey 1982:191-194).

Thus the upheavals caused by sickness had not divorced Piedmont societies from their past. Life could never be the same again for those lucky enough to come through an epidemic alive. Still, they managed to rearrange their lives under the most difficult conditions without forgetting the lessons handed down from their ancestors.

A similar blend of persistence amidst change marked the upcountry Indians' response to European technology, the second important innovation introduced from abroad after 1525. The manner in which these unfamiliar wares found their way into the hands of upcountry Indians

remains unclear. The first trickle of material goods must have appeared in the sixteenth century. European explorers routinely passed out gifts--a knife here, a metal cross there, some beads further on--to ease their passage through Indian territory, and some of these prized possessions probably ended up among more distant communities (Lewis and Loomie 1953:111). Some natives were not content to wait. In 1609, for example, Indians living along the Santee River had already made their way north to Jamestown and returned home bearing hatchets, knives, and biscuits made of wheat flour (Barbour 1969:2:312). Future archaeological research may reveal whether other curious natives from the Carolina interior made a similar trek and were similarly rewarded.

As trade with Virginia developed during the mid-seventeenth century, the pattern of exchange became clear. Each Piedmont settlement went through two distinct stages in its growing acquaintance with new technology, stages that even a novice like John Lederer recognized and that have been tentatively confirmed by recent archaeological work. The first step, which Lederer reported among the "remoter Indians" and archaeologists have found at Upper Saratown, was marked by a certain native naivete about the range of merchandise available from Anglo-America. These people were happy to barter for "trinkets" such as mirrors and pictures, glass beads and bracelets, knives and scissors, "and all manner of gaudy toys and knacks for children..." (Cumming 1958:42). The archaeological portrait of Upper Saratown matches Lederer's description closely. This Sara village, filled with beads and "trinkets," was virtually devoid of European weapons or other metal goods (Wilson 1984).

A potsherd found at Upper Saratown with the outline of a musket etched into it by some unknown native artisan hints at a growing

awareness of the material cornucopia available from Europeans and may signal the beginning of the second phase of a people's relationship with an alien material culture. Lederer found that "neighbour-Indians," more experienced in the art of intercultural exchange would not be satisfied with "trinkets." They demanded not only knives and scissors but also arms and ammunition, not only beads and bracelets but cloth, axes, hoes, "and all sorts of edg'd tools" (Cumming 1958:41). By the end of the century, Indians throughout the Piedmont were behaving like "neighbour-Indians." At the Fredricks site, the probable location of the Occaneechi town Lawson visited in 1701, archaeologists have uncovered an inventory of goods quite unlike that at Upper Saratown, occupied a generation earlier. Inhabitants of the Fredricks site possessed muskets and pistols, glass bottles and metal pipes, iron axes and pewter porringers--in short, they were more thoroughly integrated into the colonial trade system (Dickens et al. 1984:27-39; Wilson 1984).

It is easy to exaggerate the changes wrought by this deepening involvement in intercultural exchange. In fact, whereas European goods and colonial intruders were certainly novelties, traders and trade were not, and Piedmont natives fitted the new men and the new merchandise into established patterns of exchange and existence. Archaeological evidence demonstrates that Indians in the interior had long traded with their coastal neighbors for a variety of items (Merrell 1982a:22). Some of that trade remained wholly untouched by the growing colonial presence. In Lawson's day, for example, towns along the coast still gathered yaupon plants (from which Indians brewed the ceremonial "black drink") and sea shells, carried them inland, and swapped them with "remote Indians" for a root that grew near the mountains and was used to

make red paint (Lefler 1967:98, 218, 174).

With the structure of exchange so well established, Indian traders living near the English could easily begin to add new products to the supply of merchandise they hauled into the upcountry. In 1670, John Lederer met some Sara traders at a village along the Catawba River (Cumming 1958:31). Since the Sara were in touch with Virginians around that time (Wright 1966:400), it seems likely that some of the goods they carried were of European manufacture. By the time Lawson passed through, this trend was clear: coastal Indian traders were peddling everything from stolen horses to jugs of liquor in Piedmont villages (Lefler 1967:44, 54, 232).

Colonial traders gradually supplemented, then supplanted, the native middleman, but they still had to fulfill Indian expectations by conforming to local codes of conduct (Merrell 1982b:5-7) and satisfying their hosts' taste in trade goods. Despite the new and wonderful products a Virginia trader dangled before their eyes, natives insisted that he also bring goods traditionally carried past the Fall Line from the lowcountry. "This yeere [1682] the Indyans will have Roanoake," complained Cadwallader Jones, a colonist heavily involved in the Piedmont trade, "not with standing all other com[m]odities be p[re]sented.... I having at this time a considerable parcell of other goods amongst them unsold" (Great Britain, Public Record Office, Colonial Office, Series 1 1682:48:115-116). In 1691, William Byrd I, another businessman active in the uplands, also complained that the Indians wanted shell beads more than anything else (Tinling 1977:1:163). The natives' insistence on acquiring shells may explain a curious shift in the types of shells found at Piedmont villages in the Historic period (Sizemore 1984). The Fredricks site contained shells from northern

shores, and it seems likely that these items arrived there on the backs of colonial packhorses, for colonial traders often looked northward for the supplies Indians demanded. In 1671 John Lederer received a commission from Maryland's Lord Baltimore to trade with natives in the Southern Piedmont (Cumming 1958:99-100). A decade later Cadwallader Jones also looked to Lord Baltimore, begging Maryland's Lord Proprietor to grant him permission to collect shells along the colony's Eastern Shore (Great Britain, Public Record Office, Colonial Office, Series 1 1682:48:115-116). And a decade after that, William Byrd I went even further afield, writing the governor of New York to ask that he send some shell beads to be passed along to Carolina natives (Tinling 1977:1:163). The source of supply had changed; native tastes had not.

Piedmont inhabitants were no less selective in the European wares they did purchase. To his dismay, the colonial trader learned that Indians would not accept every item he happened to have on hand. Dark blue cloth sold best, as did larger hoes and smaller glass beads. But not just any beads: villages west of Virginia wanted blue and red ones, those to the south, black and white (Tinling 1977:1:30, 41, 57, 64; Ewan and Ewan 1971:385). Why? The colonist either did not know or did not say. He knew only that such idiosyncracies could spell the difference between profit and loss.

Those items natives did accept were grafted onto existing ways. Some were simply substitutions of European for aboriginal manufactures. Indians happily donned cloth instead of deerskins, painted their faces with vermillion rather than cinnabar, became export marksmen with a musket as well as a bow, dug graves with iron rather than stone tools (Ward 1984), and adorned themselves and their dead with glass beads as well as shells. At other times they reshaped an item to suit

themselves. Lawson reported, and archaeologists have since confirmed, that Piedmont men fashioned arrowheads from broken glass bottles (Lefler 1967:63; Charles 1983:31). Meanwhile, the women might take a copper kettle and cut it up to make into ornaments, or an Indian fortunate enough to obtain a horse used the animal in ways that made an Englishmen cringe. The Saponi headman proudly showed Lawson "2 of his Horses, that were as fat, as if they had belong'd to the Dutch Troopers." Natives never rode these creatures, and scarcely ever used them as beasts of burden, preferring instead to keep them as status symbols and stuff them with corn like some pampered pet (Lefler 1967:54, 44).

The merchandise Indians gave in return for all of these European goods further strengthened attachments to past ways, for each was firmly rooted in aboriginal skills. The cane baskets William Byrd's men brought back from Piedmont towns were products of a long craft tradition among women there, a tradition flourishing in de Soto's time (Ewan and Ewan 1971:384; Varner and Varner 1951:313, 315-316). Similarly, the deerskins that made up the bulk of a colonial trader's return cargo entailed no radical departure from previous modes of existence. Deer were already a vital part of everyday life, and Indians were adept at stalking, killing, and processing the animals. Even the occasional Indian slave that Virginians brought out of the interior required no revolutionary reversal of customary ways. Piedmont warriors had habitually captured enemy Indians for adoption, torture, or servitude. This reservoir of outsiders could now be tapped to supply colonial demands, and replenished by new forays against traditional foes (Merrell 1982a:78-80).

In short, neither the wares Piedmont folk acquired nor the articles they handed over in exchange revolutionized their lives. It is

therefore not surprising to find traditional patterns of belief and behavior intact despite heavy engagement in intercultural trade. Historic sources and archaeological evidence agree that routine subsistence practices did not break down despite the time Indians devoted to the trade. Natives had added peaches to their repertoire of foodstuffs, but otherwise a Piedmont Indian in 1700 ate much the same dishes as his ancestors a century or two earlier (Lefler 1967:24, 35, 115-116; Ewan and Ewan 1971:376; Wilson 1977:83, 115-116; Ward, 1980:196, 198; Johnson 1984). Young men still helped with planting, women still tended the crops and gathered wild plants, hunters still went out for food as well as deerskins, bringing back turkey as well as venison (Lefler 1967:17, 31, 34-35, 59, 177). Nor had the demands of the trade wrenched people free from the ancient system of values. A hunter stalking deer to sell the hides to colonists was no less eager to propitiate the gods than his ancestor (Lefler 1967:58). And when that hunter died, his possessions—even the coveted musket—went with him into the earth and the afterlife rather than being passed on to his kinfolk as people with European notions of property would have done (Dickens et al. 1984:35, 49).

Thus the threads binding upcountry Indians to the past remained unbroken by the steady expansion of trade with colonists. Nonetheless, the evidence of cultural persistence cannot altogether obscure signs of profound changes set in motion by the trade. The most obvious of these changes was alcohol, one European product Indians could not easily incorporate. Lawson ranked it with smallpox as a killer (Lefler 1967:232). While exaggerated, his assessment does point to the havoc created by a keg of rum. Indians would sell all they possessed to acquire it, would not stop drinking until completely intoxicated, and

then, freed of customary restraints, proceeded to maim or kill themselves and their townspeople (Lefler 1967:18, 184, 211, 240). According to Lawson, inhabitants of the interior had only recently become acquainted with liquor (Lefler 1967:232). If so, they quickly learned how destructive it could be and took steps to combat it. By 1712, the Saponi were petitioning Virginia authorities to prohibit the sale of liquor to Indians, an appeal repeated many times with no real effect (McIlwaine 1928:3:312-313). Officials in Williamsburg proved as helpless to stop colonists from selling it as native headmen were to prevent their people from purchasing it (Wright 1966:315).

Alongside the obvious addiction to alcohol was a more subtle, more pervasive, and ultimately more destructive addiction to European technology in general. The erosion of ancient craft skills, virtually undetectable at the time, is clear in the archaeological record, as arrowheads and clay pots became cruder in design and clumsier in execution with the passage of time (Lewis 1951:310; Coe 1964:49-50; Trinkley and Hogue 1979:11). This ominous development meant that Indians were steadily becoming more dependent upon fresh supplies of European merchandise, a dependence that left them at the mercy of distant markets and unknown forces.

The shifting Piedmont settlement pattern also leaves subtle clues of the growing importance of trade. With the exception of the Tutelo and Sara, by 1701 all of the remaining Piedmont groups had chosen to settle astride the principal trail from Virginia to the populous Catawba River towns, the better to waylay itinerant colonial traders headed to those lucrative markets. Between the time Lawson passed through and the publication of his book eight years later, all of these peoples had taken another important step down the road to dependence, leaving the

upcountry to bypass middlemen like the Tuscarora and get closer to their colonial suppliers. The Sara and others moved south into unfamiliar terrain along the Pee Dee River to establish a trade connection with Charleston (Anonymous 1715). The Saponi, Occaneechi, and Tutelo chose to forget their old quarrels with Virginia, and they settled along trading paths on the colony's southwestern frontier where they had easy access to the colonial trading community (Cumming 1958:16, 22; McIlwaine 1928:3:188, 196, 296, 566).

While disease had compelled independent peoples to consolidate and trade had pulled these remnant groups toward English settlements, the catalyst in these developments--the force driving survivors together and then pushing them out of the Piedmont--was Iroquois warfare, the third and final major change Piedmont groups endured in the Historic period. The beginnings of this bitter conflict date from the last half, perhaps even from the last quarter, of the seventeenth century. Before that time the Five Nations of Iroquois were preoccupied with native peoples elsewhere. Only after 1660 did northern visitors begin to penetrate the Southern Piedmont, and even then intruders were rare--colonial explorers like Lederer made no mention of them. The real threat to the uplands came in the late 1670s, when the Susquehannock--driven from Maryland by colonial militia in 1675, attacked the next year upcountry warriors in Virginia, the year following incorporated with the Five Nations--returned south with their new friends to settle old scores. Before long, northern war parties regularly "infested" the southern upcountry, attacking villages and carrying off prisoners (Merrell 1984a:3).

Warfare was hardly new to the Piedmont. Archaeological research at earlier village sites has turned up unmistakeable signs of palisades,

clear evidence that inhabitants of the pre-contact world feared attacks from someone (Benthall 1969:20; Holland 1970:115; Egloff 1980:130). Nonetheless, these Iroquois incursions were probably unprecedented in their frequency and their ferocity. The peoples Lawson met between the Catawba and the Tuscarora huddled in their fortified villages in daily fear of another raid. Lest they forget the dangers, piles of stones marking the graves of earlier victims or the occasional escapee from Iroquois captivity served as painful reminders of the harsh reality (Lefler 1967:50, 59). The recent discovery of two burials at Occaneechi Town—one showing signs of scalping, the other with a musket ball lodged in its leg--further attests to the precarious existence of Piedmont Indians in this period (Dickens et al. 1984:32, 37, 48). They banded together, acquired firearms, captured prisoners, even ventured north to gain revenge—but nothing they did could halt enemy incurions (Lefler 1967:53; Hazard 1851:2:138). Ultimately it was the search for shelter from this Iroquois storm that drove the Sara and their confederates into South Carolina's embrace while the Occaneechi and others sought refuge in Virginia (Wright 1966:398; Lefler 1967:242).

Peace proved elusive, however. For a time the Sara and their Keyauwee and Eno compatriots along the Pee Dee River enjoyed the best of both worlds: they kept their ties to Virginia while making new friends with South Carolina. When men from Charleston stopped at the Sara village in 1712 on their way to fight the Tuscaroras then raiding North Carolina, forty-two Sara warriors were heading in the opposite direction to join the Yamasee and others in an attack on South Carolina, and they carried on the fight with grim determination long after most Indians had made peace. As if South Carolina's enmity were not enough, the Sara also learned that they could run from the Iroquois invaders, but they

could not hide. In 1716 and again in 1723, war parties from the Five Nations wreaked havoc along the Pee Dee River. By the end of the 1730s, most of the inhabitants had abandoned their new homes to take refuge among the Catawba. They soon discovered that the Catawba Nation was more target than refuge, and during the 1740s Sara leaders were again talking of moving someplace "where they might have fewer Enemies." Colonists and Catawbas convinced them to stay, and they agreed, perhaps in large part because past experience had taught them the futility of escaping their implacable northern foes (Merrell 1982a:223, 234, 250, 303, 309, 363, 390).

The Occaneechi, Tutelo, and Saponi followed a path in some ways different but also quite similar. In 1714, they signed a treaty with Virginia's Lieutenant Governor Alexander Spotswood that formalized their relationship with the province. The Indians would live beside the Meherrin River in the shadow of Fort Christanna, an outpost to be built by a trading company and manned by colonial rangers. In return for their promises to help defend the frontier and pay tribute to Williamsburg, the natives were to receive protection, trade, a reservation, and--Spotswood's pet project--instruction in "civilization" and Christianity. Spotswood was optimistic, the Indians pronounced themselves satisfied, and a visitor to the settlement in 1716 found native children sitting attentively in a classroom under the watchful eye of an English tutor (Beaudry 1981:2-13; Alexander 1972:90-99).

For all the high hopes, the experiment was short-lived. Competing trade interests managed to get the trading company abolished before the end of the decade, and in the 1720s the "Christanna Indians" found themselves harassed by nearby settlers, attacked by northern war parties, and abandoned by colonial officials. In 1728, they marched

back into the Piedmont along the old trading path to join other refugees heading toward the Catawbas. Their stay in the Nation turned out to be as brief as the Christanna experiment, however. By 1732, they were back in Virginia, from whence they scattered in several directions. Some went to live with the Tuscarora still in North Carolina; others drifted into the backwaters of Virginia society; still others found a home with a North Carolina planter engaged in trade with the Catawba; most eventually drifted north to join their old enemies, the Six Nations, and become one of the "props" in the Iroquois Longhouse (Merrell 1982a:305-3089; McIlwaine 1930:4:239; Saunders 1968:3:537-538, 5:321, 6:616; Holland 1982:42; Grinnan 1895-96:189-191; White 1981:65-69; Hale 1883:5-10).

The different fates of the Sara and Occaneechi constellations remains puzzling. Why did Piedmont peoples sort themselves out into this particular configuration and not some other? Why did the Sara-Eno-Keyauwee groups eventually establish permanent residence with the Catawbas, while the Saponi and their associates did not? There was no overt antagonism between the two: the Sara and Eno had considered joining the Christanna experiment, and when Christanna Indians returned from the Catawba Nation in 1732 some Saras came along while some Saponis remained behind (McIlwaine 1930:4:269; Merrell 1982a:113, n.197). The Siouan Project currently being conducted by the Research Laboratories of Anthropology may yield clues to these and the many other riddles Piedmont peoples bequeathed to future generations. The answers lie buried beneath the surface of the land these Indians once called home, at Upper Saratown, the Fredricks site, or other places yet uncharted. Rediscovering that lost world will take time. But the marriage of history and archaeology has already begun to piece together its

outlines, to show that, however different their ultimate fate, the inhabitants of the uplands shared a common history during the first two centuries of European contact, a history marked by creative if painful adaptation to the changes the intruders brought to "this Western World."

NOTES

1. Until further archaeological research is carried out, the claims put forth in this paragraph remain speculative. It should be noted that the linguistic and cultural patterns in the Piedmont are matters of considerable dispute. Earlier scolars placed a large number of groups under the Siouan umbrella; more recently, many have demanded firmer evidence. While agreeing that the first students of the problem may have been too eager to label a people "siouan" and that nonlinguistic considerations cannot prove linguistic relationships, I am persuaded by William Sturtevant's argument (Sturdevant 1958:741) that where we lack linguistic evidence, we must make do with whatever sources are available. Here geographical proximity, cultural parallels, aboriginal or historic political relationships, and contemporary statements by colonists about linguistic similarities all suggest that most if not all of the Indians in the Piedmont at the time of English contact spoke some form of Siouan. Included among these are Catawbas, Saras, Saponis, Tutelos, Occaneechis, Monacans, Mannahoacs for certain, and Waterees, Enos, Keyauwees, Sugarees, Esaws, Shuterees, and Shakoris most probably. The linguistic debate may be followed in Mooney (1894), Siebert (1945), Miller (1957), Sturdevant (1958), Binford (1959), and Hudson (1970:5-9,27-28). For the archaeological work done (other than the Siouan Project currently underway) see Griffin (1945), Coe (1952), Wilson (1977:12), and Mouer 1983:21-24).

2. It is possible that Occaneechi developed as a trade language only in historic times.

3. The following analysis of native response to disease and trade has been adapted from work I have already published on the Catawba Nation and its neighbors. See Merrell 1984b:542-555.

CHAPTER III

ARCHITECTURE AND FEATURES AT THE FREDRICKS, WALL, AND MITCHUM SITES

by

Gary L. Petherick

INTRODUCTION

This section describes and compares the internal site structure of the Wall, Mitchum, and Fredricks sites from data available through the 1984 field season. This research is part of a larger project to investigate the processes of culture change among Indian groups of the Carolina Piedmont during the period of European exploration, trade, and colonization. Information on the structure of these three sites, which represent settlements from the Protohistoric, Early Contact, and Middle Contact periods, allow some preliminary assessments of the cultural diversity, continuity, and change as reflected in the organization of the archaeological record at intrasite and intersite levels.

Specific research questions about site structure are listed below:

1. How were the villages of the Protohistoric period structured in terms of their spatial organization and architecture?
2. Do these villages reflect increasing populations, or were they relatively stable in terms of size?
3. Were the villages seasonally abandoned or were they occupied all year?
4. Does spatial structure at these sites reflect differences in status between the members of these societies?
5. Do differences between the sites reflect differences in native cultural traditions or European-induced culture change?
6. Did participation in the deerskin trade bring about an increase in group mobility?
7. Did the introduction of metal tools or Euroamerican ideas concerning architecture and construction methods cause changes in the traditional ways of house building?

8. With depopulation, did people become consolidated in small inter-ethnic composite villages?

9. Did settlements become more compact and nucleated as a response to increased warfare?

Although the data are insufficient to approach these questions with certainty, some preliminary observations can be made by comparing aspects of the structure of the three sites under study. Complete answers to these questions will have to be derived from the integration of findings from a larger number of sites representing a greater range of time. It is hoped, however, that this paper will play some small part in leading to a more complete understanding of the cultural systems of the Native Americans who once thrived in this area.

An eclectic, and largely descriptive approach, is taken in this section. This section is largely descriptive, as it is believed that accurate and complete descriptive data are necessary for reaching correct interpretations. Limitations of the data have led in many instances to the development of preliminary interpretations that may seem to border on speculation. Such statements, however, are offered in an effort to provide a datum from which future research can be developed.

The basic assumption used in this research is that the spatial organization of a site, as it is observed archaeologically, reflects either directly or indirectly the spatial organization of the cultural system that produced the site. More specifically, the spatial arrangement of structures, facilities, and open areas reflect the cultural and physical processes that created them. Their patterned interrelationships reflect patterned behavior associated with them. These patterns also reflect ideas shared by members of a community as to how space should be organized (Hall 1969; Rapoport 1969; Clarke 1977;

Hodder 1978, 1982).

The method followed within this analysis is a search for patterns: patterns of postholes, patterns of structure location, patterns of features both in form and context, patterns in materials making up fill within features, patterns in the distribution of cultural residues. The interrelationships between these kinds of patterns may themselves form patterns. It is these larger patterns that allow for interpretations that are more secure and meaningful in terms of past human behavior. This analysis is confined to what Clarke (1977) has classified as the micro and semi-micro scales of cultural systems. That is, the analysis is confined to patterns and processes visible at the site level and at levels within the site. It is acknowledged that such an analysis would be incomplete without considering the larger settlement system of which villages are only a part. Nevertheless, it is believed that for an analysis of the larger system, detailed information concerning the parts are required. An attempt is made to interpret the observed patterns in behavioral, social, and cultural terms where possible and to offer some preliminary hypotheses when the meaning of the pattern is unclear. With these basic ideas in mind, each of the sites are discussed and comparisons and preliminary interpretations offered. The latter are directed at the research questions outlined above.

The size of the area investigated at each site is different, and this presents some problems in comparing the sites at the scale necessary for defining site patterns. It is difficult, if not impossible, to compare the village structure as it appears from over 14,000 ft^2 of excavation with the structure as it appears from 850 ft^2. Similarly, it is difficult to compare features and feature fill zones from two sites when one set of features was excavated before

archaeologists became aware of the need to use fine-scale data recovery techniques. Such are some of the problems with the data from these sites effecting comparability.

WALL SITE

The Wall site is a relatively small, palisaded village which dates to the mid-sixteenth century. Three radiocarbon dates from wood charcoal recovered from feature excavation yield an average date of A.D. 1545±80 (GX9718, GX9719, GX9834). The village itself covers approximately one and one-quarter acres and lies within a horseshoe bend of the Eno River in Orange County, North Carolina.

Investigations at the Wall site were conducted in 1938, 1940-41, and 1983-84 (Figure 12). In 1938, a 100-ft exploratory trench revealed the stratigraphy of the site and a portion of a circular structure. The 1940-41 excavations were more extensive and exposed a large portion of the western half of the village. At the end of the 1941 field season approximately 12,000 ft^2 of the village had been explored. In 1983, after a hiatus of 42 years, investigations were resumed at the Wall site. The 1983 work was designed to determine the exact location and extent of the earlier investigations. Additionally, a 600 ft^2 area to the east of the earlier excavation was exposed, revealing a group of three burials, portions of two circular structures, and a section of one of the village palisades. The focus of the 1984 work, which totaled 1100 ft^2, was to expose and excavate the circular structures identified the previous year.

As of 1984, nearly 26% of the village had been excavated (14,300 ft^2). These excavations have revealed a fairly detailed picture of the internal organization of the village (Figure 13).

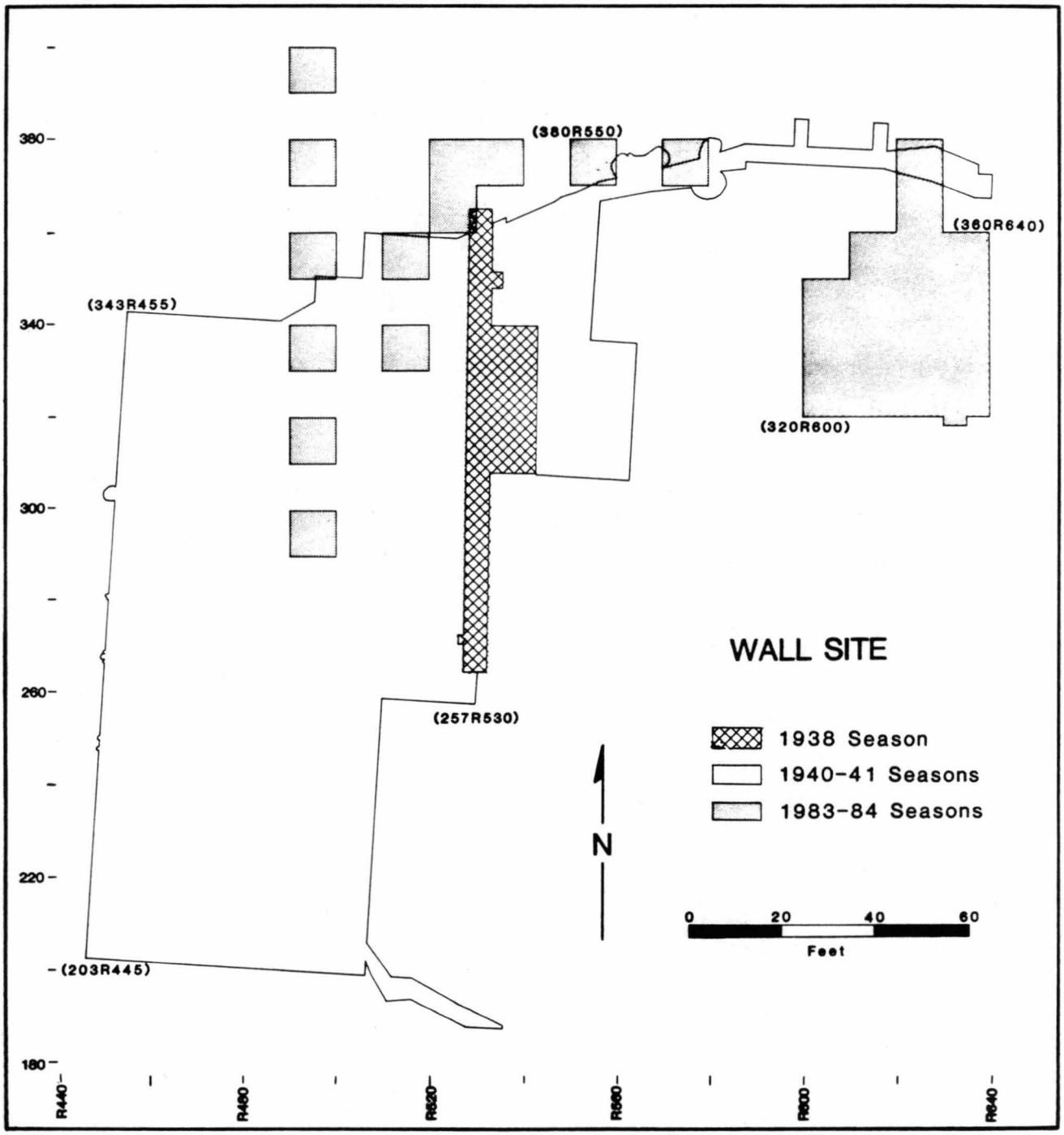


Figure 12. 1938, 1940-41, and 1983-84 excavation areas at the Wall site.

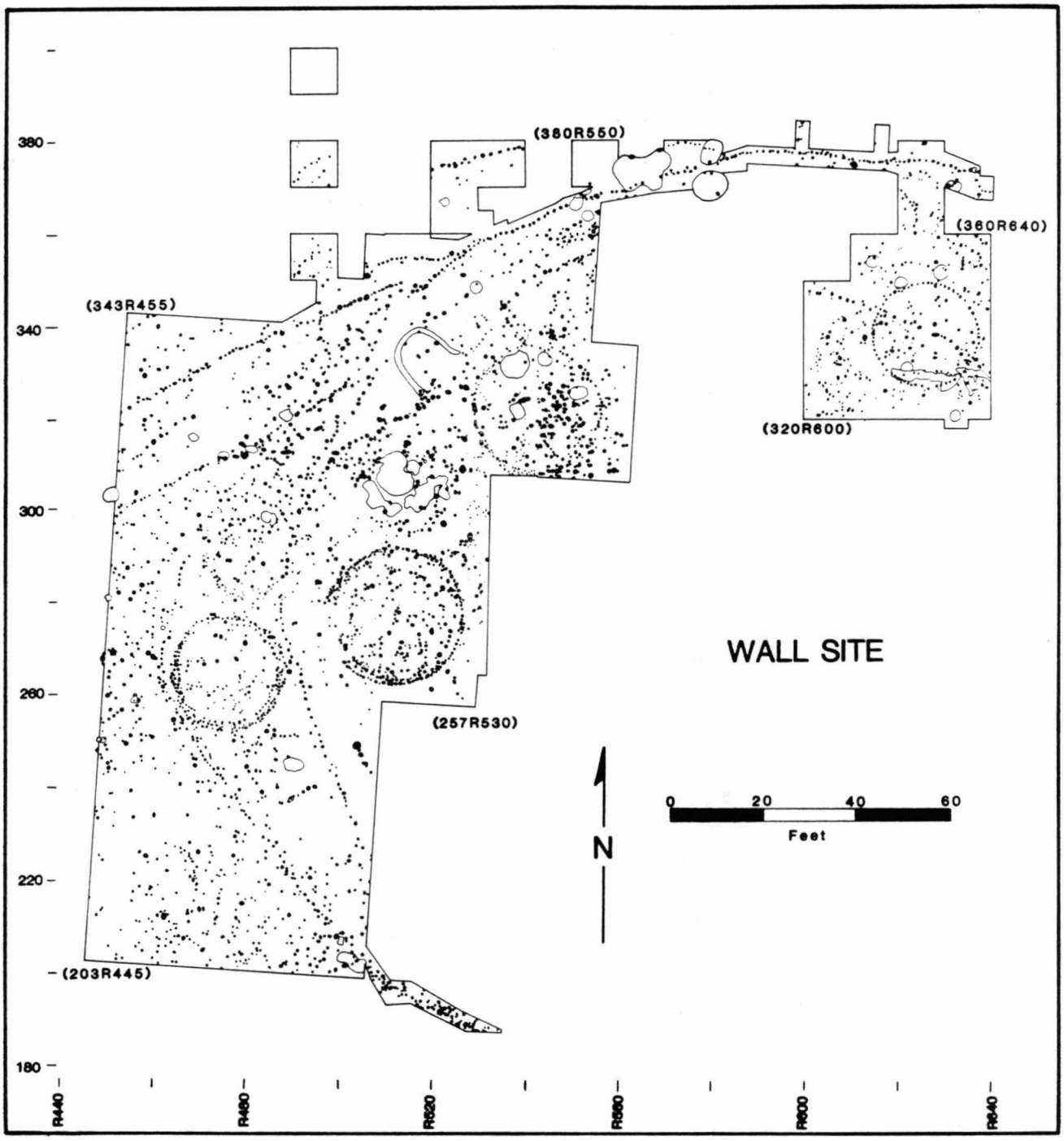


Figure 13. Excavation plan at the Wall site, 1938-1984.

Ten complete structures have been identified from the investigations so far (Figure 14). In addition, two structures are partly defined but extend beyond the boundaries of the excavations. Midden deposits were well-preserved along the northern third of the excavations. The densest deposits have been observed in the north-central part of the site in the vicinity of entrances through the various palisades (Figure 15). The features observed and investigated consist mostly of shallow basins of different sizes and shapes. Three small storage pits also have been identified, two of which were discovered during the 1984 excavations in the eastern part of the site. A total of eight burials have been excavated. These were located both within and near the structures at the site (see Ward, Wilson, this report).

Site Stratigraphy

At the Wall site, cultural remains are contained within four soil layers that are differentially preserved across the site (Figure 16). The uppermost layer (Zone I) is a plow-disturbed light brown clay loam that ranges from 0.55 to 0.95 ft thick. Artifacts recovered from this zone consist of fragments of aboriginal and Euroamerican ceramics, chipped-stone tools and debris, fire-cracked rock, daub, brick fragments, metal fragments, glass, and small amounts of charcoal and animal bone. These materials derive from both aboriginal and Euroamerican occupation of the site vicinity. The vast majority of these remains are from the mid-sixteenth-century village occupation, being derived from plowing of the upper portions of postmolds, pits, house floors, and midden. (For a description of the pre-village remains see Tippitt, this report; and for a description of the historic remains see Carnes, this report). Thus, Zone I was created by plowing through

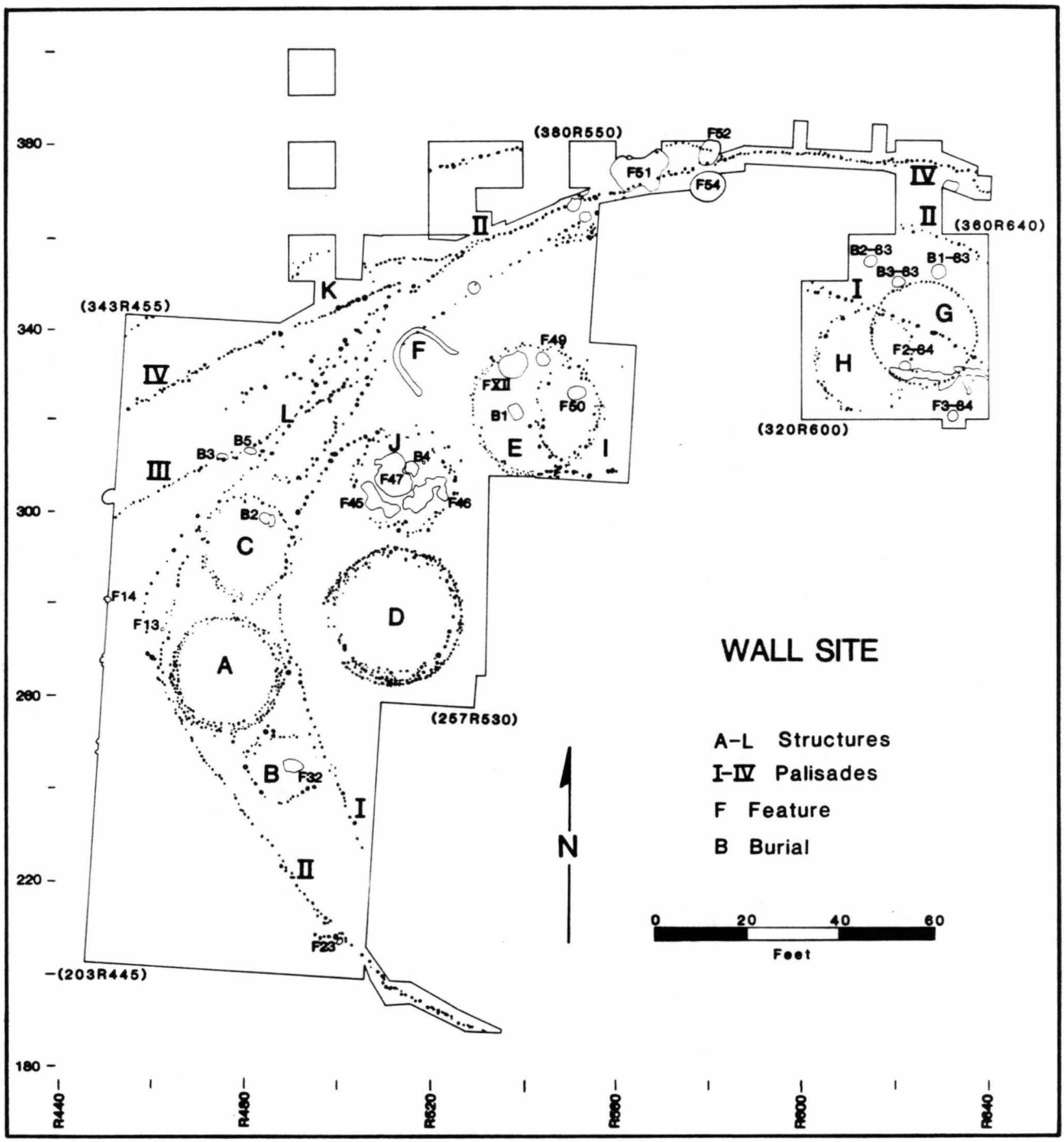


Figure 14. Plan of architecture and features at the Wall site.

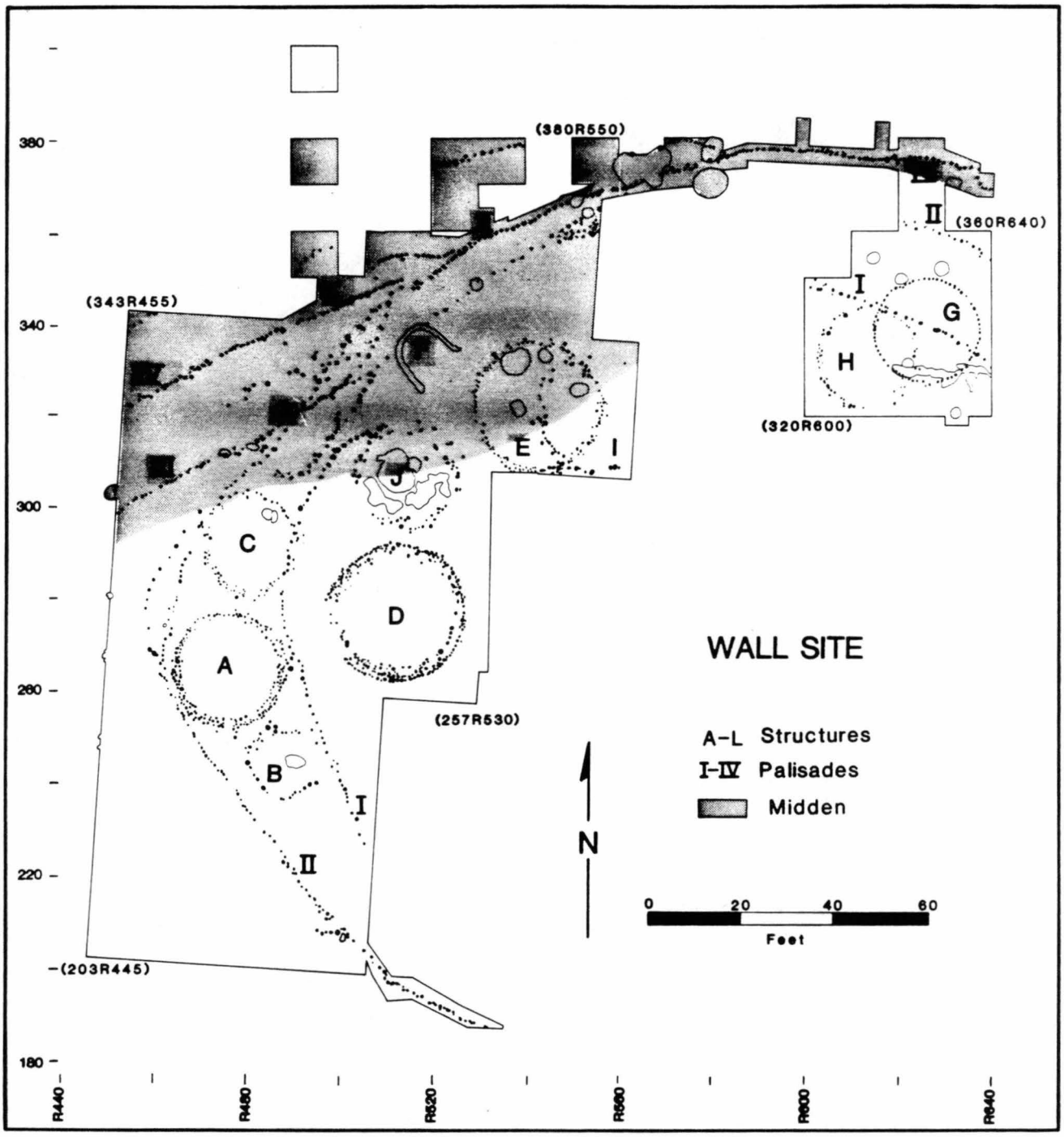


Figure 15. Areal extent of the midden at the Wall site.

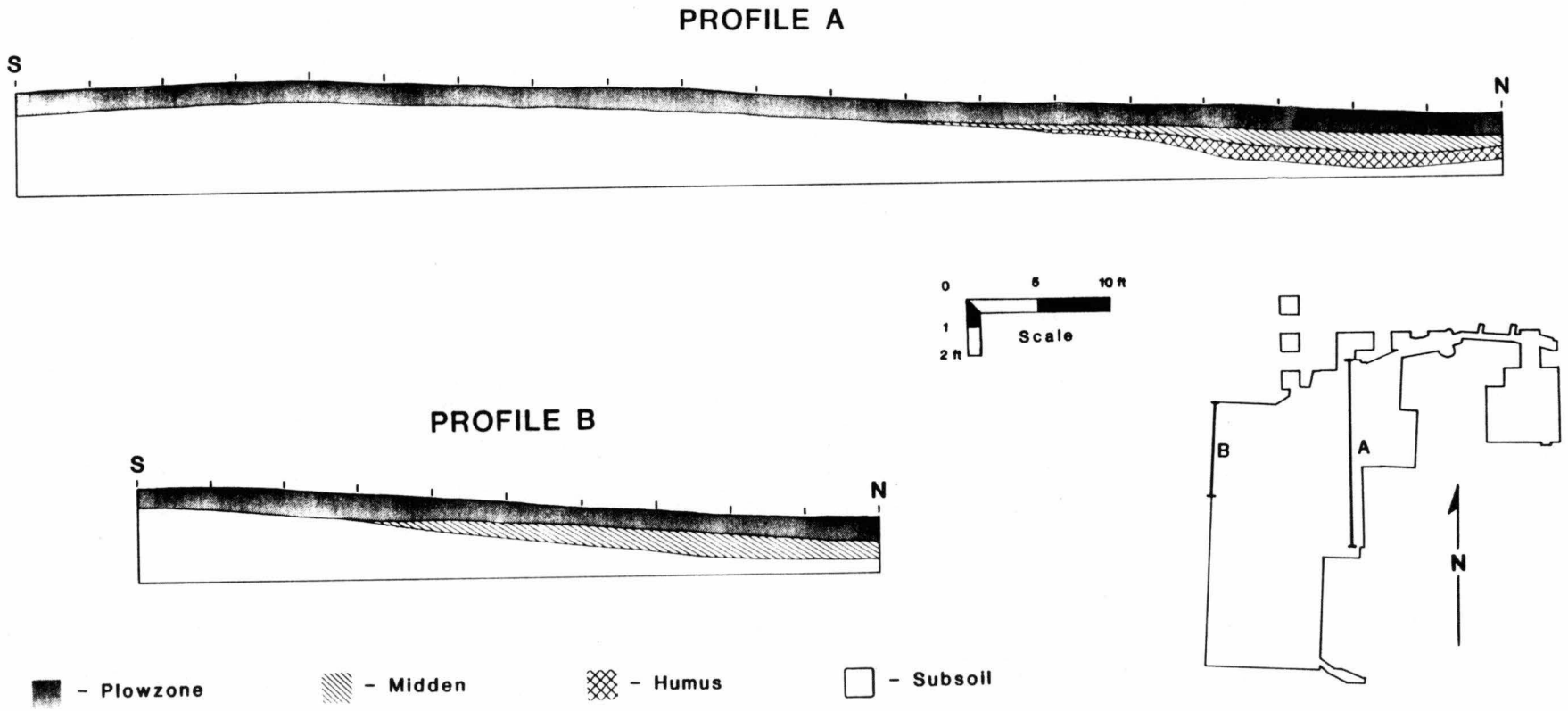


Figure 16. Site stratigraphy at the Wall site, N-S sections.

the tops of the features and mixing their contents with debris from both earlier and later occupations of the area.

The plowzone is underlain by either Zone II, III, or IV depending on the portion of the site examined. Zone II consists of an intact midden deposit which accumulated on the original occupation surface. This midden is extensive and well preserved along the northern third of the site, where the original land surface sloped downward and away from the village. Material accumulated in these low areas to a thickness that allowed for their preservation beneath the deepest penetration of the plow. Zone II ranges from 0.0 ft to 1.25 ft thick and is a dark brown loam rich in cultural and organic material. This midden contains numerous potsherds, chipped- and ground-stone tools and debris, large quantities of animal bone and charred plant remains, daub, fire-cracked rock, shell, and wood charcoal. The artifacts usually are in larger pieces and are less weathered than those of Zone I. This rich cultural deposit provides a diverse assemblage of materials that has been analyzed for information concerning faunal exploitation (Holm, this report), plant exploitation (Gremillion, this report), shell utilization (Hammett, this report), ceramic tradition and technology (Davis, this report), and lithic technology (Tippitt, this report). Zone II was excavated in two levels. The uppermost level (Level 1) was darker and appeared to have a higher organic content than Level 2. The relatively large amounts of cultural debris recovered from Level 2 suggest that this level, although much lighter in color, is not the original (pre-village) surface but is a deposit overlying and grading into the original surface.

Zone III is a light tan sandy clay loam which grades from the overlying midden zone to the underlying subsoil. This soil layer is

interpreted to be a relict of the original humus on which the midden accumulated. The upper portion of this humus probably was disturbed aboriginally and is contained in the lower portion of Zone II. One feature (Feature 5-84) was observed within Zone III and has been interpreted as hearth materials redeposited adjacent to the village prior to the accumulation of midden in that area.

Underlying Zone III, and Zone I where the midden is not present, is Zone IV. This is a yellowish-brown sandy clay subsoil of undetermined depth. Cultural remains from within this zone constitute various intrusive features excavated by the aboriginal inhabitants. These features consist of postholes, burial pits, and shallow and deep pits used in food preparation, heating, clay procurement, and storage or caching. These features are evident at the top of Zone IV as stains that contrast with the subsoil in both color and texture.

Midden

The midden at the Wall site is preserved as a continuous deposit rich in organic material and artifacts in the vicinity of the various palisades (Figures 15 and 17). It is present inside Palisade I and extends well beyond Palisades II and IV. Its presence inside the earliest palisade suggests that the extent of the midden may have been much greater before recent plowing truncated it. The thickest part of the preserved midden is in the vicinity of Palisade IV. The deposit becomes much thinner at distances greater than 20 ft from this palisade. Profile drawings (Figure 16) show that the original land surface was much lower than it is today in the area where the midden is preserved. Thus, the original boundaries of the village may have conformed to the higher area between the river and this depressed area. Refuse was deposited along the outer edge of the village and eventually built up



Figure 17. Sq. 370R530 at the Wall site showing midden preserved beneath plowzone, and a portion of the posthole pattern of Palisade E.

this low area. This process created additional area onto which the village expanded.

The full extent to which the midden originally accumulated is not known. Post-occupational processes of plowing and erosion have disturbed the upper portions of this deposit and obliterated it in areas where it was only a thin sheet. A second problem in defining the extent of the midden results from the data recovery and record-keeping methods of the 1940-41 investigations. The materials recovered from these excavations were recorded either as coming from "plowed soil" or from "undisturbed soil." The distribution of units with material recovered from undisturbed soil suggest that most of this is midden along the palisades. Several excavation units in the central part of the site in the vicinity of Structure J, however, also had undisturbed soil below the plowzone. If this undisturbed soil is village midden, it must have accumulated after the abandonment of Structure J because these deposits overlay three features and a burial that are associated with the structure.

Features

Thus far, 73 features have been found at the Wall site. (Features identified in 1938 were assigned numbers I-XIII, and those excavated in 1940-41 were assigned numbers 1-54. When work was resumed in 1983, features were assigned consecutive numbers beginning with 1-84. Because these feature designations are embedded in the excavation records of this site, original numbers are used in this discussion.) Thirteen of these were identified during the 1938 excavations. Of these 13, all but two appear to be postholes. Features XII and XIII have their locations and plan form known only and will not be discussed further.

Fifty-four features were identified during the 1940-41 excavations.

Of these, all but 13 probably represent large postholes. One is a small wall trench structure (Structure F).

The 1983-84 excavations revealed five additional features, bringing the total number of features (excluding postholes and structures) to 17. Locations of these features are shown in Figure 13, and size attributes of pits and basins are summarized in Table 1.

Features 32, 49, 50, and 52 were small and medium-sized shallow basins (Figure 18). These features were oval to circular in plan and ranged from 2.5 ft to 5.0 ft in diameter. Three were located within structures. Feature 32 was located within Structure B and Feature 49 was located within Structure E. Feature 50 was located within the area where Structures E and I overlap, and was probably associated with Structure I. As only a sketch was made of the profile of Feature 50, its exact depth is not know, but it does appear to have been a shallow basin. Feature 52 was located in the northeastern part of the site and was intruded by Palisade IV. This was the largest of the four features in this group.

Although it is possible that these features represent soil recovery facilities (borrow pits), their context suggests that most were basins used in tasks which took place inside of houses, perhaps related to food processing. Contents were removed in single units and no fine-screening or flotation was used to recover small materials such as carbonized plant remains. The field records do not describe the fill qualities, and it is not possible to ascertain whether the fill in these features represents in situ deposits from food preparation, or secondary refuse. Their relatively small size and their contexts within domestic structures suggest that they functioned primarily in household activities.

Table 1. Summary of feature attributes for pits and basins at the Wall site.

Feature	Length (ft)	Width (ft)	Depth (ft)	Estimated Original Depth (ft)	Depth/ Diameter	Estimated Volume (ft^3)	Feature Form
32	3.70	2.50	0.40	1.15	0.28	13	Shallow Basin
49	3.80	3.15	0.35	0.45	0.13	4	Shallow Basin
50	4.25	3.10	-	-	-	-	Shallow Basin
52	5.00	4.25	0.60	0.60	0.13	8	Shallow Basin
51	13.00	7.90	1.00	1.00	0.10	47	Large Shallow Basin
54	7.30	6.30	0.80	0.80	0.12	24	Large Shallow Basin
47	9.30	8.20	1.10	1.10	0.13	44	Large Shallow Basin
23	2.00	1.80	2.30	3.05	1.52	10	Deep Pit
2-84	2.60	1.75	1.45	2.20	0.98	7	Deep Pit
3-84	2.95	2.63	1.45	2.20	0.88	9	Deep Pit
45	9.70	3.20	0.60	0.60	-	10	Amorphous Basin/Depression
46	11.10	3.80	0.85	0.85	-	11	Amorphous Basin/Depression
13	1.00	0.80	-	-	-	-	Cob-Filled Pit/Basin
14	1.80	0.75	0.35	1.10	-	-	Cob-Filled Pit/Basin

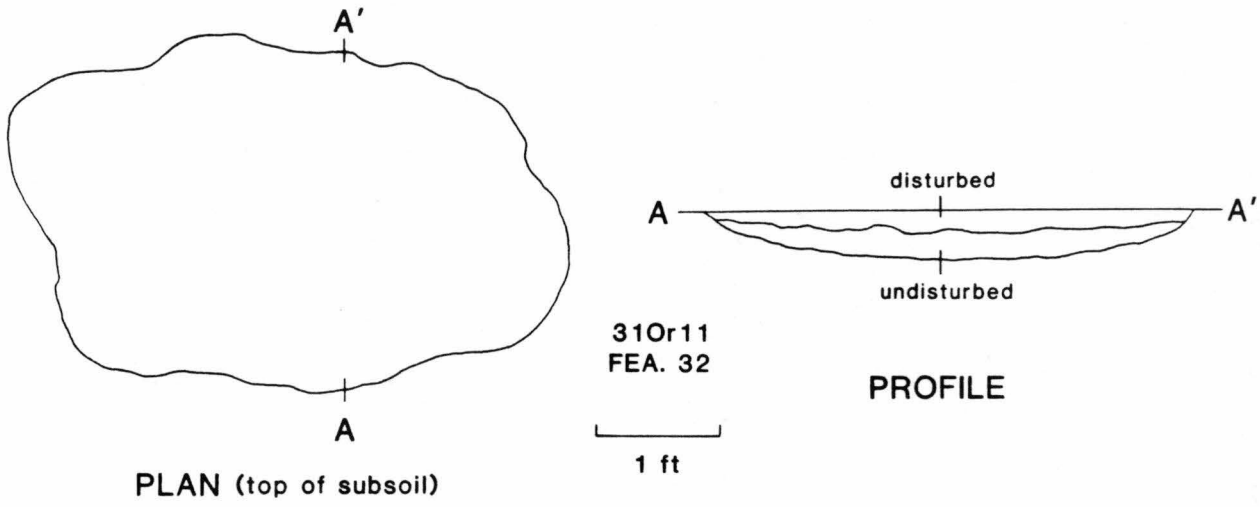


Figure 18. Plan and profile of Feature 32, a small shallow basin, at the Wall site.

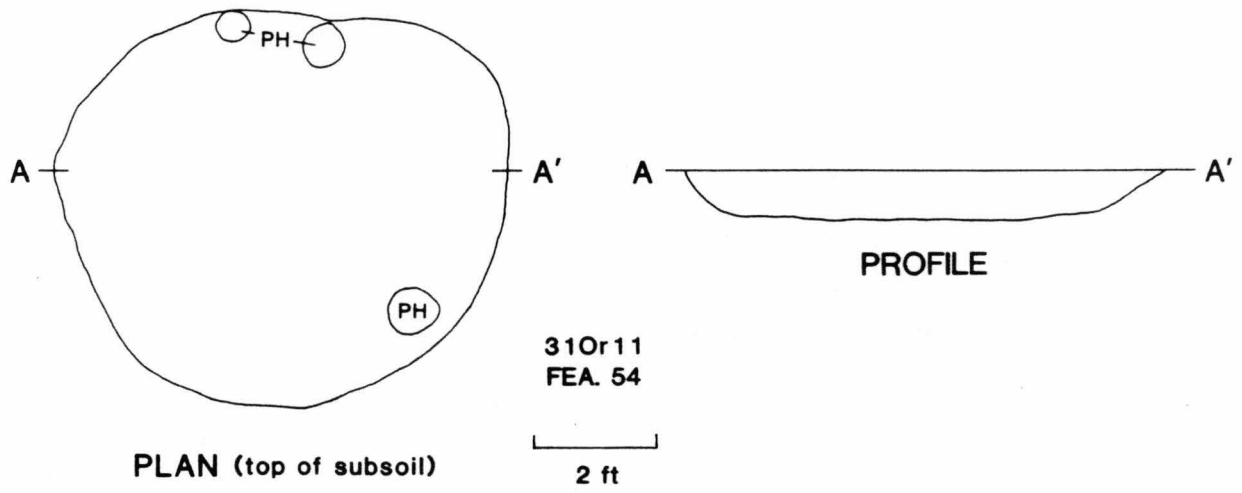


Figure 19. Plan and profile of Feature 54, a large shallow basin, at the Wall site.

Features 47, 51, and 54 were large shallow basins (Figure 19). They were oval to circular in plan and ranged in size from about six feet in diameter for the circular basins to about thirteen by eight feet for the oval forms. Depths of these features ranged from 0.80 ft to 1.10 ft below subsoil.

Two of these features were located adjacent to one of the outermost palisade lines in the northeastern area of the site. Feature 47 was located in the central area of Structure J. The contents recovered from these features consisted of a wide variety of cultural materials, including several items that were poorly represented in the midden. Bone tools, such as awls and beamers, were present. Larger quantities of shell tools, such as scrapers, and unaltered fresh water shell, probably representing food remains, also were present. Whether the contents of the features represent in situ deposits or secondary deposits is not known given the limitations of the data. However, differences in contents of these features and the midden do suggest that they resulted from different behavior. The largest of the two features was rather irregular in form, and it is probable that this one was used originally as a borrow pit for clay and subsequently as a refuse container. An alternative interpretation is that its irregular form resulted from the overlap of several more regularly shaped basins that were constructed in the same location at different times.

Two large amorphous basins, Features 45 and 46, were located within Structure J and conformed to its inside perimeter. They were irregular in both plan and profile (Figure 20) and could represent either soil recovery facilities or depressed and erosional surfaces associated with activity inside the structure. The absence of such worn surfaces inside other structures at the Wall site argues against the latter

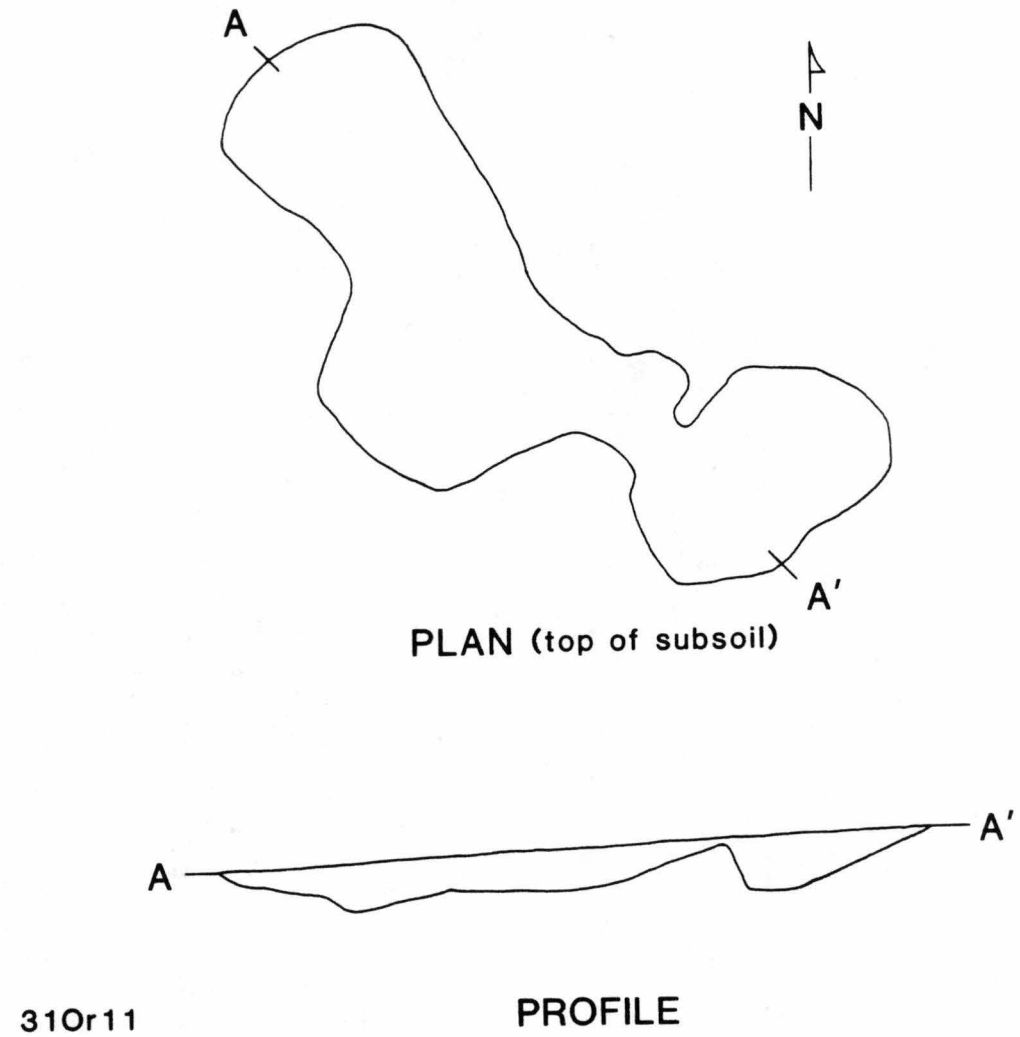


Figure 20. Plan and profile of Feature 45, a large, amorphous shallow basin located within Structure J, at the Wall site.

interpretation. The features, therefore, can best be interpreted as areas where clay was obtained to be used in the maintenance of the structures in this vicinity.

Two small pit/basins filled with charred corncobs were excavated during the 1940-41 seasons. Both of these features were located near Structures A and C. Feature 13 was within the area enclosed by Palisade II, and Feature 14 was located between Palisade II and Structure C. The fill characteristics of these features indicate that they were small facilities in which corncobs were used as fuel. Their size and shape, as well as their contents and context, suggest that they were used as hide smoking facilities (Binford 1967).

Feature 23 (Figure 21) was a small deep bell-shaped pit located adjacent to a possible southwestern entrance for Palisade II. Very few cultural materials were recovered from this pit, and it does not appear to be associated with any structures.

The five features discovered during the 1983-84 excavations were entirely different from the previously described features, and each warrants individual description.

Feature 1-84 was a large shallow amorphous depression that overlay the southern portions of Structures G and H. It measured 20.3 ft in length and 3.75 ft in width and had a maximum depth of 0.15 ft below subsoil. This feature consisted of a laminated and lensed matrix of gray sandy soils. Although forty-six small sherds were recovered from this fill, all but two were too small to analyze. No other artifacts were recovered, and only a very small amount of charred corn was recovered through flotation. The feature overlay Structures G and H, as well as a portion of Feature 4-84. The amorphous form, shallow depth, and its orientation across two overlapping structures suggest that it is

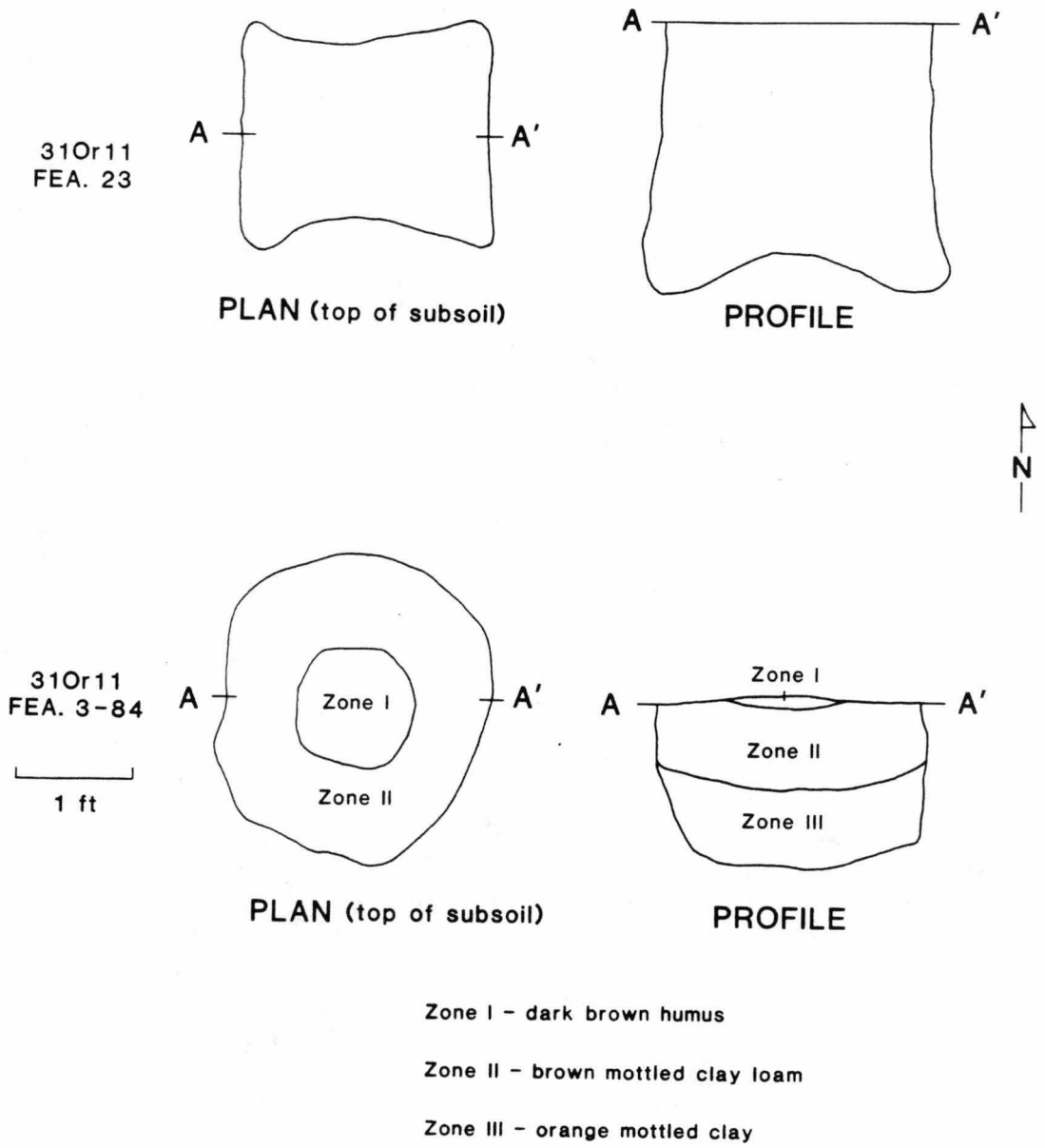


Figure 21. Plan and profiles of Feature 23 and 3-84, small deep pits, at the Wall site.

not associated with either of the structures. The low artifact density and their small size suggest that post-occupation processes were responsible for its formation. Numerous 18th- and 19th-century Euroamerican artifacts were recovered from the plowzone in this part of the site, an indication of intense Euroamerican activity in the vicinity.

Feature 2-84 was a semicircular pit located in the area where Structures G and H overlap. The pit was 2.60 ft long, 1.75 ft wide, and 1.45 ft deep below subsoil. The fill of Feature 2-84 consisted of two distinct zones. Zone I was a thin layer of mottled brown and orange clay loam that contained small amount of hickory nutshell and acorn shell (recovered from 10 l flotation sample). Zone I overlay Zone III (in situ subsoil along the southern third of the feature was mistakenly identified as Zone II) and was an orange-brown clay loam with brown mottling. This fill was very similar to relatively sterile zones of burial fill; no artifacts were recovered. The fill texture and contents suggest that this pit was only open for a brief time and refilled rapidly with mostly sterile clay subsoil.

Feature 3-84, an oval pit, was located south of Structure G. The pit was 2.60 ft long, 2.63 ft wide, 1.50 ft deep below subsoil, and had a profile similar to Feature 2-84 (Figure 21). There were three distinct zones of fill in this pit. Zone I, a thin layer of dark brown humus and charcoal, was confined to the top center of the pit. Cultural remains from this zone consisted of one chipped-stone projectile point, one flake, and a few fragments of animal bone. Zone II, a brown mottled clay loam, underlay Zone I and was approximately 0.75 ft in thickness. Cultural remains from this zone included animal bone, charcoal, a chipped-stone projectile point, and one potsherd. Zone III was an

orange mottled clay loam, 0.75 ft thick and sterile. The concave bottom of the pit, the shape of Zone II, and the fact that Zone I was confined to the extreme central area of the pit, imply that Zone I is a slump of midden that probably was characteristic of the village surface in this area. Zone II seems to represent secondary deposits of household debris associated with food preparation and consumption. Both wood charcoal and charred plant remains were abundant (Table 2), and animal bone was present.

Feature 4-84 (Figure 22) consisted of two elongated and irregularly-shaped trenches located immediately southeast of Structure G and south of Palisade I. The shape, orientation, and location of these trenches indicate that they may have been part of an entrance to Structure G. The feature was overlain by gray sandy deposits of Feature 1-84 along the northern part of both sections. The western trench was intruded by three postholes. Both trenches are comprised of two zones of fill. Zone I was a medium brown loam, both hickory nutshell and acorn remains were recovered in small quantities from this zone. Zone II underlay Zone I in all but the southernmost part of the trenches. This zone was thickest in areas where the posts appeared to intrude the feature. The shape of Zone II and the trench floor conform to the shape of the posts and are not intruded by them. This suggests that the posts and trench are associated.

Feature 5-84 is a secondary deposit of hearth contents identified near the bottom of the midden in Excavation Unit 360R530, outside of Palisade IV. The deposit was 1.7 ft diameter and was 0.35 ft thick. It did not extend into the subsoil and was confined to the lower portion of the midden (Zone II) and the old humus (Zone III). This feature consisted of fired clay, ash, and charcoal. No artifacts or

Table 2. Nonbotanical remains, wood charcoal, and plant food remains from the 1983-1984 excavations at the Wall site (grams per 10 liter flotation sample).

Excavated Context	Nonbotanical Remains	Wood Charcoal	Plant Food Remains	Total
Fea. 1-84, Zone I	31.81	0.03	0.08	31.92
Fea. 2-84, Zone I	18.94	0.10	0.06	19.10
Fea. 3-84, Zone II	46.92	15.08	0.45	62.45
Fea. 4-84, Trench 1, Zone I	77.46	1.98	0.03	79.47
Fea. 4-84, Trench 2, Zone I	36.99	0.71	0.11	37.81
Fea. 4-84, Trench 2, Zone II	120.22	0.77	0.01	121.00
Fea. 5-84, Zone I	121.18	0.95	0.28	122.41

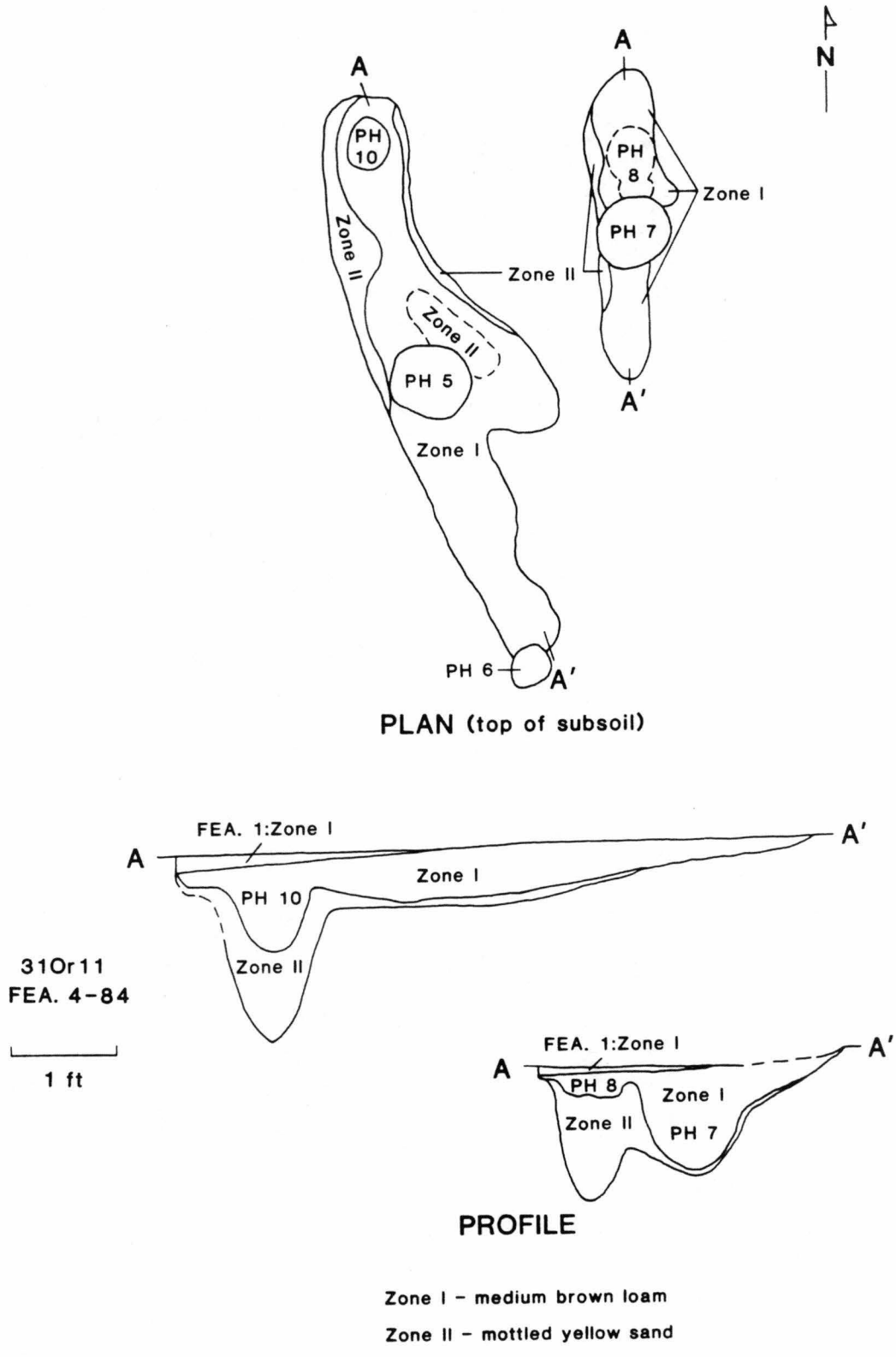


Figure 22. Plan and profile of Feature 4-84, an irregular trench-like feature associated with Structure G, at the Wall site.

fire-cracked rock were associated with it.

Aside from postholes, pits and basins are the most common features represented at the Wall site. The absence of hearths, which certainly were present when the site was occupied, is assumed to be a consequence of post-occupation processes of plowing.

Subsurface features may have their form changed as the facilities are transferred from one systemic context to another by processes of recycling. They need not necessarily change their function for their form to change, as this may be altered by processes of maintenance or rejuvenation (Schroedl 1980:17). Additionally, it is important to keep in mind that a subsurface facility may be abandoned at any point in its use-life. It is at this point that a facility may once again be transferred from one systemic context to another (e.g., a storage pit may become a container for refuse). It is only after a facility is ultimately abandoned that it enters the archaeological context (Schiffer 1972, 1976).

The production of a subsurface facility creates two end-products. First, there is the soil removed during its creation, and secondly, there is the space created (i.e., the facility itself). Either or both of these products may be the desired goal of the excavation of a pit or basin. If soil recovery is the sole desired goal, then the empty space created by its removal is an incidental by-product. If the desired goal is the space created, then the excavated soil is the incidental by-product. It is likely that these goals are often simultaneous, so that both the soil and the space are the desired end-products.

Because processes of recycling, maintenance, and rejuvenation intervene between the time that a facility is initially created and the time that it enters the archaeological record, it is not possible to

trace these processes for individual features. However, because a facility may enter the archaeological record at any point in its use-life, the variation in feature form, size, and context observed archaeologically should reflect at least some of the various stages that a facility goes through before being abandoned (Schroedl 1980:20). A feature's size and form at abandonment may provide some insight into how it functioned prior to abandonment.

The attributes of feature fill sometimes contain important information about how a feature functioned, but only if the deposits resulted directly from behavior related to the feature. Even if the deposits are secondary refuse, the fill characteristics can be useful in making inferences about the behavior that created the fill prior to its secondary deposition in pits and basins (Wilson 1977, 1985). The fill also can provide important information about the season in which a pit was abandoned, which may be useful in making inferences about the function of the facility (Dickens 1985) and about aspects of subsistence behavior (see Gremillion, this report).

Interpretations of fill classes from the features at the Wall site are limited to Features 2-84 and 3-84, which seem to have been subsurface storage facilities. Interpretation of Features 1-84, 4-84, and 5-84 has been offered earlier.

Zone I of both Features 2-84 and 3-84 seems to be midden that slumped into these pits when they settled. Both zones contain a variety of cultural remains, including stone flakes, animal bones, charcoal, and other debris which accumulated on the village surface. Very little plant food remains or wood charcoal were present in these zones of fill. Zone III of Feature 2-84 was almost sterile of cultural material and seems to represent an episode of very rapid filling with subsoil,

perhaps even with the soil that was originally excavated from this pit. This suggests that if Feature 2-84 functioned as a storage facility, it may have been a very temporary one that was quickly filled in.

Zone II of Feature 3-84 appears to have been a secondary deposit of refuse. The large amount of wood charcoal, plant food remains, and nonbotanical debris observed in the flotation sample (Table 2), along with a few small lithic tools, imply that this fill resulted from house and hearth cleaning of one of the nearby structures.

Primary Functions of the Wall Site Features

Schroedl (1980) has suggested that features whose primary function was storage and those whose primary function was soil recovery should be distinguishable by attributes of form and size. Specifically, storage facilities should be deep relative to their diameter, and large if they were to store large amounts of materials. Soil recovery facilities, on the other hand, should be shallow relative to their diameter. The variability in volume of these shallow facilities should be a measure of the extent to which they were used. This is not to say that functions of features can be determined solely by analyzing their size and shape. Context also must be taken into consideration in order to arrive at meaningful interpretations (cf. Dickens 1985; Ward 1985; Wilson 1985).

Table 1 summarizes the size attributes of the features excavated at the Wall site. The depth/diameter ratios and volumes include estimates of the portions of the features that were truncated by plowing. Where features were present beneath intact midden, the observed dimensions of the features are used for determining volumes and depth/diameter ratios. Volumes are rounded off to the nearest cubic foot. The depth/diameter ratios for the pit and basin-shaped features at the Wall site range from 0.10 to 1.52. Volumes range from 4 to 47 ft^3. These features can be

divided into four classes.

Feature Class 1 (n=4) is represented by Features 32, 49, 50, and 52. These are small-to-medium oval-to-circular-shallow basins (Figure 18). This feature class has a depth/diameter range of 0.13 to 0.28 and volumes between 4 and 13 ft^3.

Feature Class 2 (n=3) is represented by Features 51, 54, and 47. These features have a depth/diameter range of 0.10 to 0.13 and volumes between 24 and 47 ft^3. They are large shallow basins, with oval or circular plans (Figure 19).

Feature Class 3 (n=3) is represented by Features 23, 2-84, and 3-84. They have depth/diameter ratios between 0.88 and 1.52 and volumes between 7 and 10 ft^3. They are small deep pits of two forms: two have straight to slightly insloping sides, and one has slightly undercut walls (Figure 21).

Feature Class 4 (n=2) is represented by Features 45 and 46, large amorphous basin/depressions (Figure 20). The irregular shapes of these features make depth/diameter ratios difficult to determine. If [maximum length + maximum width]/2 is used as an estimate of diameter, these two features would have depth/diameter ratios of 0.09 and 0.11, respectively, and volumes of 10 and 11 ft^3. Their depth/diameter ratio falls within the range of Feature Class 2 and their volumes fall within the range of Feature Class 1.

Three of the four features in Feature Class 1 are located inside structures and the fourth is located adjacent to Palisade IV. Although these features may represent small soil recovery facilities, perhaps related to individual structure maintenance, their relationships with the insides of structures suggest that their primary function was probably related to food processing or other domestic tasks.

Two of the Class 2 features, excavated in 1940-41, are located along the palisade in the northern part of the site. The third is associated with Structure J. The primary function of these features may have been as large scale soil recovery facilities, an assumption which is based on the fact that their fill represents secondary refuse. Feature 51 probably represents a soil recovery facility related to maintenance of the palisades in that vicinity. Such large, shallow basins associated with palisade maintenance have been observed at the Warren Wilson site in western North Carolina (Dickens 1985; Ward 1985). Features 47 and 52 are much more regular in shape and may represent large-scale food processing facilities, such as the large "earth ovens" at the site of Upper Saratown (Wilson 1977, 1985).

Two of the three features in Class 3 were excavated during the 1983-84 investigations and are located within and adjacent to structures. These two features are interpreted as small storage facilities. The volume of these features is small, and it is unlikely that they were used for bulk storage of food. Instead, they may represent caching facilities used to conceal items of value during short trips away from the village (Ward 1985). The third feature of this class is a small bell-shaped pit located near a possible entrance to Palisade II in the southwestern part of the site.

In some ways the presence of just a few storage facilities is inigmatic. The general absence of such facilities may indicate that most of the food storage was carried out above ground in facilities such as granaries or cribs. Such structures are known for the area from descriptions by early European travelers (e.g., Cumming 1958; Lefler 1967).

Structures

Structures built at the Wall site are defined by patterns of postholes that can be observed at the top of subsoil (in areas of midden, the patterns are less clear). Figure 14 shows the distribution of the recognized houses and the several palisade constructions. Although some patterns are better defined than others, it appears that there were 12 structures in this area. Two of them (Structures B and F) are small open-ended buildings that probably were not habitations. The remaining 10 structures show considerable variability in size and amounts of rebuilding and/or maintenance. Descriptions of each structure are presented below and are followed by Table 3 which summarizes the attributes of the structures as a group.

Structure A was defined by a three post-wide, circular pattern of postholes with an entrance on the south side. The structure was 25.5 ft in diameter on the outside and 21.5 ft in diameter on the inside. The mean exterior post size was 0.54 ft (n=187, sd=0.12). There were numerous interior postholes distributed around the inside perimeter of the structure. The interior postholes show more variation in size than the exterior postholes, probably because of the different functions of the interior posts. Postholes larger than the exterior postholes probably represent support posts for the roof. The smaller postholes probably represent built-in furnishings, such as the sleeping platforms so often described in early historic accounts of the Eastern North American Indians (e.g., Tyler 1907; Lefler 1967; Alexander 1972; Sturtevant 1975). Structure A was located adjacent to and inside of Palisade II in the western part of the site. It was also close to Structures B and C.

Structure B was defined by an irregular oval to square pattern of

Table 3. Summary of structure attribute measurements at the Wall site.

Structure	Outside Diameter (ft)	Inside Diameter (ft)	Exterior Post Size (ft) x	sd	n	Interior Post Size (ft) x	sd	n	Floor Area (ft^2)
A	22.5	21.5	0.54	0.12	187	0.57	0.17	60	363
B	13.5x16.0	12.5x13.0	-	-	-	-	-	-	163
C	22.0	18.5	0.53	0.12	87	0.57	0.12	58	269
D	31.0	23.5	0.56	0.13	240	0.58	0.14	118	434
E	28.5	25.0	0.49	0.16	142	0.46	0.13	51	491
F	11.5x12.0	9.5x10.5	-	-	-	-	-	-	100
G	23.0	22.0	0.52	0.07	79	0.56	0.13	46	380
H	22.0	21.0	0.52	0.15	58	0.56	0.17	45	346
I	26.0	23.0	0.59	0.18	38	0.65	0.16	20	415
J	24.5	20.0	0.60	0.13	57	0.69	0.18	27	314
K	24.5	22.0	-	-	-	-	-	-	380
L	22.5	19.0	-	-	-	-	-	-	284

postholes inside of Palisade II and immediately southeast of Structure A. This structure was approximately 16.0 ft by 13.5 ft outside and 13.0 ft by 12.5 ft inside. Feature 32 was located in the approximate center of this structure.

Structure C was defined by a two post-wide, circular pattern of postholes to the north of and close to Structure A. Burial 2 was located within this structure. Structure C had an outside diameter of 22.0 ft and an inside diameter of 18.5 ft. The mean exterior posthole size was 0.53 ft (n=87, sd=0.12). The mean interior posthole size was 0.57 ft (n=58, sd=0.12). The structure appeared to abut Palisade II on its northwest side and to overlap part of Palisade I with one of its exterior postholes intruding into a posthole of this palisade.

Structure D was defined by a five post-wide, circular posthole pattern located to the east of Structure A and C and within the area enclosed by Palisade I. The mean posthole diameter was 0.56 ft (n=240, sd=0.13). The interior postholes were mostly clustered around the inside perimeter of the structure with another cluster of postholes near the center of the structure. The mean interior posthole size was 0.58 ft in diameter (n=118, sd=0.14). Structure J was located immediately to the north.

Structures E and I were overlapping structures located in the north-central part of the site. Structure E was defined by a two post-wide, circular pattern of postholes with an outside diameter of 28.5 ft and an inside diameter of 25.0 ft. Structure I was only partly exposed by the excavations. It appears to have been a two post-wide circular structure with an estimated diameter of 24.5 ft outside and 23.0 ft inside. Burial 1, Feature XII, and Feature 49 were located within Structure E. These structures overlap and it was not possible to

determine, without some question, which of the structures was constructed earlier. Feature 50 was located within the area where the structures overlap and the relative absence of postholes intrusive into this feature suggests that it was associated with the later of the two structures. The presence of a similar type of feature (Feature 49) clearly inside Structure E may suggest that Feature 50 was associated with Structure I. This, in turn, may suggest that Structure E predated Structure I. The mean exterior posthole diameter for Structure E was 0.49 ft (n=142, sd=0.16). The mean interior posthole diameter (not including those in the area of structure overlap) was 0.46 ft (n=51, sd=0.13). The western portion of this structure was excavated in 1938 and the eastern portion excavated during 1940-41. All of the interior postholes in the area where Structures E and I do not overlap were excavated in 1938. In general, the postholes observed in 1940-41 were larger than those observed and recorded in 1938. In using data from 1938 and 1940-41 to determine exterior post size, and using only data from the 1938 excavations to determine interior post size, problems of comparability have been introduced. The mean exterior post size is effected by the combination of two seasons of observation, while the interior post size is not. This resulted in the mistaken conclusion that the exterior posts were larger than the interior posts. If only the interior posts within the area excavated in 1940-41 are considered, the mean interior post diameter is 0.69 (n=49, sd=0.21). It appears, therefore, that the exterior posts were smaller than the interior posts, as with the other structures at the Wall site.

Structure F was defined by a U-shaped wall trench located to the northwest of Structure E. The structure was 12.0 ft by 11.5 ft outside and 10.5 ft by 9.5 ft inside, with the open portion on the southeast

side. It was the only structure defined by a wall trench at the site. In one portion the wall trench intrudes into a posthole of Palisade I, suggesting that the structure postdated the earliest palisade. The function of this structure is not known. It is similar in size and form to Structure B and may represent an enclosed activity area associated with one of the structures in this vicinity. Alternatively, its proximity to an entrance in Palisade IV may may mean that it was part of the defensive fortification of the village. Scaffold-like towers were described by John Smith for some of the palisades at Indian villages in tidewater Virginia during the early 17th century (Tyler 1906:148-149).

Structures G and H (Figure 23), overlapping structures, were located in the eastern part of the site. These were the only two structures excavated during the 1983-84 investigations. Structure G was defined by a one post-wide, circular pattern of postholes with an entrance to the south. This structure had an outside diameter of 23.0 ft and an inside diameter of 21.0 ft. The mean interior post diameter was 0.52 ft (n=79, sd=0.07), and the mean interior post diameter was 0.56 ft (n=46, sd=0.13). The densest area of interior postholes was in the area where the two structures overlap. The arrangement of interior postholes suggests that there were interior roof supports, to which were attached other constructions requiring smaller posts.

Structure H, located to the southwest of Structure G, was defined by a two post-wide, circular posthole pattern with an outside diameter of 22.0 ft and an inside diameter of 21.0 ft. The northeastern third of this structure was intruded by Structure G. Structure H abutted Palisade I on its northeast side. The mean exterior posthole diameter was 0.52 ft (n=45, sd=0.17). Feature 2-84 was located within the area where the structures overlap. The absence of intrusive postholes and



Figure 23. Structure G at the Wall site after excavation of postholes and pits.

the probability that Structure G postdates Structure H suggests that Feature 2-84 is associated with Structure G.

Structure J was defined by a discontinuous circular pattern of postholes north of and adjacent to Structure D. This structure was within the area enclosed by Palisade I. Features 45, 46, and 47 were located within the structure and conformed roughly to its interior perimeter and central area. Burial 4 was in the center of the structure and intruded into the northeastern part of Feature 47. The structure was 24.5 ft in outside diameter and 20.0 ft inside. The mean exterior posthole diameter was 0.60 ft (n=57, sd=0.13), and the mean interior posthole diameter was 0.69 ft (n=27, sd=0.18). The conformity of Features 45, 46, and 47 to structure walls and interior area suggests that these features were created while Structure J was still standing.

Structure K was defined by a discontinous circular posthole pattern to the northwest of Structure F and near the entrance to Palisade II/IV. This structure was only partly exposed. It is represented by two arcs of postholes, which, if joined, would produce a circular structure approximately 24.5 ft in outside diameter and 22.0 ft in inside diameter. This structure appeared to intrude across the entrance to Palisade II/IV but to fall within the area enclosed by suspected Palisade V.

Structure L was represented by a poorly defined pattern of postholes between Structures C and K and to the northwest of Structure J. Burial 5 was located within this structure, and Burial 3 was outside and to the southwest. This structure intrudes upon Palisades II and III in an area of the site where there are thick deposits of midden. The structure's poor definition may have come about because exterior posts did not extend into the subsoil below the midden. The pattern was

better defined on its southern side where the midden deposits were thinner. This structure appears to have been 22.5 ft in outside diameter and 19.0 ft in inside diameter.

The structures at the Wall site, with the exception of Structure F, were all of single-post construction. The exterior postholes for all of these structures had a mean outside posthole diameter of 0.54 ft (sd=0.13 ft), and a mean interior posthole diameter of 0.58 ft (sd=0.15 ft). The majority of the interior postholes were in the 0.4 to 0.6 ft range, however, each structure also had a few interior postholes in the 0.8 to 1.0 ft range. The large interior posts were spaced around the central area of the structures, while the small postholes were clustered between the larger postholes and the exterior walls. This suggests that the posts were of two different types: support posts for the roof, and posts used in the construction of built-in furnishings such as sleeping platforms. The very center of the structures were fairly devoid of postholes of both types, suggesting that a hearth was located in the center of each.

The use of large roof support posts implies that these structures were probably not of the domed "wigwam" form, which is so frequently described for Indians of this area during the Historic period (e.g., Wright 1947; Cumming 1958; Lefler 1967). Domed structures would not require the use of large central support posts because the roof is essentially self supporting. In a domed structure each exterior post or pole would be pulled over towards the center and lashed to posts or poles pulled over from the opposite side of the structure. The tension created by the opposing poles would be of an upward and outward direction. This would probably be sufficient to support a lightweight covering of hides or bark.

The fairly large exterior postholes (>0.55 ft) suggest that the roofs and exterior walls of the Wall site structures were separate architectural features. The posts were probably set in the ground vertically and separate rafter elements erected between the outer wall and beams supported by the interior posts. This type of roof construction would not necessarily be self-supporting. The direction of force of the roof would be downward and outward. The roofs at the Wall site, therefore, probably were conical, with the overall structure being similar to the winter houses of the Cherokee (cf. Schroedl 1983).

The type of material used as covering for the roofs at the Wall site is difficult to determine from the archaeological evidence. The roof covering may have been either grass thatch, hides, or bark. The historical evidence suggests that houses were usually covered with bark or hides (Hariot 1590; Tyler 1907; Wright 1947; Lefler 1967). However, these structures were usually described as having domed or arched roof constructions. The wall covering may have been bark or daub, although evidence for either is meager. Some daub was recovered from the plowzone during 1983-84 in the vicinity of Structures G and H. The average amount of this material recovered from each excavation unit (100 ft^3) was only 15.30 g (range=0.00-39.90 g; sd=13.70 g). Although such small amounts of daub seem to deny the use of this material for construction, factors governing its preservation must be considered.

Daub is a mixture of clay and plant materials, the latter being added as a binder. After the mixture is applied and sun dries, it is subject to weathering by the natural processes of rain, freezing and thawing, and drying out. As a result of these processes, daub probably continually enters the archaeological context, but usually as small particles. Should a structure burn, daub is greatly hardened and its

durability is increased, favoring its preservation. Post-depositional processes also would effect the preservation of daub. Trampling and cleaning up after a fire would transfer some of the material from its original depositional context in the vicinity of a structure to a secondary context elsewhere. Once it entered an archaeological context, natural processes would effect the daub, breaking it down into its constituent elements of clay and fiber. Cultural post-depositional processes, especially plowing would reduce the size of the particles even further. This would create greater surface area upon which both natural and cultural processes could act to further reduce the particles (Schiffer 1976:36).

Except in cases where daub entered the archaeological record in especially large quantities or was burned, it seems unlikely that much of it will be preserved for the archaeologist to recover. Nevertheless, small amounts of this material will probably be preserved, and its distribution, rather than its quantity, may be evidence for its use.

The distribution of daub in the plowzone of the eastern area excavations in the vicinity of Structures G and H is shown in Figure 24. Highest relative density is in the southwestern and northeastern areas of the excavations. The southwestern concentration of daub corresponds to the location of Structures G and H. The area showing the greatest density is near the western side of Structure H. Numerous postholes in this area contained charcoal. This may indicate that part of Structure H burned and modified the daub in a manner that contributed to its preservation. A smaller concentration of daub extending northeast toward the center of Structure G may be the remains of fire-hardened clay associated with a hearth in the center of that structure. Although no visible remains of a hearth were observed beneath the plowzone, the

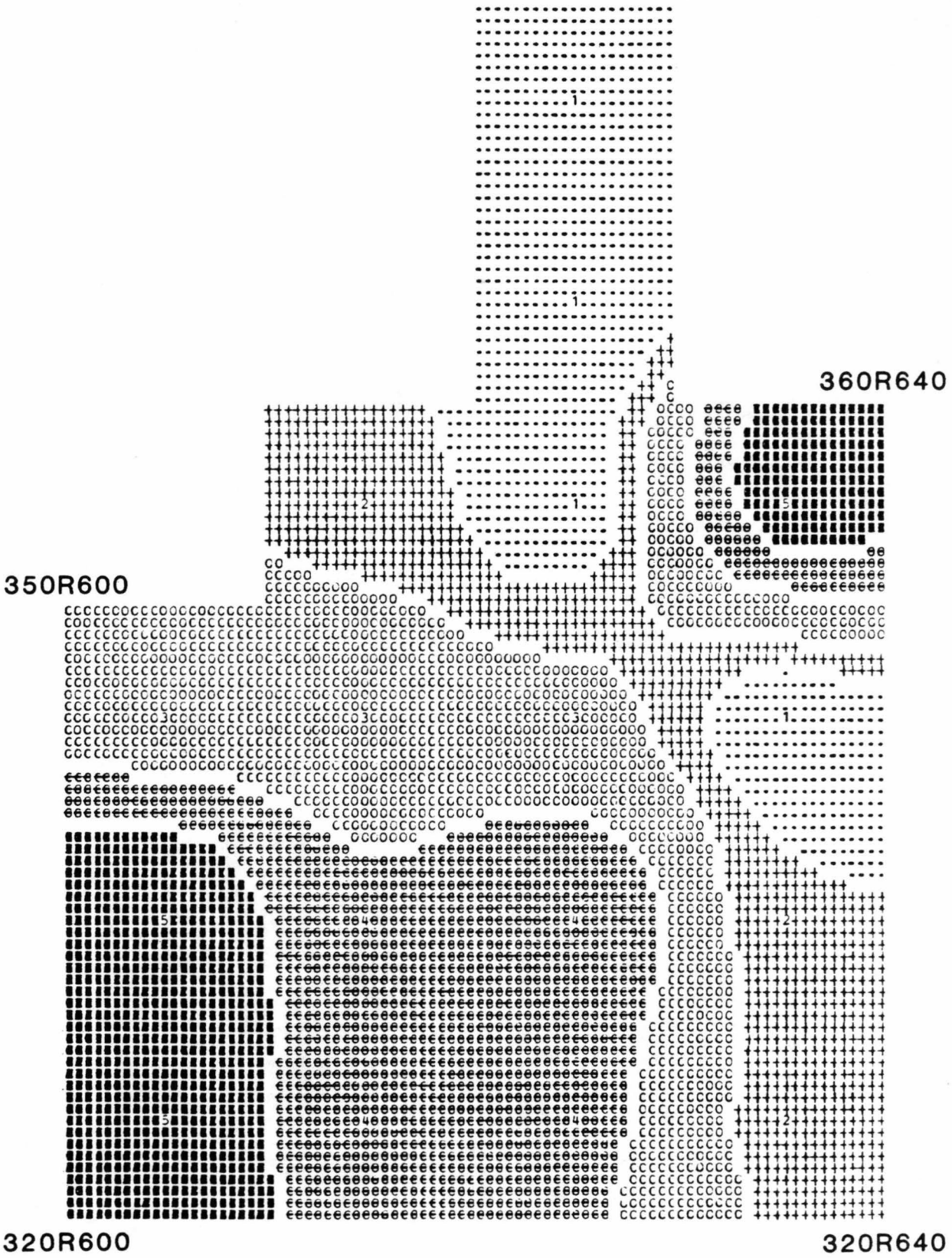


Figure 24. SYMAP of daub in the vicinity of Structures G and H at the Wall site.

location of a daub concentration in this area is suggestive. The third daub concentration is in the northwestern portion of the excavations. This concentration seems to be associated with several postholes (containing charcoal) of Palisade II.

Although the amount of daub recovered from the Wall site excavations is rather small, its concentration in areas of architectural remains that show some evidence of having been burned, suggests that it may have been used as a covering for house walls and the palisades.

Palisades

Five separate palisades have been identified at the Wall site (Figure 14). These features are characterized by long continuous posthole patterns that enclose all or some of the identified structures. The palisade postholes are larger than those associated with structures and range from 0.60 to 1.25 ft in diameter. They are fairly uniformily spaced, usually between 0.5 and 1.5 ft apart.

Palisade I was the innermost of the identified palisades. It enclosed the area occupied by Structures D, E, H, I, and J. Structure F also may have been just within this palisade. Ninety-two postholes associated with this palisade were observed in the western area of the excavation and an additional 28 postholes were observed in the eastern area excavated during 1983-84. The portion in the eastern area was intruded by Structure G, and a possible entrance through this palisade was observed in the vicinity of Structure J (Figure 14).

Palisade II was roughly parallel to and outside of Palisade I. It has been identified by 194 postholes, 180 of which are in the western area of the excavations, and 14 which are in the eastern area excavated in 1983-84. Palisade II was intruded by Structures C, K, and L.

Palisade III was defined by a linear pattern of postholes in the

northwestern area of the excavations. This palisade appeared to cut through Palisade II and join with Palisade I in the vicinity of Structure F. Structure L intruded upon this palisade.

Palisade IV was parallel to and outside of Palisade III. This palisade was defined by a linear pattern of 67 closely-spaced postholes with a well-defined entrance where Palisade IV intersected and joined with Palisade II. Structure K intruded upon this palisade.

Palisade V was located outside of Palisade IV. It was defined by a discontinuous linear posthole pattern observed in the extreme northwest corner of the 1940-41 excavations and in several of the 1983-1984 excavation units in the northern part of the site. This palisade appeared to join with Palisade II/IV in the vicinity of Features 50, 51, and 54.

The five described palisades and their spatial arrangement suggest that the village represented at the Wall site went through at least two expansions following the construction of the first two palisades. It is not possible to determine if the village was unpalisaded in its earliest form.

Although it is possible that each palisade represents an episode of village expansion, it is more likely that a double palisade type of fortification was used by the inhabitants of the Wall site and that Palisades I and II were constructed first and used simultaneously. The archaeological evidence also suggests that the expansion phases may not have been symmetrical. This is indicated by the fact that various palisades are differentially exhibited in the eastern and western areas of the site. Also, the later palisades attached to earlier ones, which means that the expansions were more lateral than concentric.

Palisades I and II were constructed first and established the

general limits of the village along its axis perpendicular to the Eno River. Subsequent palisade building episodes expanded the village limits laterally, parallel to the river, The first village expansion was accomplished by the erection of Palisades III and IV. These palisades joined with central sections of the pre-existing palisades in the vicinity of Structures F and K. Palisade IV extended east from where it intersected with Palisade II. Palisade III apparently only extended to the west, as it was not observed in the eastern area of the excavations.

As Figures 12-13 show, the eastern and western areas of the excavation were joined by a trench excavated during the 1940-1941 investigations. This trench was excavated to trace the extent of Palisade IV to the east of the main excavation area. The 1983-84 excavation area coincidentally tied into the easternmost extension of the 1940-41 trench. The interpretation of the directions of Palisades I and II through the unexplored portion of the site is preliminary and subject to modification with additional data. Nevertheless, it now appears that Palisade III does not extend into the eastern part of the site. This poses a problem in interpreting the construction phases of the village. If, as suggested, the palisades were paired, then at least portions of Palisade II must have been standing when Palisade IV was constructed.

A general interpretation of the sequence of structure and palisade building is offered as follows:

> Phase 1: Palisades I and II were constructed, enclosing the area occupied by Structures D, E, J, and possibly Structure F.
>
> Phase 2: Structures A, B, C, and H were constructed. Structure I also may have been constructed at this time, to replace Structure E. This expansion phase was accomplished without the construction of additional palisades by using the space between Palisades I and II. Palisade I may have been taken down at this time, or sections of it may have been left standing if they did not interfere with activity areas or

house construction. Structure H, which is the only structure to abut Palisade I, may have been constructed early in this phase and later replaced by Structure G.

Phase 3: Palisades III and IV were constructed. This resulted in lateral expansion of the village, at least to the west and southwest. Although no structures associated with this phase of construction were observed in the excavated area, there are several areas of high posthole density in the extreme southwestern area of the excavations.

Phase 4: Palisade V was constructed and portions of Palisades III and IV were dismantled. Structures K and L were subsequently constructed.

The variability in the number of concentric patterns of postholes defining the structures in the western area of the site is evidence for the proposition that the village was expanding. These data suggest that while the village was expanding, houses were being maintained and the population was probably growing. Abundant evidence of structure maintenance and the small number of overlapping structures suggest that all of the non-overlapping structures were standing and occupied during the maximum period of expansion reflected in the excavations.

The number of concentric posthole patterns that define the exterior walls of structures range from one (Structures G and L) to five (Structure D). The ten structures were ranked according to the number of the concentric patterns they exhibited. The structures were also ranked according to their distance from Palisade IV. It is assumed here that the number of concentric patterns of postholes is a function of the amount of maintenance invested in the structure during the course of its use. It is further assumed that these features are related to the length of time that a structure was occupied or otherwise used. Distance to Palisade IV relates each structure to a common architectural feature that is observable across the entire site. If the village expanded through time then there should be a strong positive correlation between the distance of a structure to Palisade IV and the amount of

maintenance exhibited for each structure. Table 4 presents the data on these variables. Spearman's rank-order correlation coefficient (Blalock 1960:434-436) was computed using these data to test the strength of the correlation. A value of $r=0.6788$ was obtained showing a strong positive correlation between the variables ($p<.03$, one-tail test). The small sample size and the frequency of ties in the maintenance ranking suggest that these results should be accepted cautiously. However, the results tentatively support an interpretation of an expanding village and growing population.

Spatial Organization of the Structures

The relatively small sample of structures places limits on the extent to which the spatial organization of these structures might be understood in terms of the social life of the inhabitants of the Wall site. The social order and cultural development of all communities are probably expressed at least partially in spatial terms (Hall 1969; Clarke 1977; Hodder 1978). The problem comes in making valid inferences about sociocultural factors from the static patterns of structures, palisades, burials, and other archaeological features.

It is assumed for the purpose of this discussion that social distance is reflected partly in the spatial organization of the archaeological record. The small size of the Wall site village, even at its point of maximum expansion, suggests that its inhabitants regularly and consistently associated with one another. Kin-based institutions such as clans and moieties probably provided a framework through which every individual understood his relationship to every other individual belonging to the village, and to the wider settlement system of which the Wall site village was only a part. One aspect of social organization that is visible in the archaeological record at the Wall

Table 4. Selected data related to structure maintenance and placement at the Wall site.

Structure	No. of Rebuilding Episodes	Maintenance Rank	Distance to Palisade D (ft)	Distance Rank
A	3	2	47	2
C	2	4.5	27	5.5
D	3-5	1	51	1
E	2-3	3	22	8
G	1	9.5	24	7
H	1-2	7	31	3.5
I	2	4.5	31	3.5
J	1-2	7	27	5.5
K	1-2	7	-13	10
L	1	9.5	8	9

site is the spatial configuration of the domestic structures.

The distance between structures in the western area of the excavations was examined. The limited excavations in the eastern area do not provide enough information to examine the spatial relationships of Structures G and H to other structures that certainly must be present in that area of the site. The minimum distance between adjacent circular structures is 2.0 ft and the maximum distance is 8.5 ft. The spatial relationships between Structures A, B, C, D, and J are examined in terms of their proximity to one another and their contemporaneity as defined in the proposed phases of village growth. The range of distance between adjacent structures in this group is 1.5 ft to 13.5 ft. When structure size is considered, the distribution of the distances between adjacent structures reveals a distinct pattern. The closest spatial relationships are between Structures A and B, Structures A and C, and between Structures D and J. The furthest distances are between Structures B and D, and between Structures C and J. Structures A, B, and C are considered to be related because of their close proximity to one another and their spatial relationship to Palisade II. Structures D and J are related through proximity to one another and to Palisade I.

Structures A, B, and C seem to represent a structure compound that was probably used by a single household. The central structure of these three, Structure A, is also the largest. The spatial relationship between Structures A and C is mirrored by the relationship between Structures D and J. It is probable that Structures A and C, and Structures D and J represent pairs, each pair being used either year-round by a separate family or as winter and summer houses by the same family. The differences in size of these structures (Table 3), coupled with their spatial relationships, gives somewhat greater weight

to the latter interpretation.

Following this line of reasoning, Structures L and K may represent another structure pair. Structure L is the smaller of the two and is nearly equidistant from both Structures C and J. Thus, while Structures A and C, D and J, and K and L seem to represent structure pairs, Structures C, L, and J form a group of three. These three structures create a somewhat symmetrical and approximately rectangular space between them. This space, bounded on its fourth side by Structure D (the largest and oldest structure of the six in this area), is interpreted as a small plaza/activity area shared by the inhabitants of these four structures.

Rapoport (1969) has proposed that houses are not simply shelters, but are a cultural phenomenon that reflects a particular social and cultural context. Furthermore, he suggests that houses cannot be viewed in isolation; they must be considered as parts of a larger whole. Houses, and the space created and defined by their interrelationship, undoubtedly facilitated the social interaction among their occupants.

With this in mind, it can be suggested that the structure pairs represent summer and winter houses. Paired structures like this are known ethnographically for much of the Southeast (Hudson 1976). Usually the winter houses were round and the summer houses square or rectangular; however, the Creek Indians had both rectangular summer and winter houses (Hudson 1976:216). Ethnohistoric accounts of the Carolina and Virginia Piedmont Indians (e.g., Cumming 1958; Lefler 1967) describe both winter houses and summer, arbor-like structures. Additionally, paired structures which probably represented winter and summer houses have been identified archaeologically at several sites in the Southeast (Faulkner 1977; Schroedl 1980, 1983; Ward 1984a). The

posthole patterns of the smaller structures at the Wall site are not clearly defined and have numerous gaps in their exterior walls. This suggests that the smaller structures represent partially enclosed, roofed buildings with built-in interior benches. The larger structures have more clearly and completely defined exterior walls and generally exhibit much evidence of maintenance, which implies that they were used primarily during the cold and rainy seasons of winter and spring. Ward (1984a) reported a similar pattern of clearly defined and ephemerally defined structures at the Warren Wilson site in western North Carolina.

The fact that the smaller (summer) structures are in closer proximity to each other than are the larger (winter) houses suggests that the level of social interaction between household groups may have been greater during the summer months. A possible explanation for this seasonal difference lies in the subsistence strategies of the Wall site people (see Holm and Gremillion, this report). A mixture of hunting, gathering, and horticulture is reflected in the plant and animal remains recovered from the excavations. These activities were probably scheduled seasonally, with most of the hunting being in the fall and winter, and most of the gathering and horticulture in the spring, summer, and early fall. It is also probable that larger social groups cooperated in horticultural activities than in hunting or gathering, and that the horticultural activities were at their peak during the months that the smaller structures were occupied. Therefore, the spatial relationships between the structures at the Wall site, especially the arrangement of probable summer houses, seems to reflect seasonal variation in social interaction and cooperation between household groups.

Estimates of Village and Household Populations

In recent years, several studies (e.g., Naroll 1962; LeBlanc 1971; Kramer 1979) have suggested that there is a relationship between floor area and population size. Other studies have focused on total settlement area and correlated populations (Weisner 1974; Sumner 1979). The studies using floor area to arrive at population estimates suggest that about 10 m^2 of roofed building space per person is a close approximation of space needs. Thus, household population may be estimated by dividing the amount of floor space by 10. None of the ethnographic examples used to determine this correlation, however, seem to use paired winter and summer houses.

In an attempt to arrive at a population estimate for the village at the Wall site, only the larger of the paired structures were used. It is also assumed that all of the non-overlapping structures were contemporary during some point in the occupation of the site. With these assumptions, five structures representing distinct households are present in the portion of the Wall site excavated to date. These are Structures A, D, E, G, and K. The combined area for these structures is 2048 ft^2 or 190.27 m^2. Using an estimate of 10 m^2 per person, one arrives at a population of 19 persons for the excavated portion of the site, and 3.8 persons per structure. This estimate is believed to be very low and in error. Ethnohistoric literature indicates that Indian societies of the East and Southeast at the time of European contact all lived in extended family households (Tyler 1907; Lefler 1967; Hudson 1976). These households certainly consisted of more than three or four persons.

A more accurate method to estimate population for this site is to suggest an "average" household size based on the ethnohistoric

literature and multiply this by the number of structures that can be assumed to have been occupied at the same time. Lawson (Lefler 1967:182) states that the households of the Carolina Indians consisted of several related families, and John Smith (Tyler 1907:101) relates that the Algonkian Indians of Virginia were living in multigenerational, extended-family households. Such a group would fall within the range of 6-20 persons.

In considering the households at the Wall site village, it is assumed that the lower end of this 6-20 range is appropriate, given the relatively small size of the domestic structures. Using an estimate of between eight and ten persons per household, the population for the portion of the site excavated would have been between 40 and 50 persons. Assuming that the portion of the site excavated thus far is representative of the entire village and that the entire village is about four times larger than the excavated portion, it can be estimated that between 150 and 200 persons lived in the village during the period of maximum village size. The density of population would have been about 120 to 160 persons per acre and the average floor space per person would have been between four and five m^2.

Summary

The analysis and interpretation of the spatial structure of the Wall site provides a baseline necessary for the study of the processes of culture change that occurred in this area as a result of European contact and interaction. The Wall site has been shown to have been a village that grew in size during its period of occupation. The investment in maintenance of domestic structures and palisades and absence of storage pits suggests that these people were relatively sedentary. If the Wall site can be considered typical of other villages

of this region during the Protohistoric period, some generalizations can be offered. Sites are likely to be rather small, ranging in size from about 3/4 acre to about 1-1/2 acres. They should show evidence of fortification, implying that by this time warfare was a fact of life. They were comprised of clusters of extended households that may have cooperated with each other in certain labor-intensive activities such as agriculture and hunting. The spatial organization of these household clusters implies that there was greater social interaction at the village during the months when agricultural activities dominated the subsistence cycle. This suggests that at least some labor was organized on a level larger than the household.

The data and interpretations presented above will be compared with the Mitchum and Fredricks sites in order to begin to assess some of the effects that the European invasion had on the native societies of the Carolina Piedmont.

MITCHUM SITE

The Mitchum site has received only limited excavation to date. The site is located on the Haw River approximately 17 miles southwest of the Wall and Fredricks sites. Davis (personal communication) has suggested that the site dates to the third quarter of the 17th century. Carnes (this report) places the site occupation between 1625 and 1665, based on her analysis of the glass trade beads. The excavation consisted of one area of 725 ft^2 and an additional excavation unit of 100 ft^2 to the east of the larger area.

The excavations revealed an oval structure, one burial, and 14 features (Figure 25). The small size of the excavations at the Mitchum site prevents determination of the relationship of the structure to the

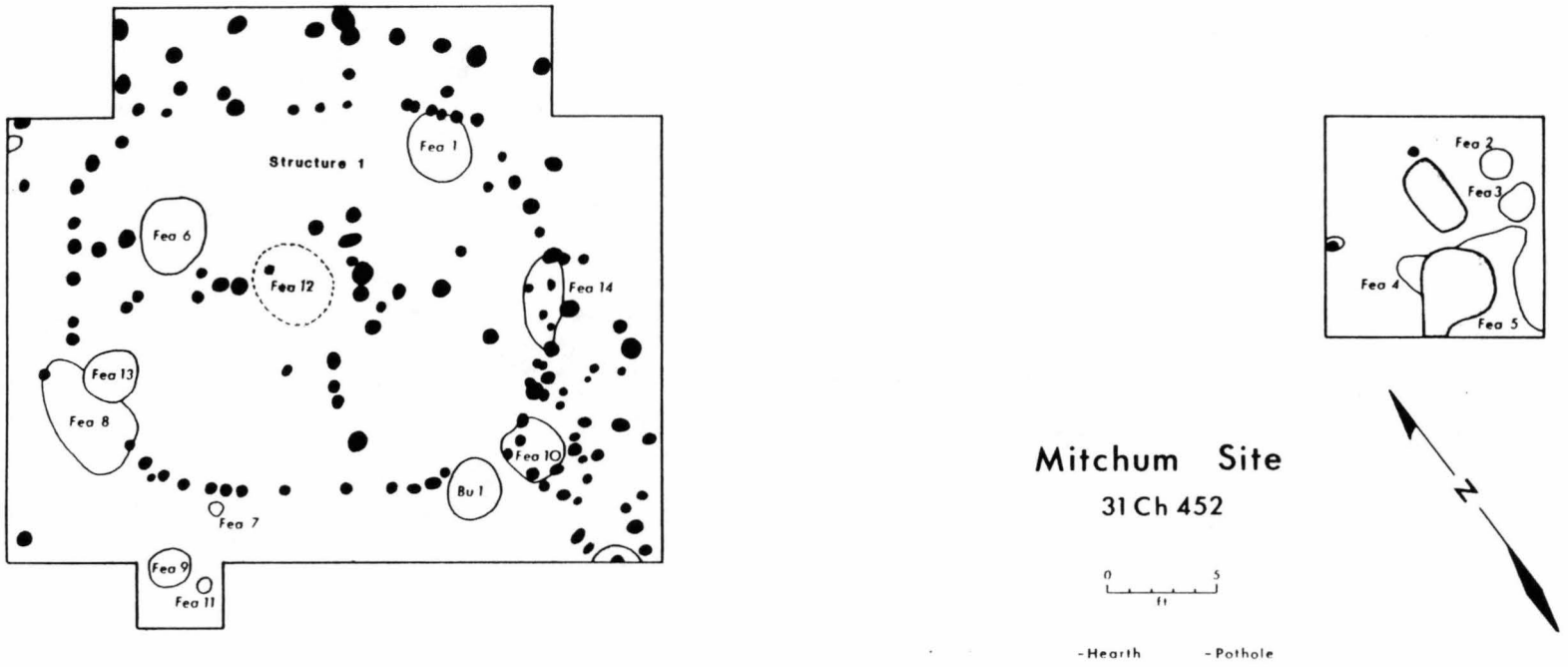


Figure 25. Excavation plan of the Mitchum site, 1983.

entire settlement. Also, the site limits are not known. The discussion below, therefore, will consist of a description of the oval structure, the features, and their relationships.

The stratigraphy observed at the Mitchum site consists of three distinct soil zones. Zone 1 is a medium brown, sandy loam that contains a mixture of both historic and prehistoric artifacts. This zone was created by periodic episodes of plowing during the Historic period. Plowing caused the displacement of cultural materials that aboriginally were deposited on the surface or within the upper portions of subsurface facilities. This thickness of the plowzone across the portion of the site investigated ranges from 0.60 ft to a little over 1.0 ft.

Underlying the plowzone is a light brown sand, Zone II. Numerous postholes and subsurface features were observed to extend into this zone, which is interpreted as an organically enriched sand that was the lower portion of a humic topsoil that developed before the area was occupied during the Early Contact period. Zone II ranges in thickness from 0.14 ft to 0.23 ft. Zone III is a yellow sandy soil. This soil is alluvial in origin and is culturally sterile except for numerous intrusive postholes, pits, and basins. The thickness of the Zone III soil is unknown.

It is likely, given the sedimentary origin and unconsolidated nature of the sandy soils at the Mitchum site, that additional distinct soil horizons are present. It is also possible that earlier, sealed cultural components are present within these buried strata.

Features

Other than postholes and the single burial, the largest class of features consisted of pits and basin-shaped facilities. Although a Late Woodland component may be present at the Mitchum site (see Davis, this

report), the features with culturally diagnostic materials are related to an early historic occupation (Davis, personal communication).

Feature 1 (Figures 26 and 28) was a deep basin. It was nearly circular in plan with a diameter of approximately 3.0 ft. The feature had a depth of 0.88 ft below the top of the yellow sand zone (Zone III). The fill consisted of a single zone of dark brown sand with charcoal mixed throughout. Cultural material from this fill consisted of potsherds, stone artifacts, aboriginal clay pipe fragments, glass trade beads, mussel shells, carbonized plant remains, and a few fragments of animal bone. This feature was located within Structure 1, adjacent to the northeast portion of the exterior wall.

Feature 2 was a very small pit located about 45 ft east of Structure 1, in the separate 10 x 10 ft excavation unit.. It was approximately circular, about 1.0 ft in diameter, and 0.76 ft deep from the top of Zone III. The fill consisted of brown sandy soil containing one potsherd, a few stone flakes, a few fragments of animal bone and mussel shell, and a small amount of charred plant remains.

Feature 3 was a small circular pit, 1.6 ft in diameter and 0.88 ft in depth below the top of Zone III. The fill consisted of a single zone of brown sandy soil containing a few potsherds, a single glass trade bead, stone flakes, charred plant remains, and small amounts of animal bone. The plant remains consisted of small amounts of wood charcoal, hickory nutshell, peach pits, and corn.

Features 4 and 5, basin-shaped facilities, were intruded by a large pit recently dug by pothunters. Feature 4 contained a single zone of dark brown, sandy soil. Very little cultural material was recovered from the remains of this feature. Feature 5 contained a single zone of light brown, sandy soil in which there were a few potsherds and lithic

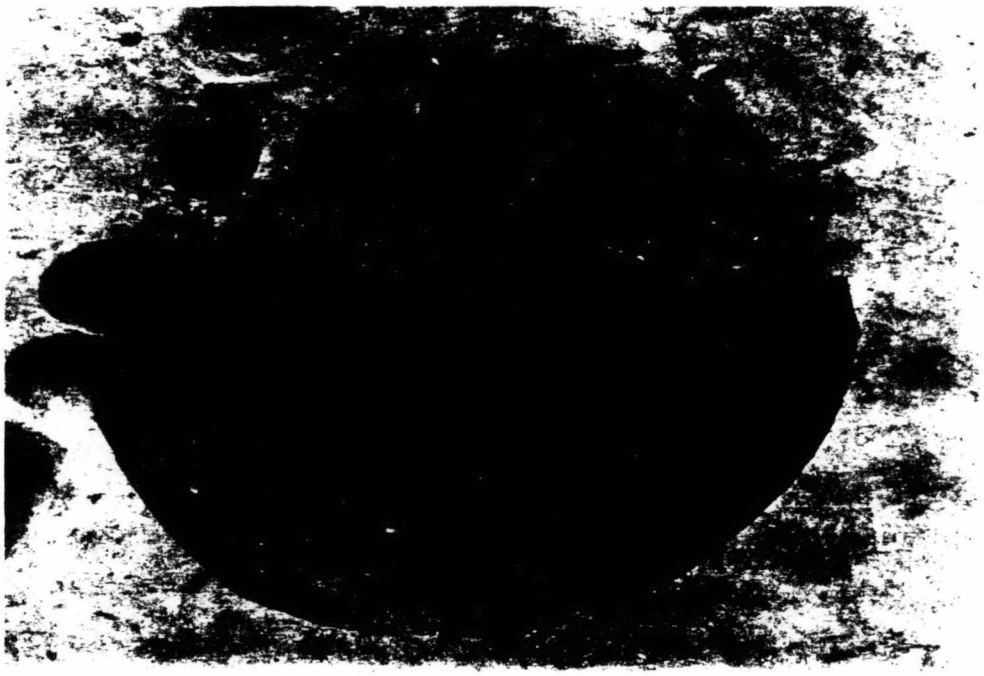


Figure 26. Feature 1, a deep basin-shaped pit (shown in profile), at the Mitchum site.



Figure 27. Feature 6 (Mitchum site) a deep pit, shown in profile.

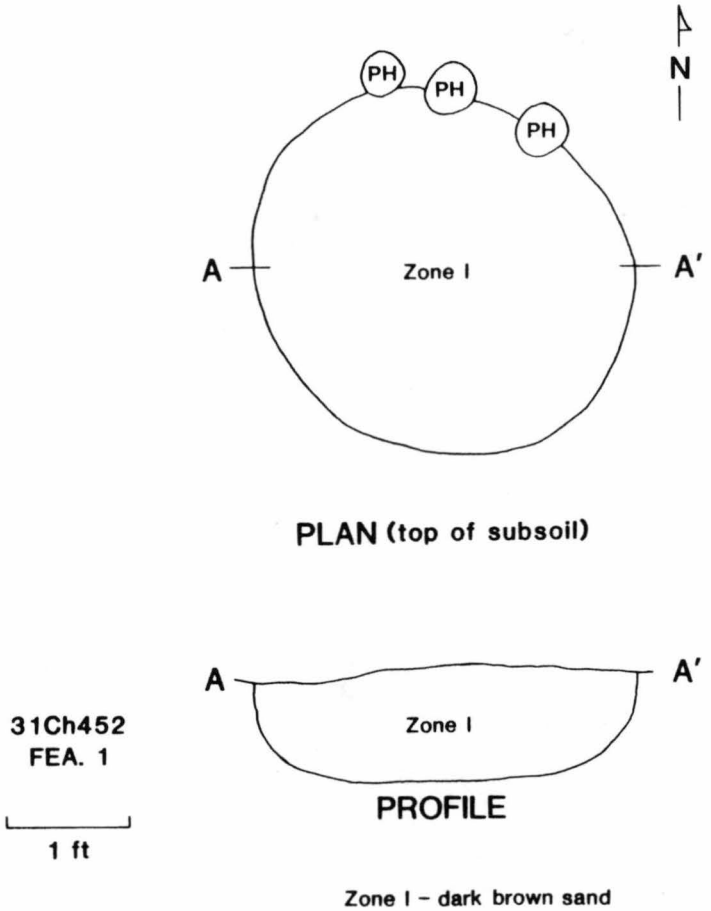


Figure 28. Plan and profile of Feature 1 at the Mitchum site.

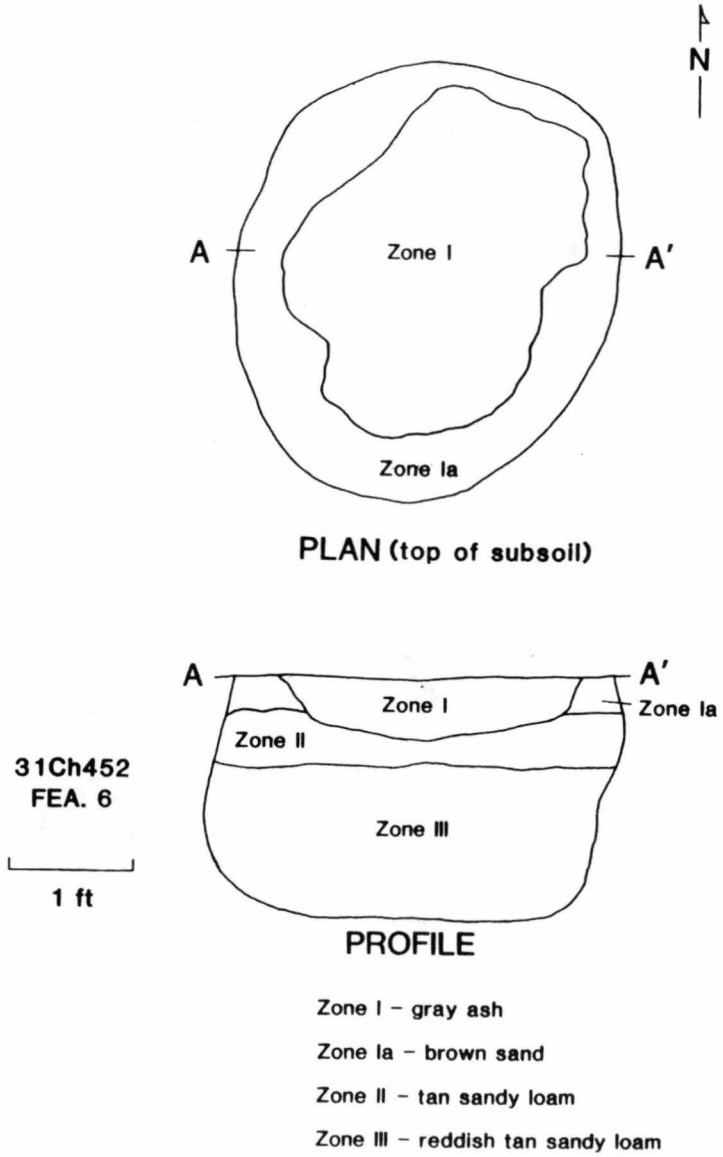


Figure 29. Plan and profile of Feature 6 at the Mitchum site.

artifacts, a small amount of animal bone fragments, and a small but diverse assemblage of plant remains that included wood charcoal, hickory nutshell, peach pits, walnut shell, corn, and maygrass seeds.

Feature 6 (Figures 27 and 29) was a deep oval pit with undercut walls giving it a slight "bell" shape when viewed in profile. It was 3.6 x 3.1 ft in plan and had a depth of 2.34 ft below the top of Zone III. This feature, which lay within the northwest quadrant of Structure 1, contained four zones of fill. The upper zone (Zone I), a basin-shaped deposit of gray ashy loam, was rich in artifacts and botanical remains. One hundred twenty-one potsherds were recovered. Stone artifacts, burnt clay, small amounts of animal bone and shell, and glass trade beads were also found in this zone of fill. Plant remains consisted of a large amount of wood charcoal, hickory nutshell, corn, cucurbit rind, and small amounts of acorn shell. Also, numerous charred seeds (mostly maygrass) were recovered. Zone I was surrounded on its sides by Zone Ia, a brown, sandy loam with charcoal and burnt clay. Although this zone contained a variety of cultural remains, it had a much smaller amount of charcoal than Zone I.

Zone II underlay Zones I and Ia. This was a tan sandy loam containing potsherds, stone flakes, animal bone fragments, shell, glass trade beads, and small amounts of wood charcoal and charred hickory nutshell and maygrass seeds.

Zone III, a reddish-tan sandy loam, underlay Zone II and filled the bottom 1.25 ft of the feature. Sparse cultural materials were recovered from Zone III. These consisted of lithic artifacts, fragments of animal bone, and a small amount of charred plant remains. The plant remains consisted of hickory nutshell, walnut shell, and acorn shell.

Features 7 and 11 were small, charred corncob-filled pits. Both

were located outside and immediately to the south of Structure 1. Feature 7 was 0.65 ft in diameter and 0.25 ft in depth below the top of Zone III. Feature 11 was oval (0.90 ft E-W x 0.85 ft N-S) and 0.35 ft in depth from the top of Zone III. Both of these features contained a homogeneous fill of charred whole and partial corncobs.

Feature 8 (Figures 30 and 32) was a large, oblong basin which was intruded by Structure 1 and Feature 13. It was 5.6 ft long and 2.9 ft wide, and had a maximum depth of 0.60 ft below the top of Zone III. The fill of this feature consisted of a single zone of dark brown sand containing a single potsherd, glass trade beads, stone artifacts, and charred plant remains. The plant remains consisted of mostly wood charcoal (several large pieces of charred wood were recovered) and a small amount of charred plant food remains consisting of hickory nutshell and a fragment of peach pit.

Feature 9 was a small oval basin located south of Structure 1 and near Features 7 and 11. This feature was 2.0 ft long, 1.65 ft wide, and 0.55 ft deep (from the top of Zone III). It was filled with a single zone of reddish-brown sand mottled with charcoal and fired clay. Three potsherds and a small amount of lithic debris were recovered along with charred plant remains consisting of a small amount of hickory nutshell and corn.

Feature 10 was a circular pit, measuring 2.5 ft across the top and having a depth of 1.22 ft below the top of Zone III. The fill consisted of a single zone of mottled, light brown sandy loam, with a few animal bone fragments, a small amount of charred plant food remains, a single aboriginal clay pipe fragment, and lithic debris. The plant remains consisted of abundant wood charcoal and small amounts of hickory nutshell, acorn, corn, and grape seeds.



Figure 30. Feature 8, a large shallow basin, after excavation, at the Mitchum site.

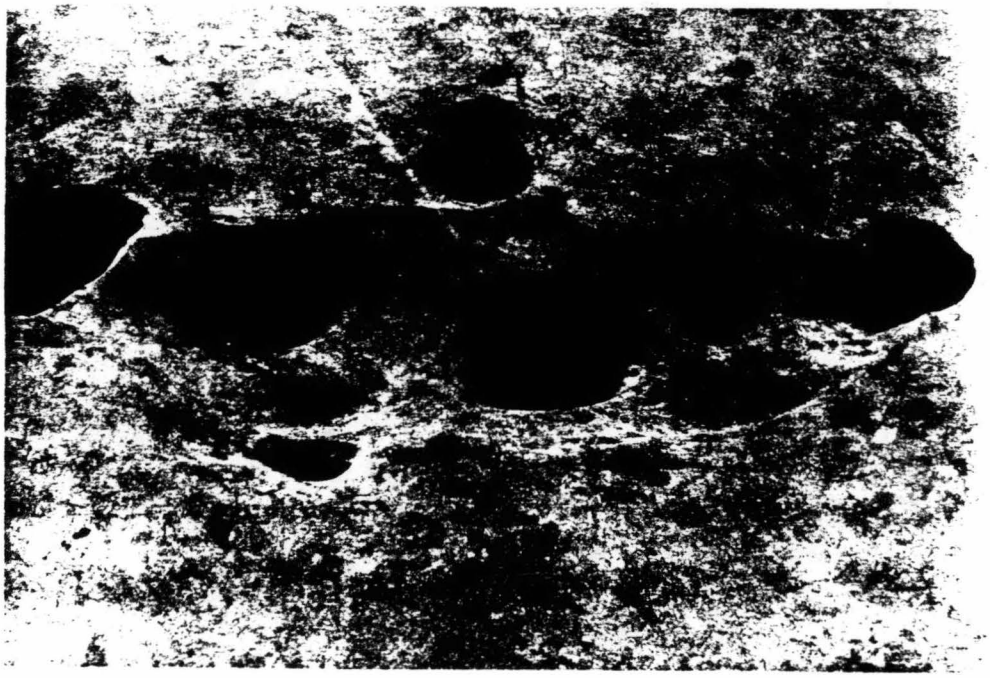


Figure 31. Feature 14, a small shallow basin, after excavation, at the Mitchum site.

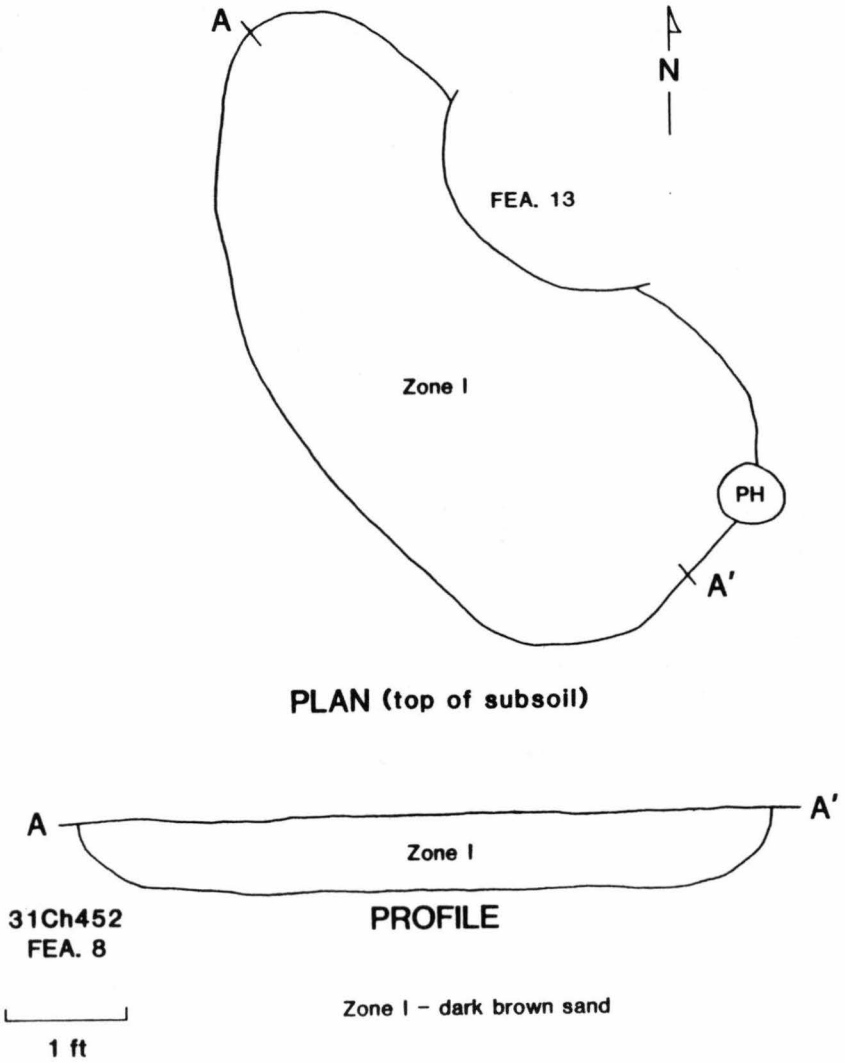


Figure 32. Plan and profile of Feature 8 at the Mitchum site.

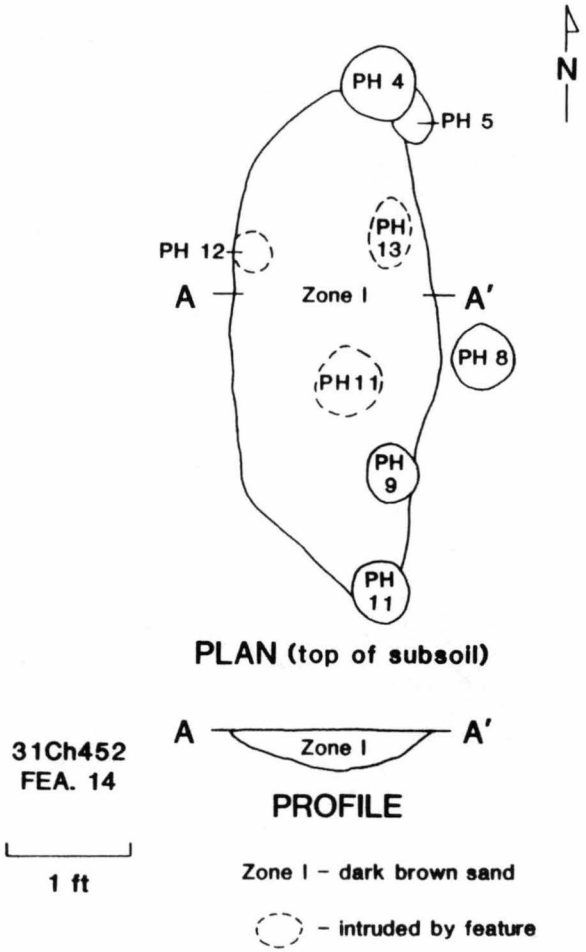


Figure 33. Plan and profile of Feature 14 at the Mitchum site.

Feature 12 was a thin and diffuse area of fired clay, probably a hearth, located in the approximate center of Structure 1. No artifacts or food remains were associated with the feature. It measured 4.0 ft by 3.8 ft.

Feature 13 was a deep circular pit, 2.8 ft in diameter, which intruded Feature 8 and Structure 1. The pit was 2.8 ft in depth below the top of Zone III. Three zones of fill were observed. Zone I, a light brown sand, contained glass trade beads, lithic debris, and small amounts of plant and animal remains. The plant remains consisted of wood charcoal, hickory nutshell, corn, persimmon seeds, and maygrass seeds. This zone represented approximately half of the pit fill.

Zone II, a dark reddish brown sand, underlay Zone I and was only 0.35 ft thick. It contained eight potsherds, some lithic debris, a few animal bone fragments, glass trade beads, and charred wood and other plant remains. The plant food remains consisted of hickory nutshell, acorn shell, peach pits, corn, maypop seeds, and persimmon seeds.

Underlying Zone II was Zone III, a brown sand containing a mixture of small amounts of pottery, animal bone, lithics, and wood charcoal. The plant food remains consisted of hickory nutshell, acorn shell, corn, maypop seeds, and persimmon seeds. This zone was 1.25 ft thick and extended to the bottom of the pit.

Feature 14 (Figures 31 and 33), an oblong basin, was intruded by the eastern side of Structure 1. The feature measured 4.0 ft long, 1.7 ft wide, and extended 0.35 ft below the top of Zone III. The fill consisted of a single zone of dark brown sand containing small amounts of pottery, lithics, animal bone fragments, and charred plant remains. The plant remains consisted of hickory nutshell, corn, maypop seeds, and butterfly pea seeds.

The dimensions of the features at the Mitchum siteare summarized in Table 5. The estimated volumes and depth/diameter ratios are based on extrapolations that take into consideration the portions of these features that were truncated by plowing.

There is considerable variation in the kinds of features represented at the Mitchum site. Feature 12 is interpreted as the remnant of a hearth associated with Structure 1. Features 7 and 11 are small charred cob-filled pits which probably functioned as hide-smoking facilities. Feature 2 is probably a large posthole, perhaps associated with a suspected palisade that was partly defined north of Structure 1. The remainder of the features are pits and basins having fill that contains refuse and other secondary deposits. These features can be divided into four general classes: small shallow basins, large shallow basins, small deep basin/pits, and large deep pits.

The small shallow basins are defined by a depth/diameter ratio of <0.40 and a volume of <20 ft^3. Feature 14 is the only feature in this class (Figures 31 and 33).

The large shallow basins (Figures 30 and 32) are defined by a depth/diameter ratio of <0.40 and a volume of >20 ft^3. Feature 8 is representative of this feature class. Feature 5 is also probably of this class, although since it had been disturbed by pothunters an accurate determination of its original form could not be made.

Features in Class III are small, deep basins and pits (Figures 26 and 28). They are characterized by a depth/diameter ratio of >0.40 and a volume of <20 ft^3. Features 1, 3, 9, and 10 are Class III features. Feature 4, which was disturbed by recent pothunting, is also probably of this class.

Feature Class IV (Figures 27 and 29) consists of pits with

Table 5. Summary of feature attributes at the Mitchum site.

Feature	Length (ft)	Width (ft)	Depth (ft)	Estimated Original Depth (ft)	Depth/ Diameter	Estimated Volume (ft^3)	Feature Form
1	3.20	2.85	0.88	1.92	0.63	13	Deep Basin/Pit
2	1.10	1.00	0.76	1.80	1.80	1.5	Large Posthole ?
3	1.60	1.60	0.88	1.75	1.09	3	Small Pit
4 *	1.70	1.10	0.23	1.27	0.91	-	Shallow Basin
5 *	4.70	4.50	0.20	1.24	0.27	-	Large Basin
6	3.60	3.10	1.95	3.00	0.90	26	Deep Pit
7	0.65	0.65	0.25	1.29	-	-	Cob-Filled Pit/Basin
8	5.60	2.90	0.60	1.64	0.36	25	Large Basin
9	2.00	1.65	0.55	1.59	0.66	6	Deep Basin
10	2.50	2.50	1.22	2.26	0.87	10	Deep Pit
11	0.90	0.85	0.35	1.39	-	-	Cob-Filled Pit/Basin
12	4.00	3.80	-	-	-	-	Hearth Remnant
13	2.90	2.70	2.80	3.85	1.51	19	Deep Pit
14	4.00	1.70	0.35	1.39	0.35	12	Shallow Basin

* Partially disturbed by pothunters. Size and form estimated from undisturbed portion.

depth/diameter ratios of >0.40 and volumes of $\geq$20 ft^3. Features 6 and 13 are of this type. Both of these are cylindrical to bell-shaped pits having stratified zones of fill.

Following Schroedl (1980), it is assumed that features whose primary function was for storage should have a relatively high ratio of depth to diameter. The features in Classes III and IV are of this form. Although their usefulness as storage facilities in terms of volume varies from 6 ft^3 to 26 ft^3, they are all relatively deep in comparison to their horizontal area.

Class I and II features probably served as food processing facilities. The sandy soil at the Mitchum site disputes their use as borrow pits for clay.

The various zones of fill in the Mitchum site features can be divided into three general groups based on fill color and texture. Fill Group I, gray ash with charcoal, contained abundant wood charcoal, charred plant food remains, and artifacts. Zone I of Feature 6 is the only example of this type of fill. Feature fill Group II is a reddish-tan, brown sandy loam containing small amounts of wood charcoal. Zone I of Feature 9, Zone II of Features 13, and Zone III of Feature 6 are of this type. The majority of the feature fill zones are of Group III. This fill is a light to dark brown sand with various amounts of wood charcoal.

Besides color and texture, there are other differences in the composition of the zones of fill at the Mitchum site. The zones vary in terms of the amounts and proportions of non-botanical remains, wood charcoal, and charred plant food remains (Table 6).

The gray ashy fill of Feature 6, Zone I, contained a proportion of wood charcoal that was large in comparison to other types of refuse.

Table 6. Amounts and percentages of nonbotanical remains, wood charcoal, and plant food remains from feature fill at the Mitchum site (grams per 10 liter flotation sample).

Excavated Context	Nonbotanical Remains		Wood Charcoal		Plant Food Remains		Total	
	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Fea. 1, Zone I	9.15	79.4	1.53	13.3	0.84	7.3	11.52	100.0
Fea. 2, Zone I	4.41	92.1	0.24	5.0	0.14	2.9	4.79	100.0
Fea. 3, Zone I	11.26	92.2	0.85	7.0	0.10	0.8	12.21	100.0
Fea. 4, Zone I *	4.94	95.2	0.25	4.8	<0.01	<0.1	5.19	100.0
Fea. 5, Zone I *	16.10	89.1	1.66	9.2	0.30	1.7	18.06	100.0
Fea. 6, Zone I	2.44	13.2	15.77	85.5	0.23	1.2	18.44	99.9
Fea. 6, Zone Ia	24.98	85.9	3.94	13.5	0.16	0.6	29.08	100.0
Fea. 6, Zone II	12.56	86.0	1.96	13.4	0.08	0.5	14.60	99.9
Fea. 6, Zone III	0.19	24.1	0.52	65.8	0.08	10.1	0.79	100.0
Fea. 8, Zone I	0.91	4.0	21.66	95.8	0.04	0.2	22.61	100.0
Fea. 9, Zone I	1.82	42.5	2.44	57.0	0.02	0.5	4.28	100.0
Fea. 10, Zone I	9.13	41.4	12.34	56.0	0.58	2.6	22.05	100.0
Fea. 13, Zone I	0.63	13.4	4.03	85.7	0.04	0.9	4.70	100.0
Fea. 13, Zone II	1.22	18.0	5.14	75.9	0.41	6.1	6.77	100.0
Fea. 13, Zone III	23.44	89.8	2.45	9.4	0.22	0.8	26.11	100.0
Fea. 14, Zone I	8.01	90.7	0.62	7.0	0.20	2.3	8.83	100.0

* Flotation samples taken from undisturbed fill only.

The plant food remains were diverse and contained a high percentage of charred seeds. The non-botanical remains were rich in animal bone and shell. This fill zone contained only small amounts of artifacts. This fill probably represents a rather restricted set of behaviors involved in the preparation of food for either consumption or storage (Wilson 1985).

Fill Group II zones contained very small quantities of cultural materials. The largest proportions of refuse represented in this fill was wood charcoal. Artifacts are poorly represented in the flotation samples; only one of the three zones contained lithic debris and none had pottery. However, small amounts of pottery were recovered from the waterscreened fill, and glass trade beads were recovered from two of the three zones. Zone I from Feature 9 contained only a minute amount of plant food remains. The other two fill zones, although only represented by small weights of plant remains, contained among the largest amounts of plant food remains when considered as a proportion of the remains making up of the fill. The reddish color of the soil suggests the fill originated from activities involving the preparation of plant foods in two cases and non-cooking fire-related activity in the case of Feature 9.

Feature fill Group III shows considerable variability in fill composition. The fill zones in this category fall into three classes. Class I, represented by Zones 1 of Feature 8 and Feature 13, contain large proportions of wood charcoal.

Material recovered from Feature 8 fill consisted of little other than wood charcoal and very small amounts of hickory nutshell and peach. Zone I fill of Feature 13 contained a more diverse assemblage of materials, including plant remains, lithic debris, animal bone, and

glass trade beads. Since Feature 13 intrudes into Feature 8, it is difficult to be certain that there was no aboriginal mixing between the two. The variety of material in Zone I of Feature 13 suggests that this fill may have resulted from general house-cleaning. Feature 8 fill reflects a much more restricted set of behaviors that probably were not related to the preparation of food. Feature 10 fill consisted of a mixture of non-botanical and botanical remains. The few artifacts found within this fill consisted of lithic debris and a single clay pipe fragment. No ceramics were recovered. Most of the non-botanical remains were non-artifact debris and small fragments of animal bone. This diverse assemblage of materials, with a large percentage of charcoal, suggests that this fill originated from domestic food preparation and consumption.

The remainder of the Group III zones at the Mitchum site have non-botanical materials as the major component of the fill. These remains are a mixture of debris, animal bone, glass beads, pottery, and lithics. It is suggested that the fill in these zones represent behavior that was not narrowly restricted temporally and was associated with ongoing village activities. The high proportion of debris implies that natural processes such as erosion and slumping, as well as cultural processes, operated to create them.

Structure 1

The remains of a single structure were uncovered at the Mitchum site (Figures 25 and 34). Structure 1 was defined by an oval pattern of single postholes. The exterior dimensions of this structure were 18.0 x 24.0 ft and the inside dimensions were 17.0 x 22.0 ft. There was no evidence of post replacement or rebuilding of the structure's exterior. The exterior wall posts have a mean diameter of 0.49 ft (n=58, sd=0.09).

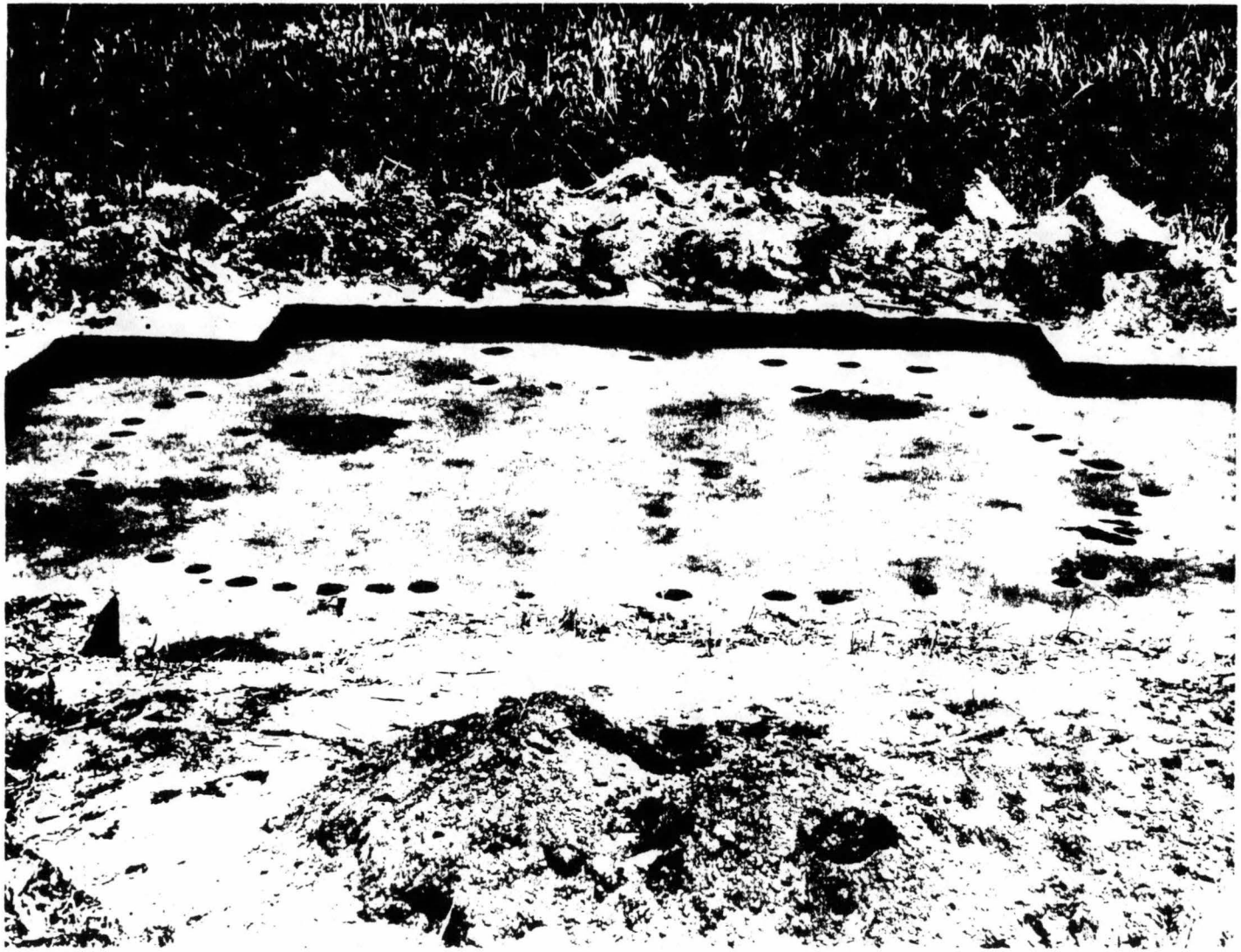


Figure 34. Structure 1 at the Mitchum site after excavation of postholes.

The use of small posts or poles and the oval shape suggest that this was a domed-roof structure similar to the wigwams so frequently described in the ethnohistoric literature (e.g., Wright 1947; Lefler 1967). Lawson describes the construction of this type of house as follows:

> These Savages live in Wigwams, or Cabins built of Bark, which are made round like an Oven, to prevent any Damage by hard Gales of Wind. They make the Fire in the middle of the House, and have a Hole at the Top of the Roof right above the Fire, to let out the Smoke. These Dwellings are as hot as Stoves, where the Indians sleep and sweat all Night. The Floors thereof are never paved nor swept, so that they have always a loose Earth on them...
>
> The Bark they make their Cabins withal, is generally Cyprus, or red or white Cedar; and sometimes, when they are a great way from any of these Woods, they make use of Pine-Bark, which is the worser sort. In building these Fabricks, they get very long Poles, of Pine, Cedar, Hiccory, or any Wood that will bend; these are the Thickness of the Small of a Man's Leg, at the thickest end, which they generally strip of the Bark, and warm them well in the Fire, which makes them tough and fit to bend; afterwards, they stick the thickest ends of them in the Ground, about two Yards asunder, in a Circular Form, the distance they design the Cabin to be, (which is not always round, but sometimes oval) then they bend the Tops and bring them together, and bind their ends with Bark of Trees, that is proper for that use, as Elm is, or sometimes the Moss that grows on the Trees, and is a Yard or two long, and never rots; then they brace them with other Poles, to make them strong; afterwards, cover them all over with Bark, so that they are very warm and tight, and will keep up firm against all the Weathers that blow (Lefler 1967:180-182).

The postholes observed inside Structure 1 are difficult to interpret. Their large size (diameter: x=0.60 ft, sd=0.15 ft) and distribution along the long axis of the structure suggests that they may have been used to support the roof. This type of roof, created by pulling tops of the wall poles over the center, should not have required substantial support. It is possible, although unlikely, that these postholes predate the structure. It is more likely that most of these posts were used by the occupants of the structure both as supports for the roof, ceiling beams, partitions, and for sleeping platforms.

The covering material of this structure was probably hides or bark.

Approximately 95 g of material cataloged as daub was recovered from some of the excavation units in and around the structure. The majority (62%) of this daub was concentrated in the excavation unit near the center of the structure. Feature 12 is located in this unit and is a diffuse area of fired clay. Hence, the "daub" probably originated from a prepared-clay hearth in the center of Structure 1.

A line of nine large postholes was observed approximately two feet north of Structure 1. These fairly widely spaced postholes, arranged parallel to the long axis of Structure 1, may represent a portion of a palisade. It is equally possible that these posts are part of another domestic structure. Additional excavations will be required to determine what this apparent posthole alignment represents.

Of the features observed at the Mitchum site, only Features 1, 6, and 12 were definitely associated with Structure 1. It is possible that Features 7, 9, and 11, located close together and to the south of the structure, also resulted from activities of the domestic group that occupied Structure 1. If Features 7 and 11 (cob-filled pits) are associated with Structure 1, they probably were used in an activity that needed to be carried out outside of the structure.

Features 8, 10, and 14 predate the construction of Structure 1, as they all are intruded by exterior wall posts of the structure. Burial 1 (see Ward and Wilson, this report) may postdate the occupation of Structure 1; Feature 13 may also postdate the occupation.

A spatial analysis of the materials recovered from the plowzone was not undertaken, since the area of the site exposed thus far is so small.

Summary

The excavations at the Mitchum site have yielded important but limited information concerning the native culture of this area during

the Early Contact period. The excavations to date are only large enough to expose Structure 1 and a small area surrounding it. Relationships between this structure, outside activity areas, other structures in the vicinity, and the village as a whole cannot be attempted at this time.

The features observed and excavated in the 10 x 10 ft excavation unit just to the east of Structure 1 were badly disturbed by pothunters. Additional excavation will be required to determine associations of these features.

Even with the limitations imposed by the small size of the excavations at the Mitchum site, the complete exposure of Structure 1 has provided insight into domestic architecture of the village, and the feature data have yielded information on food storage and processing strategies and technologies of the occupants. Such data will be essential for comparing the site structure of the three sites examined in this paper.

One of the most obvious differences between the Wall site and the Mitchum site is in the number and kinds of subsurface facilities. The number of deep facilities with constricted openings, defined by a depth/diameter ratio of >0.40, is significantly greater at the Mitchum site. Six of the features observed at the Mitchum site could have been used for caching or storage facilities. Their meaning, in terms of human behavior and adaptive strategies, will be addressed following the discussion of the Fredricks site.

The single structure observed at the Mitchum site is of very different construction than those at the Wall site. The use of a bent-pole, bark- or hide-covered structure agrees with the ethnohistoric accounts of this period, and may reflect greater mobility of Piedmont Indian groups during the Early Contact period. There does seem to be a

general continuity in the density of occupation within domestic structures, if it can be assumed that an extended family was living together in a single structure. Structure 1 has a floor area of about 290 ft^2. Assuming that between 8 and 10 persons comprised the social unit of an extended family, there was a density of approximately one person per 30-40 ft^2 of floorspace. Although this is somewhat smaller than the figures derived using the Wall site structure data, it is not impossible that small houses like Structure 1 were densely occupied. In fact, structures of similar size and form of the Western Niantic, a New England Indian tribe, were observed in the mid-18th century to have an even greater density of occupants than has been suggested for the structures at either the Wall or Mitchum sites (Sturdevant 1975). Whether such a density of house occupation would have occurred year-round or only seasonally is a difficult question to answer. The seasonal profile based on plant remains (see Gremillion, this report) of the upper fill zones of the two pit/basin features associated with Structure 1, indicates that these facilities did not function as storage facilities during summer. Therefore, the facilities probably functioned as storage pits during the winter. Thus, it is possible that Structure 1 was occupied primarily during the late fall and winter and was abandoned during the summer.

FREDRICKS SITE

Two seasons (1983-1984) of investigation at the Fredricks site have exposed 3500 ft^2 of the village (Figure 35) and have provided information for a preliminary interpretation of site structure. From the existing excavations and auger testing, it appears that the village covered no more than one acre. The Fredricks site undoubtedly

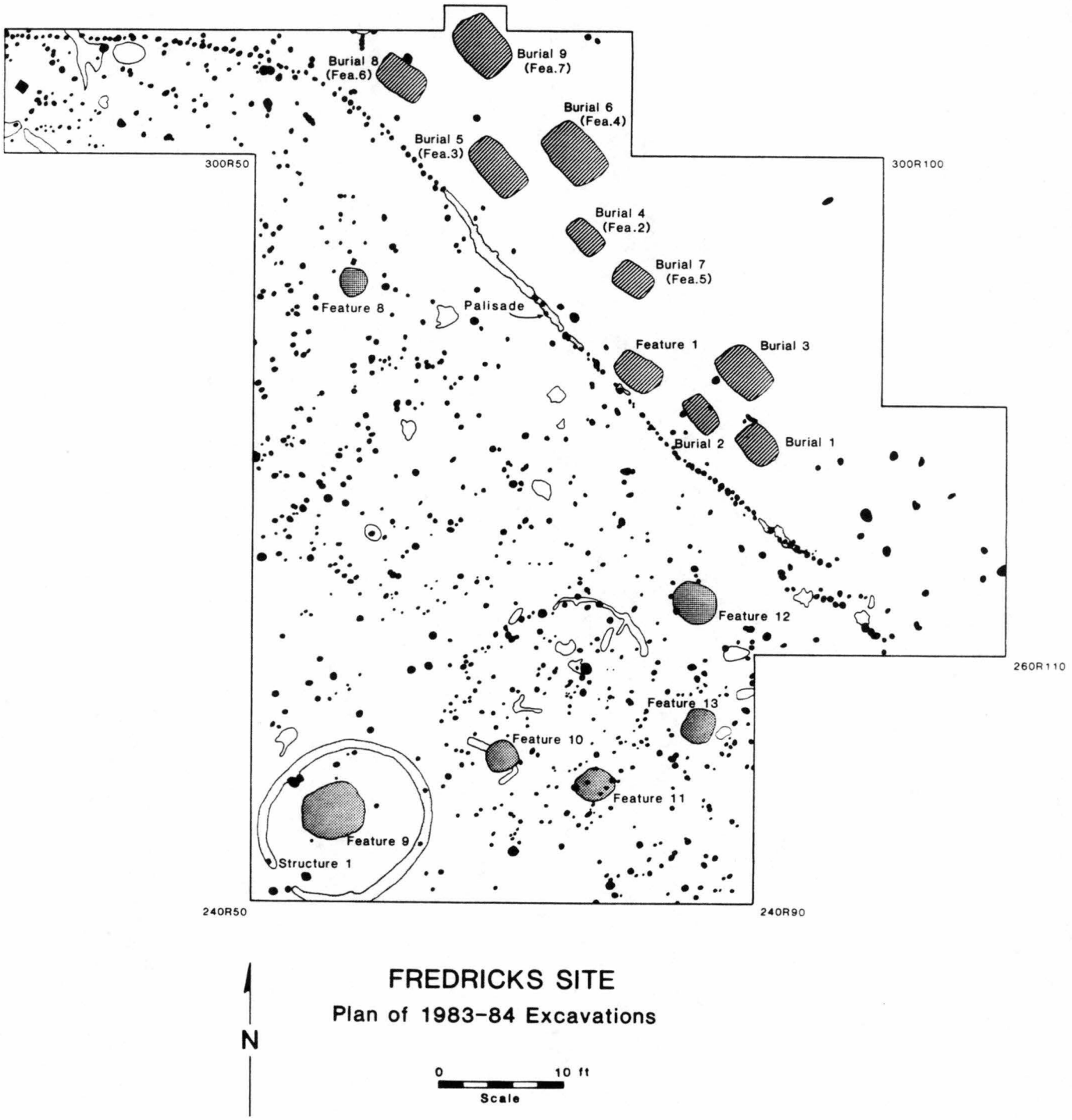


Figure 35. Excavation plan of the Fredricks site, 1983-1984.

represents a Middle Contact period (A.D. 1680-1710) village occupied by the Occaneechi who had moved to this area from the vicinity of the Staunton and Dan River confluence in the late 17th century (see Merrill, this report). Historic artifacts recovered from the excavations support the temporal placement of the site in the late 17th and very early 18th century (see Carnes, this report).

Site Stratigraphy

The archaeological manifestations of the village occupation are contained within two soil zones at the Fredricks site. The upper zone, Zone I, is a light brown clay loam consisting of a mixture of soil, artifacts, and organic matter that have accumulated over the past several thousand years. These materials have been intermixed by agricultural plowing, which has been extensive since Europeans settled in this area in the mid-18th century (see Tippitt and Davis, this report, for a discussion of the prehistoric remains in the plowzone; and Carnes, this report, for a discussion of the European component that postdates the historic Indian occupation). The materials associated with the Occaneechi occupation at the Fredricks site and contained within this plowzone are derived from the upper portion of the various pits and postholes that have been truncated by plowing, and of materials that accumulated on the original surface of the village either as scatters or in middens. Although no intact midden has been observed during the excavations, relatively larger amounts of artifacts have been found along the palisade especially in the northwestern area of the site (Figure 36). The underlying subsoil in this area was also more organically stained than in areas to the east and southeast. The subsoil, Zone II, underlying the plowzone is a yellow-brown clay of undetermined depth. This soil contains numerous boulders of blue-gray

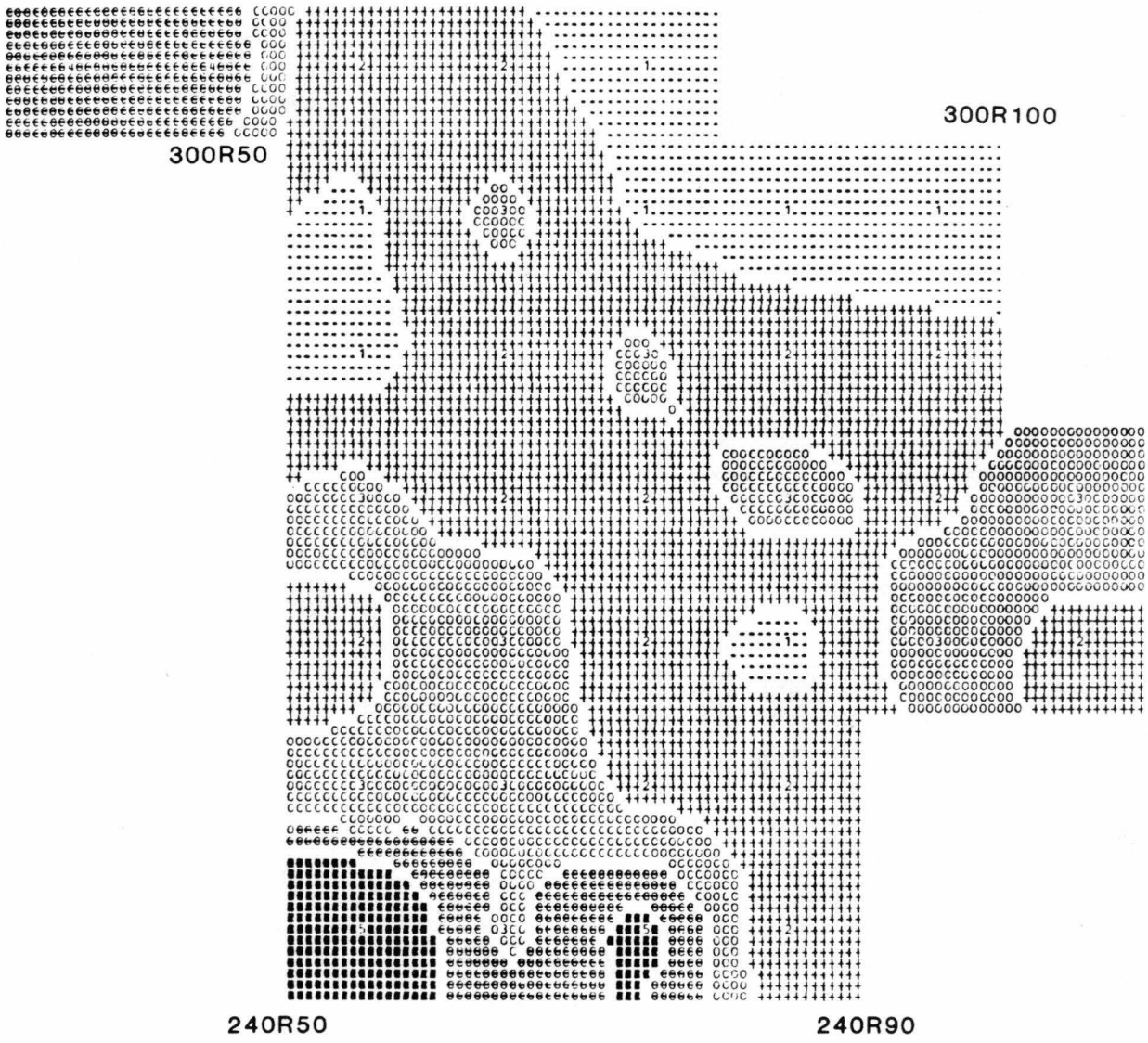


Figure 36. SYMAP of aboriginal historic ceramics in the plowzone at the Fredricks site.

phyllite at a depth between two and three feet below the base of the plowzone. Cultural remains within the subsoil consist of various intrusive pits and postholes along with their contents. These features were clearly evident at the top of the subsoil. Once the plowzone had been excavated, they stood out as brown-to-black stains contrasting with the yellow-brown clay subsoil (Figure 37).

The excavations exposed a varied set of archaeological features including a cemetery (see Ward and Wilson, this report), five subsurface pit facilities, the remains of several kinds of structures, and a portion of a small palisade that enclosed the village (Figures 35 and 51).

Immediately southwest of Palisade 1 was an area dense in postholes, with two complete structures and portions of additional structures that extended beyond the limits of the excavation. Several pit features were also located within this 30-ft-wide area parallel to the palisade. To the southwest of this area was Structure 1, an oval wall trench centered on a large cylindrical pit.

The discussion of site structure focuses on features, structures, and their interrelationships. Also discussed is the spatial distribution of some of the artifact classes recovered from the plowzone. Finally, the results of the systematic auger testing are presented and the information recovered from this testing is incorporated into the interpretations of site structure. The spatial organization of the cemetery and its associated burials is not addressed in this analysis. Although this area and the behavior it represents is pertinent to the interpretation of site structure, the spatial organization of the area is discussed elsewhere (see Ward, this report).



Figure 37. Overview of the 1984 excavations at the Fredricks site showing portions of the palisade and cemetery.

Features

At the Fredricks site, 13 subsurface intrusions were assigned feature numbers. Features 1 through 7 were burials and Feature 8 proved to be a tree disturbance upon excavation. Features 9 through 13 were aboriginally excavated pits of various sizes. The physical dimensions of these features are summarized in Table 7.

All of these features could have been used effectively as storage facilities. The depth/diameter ratios ranged from 0.51 to 1.55 and their volumes (estimates which include the portion of the pits truncated by plowing) ranged from 12 to 59 ft^3. Feature 10 had undercut walls, which indicated that it may have been cleaned periodically and maintained as a storage facility for a longer period than the other pits. Features 11 through 13 were shallower than Feature 10 and all had straight-to-insloping sides. These features might have functioned as storage facilities or as expediently produced pits to cache valuables. Each of these features is described in detail below.

Feature 9 (Figures 38-42) was a large deep cylindrical pit located within Structure 1. The pit was 5.0 ft long, 4.7 ft wide, and 2.85 ft deep below subsoil. A massive rock that extended into the pit on the south side appeared to have been heated repeatedly. Its depth/diameter ratio (0.73) and large volume (59 ft^3) are similar to large storage facilities observed archaeologically at Historic Cherokee sites in Tennessee (Schroedl 1980). It must be remembered, however, that pits used for different purposes may have similar forms and volumes. Additionally, pits like other artifacts may undergo substantial changes in function as needs change. A feature's form at an abandonment stage in its life-cycle is, in part, the result of all of the uses to which it was put. It may or may not contain evidence of each different use. It

Table 7. Summary of feature attributes at the Fredricks site.

Feature	Length (ft)	Width (ft)	Depth (ft)	Estimated Original Depth (ft)	Depth/ Diameter	Estimated Volume (ft^3)	Feature Form
9	5.00	4.70	2.85	3.55	0.73	59	Large Deep Pit
10	2.60	2.30	3.10	3.80	1.55	20	Deep Pit
11	3.30	2.60	1.65	2.35	0.80	14	Small Deep Pit
12	3.60	3.00	1.14	1.84	0.51	17	Small Deep Pit
13	2.80	2.40	1.60	2.30	0.85	12	Small Deep Pit

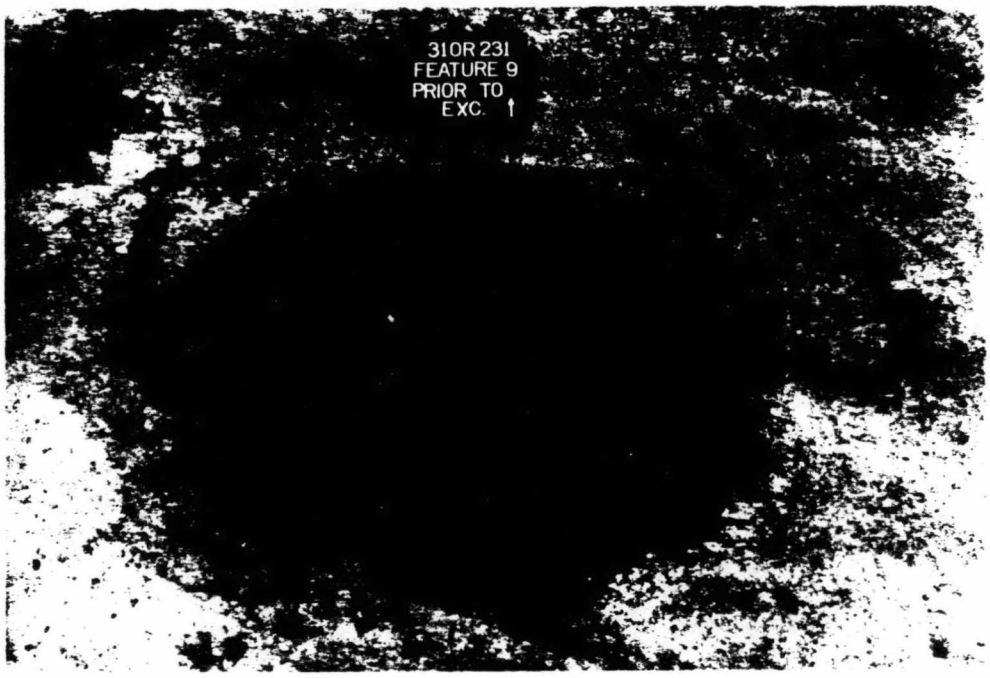


Figure 38. Feature 9 at the Fredricks site, prior to excavation.

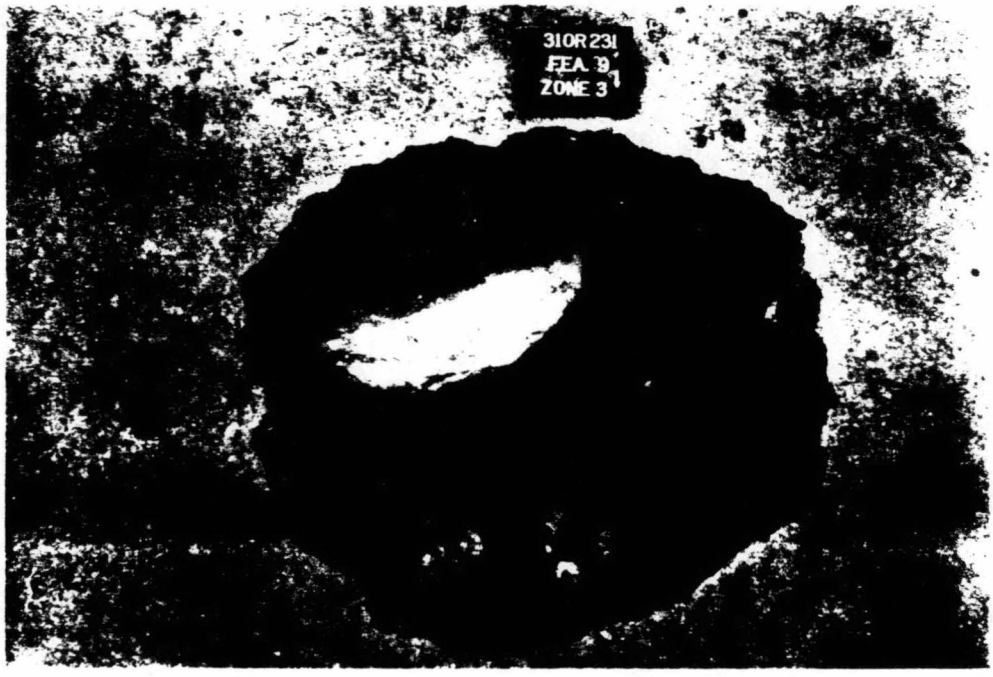


Figure 39. Feature 9 at the Fredricks site, after excavation.

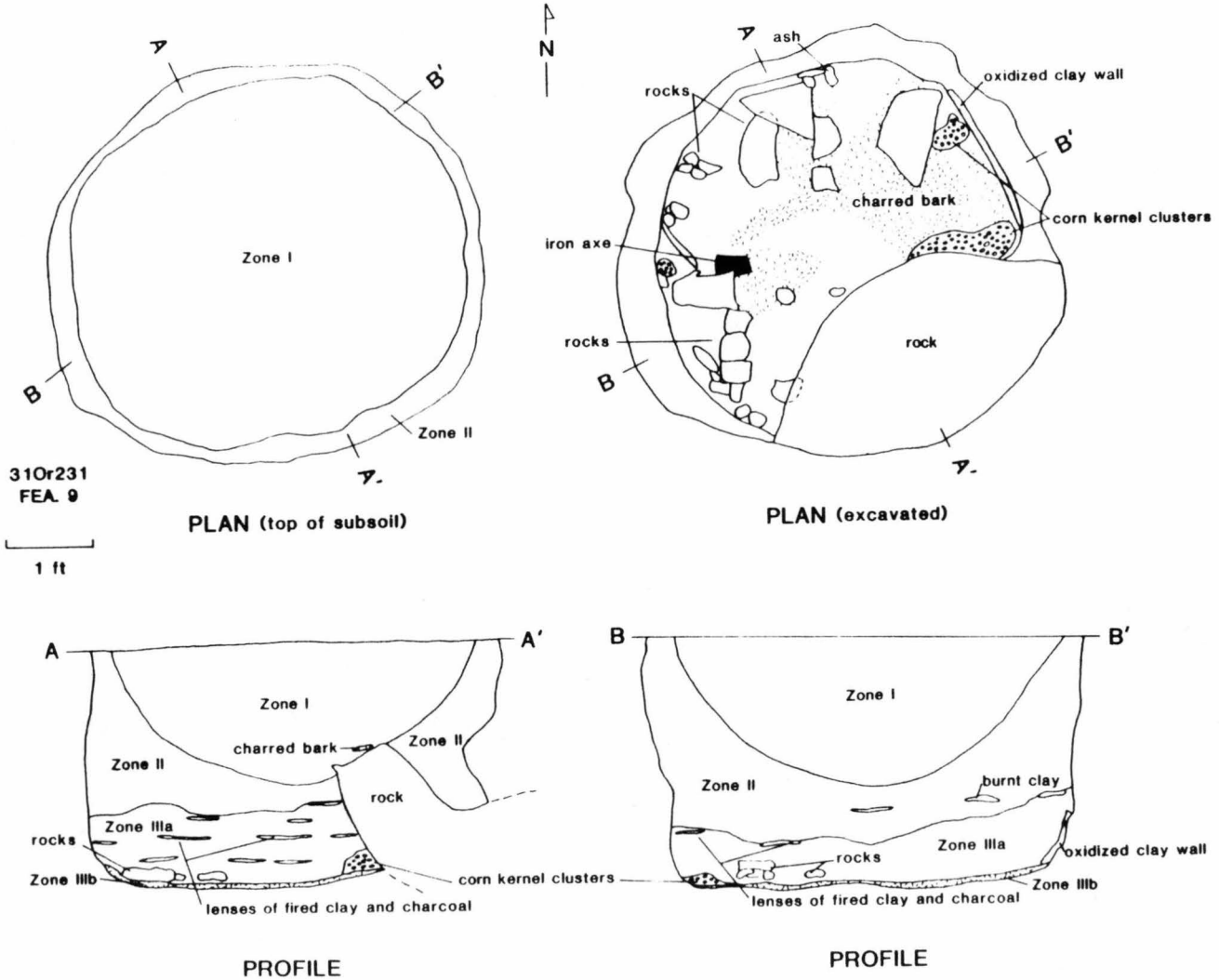


Figure 40. Plan and profile of Feature 9 at the Fredricks site.



Figure 41. Feature 9 at the Fredricks site, showing stratigraphy of pit fill.



Figure 42. Bottom of Feature 9 at the Fredricks site, showing rock clusters and charred plant remains on pit floor.

is for this reason that functional interpretations of features must consider attributes of form, fill, and especially context (Wilson 1985). Feature 9 is an excellent example of a pit facility that may have undergone several transformations in its function prior to its abandonment. The fill zones of this feature (Figures 40-41) reflect these potential transformations.

The bottom zone (Zone IIIb) consisted of masses of charred bark and clusters of carbonized corn kernels, all on the pit floor. The masses of corn had been contained in woven baskets, portions of which were recovered in the excavations. These baskets seem to have been intentionally placed on the pit floor around the inside perimeter adjacent to the walls. The pit floor beneath the bark lining, as well as the lower pit walls, was colored brick-red from having been fired. The only animal remains from this zone were 134 fragments of charred foot bones from an unidentified small mammal (Holm, this report). A few flakes and small glass trade beads completed the inventory from this zone.

If Feature 9 had functioned as a storage facility the bark lining and corn could represent materials that were left in place when the first observable transformation of the facility occurred. Although most corn was probably stored on the husk, Harrington (1908:589) observed that the Seneca stored roasted and dried green corn in bags.

An alternative interpretation of Zone IIIb is that it represents initial preparation of the feature for use as a fire pit (This does not rule out the possibility that the pit was originally used for storage). The containers of corn kernels may reflect ritual behavior associated with feasts of thanksgiving at the end of the corn harvest, such as those described by Lawson (Lefler 1967:67,177). Such harvest ceremonies

were common throughout much of North America (Hudson 1976).

Zone IIIa accumulated on top of Zone IIIb. This zone had evidence of repeated episodes of fire building. Numerous fire-cracked rocks and uncracked hearth stones were present in this zone (Figure 42). Associated with hearth stones was a damaged and burnt steel axe head (Carnes, this report), several lumps of sand-tempered potter's clay, and a small hammerstone (Tippitt, this report). One of the large rocks showed evidence of having been used as a grinding stone. These materials were contained within a rich organic, ashy-clay loam matrix. Numerous lenses of brick-red fired clay were present throughout this zone as were many fragments of charred wood and bark. The soil matrix, rocks, fired clay, and fire-reddened and hardened pit walls and floor strongly suggest that this zone of fill accumulated in-place as a result of repeated episodes of fires.

The plant food remains from this zone were the most abundant and diverse of all the fill zones in either the refuse-filled pits or the burials excavated at the site (Gremillion, this report). This seems to imply that plant food preparation on a large scale might have been an important behavioral component in the formation of this zone. However, it is very possible that much of the corn (which represents 68% of the plant food remains by weight) might have originated from the same activities that produced the corn kernel clusters in the underlying zone. Although there was a diverse assemblage of seeds present in the fill, most of these seeds were of weedy species and could have been introduced into the fill by natural processes. It fact, an open fire pit might be expected to "capture" an assortment of seeds from nearby plant communities. The other seeds represented in this zone were grape, maypops, and sumac, all of which could have been consumed while people

were sitting around taking sweat baths.

Zone II, a mottled clay loam, contained a mixture of cultural materials, including potsherds, lithic artifacts, animal bone fragments, glass trade beads, wood charcoal, and charred plant food remains. The mottled composition of the fill suggests that it was a mixture of subsoil and humus excavated to fill the pit after it ceased to function as a fire pit. The ceramics were diverse and represent a mixture of prehistoric materials and historic aboriginal sherds. This zone was more organically rich where it was bounded by the underlying and overlying zones of rich organic material. All of the species of plant food remains from this fill were present in the overlying Zone I deposit and may have originated from the same activity that produced that zone. Zone II extended to the top of the feature (base of the plowzone). At that level it appeared as a 0.3 ft ring surrounding a central ashy deposit (Zone I). It is probable that Zone II had extended to the surface and that Zone I was intrusive into it.

The upper zone of fill (Zone I) was a basin-shaped deposit of dark, yellowish-brown sandy ash containing a mixture of diverse plant and animal remains, along with a variety of artifacts. The artifacts within this zone consisted of potsherds, lithic debris and tools, glass trade beads, kaolin pipe fragments, wood charcoal, fired clay, and daub. This zone was a very homogeneous and fine-grained deposit of ash. In composition, it contained the least amount of nonbotanical remains of any of the fill zones at the site (Table 8). There was a relatively high percentage of plant food remains, which included hickory nutshell, acorn shell, peach pits, walnut shells, corn, grape seeds, and maypop seeds. A variety of other carbonized seeds representing non-plant food remains were also present. Four species of animals were represented as

Table 8. Nonbotanical remains, wood charcoal, and plant food remains from the 1983-1984 excavations at the Fredricks site (grams per 10 liter flotation sample).

Excavated Context	Nonbotanical Remains	Wood Charcoal	Plant Food Remains	Total
Fea. 9, Zone I	62.06	1.10	3.08	66.24
Fea. 9, Zone II	89.31	1.20	2.02	92.53
Fea. 9, Zone IIIa	469.32	7.41	8.43	485.16
Fea. 9, Zone IIIb	401.20	37.48	8.15	446.83
Fea. 10, Zone I	141.35	8.40	0.98	150.73
Fea. 10, Zone II	130.79	5.91	0.19	136.89
Fea. 11, Zone I	135.98	2.15	0.01	138.14
Fea. 12, Zone I	145.62	1.19	0.94	147.75
Fea. 12, Zone II	112.22	1.02	0.99	114.23
Fea. 13, Zone I	105.08	12.52	0.58	118.18
Fea. 13, Zone II	134.24	0.95	0.78	135.97

bone fragments in the fill: deer, raccoon, bear, and a single horse molar. The textural qualities of the fill and the relatively small amounts of nonbotanical remains represented in the flotation sample suggest that this zone accumulated in situ. The basin shape of the deposit probably resulted from partial re-excavation (cleaning out) of the pit aboriginally. The large and diverse assemblage of plant food remains imply that this facility may have been used for the large scale preparation of food, perhaps with feasting that occurred as part of the mortuary practices of the occupants of the village (see Ward, this report).

Feature 10 (Figures 43 and 45) was a deep cylindrical pit with undercut walls that gave it a slight bell-shaped profile. This feature was 2.6 ft long, 2.3 ft wide, and was 3.1 ft deeper than the top of subsoil The depth/diameter ratio (1.55) and volume (20 ft^3) suggest that the pit was used for storage of food or other materials. It was located within a small oval structure (Structure 3) and probably served as the primary subterranean storage facility for the members of that household.

Feature 10 contained two zones of fill. The upper zone, Zone I, was a dark brown loam that contained a variety of cultural remains. These remains consisted of potsherds, lithic artifacts, kaolin pipe fragments, glass trade beads, animal bone, wood charcoal, and charred plant food remains. Deer was the only identifiable animal species represented. The plant remains recovered were hickory nut, acorn, peach, and corn; wood charcoal also was fairly abundant. The lower portion of this zone contained most of the above material, as well as a small concentration of fire-cracked rock, charcoal, and sandy ash. The fill probably represents a brief episode of disposal of household debris, including hearth materials. Zone II was a deposit of dark,



Figure 43. Feature 10 at the Fredricks site, after excavation.

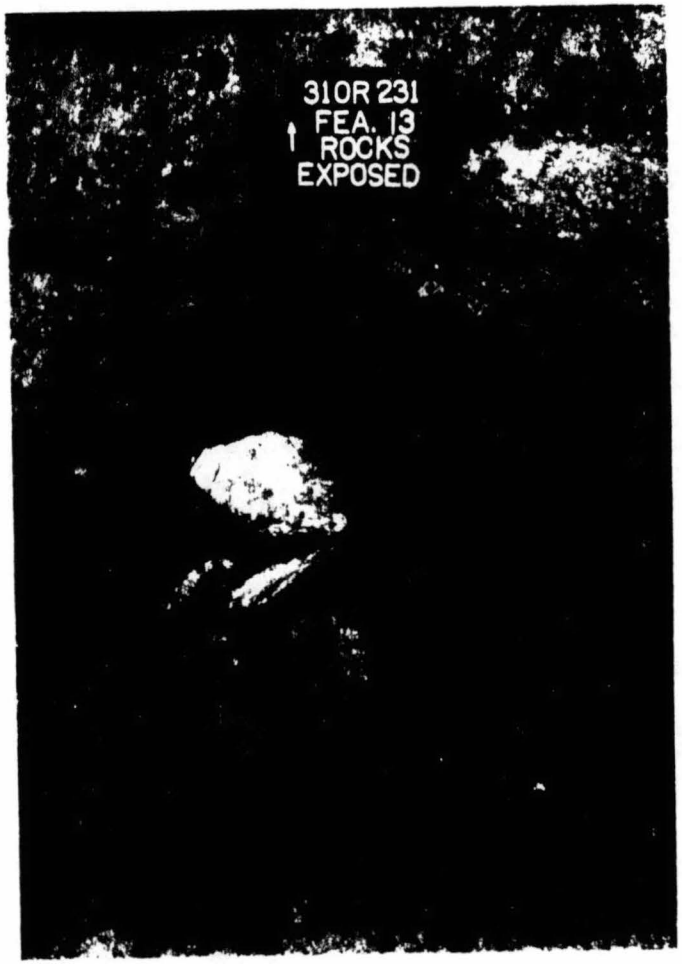
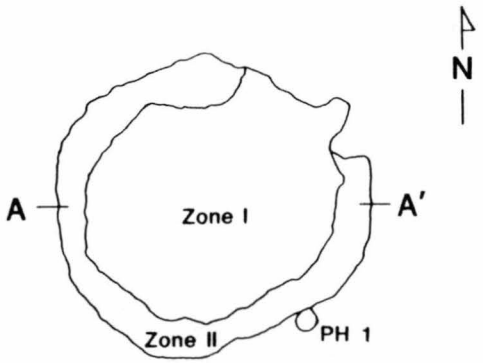
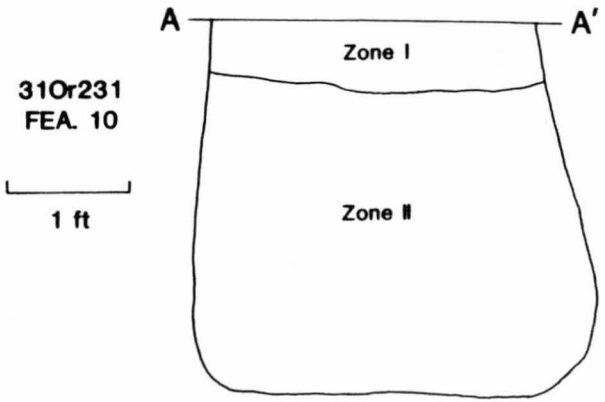


Figure 44. Feature 13 at the Fredricks site, after excavation.



PLAN (top of subsoil)

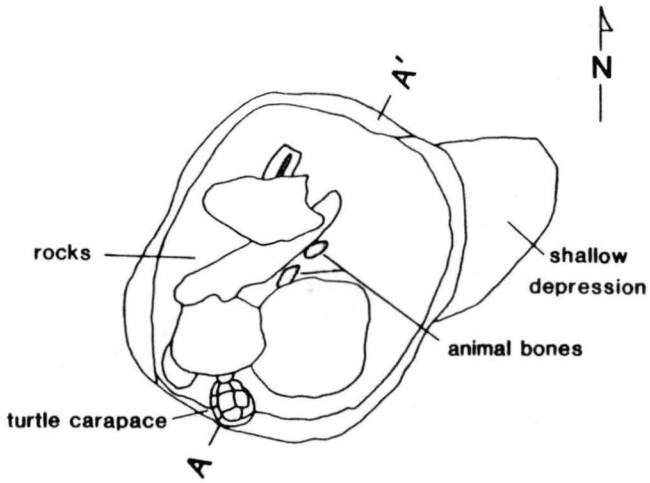


PROFILE

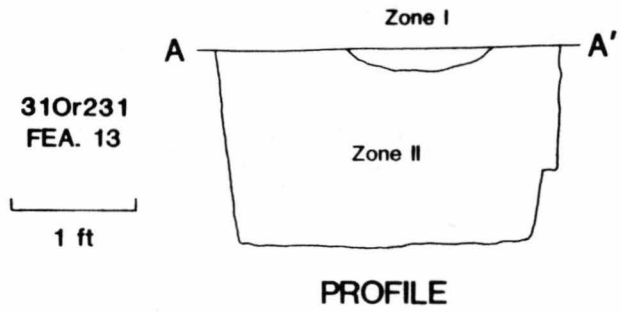
Zone I - dark brown mottled loam

Zone II - orange-brown mottled clay

Figure 45. Plan and profile of Feature 10 at the Fredricks site.



PLAN (excavated)



PROFILE

Zone I - medium dark brown loam

Zone II - mottled yellow clay

Figure 46. Plan and profile of Feature 13 at the Fredricks site.

brownish-orange, mottled clay loam that extended to the bottom of the pit. This zone was about 2.5 ft thick and contained over 700 g of animal bone fragments representing deer, box turtle, squirrel, and turkey. A small amount of plant food remains were recovered, consisting of hickory nut and a trace of corn. Wood charcoal was well-preserved but in a smaller amount than in the overlying zone. Potsherds were more abundant than in Zone I. Zone II seems to represent the initial filling of this pit upon its abandonment as a storage facility. A lack of lensing in the fill suggests that it accumulated fairly rapidly. It is not possible to determine the origin of this fill, although its mottled color and variety of cultural debris may identify it as a redeposited mixture of humus soil, midden, and clay subsoil.

Features 11, 12, and 13 were small deep refuse-filled pits. Feature 11 (Figures 47 and 49) was an oval pit located within and adjacent to the southeastern wall of Structure 3. This feature was 3.0 ft long, 2.4 ft wide, and 1.53 ft in depth below the top of subsoil. A large rock extended into the pit from the surrounding subsoil and the pit wall had been undercut around this rock, perhaps in an attempt to remove it. The depth/diameter ratio was 0.80 and it probably functioned as a small storage facility. The small volume (14 ft^3) suggests that it was not used for bulk storage, but rather that it may have functioned as a cache for non-food items.

Feature 11 contained a single zone of brown sandy clay loam with charcoal and fired clay. This fill contained only a small amount of plant remains (0.01 g of hickory nutshell per 10 l flotation sample). Animal remains were present but in very poor condition; only 13 of 94 fragments were identified, all of which were deer remains. Other cultural materials consisted of potsherds, stone flakes, rocks, kaolin



Figure 47. Feature 11 at the Fredricks site, after excavation.

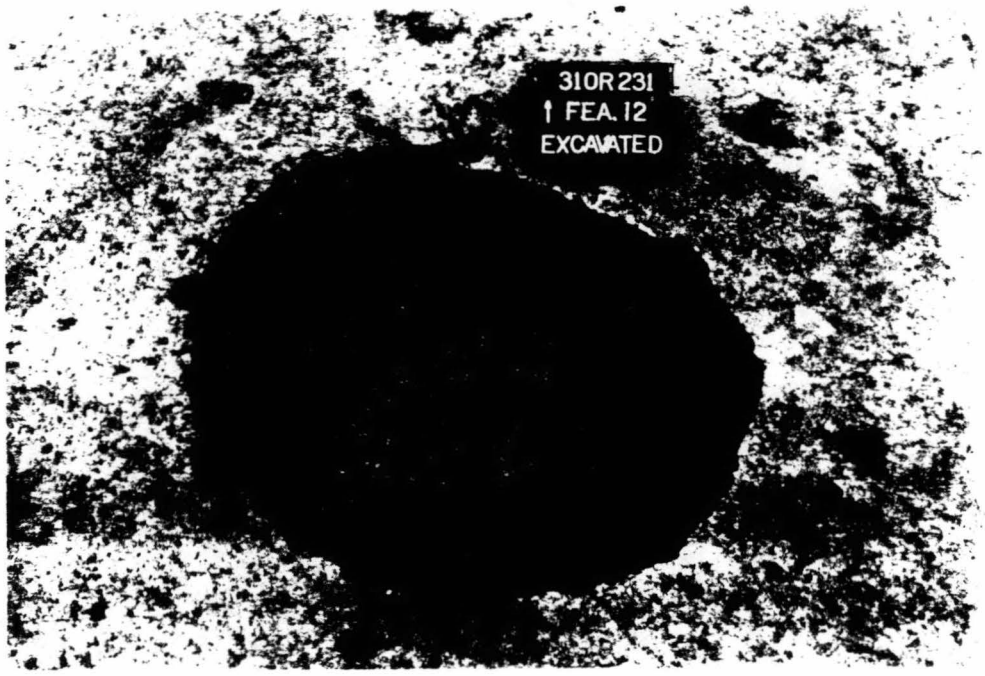
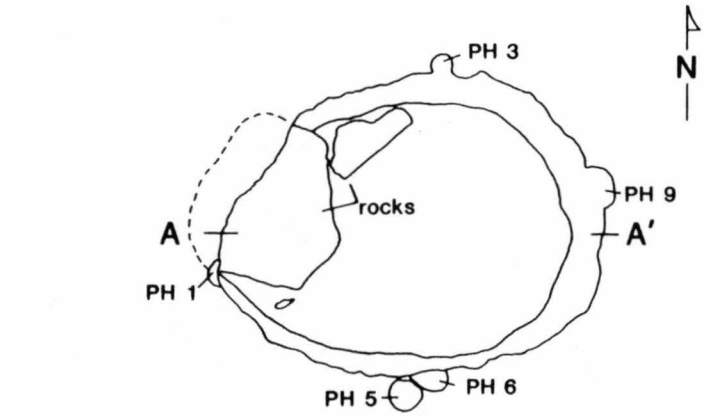
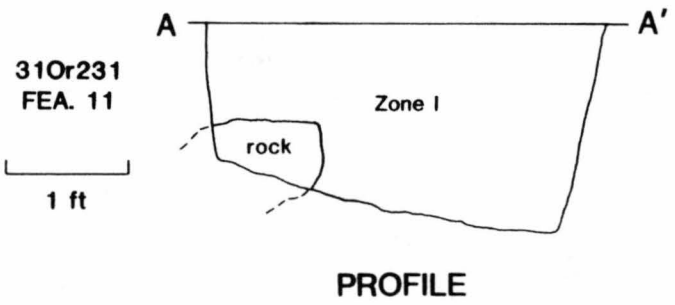


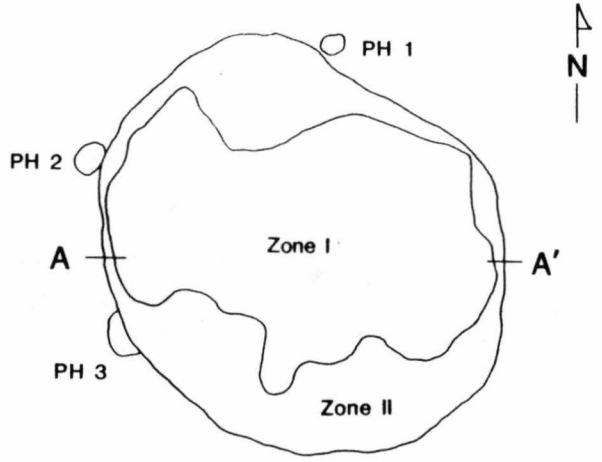
Figure 48. Feature 12 at the Fredricks site, after excavation.

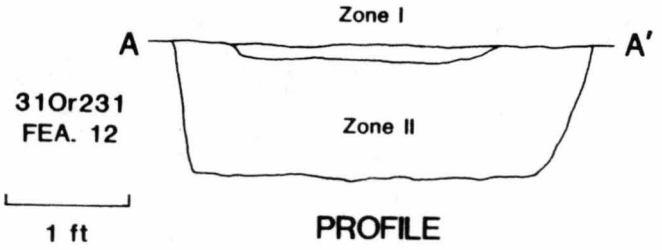




Zone I - medium dark brown sandy loam

Figure 49. Plan and profile of Feature 11 at the Fredricks site.





Zone I - dark reddish-brown mottled sandy loam

Zone II - dark brown mottled sandy loam

Figure 50. Plan and profile of Feature 12 at the Fredricks site.

pipe fragments, and glass trade beads. The fill in this feature contained the fewest cultural remains of all the features excavated at the Fredricks site, and the sloped bottom of the pit gave it a somewhat "unfinished" appearance. It may be that it was perceived as unsuitable once the rock was encountered and efforts to remove it failed.

Feature 12 (Figures 48 and 50) was a small deep oval pit located to the northeast of Structure 3, between it and the opening in Palisade 1. It was 3.4 ft long, 3.2 ft wide, and 1.4 ft deeper than the top of subsoil. The depth/diameter ratio was 0.51, indicating that it could have functioned as a storage facility. The location of this pit is somewhat enigmatic because of its proximity to the palisade entrance, in what was probably an area of heavy traffic. It is possible that this feature represents a small soil recovery facility rather than a storage pit.

Feature 12 contained two zones of fill. The upper zone, Zone I, was a dark reddish-brown sandy loam containing a variety of historic trade items, aboriginal potsherds, charcoal, fired clay, charred plant food remains, and a large quantity of animal bone. The animal remains consisted of box turtle, deer, and bear. The plant food remains were mostly hickory nutshell, with a small amount of acorn shell, peach pit, and corn. Less wood charcoal was present than in the other features. Among the trade items were glass beads, copper wire, and the handle and blade of an iron knife. This zone was relatively thin and confined to the central area of the feature. The composition and texture of this fill suggests that it originated as household debris representing a variety of activities.

Zone II was a homogeneous deposit of dark brown sandy loam mottled with subsoil. Numerous animal bone fragments, charred plant remains,

wood charcoal, historic trade items, lithic artifacts, potsherds, and plant remains were recovered in this zone. The animal bone consisted of deer, box turtle, turkey, squirrel, and bear. The plant food remains were mostly hickory nutshell with a small amount of corn and cucurbit. The homogeneous brown color of the fill, the small amount of wood charcoal, and the diversity of animal and plant species suggest that this fill was redeposited midden and humus.

Feature 13 (Figures 44 and 46) was an oval pit 2.8 ft long, 2.4 ft wide, and 1.47 ft in depth below the top of subsoil. It was located adjacent to, and east of, Structure 3. This area has numerous postholes that may define a portion of a structure extending beyond the limits of the current excavations. Feature 13 was the smallest of the features excavated at the Fredricks site. It had a depth/diameter ratio of 0.85 and an estimated original volume of 12 ft^3.

Two zones of fill were present in this feature. The upper zone (Zone II) was a thin deposit of mottled yellow clay which contained only a sparse amount of cultural material other than charcoal, animal bone, and plant remains. The animal species represented were deer and raccoon. The plant food remains consisted of hickory nutshell, peach pits, and a trace of corn. The lower zone of fill (Zone I) was a dark brown, highly organic, loam containing diverse animal and plant food remains, abundant wood charcoal, potsherds, lithic artifacts, and a variety of European trade items (see Carnes, this report). Many of these items, including a brass bell, metal fishhook, brass wire, and aboriginal as well as kaolin pipes, were more complete and less worn out than most of the trade artifacts, except those from burials. The brass bell appeared to have been associated with one of the two complete turtle carapaces recovered from this zone.

Feature 13 had a ledge about 0.2 ft wide around the western half of the feature about 0.65 ft above the pit floor. Six large rocks were found on the pit floor, two of which showed evidence of intentional modification (see Tippitt, this report). One of these had been bifacially modified along the edges, creating a shape that conformed to the pit wall. The six large rocks seemed to fit together and may have originally formed a cover (at about the level of the ledge) over items cached in the bottom of this pit.

The animal remains from Zone I represent the most diverse group of species found in any of the nonburial features present. These species consist of box turtle, deer, passenger pigeon, turkey, frog, gray squirrel, fox squirrel, raccoon, and bear. This assemblage of animal remains is very similar to that found in several of the zones of fill from the burials at the site. The closest similarity appears to be with the upper burial fill from Feature 3/Burial 5. Fourteen species are represented in the combination of Feature 13, Zone I and Burial 5, Zone II. Nine of these species are present in both zones. Thirteen species are represented in the combination of Feature 13, Zone I and Burial 5, Zone I. Eight of these are present in both zones. The plant food remains show the same association between zones of fill. In both of them, hickory, peach, corn, and grapes are the only plant foods represented.

The food remains from Zone I of Feature 13 suggest that the feature was filled at the time of the ritual feasting associated with the burial of the adult male in Burial 5.

Structures

Three structures were observed at the Fredricks site (Figure 51). Each of these structures was different from the others in form and with

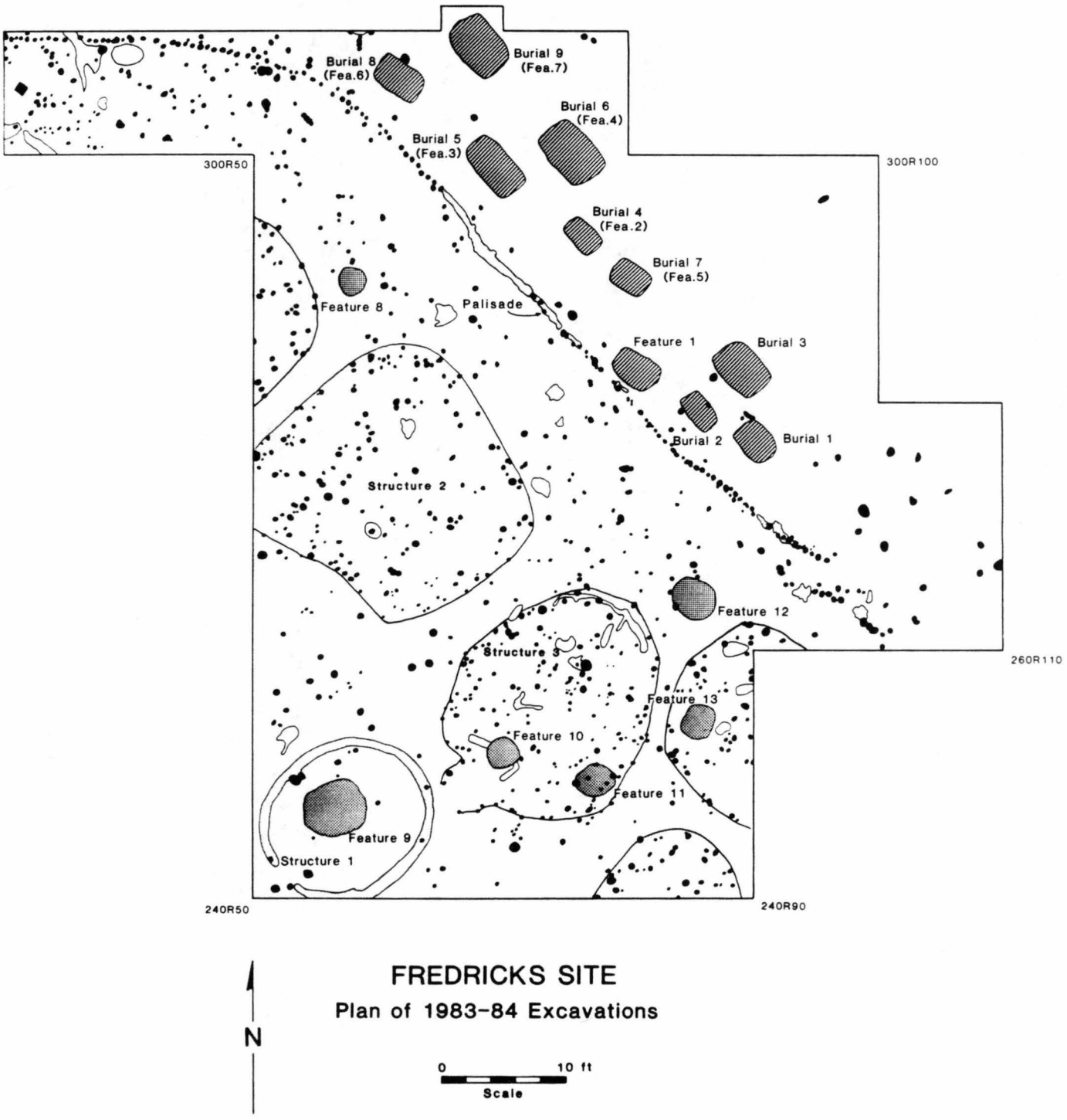


Figure 51. Plan of architecture and features at the Fredricks site.

respect to associated features. Table 9 summarizes the formal attributes of these structures.

Structure 1 (Figures 52-53) was defined by an oval wall trench with an opening to the southwest. This structure was oriented NE-SW and had overall dimensions of 14 ft by 12.5 ft. The wall trench varied in width from 0.60 ft to 1.00 ft, with an average of about 0.80 ft. The opening in the southwest end was just under 2.0 ft wide. The fill of the wall trench, a mottled brown soil, contained glass trade beads, a fragment of possible mirror glass (see Carnes, this report), plant food remains, and a small amount of wood charcoal.

No postholes or postmolds were observed in the wall trench. The absence of remains of posts suggests that the structure was a dome-shaped building constructed of small flexible poles which were pulled together at the top. The resulting tension would have held the poles against the outer wall of the trench.

The large pit (Feature 9) at the center of the floor of Structure 1 functioned as a fire pit. The small size of the structure, 110 ft^2 (including the area taken up by Feature 9), indicates that it was not a dwelling. It is interpreted to be the remains of a sweat lodge. Such structures are frequently mentioned in the early historic accounts for this region (e.g., Wright 1947:218-219; Jones 1956:55; Lefler 1967:48,55; Myers 1970:49). John Fontaine, a traveler who visited the "Saponi" town near Fort Christanna in 1716, when some of the Occaneechi were residing there, described the sweathouses as follows:

> Between the town and the river side there are several little huts built with wattles in the form of an oven with a small door in one end of it. These wattles are plaistered without side with clay very close, and they are big enough to hold a man. They call those houses sweating houses, for when they have any sickness they get 10 or 12 pebble stones which they make very hot in a fire and when they are red hot they carry them in those little huts and the sick man or woman goes in

Table 9. Summary of structure attribute measurements at the Fredricks site.

Structure	Outside Diameter (ft)	Inside Diameter (ft)	Exterior Post Size (ft) x	sd	n	Interior Post Size (ft) x	sd	n	Floor Area (ft^2)	Shape
1	12.5x14.0	10.5x12.5	Wall Trench (0.8 ft wide)			-	-	-	110	Oval
2	19.0x21.0	14.5x18.0	0.34	0.09	84	0.37	0.10	53	261	Rectangular
3	16.0x18.5	14.0x16.0	0.33	0.10	73	0.30	0.10	53	210	Oval



Figure 52. Structure 1 and Feature 9 at the Fredricks site, prior to excavation.



Figure 53. Structure 1 and Feature 9 at the Fredricks site, after excavation.

> naked, only a blanket with him and they shut the door upon them and there they sit and sweat until they are no more able to support it and then they go out naked and immediately jump into the water over head and ears. This is the remedy they have for all distempers (Alexander 1972:97).

Architecturally, Structure 1 conforms very well to this description. Daub and fired clay are very abundant in the vicinity of Structure 1 (Figure 54), indicating that Structure 1 was daub-covered.

A major discrepancy between the ethnohistoric description and the archaeological remains appears to be the way in which heat was introduced into the structure. The historic accounts describe a process by which hot stones, heated outside of the sweat lodge, were brought inside where water was poured over them to create steam. The fire pit inside of Structure 1 is somewhat anomalous in this respect. It is suggested that Feature 9 was originally excavated not for use as a fire pit, but probably to be used as a storage facility. The large inclusive rock within the pit may have been perceived as potentially useful as a substitute for more traditional ways of heating a sweat lodge. The lower deposits of this feature show that repeated fires were built in the pit. Such fires would have heated the large rock and there would have been no need to build fires outside. It then would have been necessary only to bring in water to make steam.

Structure 2 (Figure 51) was a rectangular structure measuring 19.0 x 21.0 ft and located about five feet north of Structure 1. It was of a single-post construction with no clearly defined entrance. The postholes defining its exterior walls were rather small with an average diameter of 0.34 ft. They were irregularly spaced about one-half foot apart. The exterior wall pattern ranged from two to three posts wide, suggesting that the structure had been maintained for some time, with replacement of some posts. The interior postholes were slightly larger

than the exterior ones, averaging about 0.37 ft in diameter. These postholes formed a rectangular pattern concentric with the outside wall pattern, and probably were roof supports and supports for benches and sleeping platforms around the inside perimeter of the structure. Although no hearth was observed within the structure, an area relatively clear of posts at the center of the floor may have once contained a hearth.

Structure 3 (Figure 51) was an oval structure located two feet to the southeast of Structure 2. This structure measured 18.5 ft by 16.0 ft on the outside with its long axis oriented parallel to Structure 1. An opening in the posthole pattern on the southwest end probably represents an entrance. The structure seems to have been of single-post construction, although a discontinous band of dark mottled soil conforming to the northeast portion of the exterior wall may be a remnant of a wall trench that has been mostly plowed away. Feature 10, a deep storage pit, was located near the entrance of the structure. Although several of the exterior wall posts intruded into the southeastern side of Feature 11, there were also exterior wall posts outside the feature. The presence of these latter posts may indicate that the feature was associated with an early phase of the structure and was filled before the structure was abandoned.

The outside wall postholes of Structure 3 had an average diameter of 0.33 ft. The interior posts were generally smaller, averaging about 0.30 ft in diameter. These postholes were concentrated around the inside perimeter of the structure and probably served as supports for sleeping platforms. The size and shape of this structure suggests that it was an oval, domed structure similar to the one observed at the Mitchum site, and to those described in the early historic accounts of

the Piedmont Indians (e.g., Lefler 1967:180-182).

Material preliminarily classified as daub is relatively abundant at the Fredricks site, with a heavy concentration in the vicinity of Structure 1 (Figure 54). Aside from the concentration around the sweat lodge, "daub" is distributed uniformly across the portion of the site inside the palisade. While there are not separate concentrations conforming to the posthole patterns defining Structures 2 and 3, the presence of daub as a linear concentration inside the palisade and in the vicinity of the structures suggests that daub was used to cover these structures.

Parts of three additional structures seem to be present in the excavated portion of the site. One of these structures was located northwest of Structure 2 and was defined by a linear pattern of postholes parallel to and 1.5 ft away from Structure 2. This pattern appeared to turn to the northwest at about 10-12 ft from the palisade and may represent the corner of another rectangular structure. The northeast corner of another possible structure was partially defined in the extreme southwest corner of the excavations where a linear cluster of postholes was observed about two and a half to three feet away from, and parallel to, Structure 3.

A third area with high posthole density was observed to the east of Structure 3. These postholes may define part of a structure that extends beyond the excavation. Feature 13 was located within this area.

Palisade 1

Aside from the structures, the major architectural feature at the Fredricks site is a palisade, 90 ft of which has been exposed in the north and northwestern part of the excavations (Figures 35 and 37). This linear feature separates the cemetery from the habitation area of

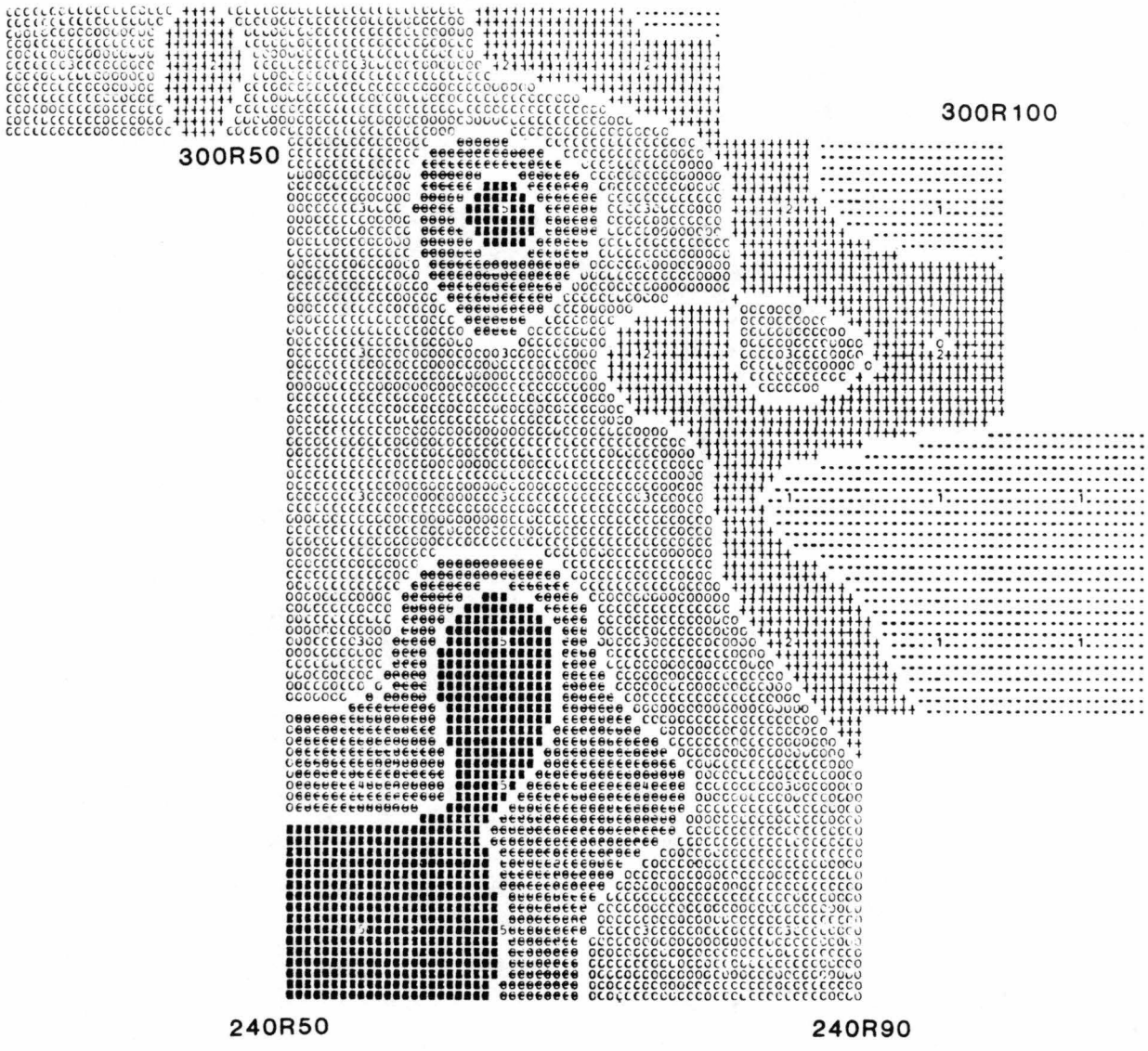


Figure 54. SYMAP of daub in the plowzone at the Fredricks site.

the site.

The section of the palisade observed in the excavations consisted of 135 small postholes with a mean diameter of 0.35 ft. Some of these postholes were observed within a narrow wall trench. Only discontinuous portions of the wall trench were observed and it is uncertain whether the entire palisade originally consisted of posts erected within a wall trench, or if only portions of it were constructed in this manner. The wall trench was not observed in the extreme northwestern area of the excavations, even though it appeared that the village remains were better preserved in that area.

A single entrance, just southwest of the cemetery, was observed in Palisade 1. Associated with the entrance were a series of paired postholes that formed an arc extending outward from just south of the entrance and towards the first group of burials in the cemetery. This posthole pattern may represent a tower or similar feature, associated with the village entrance.

Auger Testing

In conjunction with the excavations undertaken at the Fredricks site, systematic auger testing was conducted to obtain subsurface data on unexcavated portions of the site.

A 1-in Oakfield soil-sampling tool was used to obtain soil cores at 2.5 ft intervals on the site grid. Limited testing using this technique was undertaken prior to the 1984 excavations and was found to be 100% effective in locating features encountered later during excavation.

9200 ft^2 of suspected site (beyond the area excavated in 1983-1984) was tested using the soil auger. This procedure produced 120 positve tests, 41 of which probably represent pit types of features, and 79 of which probably represent postholes, shallow subsurface disturbances, or

remnants of midden. The distribution of the positve tests is shown in Figure 55.

Figure 56 shows the relative density of the suspected pit features based on the results of the auger tests. (also included is the feature density in the excavated area as it would have appeared through auger tests placed in this area). It does not depict the density of numbers of individual features because positive tests adjacent to each other likely intruded into the same feature. The sampled area was divided into 5-ft square units for the purpose of computer mapping (SYMAP), and the number of positive tests encountering pit features for each unit was determined. Where positive tests were on boundaries between units the value of that test was divided between the units. The range of values for positive tests per unit was between 0.00 and 2.00.

When feature density is mapped at this scale some large patterns emerge that relate to the internal structure of the Fredricks site. The cemetery stands out as a prominent feature as does the sweat lodge. Features 11-13 appear to be the northern most end of a band of features extending toward the southwest. Areas devoid of features are depicted on both sides of this arc and probably relate to the location of structures, and activity areas.

A different pattern of feature density and distribution is apparent to the west of the excavated area. The predicted density of features in this part of the site is much greater than in the area that has been excavated. This pattern suggests that the occupation of the site may have been denser, or is better preserved, to the west. The absence of features southeast of the present excavations suggests that the palisade is turning fairly sharply toward the south. Thus, the 1983-84 excavations appear to be on the eastern periphery of the village.

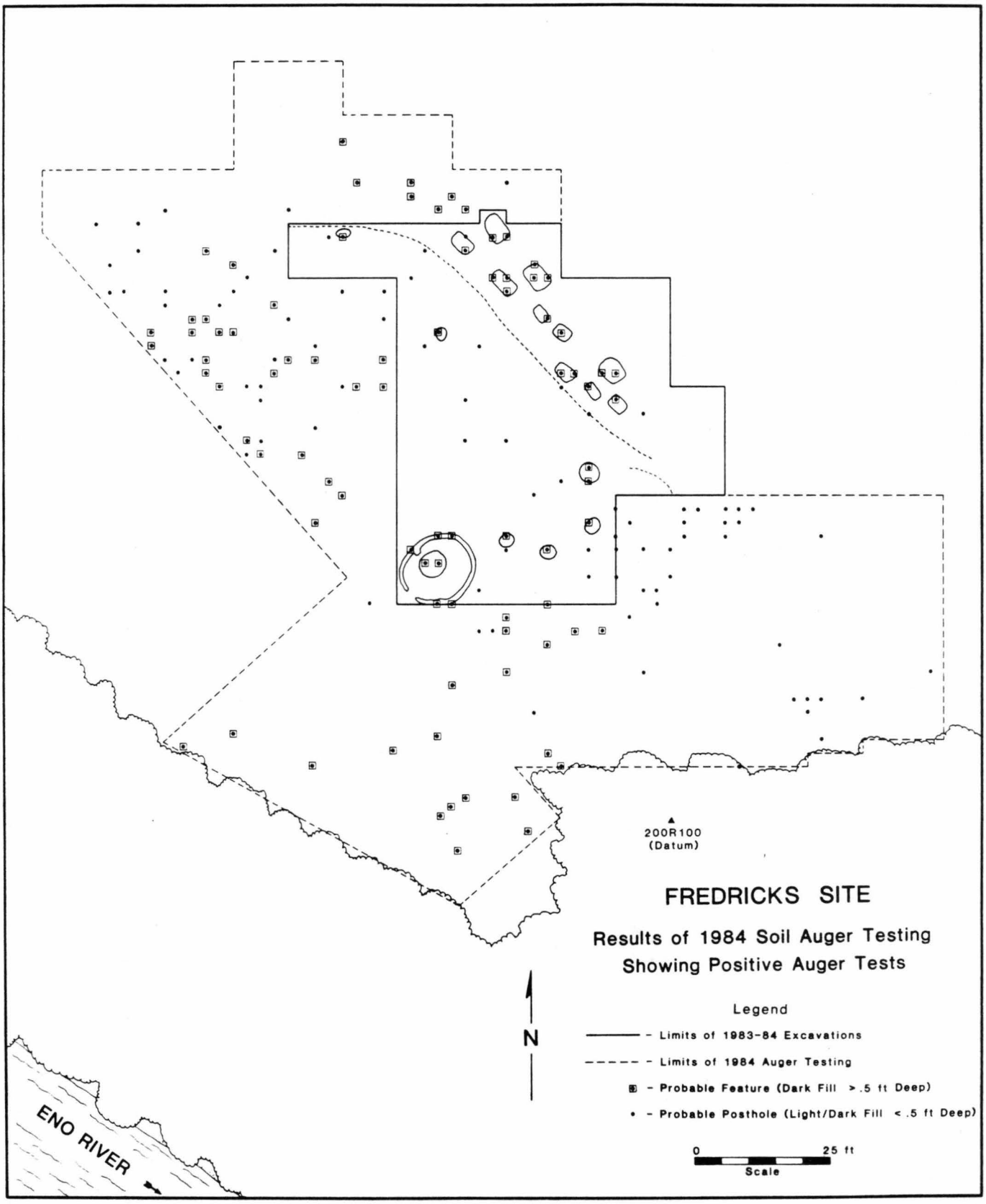


Figure 55. Map showing the results of soil auger testing at the Fredricks site.

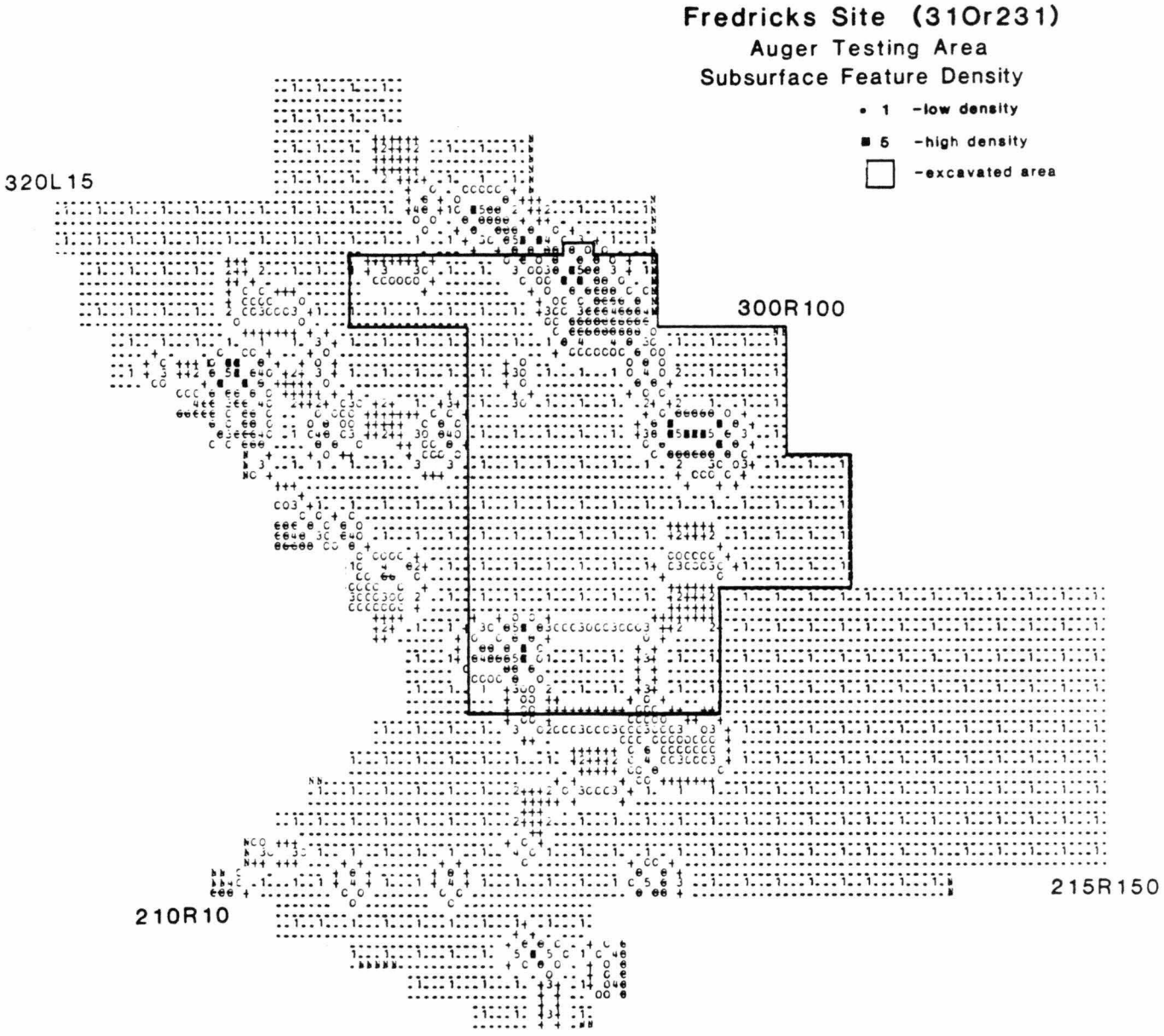


Figure 56. SYMAP of features at the Fredricks site, based on the results of the auger testing.

Several relatively open areas are also evident. They probably represent locations of additional structures, especially in areas west of the excavations in line with Structures 2 and 3. The open area to the southwest of Structure 1 may represent a plaza in the center of the village.

Summary

Investigations undertaken thus far suggest that the Fredricks site represents a village site of the Occaneechi Indians during the Middle Contact period. The village appears to have been surrounded by a palisade of small posts, and to have had a cemetery on the outside, and adjacent to, the palisade. Domestic structures, located about 10-12 ft inside of and parallel to the palisade, were rather small (210-260 ft^2) and closely spaced. Two forms of domestic structures were present--rectangular and oval. The rectangular structure observed in the excavation did not have any features associated with it. Two features were located within the oval structure--a large, deep storage facility and a smaller pit. Additional pits were located outside and around the structure.

It is possible that Structures 2 and 3 represent summer and winter houses. It can probably be assumed that storage pits were designed for concealment of materials (DeBoer 1984; Ward 1985). Caching facilities would have been useful during periods when men were away on hunting or trading trips or when there was threat of a raid. They may not have been necessary during the spring and summer when agricultural activities dominated subsistence activities. Structure 3 may represent a winter house, and Structure 2 a summer shelter, possibly an open arbor such as described by Lawson in the early 18th century.

> They have other sorts of Cabins without Windows, which are for their Granaries, Skins, and Merchandizes; and others that are

> covered overhead; the rest left open for the Air. These have Reed-Hurdles, like Tables, to lie and sit on, in Summer, and serve for pleasant Banqueting-Houses in the Hot Season of the Year (Lefler 1967:182).

Storage facilities were used as trash recepticles when they were no longer needed. It is likely that other refuse was disposed of around the periphery of the village. The plowzone distribution of aboriginal ceramics from the historic occupation (see Davis, this report) indicate that household waste was discarded outside of houses, either in pits, against the palisade, and just outside the village entrance (Figure 36).

It is not yet entirely clear how the village was structured spatially. Four distinct activity areas are evident (Figure 57), but a larger area will have to be investigated in order the substantiate this interpretation.

The outer area consists of a long and narrow (approximately 12 ft wide) special purpose area which was reserved for mortuary activities. This area is parallel to the palisade. Data from this context have provided valuable information on ritual mortuary behavior, technology, subsistence, and biology of these peoples (see Ward, Carnes, Holm, Gremillion, and Wilson, this report). Comparisons of characteristics of the pitfill from these burials and the features suggest that ritual feasting contributed to the formation of the burial fill.

The second activity area consists of a narrow zone between the palisade and the structures. The density of postholes observed in the extreme northwest of the excavation suggests this zone may be confined to the part of the site already excavated. If this is proven by future work, then it might be profitable to consider this area an activity area associated with the structures in this vicinity rather than as an area used as a passageway around the village. There is some evidence that refuse may have been disposed of in the part of this area nearest the

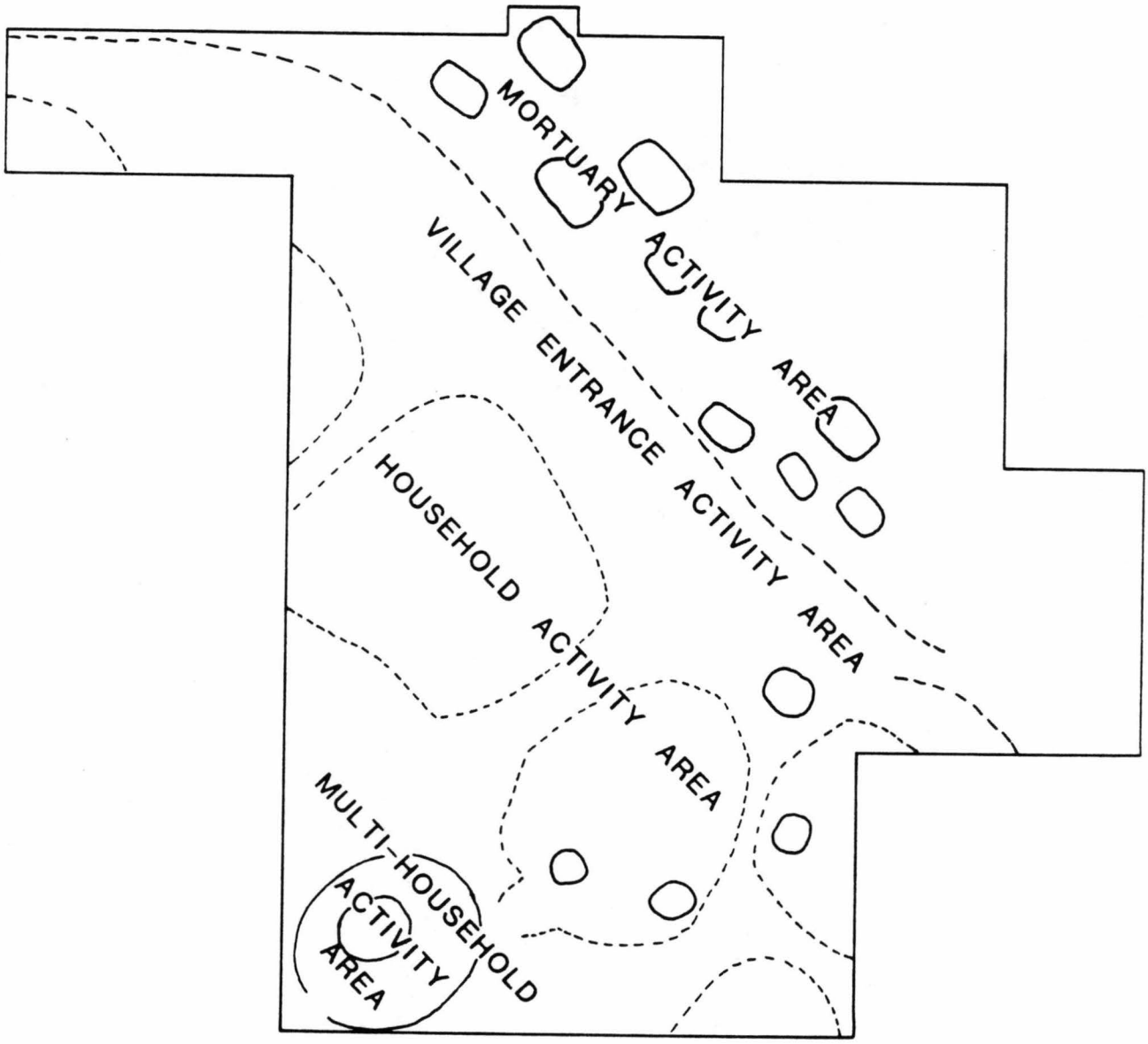


Figure 57. Excavation plan of the Fredricks site showing activity areas.

palisade.

The third activity area is identified as a domestic use area and is defined by several domestic structures and storage facilities. It is about 22 ft wide and appears to extend about 30 ft into the village. The associated activities were probably related to a variety of day-to-day and seasonal tasks that took place within and around houses. Such behavior is reflected in the trash deposits recovered from abandoned storage facilities. The many small pits suggest that surplus was organized at a household level, and that caching of materials was a necessary precaution during times when hunting and warfare necessitated seasonal abandonment of the village by at least a portion of the population.

Because of the orientation of the present excavation, only a small area interior to the third activity area has been investigated. This fourth area is defined by the presence of a sweat lodge and represents a different set of activities than those in the domestic area. The area probably was reserved for activities involving members of several different households or the entire village and may be the edge of a plaza. According to historic accounts, sweat lodges functioned as therapeutic facilities. Beverly (Wright 1947:218-219) noted in 1705 that among the Virginia Algonquin Indians "sweating-houses" were maintained by a village "doctor." He described these facilities as follows:

> in every Town they have a Sweating-House, and a Doctor is paid by the Publick to attend it. They commonly use this to refresh themselves, after they have been fatigu'd with Hunting, Travel, or the like, or else when they are troubl'd with Aches, or Pains in their Limbs. Their method is thus, the Doctor takes three or four large stones, which after having heated red hot, he places 'em in the middle of the stove, laying on them some of the inner Bark of Oak beaten in a Mortar, to keep them from burning. This being done, they creep in six or eight at a time, or as many as the place will

> hold, and then close up the mouth of the Stove, which is usually made like an Oven, in some Bank near the Water side. In the mean while, the Doctor, to raise a Steam, after they have been stewing a little while, pours cold water on the Stones, and now and then sprinkles the Men to keep them from fainting. After they have sweat as long as they can well endure it, they sally out, and (tho it be the depth of Winter) forthwith plunge themselves over Head and Ears in cold water, which instantly closes up the Pores, and preserves them from taking cold...they instantly recover their Strength, and find their Joynts as supple and vigorous as if they never had travell'd, or been indispos'd.

They also probably functioned as social gathering places and as individual retreats (Alexander 1972; Myers 1970; Lefler 1967). The social context is interpreted to be at the level of multiple households. It is doubtful that every household maintained such a facility.

One can hypothesize that additional activity areas will be characteristic of this site. The historic descriptions of towns are filled with accounts of gaming fields (Cumming 1958:26-27), and plaza areas (Alexander 1972:96-97; Morton 1956:55) used for activities involving larger portions of the village population.

In summary, the excavation of the Fredricks site has provided information allowing a preliminary interpretation of the spatial organization of the village. If the area of present excavation is representative of the entire site, the data suggest that this village was densely occupied regardless of its total size. It is only possible to estimate the village size within a range of area as it is not known as yet whether the palisade extended to the river edge or whether it enclosed a smaller area away from the river. Nevertheless, it appears that between 8% and 20% of the site has been excavated thus far. From this range, it can be estimated that between 10 and 25 houses were present, along with other burial areas and sweat houses, and possibly other kinds of special-function areas. Overall, the village spatial organization appears to be very similar to the Saponi town near Fort

Christanna visited by Fontaine in 1716. He described the town as follows:

> (April 17, 1716) The fifth day. After breakfast I went down to the Saponey town, which is about a muskey shot from the fort. This town lieth in a plain by the river side. I walked round the town to view it. The houses join all the one to the other and altogether make a circle. The walls of their houses are large pieces of timber, which are squared and being sharpened at the lower end, they put above two feet in the ground and about seven feet above the ground. They laid them as close as they could the one to the other, and when these posts are all fixed after this manner then they make a sort of roof with rafters and cover the house with oak or hickory bark, which they strip off in great flakes, and lay it so closely that no rain can come in. Some of their houses are covered in a circular manner which they do by getting long saplings and stick each end in the ground and so cover them with bark, but there is none of the houses in this town so covered. There is three ways of coming into this town or circle of houses which are passages of about 6 feet wide between two of the houses. All the doors of the houses are on the inside of the ring and it is very level withinside which is in common with all the people to divert themselves. There is also in the centre of the inside circle a great stump of a tree. I asked the reason they left it stand, and they informed me that it was for one of their head men to stand on when he had any thing of consequence to relate to them, that being raised, he may better be heard....Between the town and the river side there are several little huts....They call those houses sweating-houses... (Alexander 1972:96-97).

Identification of these activity areas within the Fredricks site is essential. Each of these areas was utilized for different activities by social groups of different size and composition. Features associated with each of these areas contained information relevant to different problems and questions. For example, ritual behavior represented in the first activity area is reflected in the burial remains. The diversity of animal and plant remains from the fill in these features may not reflect normal subsistence activities. Nevertheless, they probably do represent the breadth of the resources available at any one time. Questions regarding household activities can be addressed through artifacts, structures, and features from the domestic activity areas. Similarly, questions about non-mortuary activity involving groups larger

than the household, or comprised of individuals from several households, may be addressed by data derived from the fourth activity area, perhaps characterized by special purpose facilities like the sweat lodge.

COMPARISONS AND CONCLUSIONS

Comparisons of data from the three sites used in this study are limited in some respects by difference in the scale of excavation at each site. The Mitchum site has received the least investigation so far, and the scale of excavation makes it impossible to even speculate on the overall configuration of the village. The Wall site has received the largest amount of excavation, yet a large majority of this work was undertaken when data recovery techniques and the questions being asked were different from what they are today. The Fredricks site received the most attention during the 1983-1984 field seasons, and the quality of the data is excellent. However, the excavations have exposed only a portion of the village. Nevertheless, some comparisons between the sites are possible. These comparisons are presented below along with interpretations of what the differences observed between the sites may mean in terms of the research questions posed at the onset of this study.

Differences in the kinds and amounts of features at the three sites undoubtedly reflect cultural changes throughout the period from A.D. 1500-1720. Figure 58 shows the percentages of features by class observed at the three sites. These data should be used cautiously, however, since the different scales of excavations at the sites may mean that additional feature classes will be found in parts of the Mitchum and Fredricks sites not yet investigated. The area of the Wall site investigated is sufficiently large that all of the feature types present

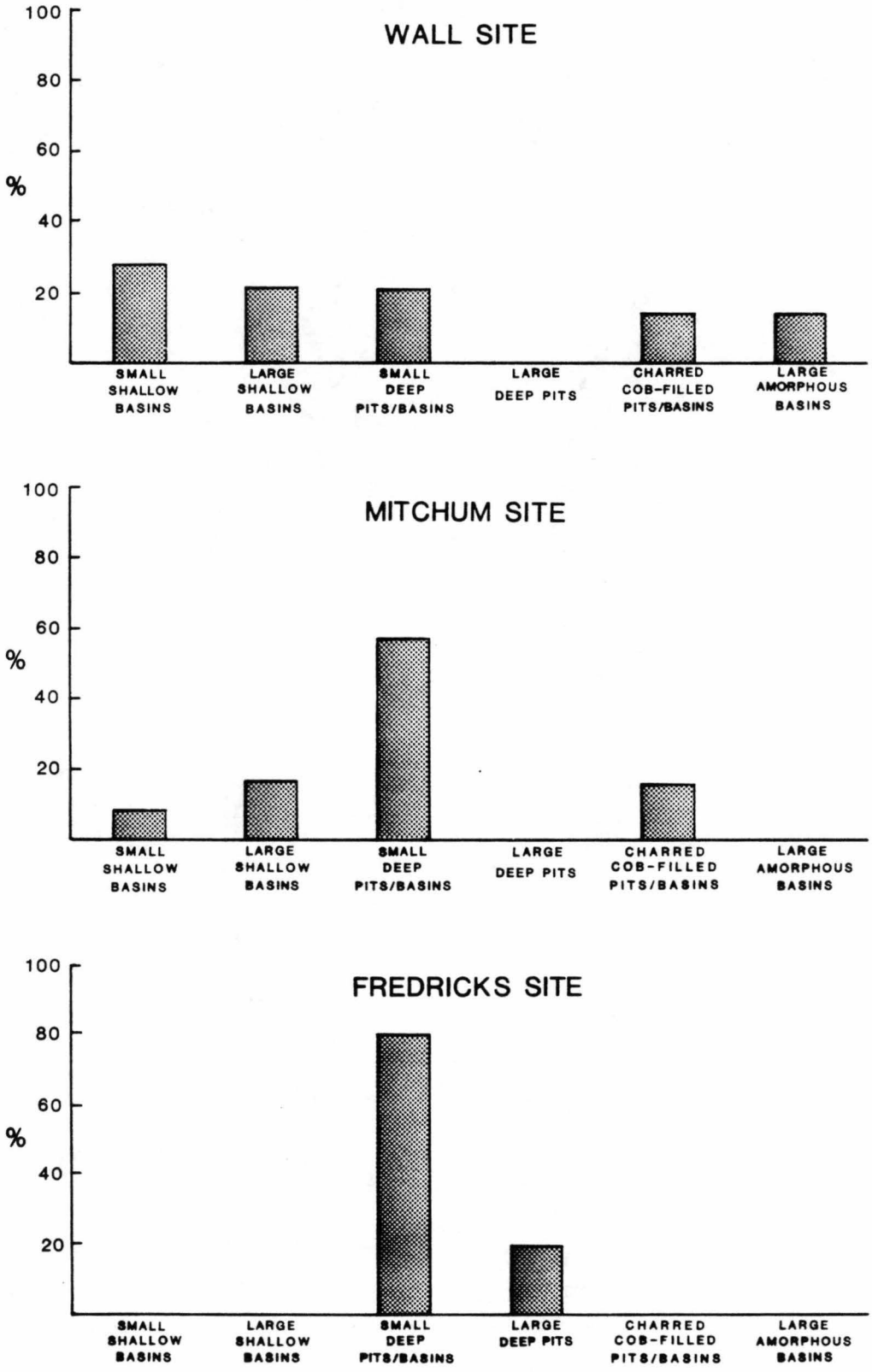


Figure 58. Relative frequency histogram of feature classes at the Wall, Mitchum, and Fredricks sites.

at this site are represented in the sample.

Feature Class I consists of small shallow basins that make up 28.6% of the features at the Wall site, 8.3% at the Mitchum site, and none at the Fredricks site. These features probably represent food processing facilities, although clay recovery may also have been a function of those basins at the Wall site. It is not known what kinds of foods were processed using these facilities, but the decline in their use may be related to the decreased emphasis on acorn utilization (see Gremillion, this report). Acorns require a leaching process to be edible and small basins could have functioned in this manner (Driver 1969:91).

Feature Class II consists of large shallow basins and is represented by 21.4% of the features at the Wall site and 16.7% of the features at the Mitchum site. No Class II features were observed at the Fredricks site. These features probably represent two functional classes at the Wall site, large-scale soil-recovery facilities and large-scale food processing facilities. The large shallow basins at the Mitchum site were probably used as food processing facilities. Such facilities probably are also present in unexcavated areas of the Fredricks site. The excavated areas at that site are confined primarily to the domestic and mortuary activity areas. The basin-shaped deposit of Zone I in Feature 9 at the Fredricks site has been interpreted as in situ deposits representing large-scale plant food processing, perhaps associated with ritual feasting. While this deposit has a depth/diameter ratio of greater than 0.40, it probably functioned in a similar manner to the larger but shallower features of this class.

Class III features are small and medium-sized deep pits which include both deep, bell-shaped pits with constricted openings and smaller straight-sided and sloped-sided deep pits and basins. The

relative proportion of features shows an increase from 21.4% at the Wall site, to 58.3% at the Mitchum site, and to 80% at the Fredricks site. All of the features in this group would have been useful for below-ground storage of small quantities of foodstuffs or caching of valuable items (Schroedl 1980; DeBoer 1984; Ward 1985). This pattern demonstrates a fundamental shift in storage behavior from the Protohistoric to the Historic period.

Only one Class IV feature was present at any of the three sites. This is the large pit at the Fredricks site which has been discussed in detail above. It is likely that this pit was originally excavated for storage purposes and was later transformed into a fire pit for the sweat lodge. This strengthens the argument for the shift to below-ground storage.

Cob-filled pits make up 14.3% of the feature inventory at the Wall site and 16.7% at the Mitchum site. No such pits were observed at the Fredricks site. Assuming that these facilities were used in the preparation of animal hides and skins, it is somewhat surprising that they are absent from the Fredricks site feature inventory. What this may imply, if sampling error is not responsible for the absence of these features, is that as the participation in the deerskin trade increased, there was a shift in hide-processing strategies. Since both dressed and undressed deerskins were traded (France 1985), time previously devoted to hide preparation was spent in skin procurement. In an examination of the trade inventories in the historic records, France (1985) noted that the bulk of trade items consisted of cloth products, which may reflect a shift from animal-skin clothing to clothes made from incoming European fabrics.

The structural evidence from the three sites is difficult to

compare because of the great differences in areas excavated. Circular, oval, and rectangular structures are present. Palisades are present at both the Fredricks site and the Wall site and possibly at the Mitchum site. Figure 59 summarizes the structure data from the three sites. Included in this figure are the volumes of Class III features associated with each structure, and the ratio of pit volume to floor area (ft^3/ft^2).

All of the habitation structures at the Wall site are circular, and they have an average area of 367.60 ft^2 (range 284-491 ft^2). As discussed earlier, these structures seem to be paired. The single structure identified at the Mitchum site is oval and has 290 ft^2 of floor space. The two habitation structures at the Fredricks site represent both oval and rectangular house forms. The absence of subsurface features in the rectangular structure and its proximity to the oval structure may suggest that these are paired winter/summer structures. If this is true, there is a continuity in function for domestic architecture, even though the house forms are different.

It appears that the structures at the Wall site were fairly substantial buildings that received considerable maintenance. They may have been daub-covered as well. The structures at the Mitchum and Fredricks sites were built using much smaller posts and do not exhibit as much evidence of maintenance as those at the Wall site. This may be partly because of briefer periods of occupation at the Fredricks and Mitchum sites, possibly reflecting more frequent population movements during the Historic period. The structures at the Fredricks site also appear to be more closely spaced than those at the Wall site.

The differences in the palisades at the Wall and Fredricks sites is notable. The Wall site's palisade was built with large posts and

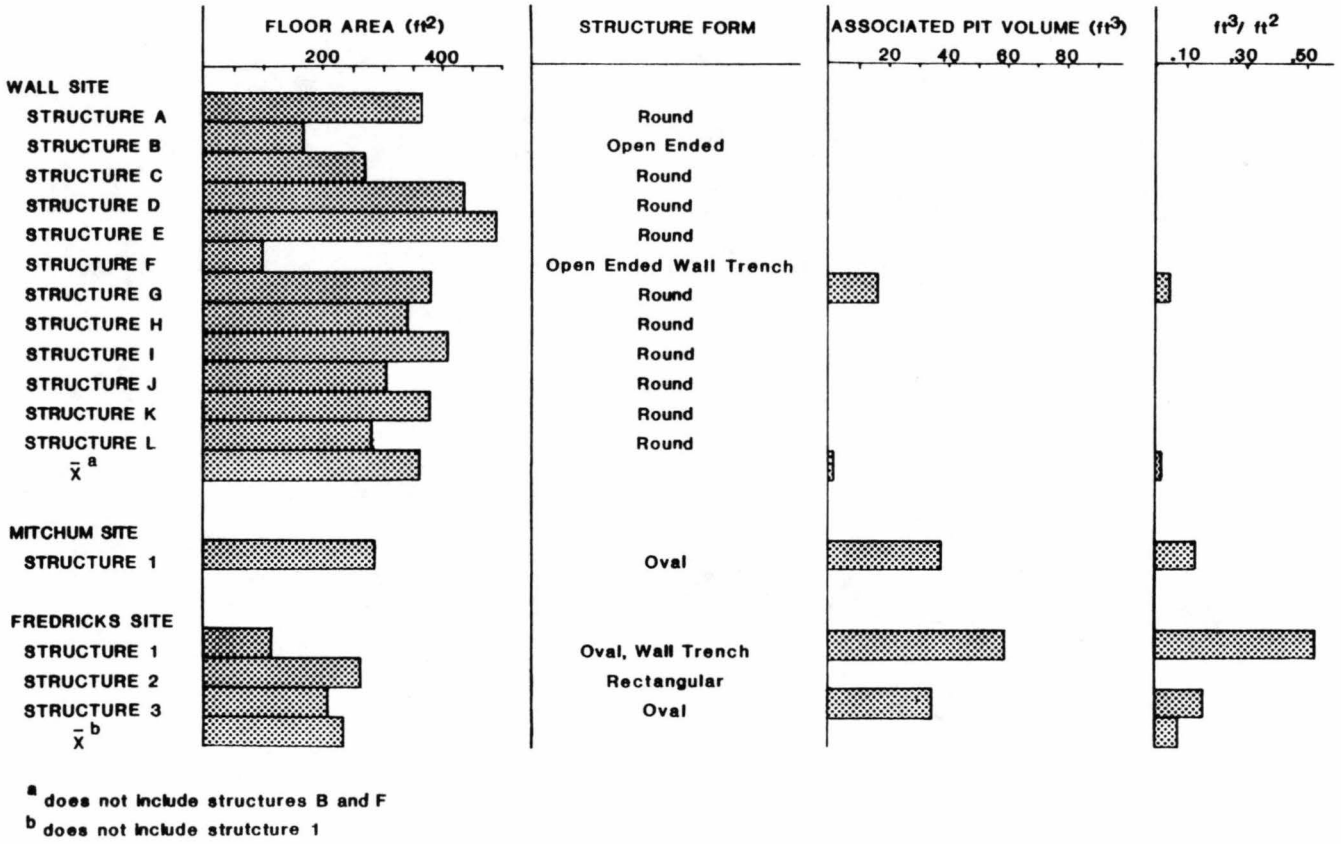


Figure 59. Histogram showing the floor area of structures at the Wall, Mitchum, and Fredricks sites, and their associated storage pit volumes.

probably served as a formidable defensive work. The Fredricks site's palisade was constructed of much smaller posts and could not have provided much of a barrier to intruders.

The most striking difference between the sites is in the dramatic increase in the number of subterranean storage pits at the Mitchum and Fredricks sites compared to the Wall site. This shift is reflected in the changing ratio of storage volume to floor area of associated structures, which DeBoer (1984:18) has proposed as a measure of subterranean "storage-per-capita."

The Wall site had 10 structures, for which only one has associated storage pits. The volume/floor area ratio for the structure in 0.042. The rest of the structures have ratios of 0.00 which yields an average storage/floor area ratio of 0.004. The Mitchum site is represented by a single structure with two storage pits associated with it. The combined volume of these two facilities is 39 ft^3 yielding a volume/floor area ratio of 0.134. The Fredricks site is represented by three structures. One of the structures has no associated storage pits, one has two, and the third structure is a sweat lodge with a large pit that may have originally been used for storage. Since the association of this pit with a domestic habitation structure is not clear, it is not used in the intersite comparison. The two habitation structures have volume/floor area ratios of 0.00 and 0.162, yielding an average of 0.081 for the two structures. The difference between the Mitchum and Fredricks site ratios is probably a result of sampling error, especially since only one structure has been excavated at the Mitchum site.

Both DeBoer (1984) and Ward (1985) have argued, from ethnographic and archaeological data, that subterranean storage is a concealment strategy used when settlements are seasonally abandoned by all or a

portion of the inhabitants, such as by hunting/raiding groups of males. The deerskin trade, displacement of populations, and population reduction created a condition which led to increased interaction between the Native American societies of the North Carolina-Virginia area (Ward 1984b; Dickens 1984). This interaction was complex and resulted in both increased intertribal warfare and consolidation of formerly distinct societal systems. Participation in the deerskin trade and warfare resulted in parties of men being away from the village for varying periods, especially during fall and winter after crops were harvested and stored. The absence of men from the villages during these expeditions would leave the settlements vulnerable to raids. It is precisely under these conditions that concealment of surplus would be adaptive. The risk of spoilage from burying items below ground would be outweighed by the risk of loss from raiding parties.

This shift from stable, long-term village occupation to less permanently occupied villages is dramatically illustrated in the respective archaeological remains of the Wall and Fredricks sites. At the Wall site intensive investments were made by the community in the construction and maintainance of a defensive fortification. Houses were lived in and maintained for long periods of time, and the village expanded in response to its growing population. Storage of surplus crops was accomplished with the use of above-ground storage facilities like corn cribs. This general pattern is in marked contrast to the pattern described above for the Fredricks site. It is not known whether the Wall site was abandoned because its population grew too large for the local environment to support, or its development was cut short by the disruptive effects of 16th century Spanish intrusions into the interior of the Southeast. The data from the Fredricks site clearly

show that by A.D. 1700, about 150 years after the abandonment of the Wall site, adaptation to the same local physical environment had changed greatly as a result of changes in the social and cultural environment.

It is now possible to offer some preliminary answers to the research questions raised at the beginning of this paper. One important question concerned the nature of village structure during the Protohistoric period. Assuming that the Wall site was representative of a portion of the larger settlement system of which it was a part, it appears that Protohistoric villages of this area were small palisaded communities consisting of several groups of extended families. The spatial arrangement of houses were in clusters of summer and winter houses arranged around small plaza-like open areas. The groups occupying these houses probably cooperated in collective endeavors such as agriculture and village maintaince. Storage of surplus food was in above-ground facilities; subterranean storage was minimal. A double set of palisades was used for defense, and villages were occupied year-round. Domestic structures were circular, conical-roofed buildings that probably were plastered with daub. At least some of these villages underwent expansion in response to increased population growth during the Protohistoric period.

There is still little evidence on which to base an interpretation of socio-political organization during the Protohistoric period. No large communal structures were observed at the Wall site, nor was there evidence of social stratification in the burials. Nevertheless, given the scale of social investment by the inhabitants in the village fortification, the village expansion in area and population, and the evidence that it was occupied year-round, it is possible that the stage may have been set for the development of low-level chiefdoms in this

area, such as those observed in the coastal regions of Carolina and Virginia in the late 16th century (Hariot 1590).

Differences in house forms between the Wall site and the Mitchum and Fredricks sites are pronounced. These differences may have ethnic rather than temporal implications. The ceramics represented at these sites support the idea that at least two distinct ethnic groups occupied the different drainages in the study area (see Davis, this report).

Analysis of site structure of the Wall, Mitchum, and Fredricks sites shows that mobility increased during the Early and Middle Contact periods. This shift is probably a result of the complex interaction of factors relating to participation in the deerskin trade, population decimation from disease, increased tribal interaction, and increased warfare.

The introduction of metal tools during the Historic period does not seem to have greatly effected traditional architecture and construction techniques. A few square postmolds were observed at the Fredricks site but were not associated with any of the domestic structures. It is possible that the introduction of metal digging tools such as hoes, led to a change from construction of structures using posts set individually to the construction of structures using posts set in wall trenchs, excavated with metal tools. It is likely that subterranean facilities were constructed using metal tools but these facilities retained traditional oval and circular forms. Burial pits, which were rectangular with sharp edges and corners, undoubtedly were excavated with metal tools.

Evidence for the overall configuration of the Fredricks site is insufficient at this point to address the question of whether or not different ethnic groups were consolidated and living together in the

village. It is probable that population density at the Fredricks site was higher than at the Wall site. The structures, although smaller, appear to have been much more closely spaced. Additional excavations will be necessary to determine if ethnic differences are reflected in either architecture or spatial patterning of features and artifacts. If the village was a composite of formerly distinct groups, these groups may have demarcated themselves in distinctive ways as part of an effort to maintain their identity. Ward (this report) argues that the spatial patterning of the Fredricks site cemetery reflects possible ethnic differences. It would be surprising if efforts to maintain group identities were confined to mortuary behavior.

The analysis of the spatial structure of the Wall, Mitchum, and Fredricks sites has provided a baseline of information on village and household structure and behavior. The interpretations of the spatial patterns at these three sites are not intended to be conclusive. Instead, these interpretations are meant to be working hypotheses to be tested with additional data from these and other sites within the region.

CHAPTER IV

MORTUARY PATTERNS AT THE FREDRICKS, WALL, AND MITCHUM SITES

by

H. Trawick Ward

INTRODUCTION

In this section, an attempt will be made to describe the burials from the Fredricks site, and to discuss the mortuary complex as it reflects the organization of later 17th-century Siouan Indian society and the processes of prehistoric-to-historic culture change. Comparative data will be presented from the archaeological and ethnohistoric records to reconstruct changing mortuary patterns of Siouan peoples as well as those of neighboring groups.

Mortuary practices at Siouan sites occupied during the Prehistoric and early Historic periods will be compared with the mortuary pattern at the late 17th-century Fredricks site to elucidate temporal changes in spatial organization, burial pit morphology, and grave associations. Finally, questions concerning Indian-Colonial interaction and acculturation will be addressed in the context of the Fredricks site mortuary complex.

The Occaneechi were very influential in the development of Siouan societies during the Historic period. They occupied a strategic position in a trade network that was comprised of Native American and Colonial groups. It is probable that their prominence in this network was established early in the Historic period because of pre-existing ties and relationships with groups to the north. The Susquehannocks, for example, seem to have been at least partially responsible for the development of the Occaneechis as a major link in the Virginia-Carolina

trading system. As the intensity of colonial influence increased during the latter part of the 18th century, the Occaneechis, as with other interior tribes, had to cope with depopulation and other consequences of the colonial expansion. Social and cultural adjustments should be reflected in Siouan mortuary practices.

APPROACHES TO MORTUARY ANALYSIS

Over the past two decades, studies of mortuary behavior have dramatically increased. This trend is often seen as a direct consequence of the rise of anthropological archaeology and the acceptance of the analysis of social organization as a proper domain of archaeological inquiry. As a result, mortuary data are no longer used only to speculate about primitive belief systems but rather to provide the main focus for studying social differentiation, cultural complexity, culture change, and demography (Bartel 1982:52; O'Shea 1984:1-3). In fact, mortuary ritual probably contains more information concerning social processes and culture change than does any other data category available to the archaeologist (Goody 1962:142; Tainter 1978:110).

It should also be kept in mind that the primary archaeological manifestation of mortuary behavior, a burial, represents only one link in the behavioral chain surrounding the ceremonial treatment and disposal of the dead. Mortuary practices involve several distinct stages; death, body preparation, burial chamber preparation, interment, and post-interment activities (Bartel 1982:53). The burial itself, however, should inform on precedent and subsequent behaviors (i.e., what happened before and after the body was placed in a pit or other receptacle).

Most studies of mortuary practices by American archaeologists have

been concerned with status differentiation, particularly within ranked societies, and have used grave associations as their primary source of information (e.g., Brown 1971). Tainter (1978:121), however, has found that social distinctions were symbolized by mortuary associations in less than five percent of a sample of 93 mortuary systems described in the ethnographic literature. Because the way a culture disposes of its dead can mirror a complex web of economic and sociopolitical variables as well as ideological beliefs, Bartel (1982:52), Brown (1971), Binford (1971), Rothchild (1979), and others have pointed out that for studies of mortuary behavior to be productive, they must take into account the structure and organization of the total mortuary system, not simply the material content resulting from burial behavior.

After critically reviewing recent approaches to the analysis of mortuary behavior, O'Shea (1984:14) proposes that if mortuary remains are to be understood directly it is necessary to assume that only a single set of cultural directives governing mortuary treatment was in operation throughout the duration of a burial group. Following Binford (1971:13-18), O'Shea further states that there are regularities that link a society and how it disposes of its dead. The most important relationships are: 1) mortuary differentiation is patterned and integrated with other components of the cultural system; 2) mortuary differentiation accorded an individual is consistent with and reflects his social position (i.e., "social persona") in the living society; and 3) mortuary differentiation becomes more complex as societal complexity increases (O'Shea 1984:21).

In societies with little complexity, the dimensions of status differentiation are based on age, sex, and "differential capacities" for performing cultural tasks. In more complex societies, on the other

hand, status differentiation is determined by culturally defined sociocentric statuses (Binford 1971:18; Service 1962:155). At the same time, there are no set rules concerning the degree of mortuary differentiation within any given society. Some may permit a lot of variation, whereas others permit only a little. And all social differences may not be recognized through differential mortuary treatment. In some societies, for example, the way a person dies may have primary influence in determining mortuary treatment (O'Shea 1984:36).

The spatial dimensions of the structure and organization of mortuary systems can be a sensitive barometer of social variability (Saxe 1971). Peebles (1971:87) in his analysis of Moundville burials found that individuals of high status were spatially separated from lower status individuals. Persons were segregated within cemeteries, and cemeteries within the site were ranked relative to one another. Individuals buried in mounds were further segregated from those buried in cemeteries. A similar mound-cemetery segregation has been reported at Etowah (Larson 1971) and Spiro (Brown 1971). "Status space" is a characteristic and significant feature of the mortuary practices of complex, ranked societies, and the structure of cemetery burials is reflective of the hierarchical nature of their social organization.

Cemetery burial may also provide information on social variables other than status. Tainter (1978:123) suggests that the presence of cemeteries reflects the importance of individual corporate groups; Saxe (1971:51) interprets cemeteries among egalitarian societies as indicating strong lineal affiliation; and Bartel (1982:51-52) states that societies with social structures characterized by clan or lineage organization usually will have distinct geographical burial locations

within cemeteries. Thus, cemeteries may be expected in unranked, as well as ranked, societies as long as strong unilineal kinship ties define corporate groups.

One of the primary reasons for the acceptance of mortuary analysis into the mainstream of archaeological thought is that it can be tied directly to ethnohistoric and ethnographic data (O'Shea 1984:1). Although the use of these data does not suggest a one-to-one correlation between the acts of one culture and the material remains of another, descriptive accounts of mortuary practices can reveal behaviors that may be detected as patterns in the archaeological record. Obviously, the correlation between ethnographic or ethnohistoric observations and archaeological remains is considerably strengthened if there is an historic connection between the two, as there is with the Occaneechis. Nonetheless, ethnohistoric descriptions in particular must be closely scrutinized because they are usually filtered through the biased eyes of individuals from an alien culture. The ultimate test of whether such accounts are relevant to the interpretation of archaeological remains depends on how close the fit is between facts revealed by the archaeological record and the ethnohistoric or ethnographic model (see Ucko 1969:263).

ETHNOHISTORIC BACKGROUND

To follow are ethnohistoric descriptions of Siouan mortuary behavior as well as accounts of such behavior in other, neighboring cultures, particularly groups to the northeast where there is a rich reservoir of ethnohistoric data. There were strong cultural affiliations between some of the interior northern tribes and the Siouans, particularly the Occaneechi. This relationship is best

supported by the fact that the Tutelo, Occaneechi, and Saponi all ultimately settled with the tribes of the Iroquois Confederacy in New York (Mooney 1894:55).

In searching the ethnohistoric record for descriptions of burial practices among Siouan groups and their neighbors, one quickly discovers a paucity of such observations by White visitors. The extant written records are by individuals who visited the tribes for relatively brief intervals. Given communities with populations of about 200, and a high mortality rate of 30 per 1000, there would be an average of about six deaths per year (Gruber 1971:64-65). It is obvious, therefore, that the chance of a traveler such as John Lawson or John Lederer observing a burial ceremony first-hand would be very slight. Certainly the frequency of observations would not have been sufficient to allow detailed descriptions of patterns of mortuary behavior. Also, it sould be recognized that, even if an outsider did arrive at a village at the time of a death, it is unlikely that he would be told about the death or allowed to observe the mortuary ritual. This point is made clear by Adair (1930:189), who observed among the Cherokee that

> they will not associate with us, when we are burying any of our people, who die in their land: and they are unwilling we should join with them while they are performing this Kindred duty to theirs.

Thus, because of the relatively low frequency of death and burial, and the fact that most groups probably did not allow outsiders to observe or participate in burial ceremonies, most of those descriptions that are available probably are second-hand.

John Lawson, the most detailed chronicler of the Indians of the Carolina Piedmont, wrote concerning the South Carolina Indians that their tombs were located near the cabins, with the implication that these tombs were grouped. "Near to these Cabins are several Tombs made

after the manner of these Indians; the largest and chiefest of them was the Sepulche of the late Indian King of the Santees..." (Lefler 1967:27). Lawson goes on to describe in detail the burial customs of the Santee.

> The manner of their /interment is thus: A Mole or Pyramid of Earth is raised, the Mould thereof being worked very smooth and even, sometimes higher or lower, according to the Dignity of the Person whose Monument it is. On the Top thereof is an Umbrella made Ridgeways, like the Roof of an House, this is supported by nine stakes, or small posts, the Grave being about six or eight Foot in Length and four foot in Breadth; about it is hung Gourds, Feathers and other such Trophies, placed there by the dead Man's Relations, in respect to him in the Grave (Lefler 1967:28).

Lawson continues by describing pre-burial mortuary behavior and states that when someone dies, they are laid out in the sun and "seasoned" with a concoction made of bear fat and a red root. This ointment is also used by the living as a hair dressing. After two or three days, the body is covered with pine or cypress bark. The worldly possessions of the deceased are brought to the body, and a close male relative sings "a mournful Ditty" for three or four more days. Finally, when it decays to the extent that it can be stripped from the bone, the flesh is removed and burned. The bones are then thoroughly cleaned, oiled, and put into a wooden box to be kept by the deceased's closest relative (Lefler 1967:28).

Lawson also mentions a burial ceremony that took place while he was visiting a Tuscarora town and stated that it was "much the same as that of the Santees, who make a great feast at the interment of their Corpse" (Lefler 1967:66).

Lawson (Lefler 1967:185-189) also discusses mortuary rituals in his general description of the Indians of Carolina. He lists a sequence of the events that is very similar to his description of the Santee ritual. There is a great deal of mourning by the nearest relatives, and the

corpse, after lying in an outbuilding constructed for that purpose for a day and a night, is wrapped in a blanket or match coat and two or three cane or rush mats. This bundle is then enclosed by a web of woven reeds or cane. Next, the body is taken outside the village ("into an orchard of Peach-Trees") where the individual's kinsmen and other members of his tribe as well as representatives from allied tribed listen to a shaman ("Doctor or Conjurer") give a detailed account of the highlights of the dead person's life. After this lengthy discourse, the corpse is carried to the burial pit which is six feet deep and eight feet long. A forked branch of pitch pine or light wood is driven down either side of the grave, and several layers of bark are placed on the bottom. The corpse is then laid down gently, and a pole is placed across the two forked sticks.

> Having a great many Pieces of Pitch-Pine logs about two foot and a half long, they stick them in the sides of the Grave down each End and near the top thereof, where the other ends lie on the Ridge-Pole, so that they are declining like the Roof of a House. These being very thick placed, they cover them (Many times double) with Bark; then they throw the Earth thereon that came out of the Grave, and beat it down very firm; by this means the dead Body lies in a Vault, nothing touches him; so that when I saw this way of Burial, I was mightily pleased with it, esteeming it very decent and pretty, as having seen a great many Christians buried without the tenth part of that Ceremony and Decency (Lefler 1967:18).

After the flesh had rotted, the bones were taken out and dressed in deer skins and placed in a charnel house to accompany the remains of other "Kings" and "War-Captains." Lawson continues his description by saying that, although the burial ceremonies differ slightly among the various Indians, all had in common

> the Mourning, which is, to appear every night at the Sepulchre, and howl and weep in a very dismal manner.... If the dead Person was a Grandee, to carry on the Funeral Ceremonies, they hire People to cry and lament over the dead Man (Lefler 1967:189).

The first part of Lawson's descriptions seem appropriate and

generally conform to the archaeological record. However, there is no archaeological evidence that the Occaneechi or other Siouan burials were unearthed, defleshed, and placed in communal burial houses. It appears that Lawson combined some attributes of Siouan mortuary customs with the Algonquian practice of defleshing bodies and storing them in charnel houses until they were interred in a communal pit or ossuary. There is abundant archaeological evidence from Siouan sites, including Occaneechi Town, that bodies were wrapped prior to interment and that the graves contained chambers or vaults (Navey 1982).

The only other description of Siouan burial ritual comes from John Lederer, written in 1670. Lederer's account is interesting because he clearly states that individuals were buried in cemeteries.

> Their places of Burial they divide into four quarters, assigning to every Tribe one: for, to mingle their bodies, even when dead, they hold wicked and ominous. They commonly wrap up the corpse in beasts skins, and bury with it Provision and Household stuff for its use in the other world. When their great men die, they likewise slay prisoners of war to attend them (Cummings 1958:14).

As with Lawson, Lederer mentions that the bodies were wrapped before burial. He also states that grave goods, in particular utilitarian items, were placed with the dead. Unfortunately, it is not possible to ascertain to what social divisions Lederer's "tribe" refers to. The implication is that these were clans of one village, since they shared a common cemetery that was divided into spatial units. There are no historical accounts or archaeological evidence to support his contention that prisoners of war were killed at the time of the death of their "great men." This statement, rather, seems to reflect Lederer's familiarity with de Acosta's account of the Mexican Indians rather than a first-hand observation of Siouan mortuary behavior (see Cummings 1958:13, footnote).

There are several ethnohistoric accounts of mortuary behavior of the Indians located just north of the Siouan area. These accounts are important because they seem to have some close counterparts in the archaeological record of the Occaneechi. A recurring theme in virtually all of these accounts is the emphasis placed on feasting in the mortuary ritual. Lawson, however, only refers to feasting indirectly when comparing the Santee burial customs with those of the Tuscarora. Another important aspect of mortuary behavior shared by most of the northern groups is the fact that gift-giving and redistribution also were part of the mortuary pattern. Among Algonquian groups in Maine, the Jesuit Pere Pierre Biard observed that the village prepared a feast which continued, day and night, from the time of death until all of the food was gone (Bushnell 1920:12). In describing the burial ritual Biard states that

> They arch the graves over with sticks, so that the earth will not fall back into it, and thus they cover up the tomb...If it is some illustrious personage they build a Pyramid or monument of interlacing poles...If it is a man, they place there as a sign and emblem, his bow, arrows, and shield; if a woman, spoons, Matachias, or jewels, ornaments, etc....they bury with the dead man all that he owns, such as his bag, his arrows, his skins and all his other articles and baggage (Biard quoted in Bushnell 1920:13).

The description of the grave with sticks arching over it to prevent dirt from touching the body is very similar to Lawson's account. Also of interest is the mention of grave offerings being differentiated by sex and of the graves being marked on the surface by some of the belongings of the deceased. Apparently among these Algonquians, all of the personal property of the deceased was buried with him and not redistributed among the living.

A description of the burial of a Delaware chief's wife in 1762 clearly indicates the importance of feasting and the redistribution of

goods, particularly European trade goods, in the burial ritual (Bushnell 1920:22). As with the Algonquians, burial was in a cemetery located outside the village, and graves were marked with painted or decorated posts. The deceased was wrapped and covered to avoid contact with the dirt. At the end of the funeral procession from the village to the cemetery area, "two stout men [carried] loads of European manufactured goods upon their backs." After the grave was covered and surrounded by a palisade, food was prepared and passed out.

> Then presents were distributed the many things which had been carried by the two men in the rear of the procession. Those who had rendered assistance were given the most valuable and highly prized pieces, but no one was omitted...At dusk after the burial, a kettle of food was placed upon the grave, and this was renewed every evening for three weeks (Heckewelder quoted in Bushnell 1920:22).

A couple of important inferences can be drawn from the above description. First, the redistribution of European goods as part of the mortuary ritual may provide a clue as to how these goods were generally distributed within various social groups. Second, not only was there a feast for the living, but food was also placed on the grave so that the deceased might share in the feast. The fact that food is placed on the grave itself has archaeological implications that will be discussed later in this section.

The Delaware also put

> tobacco pouch, knife, tinder box, tobacco and pipe, bow and arrow, gun powder and shot, skins and cloth for clothes, paint, a small bag of Indian corn or dried bilberries, sometimes the kettle, hatchet, and other furniture of the deceased, into the grave, supposing that the departed spirits would have the same wants and occupations in the land of souls (Loskiel quoted in Heye and Pepper 1915:77).

There are also detailed descriptions of the mortuary behavior of the Shawnee who are thought to be related to the Seneca and Delaware. These accounts state that the graves were lined with wood or bark which

also covered the body. Before burial, gifts were brought to the dead person's kinsmen and redistributed. After burial, a small house was constructed over the grave, and a large feast was served to the funeral guests. After the third day, an all-night vigil was held. A meal was prepared for the deceased and served to the dead and his blood kin prior to and during the vigil (Voegelin 1944:240-245).

Food and fire were placed on the grave for three nights during his journey to the other world. On the fourth morning, food for a feast was again set near the grave. At this time, the funeral leader spoke to the dead while burning tobacco in a small fire made near the grave. The Shawnee believed that the smoke created by the tobacco being thrown in the fire would take the leader's words upward to the dwelling place of the spirit of the dead (Voegelin 1944:261-268).

Another interesting feature of Shawnee burial ritual is that all the dirt excavated from the burial pit had to be placed back on top of the grave. If this were not done, the Shawnee believed that another death would occur shortly in the same family (Voegelin 1944:390). Feasts were held and gifts were redistributed one year after an individual died. Accounts prior to 1687 indicate that these feasts were given annually for a period of four years (Voegelin 1944:297).

The most detailed description of Susquehannock culture comes from the 1666 writings of George Alsop, who published the following account of their mortuary practices:

> When any among them depart this life, they give hom no other imtombment, then to set him upright upon his breech in a hole dug five feet long and three feet deep, covered with the Bark of Trees Arch-wise, with his face Du-West, only leaving a hole half a foot square open. They dress him in the same Equipage and Gallantry that he to be trim'd in when he was alive, and so bury him (if a Soldier) with his Bows, Arrows, and Target, together with all the rest of his implements and weapons of War, with a Kettle of Broth, and Corn standing before him, lest he should met with bad quarters in his way...They bury

> all within the wall of Palisade'd impalement of their City or Cannadogo as they call it (Alsop quoted in Kent 1984:41).

Kent (1984:41) finds that Alsop's description of the Susquehannock form of burial fits fairly well with the archaeological evidence. According to Kent, individuals originally placed in burial pits in a sitting position later would have fallen over from pressure of colapsing dirt, thus creating the flexed posture normally found in Susquehannock burials. Alsop's description of grave goods also matches the archaeological record.

Every detail of the ethnohistoric descriptions should not be accepted uncritically, but there are regularities and trends that suggest that the more general aspects of the descriptions are accurate. For example, the burials were always wrapped to avoid contact with the earth. In addition, they were usually covered and placed in a dirt-free chamber. Some had other coverings, in the form of small house-like structures, placed on the top of the grave. In some cases, the burials were protected by palisades. All the ethnohistoric accounts indicate that burials were grouped in cemeteries spatially distinct from the habitation areas. Feasts were prepared as part of the mortuary ritual, and in some instances, these feasts were renewed for several years on the anniversary of the death. Usually, although these feasts were prepared by the deceased's relatives, they were participated in by the village as a whole. Food was also prepared for the dead and placed on or near the grave. A redistribution of material goods, usually items of European manufacture, almost always accompanied the redistribution of food. In most cases, special attention was given leaders, with "grandees" and "kings" receiving greatest accord.

It is also important to note that food and personal property were placed with the burials. Among the Susquehannocks, these items included

implements and weapons that the individual had owned during life. Algonquians buried with the dead all that he owned, and the Delaware placed food, weapons, and tools with the dead. A common theme seems to be that an individual was given what his kinsmen determined that he would need in the afterlife, and these needs were perceived as being similar to those the individual had while alive.

ARCHAEOLOGICAL BACKGROUND

Having presented ethnohistoric descriptions of the mortuary rituals of the Siouans and other groups along the Eastern Seaboard, it is now appropriate to turn to the archaeological record to isolate correlates to the ethnohistoric accounts. First, archaeological sites that are known to have been occupied by Siouan groups during the Prehistoric and early Historic periods will be discussed. Then archaeological data from groups known to have interacted with the Siouans during the Historic period will be presented. These latter data are presented because it is believed that there are closer similarities between the Occaneechi burials at the Fredricks site and those of groups such as the Susquehannock and Delaware than there are between the prehistoric and historic Siouan mortuary patterns.

The Wall site, located immediately east of the Fredricks site, dates to the Protohistoric period. Although roughly 16,000 ft^2 have been excavated, only eight burials have been identified. All the burials were inside or in the vicinity of houses. The individuals were flexed, and all but one were placed in ovoid shaft-and-chamber pits with their heads usually positioned to the southeast. Grave goods consisted entirely of aboriginal artifacts. Decorative items such as shell beads and gorgets were found along with aboriginal pots and smoking pipes.

The latter were associated with adults, whereas, the former were found with children. The burials from this site will be discussed in detail later in this section.

At the Clarksville site, located on the North Carolina-Virginia border and dating to the Late Prehistoric period, burials were randomly dispersed across the excavation area. Although these burials probably also were in the vicinity of houses, no such structures were identified by the excavators (Miller 1962). The overall inventory of grave goods at the Clarksville site was very similar to that from the Wall site.

During the summer of 1983, excavations at the Mitchum site, an historic village site, uncovered an oval house structure and a single shaft-and-chamber burial lying within the floor area of the house. Grave goods were represented by a necklace of small glass trade beads and two copper ear ornaments. A detailed description of this burial also will be presented later in this section.

At the Madison site, located in Rockingham County, North Carolina, 120 burials were removed from an area of approximately 14,000 ft^2. Unfortunantely, most of these burials were taken out by pot-hunters. However, some records of the excavations were kept. This site probably dates to ca. 1650-1670 and was occupied at about the same time as Upper Saratown, discussed below. Twelve of the burials were arranged in a semicircle around a cluster of refuse pits, and the remaining burials radiated out from the primary group in a more or less random fashion. The burials were flexed and all but one was oriented in an eastward direction. European trade goods, found in 70% of the graves, consisted mostly of glass beads and brass ornaments (Gravely 1969:11). In general, this pattern is very similar to that described below at Upper Saratown. Postholes and house patterns among the burials probably were

present but were not observed by the excavators.

At Upper Saratown, occupied during the middle 17th century, an area similar in size to that of the Wall and Madison sites has been excavated and 111 burials identified. All these interments were found either inside or in the vicinity of house structures. Navey (1982:152) notes that, "It can be stated with certainty only that the preferred burial locations were within the village and in the proximity of houses". Only 12% of the burials were in shaft-and-chamber pits. The most popular pit type was ovoid to rectangular in shape and usually had shelves for a burial covering near the top of the pit. The bodies were flexed and the heads generally oriented in an easterly direction (Navey 1982:158-168). The most common grave goods were glass beads and brass ornaments, followed by aboriginal shell ornaments (Navey 1982:170).

At the Wall, Madisonville and Upper Saratown sites, areas almost equal in size have been excavated. A like number of burials were found at the latter two sites, 120 at Madison Cemetery and 111 at Upper Saratown, whereas only eight were found at the Wall site. A comparison of the Wall site and Upper Saratown shows that a similar number of houses was constructed at both sites, although there is more evidence for rebuilding and superimpositions at Upper Saratown. That Upper Saratown was occupied somewhat longer is also suggested by a denser concentration of artifacts, but there is no reason to suspect that it was a viable community for more than 50 years. In all likelihood, the Wall site was occupied for about 20 years, given the multiple palisade alignments and a rich midden deposit around the periphery of the village. The difference in numbers of burials between the two sites, therefore, is much too large to be dismissed as the result of sampling error or different durations of occupation. It is rather a clear

indication of the devastating impact of European diseases on the aboriginal populations, and that this is one area where the accounts of the early traders and explorers were not exaggerated (e.g., Lefler 1967:232).

In summary, there seems to be a definite pattern in the dimensions of Siouan mortuary behavior during the Late Prehistoric and Historic periods. During the Late Prehistoric period there was a preference for ovoid shaft-and-chamber burial pits. Although that type of pit was continued into the early Historic period, its popularity diminished. Grave goods consisted of aboriginal utilitarian and decorative artifacts with shell ornaments being most popular. During the middle 17th century, the most popular grave was ovoid to rectangular in shape and usually had shelves to support a covering. Aboriginal decorative artifacts were replaced by glass beads and brass or copper ornaments. Aboriginal utilitarian artifacts, however, were still popular (Wilson 1984).

During the Late Prehistoric and Early Historic periods, bodies were flexed and the heads usually pointed in an easterly direction. During both periods, most burials were randomly distributed in the villages, although some may have been associated with house structures. With the possible exception at the Madison site, graves were not spatially segregated into clusters or aligned with one another.

An early archaeological account that describes a cemetery complex is the Munsee Cemetery report (Heye and Pepper 1915). The Munsee site, located in southern New Jersey, consists of a circular palisaded village and cemetery occupied by members of the Delaware tribe during the middle 17th century. The cemetery was excavated during the summer of 1914, and there are some problems in interpreting the remains because of the

relatively poor archaeological field methods at that time. It is clear, however, that the cemetery contained burials that were aligned with one another along a northwest-southeast axis. Several of the pits also contained upper zones of refuse, and in some instances deer bones and charcoal were intermingled with the human skeletal material. Heye and Pepper (1915:22) interpreted the animal remains as representing refuse from a feast. The clearest evidence of feasting activity was found in a child's burial.

> In association with this burial there were evidences of a feast, for over the body there was a broad discolored area in which were much charcoal and many cracked animal bones, mostly those of deer. Other burials showed evidences of accompanying feast-pits, but none was so strongly marked as this (Heye and Pepper 1915:28).

Pewter pipes and artifact bundles were also reported associated with the burials. "Resting against the left shoulder was a deposit of objects consisting of two flints and fragments of a steel, two circular mirrors with metal backs, a clay pipe of European manufacture, and a pewter pipe" (Heye and Pepper 1915:53). Several other pewter pipes were also found, and these were determined to have been imports from Iroquois groups to the west and north (Heye and Pepper 1915:53). In addition to the pipes, brass kettles and bracelets, metal spoons, glass and shell beads, and fragments of European fabric were found in the graves. In summary, the inventory of grave offerings at the Munsee site, though larger than that of the Fredricks site, is quite similar in overall content, as will be seen in the following descriptions.

Several Susquehannock sites exhibit marked similarities, through time, to the Siouan sites. The Ibaugh site, located near Washington Boro in Lancaster County, Pennsylvania, is a Susquehannock cemetery and

village that dates between 1600 and 1625, a time when the Susquehannock were first becoming intensively involved in the fur trade. The population of the Ibaugh site is estimated to have been around 1000 (Witthoft et al. 1959:119). Here, the grave depths averaged 31-in and appeared to have been dug with hoes. The pits were oval in outline with flat bottoms and sloping sides. In most cases, the pits were larger than necessary to accommodate the burial (Witthoft et al. 1959:105).

At the Ibaugh site, all the bodies except infants were flexed. Most were loosely flexed; only two were tightly flexed. The dominant orientation of the burials was west or southwest, with the heads oriented westward. In a single incident of secondary burial, two bundled individuals had been placed in the same pit with a flexed skeleton. Whitthoft et al. (1959:109) state that

> it seems quite obvious that the secondary nature of this interment was not the result of any traditional burial practice, but that it represents the remains of two persons who had died away from home, perhaps in warfare or in a hunting accident. The bones had been found in the woods at a somewhat later date and had then been carried home and placed in the first available grave, an open one which had just received a fresh corpse.

Most of the burials contained both aboriginal artifacts and Euroamerican trade goods. Large quantities of glass beads were found in clusters as if sown on clothing. Small white and blue glass "seed" beads were most common, with only a few tubular shell "wampum" beads being present. The graves of children and infants contained more beads than those of adults. Iron artifacts included knives, axes, hoes, scissors, and a few nails. Also recovered were pipes, kettles, bracelets, and tubular beads made from glass. Artifacts sown on clothing were discoidal shell beads, conch columella beads, shale beads, perforated elk and bear tusks, brass cones and bells, and a sheet brass

breast ornament. Most of the burials also contained aboriginal ceramic vessels that contained the remains of food offerings (Witthoft et al. 1959:110-115).

The Strickler site, also located near Washington Boro, is a large palisaded Susquehannock village with at least three associated cemeteries. It is estimated that the village was occupied between 1650 and 1675 (Futer 1959:147) or between 1645 and 1665 (Kent 1984:367). It may have contained as many as 3000 inhabitants (Kent 1984:363). Burials at the Strickler site averaged 25-in deep below the subsoil surface. As with those at the Ibaugh site, the pits were bath-tub shaped and had an average horizontal measurement of 65-in by 30-in. Most skeletons were flexed either on their right or left sides; 23% were extended (Kent 1984:365). By in large, the bodies were oriented northwest-southeast, with the heads to the northwest (Futer 1959:136).

Most of the Strickler burials were accompanied by brass kettles, gun parts, metal or kaolin pipes, and glass beads, in addition to aboriginal clay pots and pipes. Four pewter pipes were recovered, and fragments of trade cloth and blankets were found preserved by contact with the metal artifacts. The inventory also included several flintlock and doglock muskets, axes, hoes, knives, swords, a single pistol, and over 200 musket balls. Other artifacts included hawkbells, Jews harps, and buckles (Futer 1959:137-140). In short, "Grave offerings at Stricker consist of virtually every kind of material item made by, or which came into the hands of, the Susquehannocks" (Kent 1984:366).

The final site to be occupied by the Susquehannock was Conestoga Town, located in Lancaster County, Pennsylvania. This village, established after the 1675 defeat of the Susquehannocks by the Iroquois, is believed to have been occupied between 1690 and 1730 (Kent 1984:386).

Excavations in 1972 revealed striking differences between this site and earlier Susquehannock villages. Instead of long houses, the houses were more cabin-like, and the space between houses was greatly increased over earlier villages. The small settlement, confined to an area less than 90,000 ft^2, is estimated to have been occupied by only 100 to 200 individuals (Kent 1984:282-283).

Conestoga Town contained five distinct clusters of burials, which seem to have been spatially related to different groups of houses. It is known that different ethnic groups occupied the site at the same time, (Susquehannocks, Seneca and possibly others), and these distinctions may be reflected in the burial clusters. Most of the burials were extended (supine position) instead of being flexed, and each grave pit was dug just large enough for the body. A few apparently were coffin burials. Most of the skeletons had their heads oriented to the west-northwest; however, a few graves were oriented toward the southwest, southeast, east, and northeast, with greater variability than at earlier Susquehannock cemeteries (Kent 1984:387).

All the burials at Conestoga Town that had not been looted contained some form of grave goods, ranging from a few beads or a knife to thousands of glass beads accompanied by a variety of other trade artifacts. "Generally it was the adolescents who had the largest quantities of objects interred with them" (Kent 1984:387). The most common grave associations were beads, iron knives, and brass kettles, the latter often serving as repositories for artifact caches. Wooden spoons and fragments of split-cane baskets were sometimes found with the kettles. The overwhelming majority of burial artifacts were of European origin, and the list includes almost every imaginable item from beads and buttons to guns and bullets (Kent 1984:389).

> The various kinds of objects and their quantities found buried with the dead at Conestoga Town are indicative of the retention of certain old native beliefs, together with a cumbersome admixture of ideas borrowed from Christianity. In our opinion the kinds of quantities of objects do not reflect anything about individual status or economic conditions of the community (Kent 1984:390).

The earliest historic Siouan villages, such as Upper Saratown, do not compare with a Susquehannock town such as Igbaugh. The latter are at least 10 times as large and have spatially distinct cemetery areas, whereas the former are relatively small and have burials distributed throughout the village. However, in both cases the vast majority of the bodies are loosely flexed and oriented in specific directions; the Siouans usually to the east, and the Susquehannock usually to the west. There are also similarities in the kinds of European artifacts used as burial furniture. Although nonutilitarian goods such as beads are predominate at Upper Saratown and the Ibaugh site, axes, hoes, and other utilitarian objects are also found with the burials at both sites. The Ibaugh site, however, appears to have produced a greater variety of iron and brass artifacts than Upper Saratown.

There are no known parallels in the Siouan area to the Strickler site. Most of the Siouans never coalesced into a single village or group of villages that match the Stricker site in size and complexity. It was, however, during the span of occupation of the Strickler site that most of the cultural interaction took place between the Susquehannocks and the Siouans. And the original home of the Occaneechis on Occaneechi Island may have been in the process of becoming like Strickler when it was raided by Bacon in 1676. Three "forts" were occupied on the island when Bacon attacked. Immediately before Bacon's attack, the Occaneechi King, Posseclay, started:

> Massing his Indians and also the Hayhelocks, and Manakins and Annalectons, man all his forts and lined the other side of the

> river thick with men so that wee could neither well attack nor depart the Island (Billings 1975:268).

As the militia tried to stop the Indians from entering the fort, King Posseclay attempted to appease Bacon by blaming the Manakins and Annalectons who were "too numerous for him [the king] to control" (Billings 1975:268).

From this account, it would seem that the Occaneechis and their allies who occupied Occaneechi Island in 1676 were somewhat more numerous than the archaeological and ethnohistoric records indicate for other Siouan villages and in some ways more comparable to the Strickler site. Unfortunately, Occaneechi Island is now inundated, and archaeological research on the island prior to its flooding failed to locate the village and forts of the Occaneechis (Miller 1962).

There are numerous similarities and a few differences between the Fredricks site as it is currently known and Conestoga Town. As for the differences, most of the burials at Conestoga Town were extended and a few were in coffins, perhaps reflecting Christian influence. Also, burial orientation was variable. In contrast, the burials at the Fredricks site are all flexed and oriented in the same direction. The two sites are similar in the presence of a wide range of Euroamerican trade artifacts used as grave offerings and in the clustering of burials into small cemeteries. Although only one such cluster has, so far, been found at the Fredricks site--compared with five at Conestoga Town--it is highly probable that additional cemeteries are present at Fredricks. The two sites are also similar in the fact that subadults received a great deal of attention at the time of burial. In terms of overall village size, the two sites seem to be very similar, and both villages included a mix of once distinct tribal groupings. It is believed that the mixed ethnic composition at both sites is the reason for the

relatively small and distinct burial clusters.

THE SUSQUEHANNOCK CONNECTION

It was stated in the introduction of this section that cultures located north of the Occaneechi and the other Siouan tribes had a significant impact on the development of Siouan cultures during the Historic period. Ethnohistoric data indicate that the Susquehannocks were particularly influential in the southern Piedmont, and that they may have been responsible for setting up the Occaneechi as "middlemen" in the Carolina-Virginia deerskin trade.

From the beginning, trade with Europeans along the Atlantic Seaboard was controlled and managed by a relatively small number of Indian tribes. No doubt, in many cases, these strategic positions had been at least partly established during the Late Prehistoric period, and the large-scale trade with the colonists simply enhanced and entrenched previously established trade networks (Merrell 1982:72).

In the northeast, European trade was controlled by the tribes of the Iroquois Confederacy; the Mohawks, Onondagas, Cayugas, Oneida, and Seneca, the latter being the westernmost and the largest of these groups. The Seneca also appear to have been the most hostile in their relations with other tribes, particularly those to the south (Abler and Tooker 1978:505). Initially Seneca raids were aimed primarily at the Susquehannocks who were located in a strategic position in the lower Susquehanna valley. Many of these raids were prompted by Susquehannock attacks on the Seneca's shipments of furs to their eastern markets (Hunter 1959:15). After the defeat of the Susquehannocks in 1675, the Seneca continued raiding the southern frontier and into Siouan territory. In 1684, William Byrd I mentioned that he had spoken with 50

Seneca Indians who, "promised to behave themselves hereafter very peaceable towards the English" (Trinling 1977:16). In 1701, John Lawson was warned by the white trader Massey, "to strike down the Country for Ronoack, and not think of Virginia, because the Sinnagers, of whom they were afraid, though so well armed and numerous" (Lefler 1967:61).

As mentioned above, the Susquehannocks occupied a strategic position in the trade network and acted as intermediaries as early as 1608, when John Smith reported that the Tockwkogh living at the head of Chesapeake Bay had knives, hatchets, and pieces of iron and brass they had received from the Susquehannocks (Kent 1984:26). The geographic location of the Susquehannocks and their role as entrepreneurs placed them in a continuing state of hostilities with the Seneca. For a time they were allied with the Maryland colony against the Seneca. However, in 1674, Maryland made peace with the Seneca and declared war against the Susquehannocks, who were defeated by the Seneca in 1675. Weakened, the Susquehannocks were later pursued by the Maryland and Virginia militia and sought refuge with the Occaneechi who were, at that time, living on an island in the Roanoke River.

In contrast to the hostile relations the Susquehannocks had with the Seneca, they appeared to have lived in harmony with the neighboring Delaware Indians, as well as with groups to the south, especially the Occaneechi (Hunter 1959:15). Because of this relationship, the Susquehannocks appear to have established themselves as middlemen in the fur trade with the Siouans prior to 1670. And in establishing this position, they also made the Occaneechi, located astride the major north-south trading path, their primary trade agents. Up to this period, few white traders had yet ventured into the southern Piedmont. John Lederer, on his second voyage in 1670, hired a Susquehannock guide,

Jackzetavon, to lead him through Siouan territory. This guide may have been familar with the Carolina Piedmont from participating in earlier Susquehannock trading expeditions, an interpretation that is supported by Lederer on his approach to a Siouan town.

> You must by your scouts inform your self whether they hold any correspondence with the Sasquesahanaughs: for to such you must fire notice of your approach by a gun; which amongst other Indians is to be avoided, because being ignorant of their use, it would affright and dispose them to some treacherous practice against you (Cummings 1958:41).

Lederer's comments suggest that not only did the Susquehannocks trade with the Siouans, but they traded in firearms, and probably other Euroamerican utilitarian goods, and not just in beads and trinkets.

Shortly after 1670, the Occaneechi had established their own reputation as trade middlemen. In 1673, Abebraham Woods observed that the Occaneechi's store of arms and powder made them "the mart for all the Indians for at least 500 miles" (Woods, quoted in Merrell 1982:91). During this same period the Occaneechi had established ties with several other tribes, and their village was said to be:

> Strongly fortified by nature and that makes them so insolent for they are but a handfull of people besides what Vagabonds repaire to they it being a receptakle for rogues (Alvord and Bidgood 1912:225).

The Susquehannock-Occaneechi connection is clearly illustrated by the fact that after being defeated by the Iroquois in 1675, and being chased by the Virginia and Maryland militia, a band of Susquehannocks sought refuge among the Occaneechi who at the time lived on their island stronghold in the Roanoke River. In 1675 "Manakins" and "Annalectins" had also retreated to Occaneechi Island. Nathanial Bacon conspired with these two groups to betray the Susquehannocks, which they did along with capturing 30 individuals who were turned over to Bacon's forces and put to death (Billings 1975:267). It is important to note that the

Occaneechi were not involved in the Susquehannocks betrayal but rather continued to play their role as middlemen by trying to stall Bacon. Their strategy did not work, and the Occaneechis were attacked by Bacon and so devastated by the attack that they were forced to abandon the island and retreat southward to the vicinity of present day Hillsborough, North Carolina (Billings 1975:267-268).

It is hypothesized that ties of trade brought with them bonds of social responsibility, and it is likely that a strong trade relationship was sanctioned by an equally strong network of social ties. This relationship of mutual obligations is evident in the above accounts and in an earlier 1663 report of the Virginia General Assembly in which it was stated that some of the "ill-omened and murderous Doeg (Susquehannock) Indians" had taken up sanctuary with the Occaneechi (Cummings and Rights 1958:119). Social bonds between the Siouans and Susquehannocks are also evidenced by the fact that neither Lederer nor his Susquehannock guide were threatened by any of the Siouans they visited. This is in sharp contrast to the reception given by the Occaneechi to five Cherokee who were visiting among them at the same time as Lederer. The Cherokee wanted to establish trade relations directly with the Virginia colonists, and this so angered the Occaneechi, that they murdered their visitors (Cummings 1985:261). A similar fate met James Needham in 1674, when he also attempted to establish trade relations independent of the Occaneechis (Alvord and Bidgood 1912:217).

Thus, the ethnohistoric and archaeological records argue for a strong connection between the development of Piedmont Siouan tribes and tribes of the Susquehanna valley. The northern groups first felt the invasion of the Europeans, and early in the 17th century, they

established extensive trade networks with them and other Indian groups. By the middle of the 17th century, trade competition from the Iroquois Confederacy to the north forced the Susquehannocks to look to the southern Piedmont for potential trading partners. It is believed that they found in the Occanneechis, both geographically and culturally, an ally that would allow them to monopolize the Siouan trade. The Occaneechis were in a sense "set up" by the Susquehannocks as middlemen with whom they could deal directly. And, as Susquehannock influence was on the wane after 1670, the Occaneechi were just coming into their own as a major trading influence when attacked by Nathanial Bacon. This no doubt effected their unchallenged prominance in the Siouan fur trade. However, even after moving to Hillsborough in the late 17th century, they were apparently still prosperous.

During the early 1700s, European diseases and slavery greatly reduced the tribes of the middle Atlantic region. Remnants of various groups coalesced to maintain social solidarity and to try to overcome the effects of depopulation. By 1700, similar cultural patterns had developed in both the Susquehanna valley and in the hills of the Eno, and, as a consequence, Conestoga town and Occaneechi Town shared many characteristics that are still visible in the archaeological record.

FREDRICKS SITE BURIALS

In 1983, four burial pits were uncovered at the Fredricks site. These burials were situated just outside a palisade that surrounds at least part of the village. By the end of the 1984 field season, nine burials had been excavated and auger tests indicated that from three to five additional burials were present (Figure 60).

All the burials are rectangular in outline, regularly spaced, and

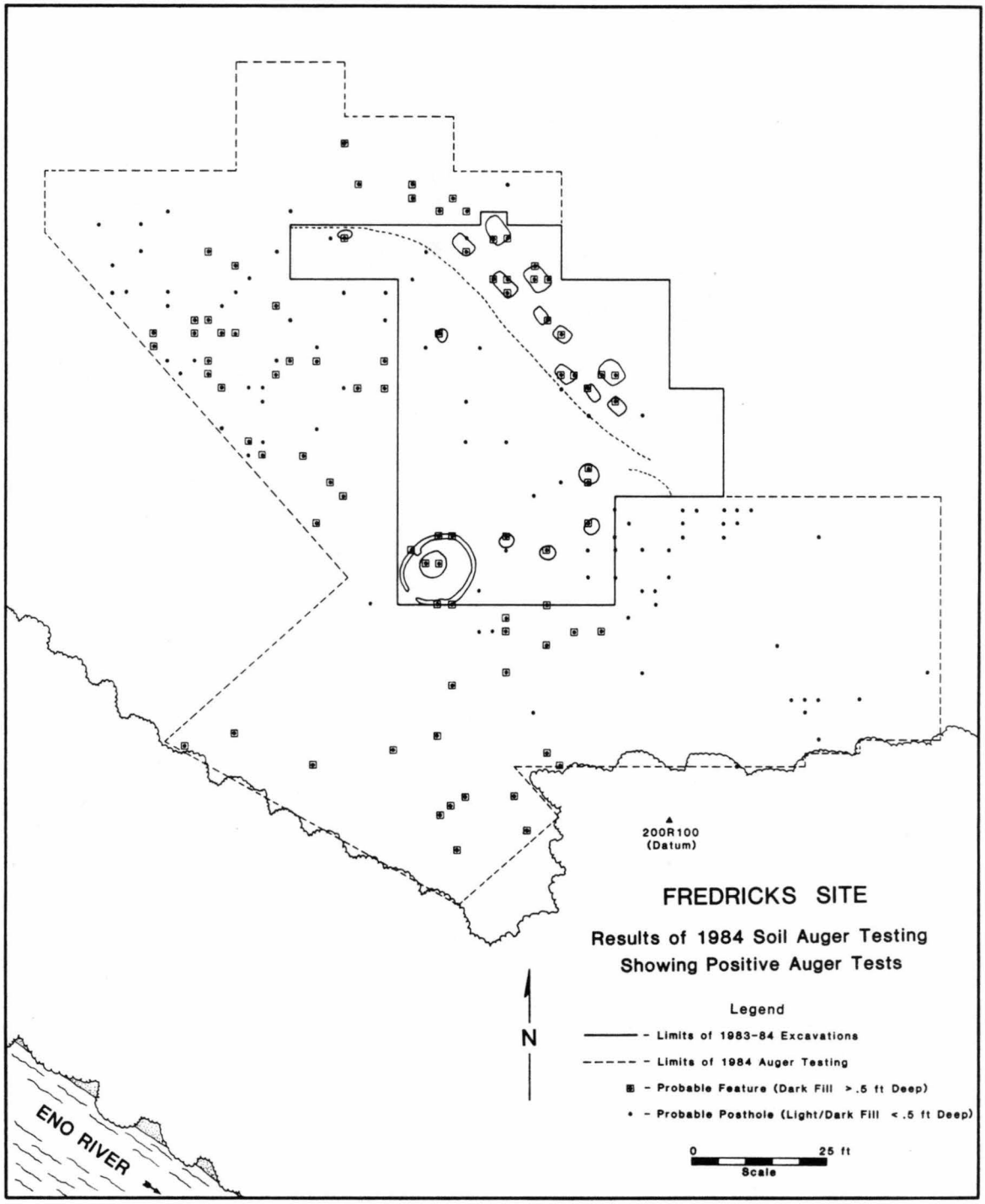


Figure 60. Results of soil auger testing at the Fredricks site showing the cemetery.

consistently aligned in a northwest-southeast direction. These spatial dimensions clearly define a cemetery where individuals were buried in locations that required a knowledge of previous interments. Either the burials were dug more or less simultaneously, or their locations were designated by above ground markers. Heretofore, cemeteries such as this had not been reported in the North Carolina Piedmont. Given the configuration of the village, it is suspected that other cemeteries are also present and will be uncovered by additional excavations.

Burial 1 (Figures 61-63)

Pit Morphology. The pit for Burial 1 was first observed as a rectangular patch of dark brown humus containing a generous amount of charcoal, animal bones, and other refuse. It was oriented northwest-southeast, had a maximum length of 3.6 ft and a maximum width of 2.6 ft, and was rectangular in plan. When excavated, the pit was found to have straight walls, a flat bottom, and to measure 2.4 ft in depth (Table 10). The relatively flat walls and bottom showed evidence of having been dug with bladed (probably metal) digging implements. The fill was comprised of three distinct soil zones. Zone 1 consisted of a dark brown humus rich in refuse including charred food debris (animal bones and charred plant parts), potsherds, part of a corroded iron knife blade, and numerous glass beads. The northern half of Zone 1 was noticeably richer than the southern half. Zone 1 rested upon an irregular layer of mottled orange clay with ashy lens (Zone 2) that appeared to intrude Zone 1 in the northern section of the pit. It also contained lens of greyish black fill which were excavated separately from the mottled orange clay. Zone 2 probably represents a transitional face between Zone 1 and the bottom zone, Zone 3. The latter consisted solely of mottled orange clay, probably a portion of the soil excavated to create the pit, typical of burial fill at other Piedmont sites. The



Figure 61. Burial 1 at the Fredricks site.

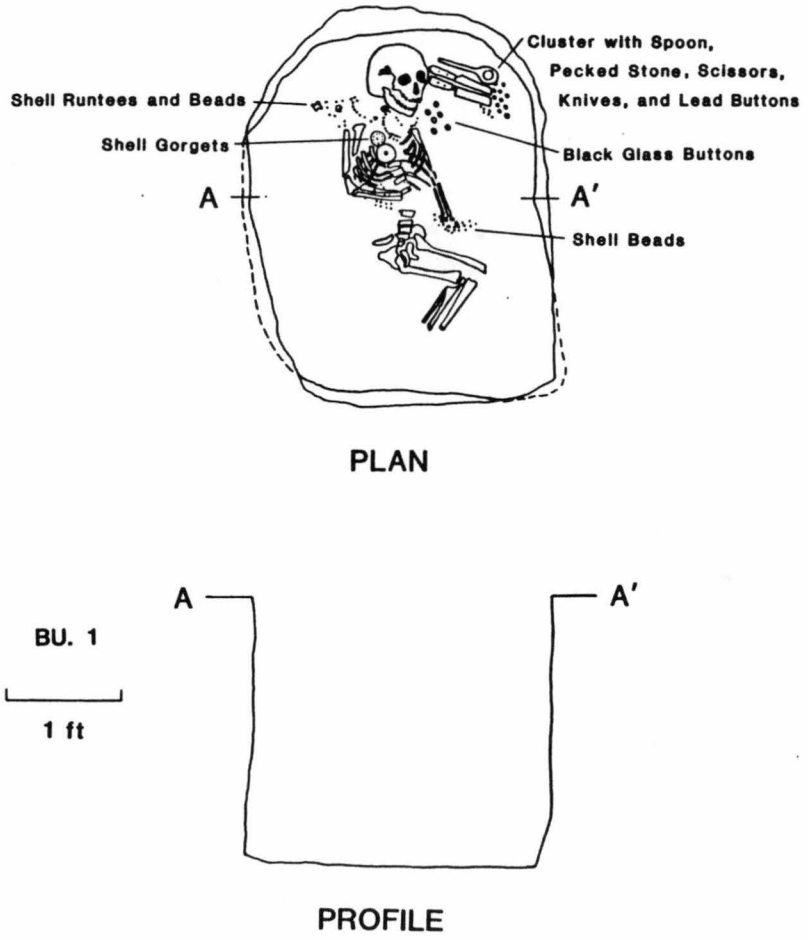


Figure 62. Plan and profile of Burial 1 at the Fredricks site.

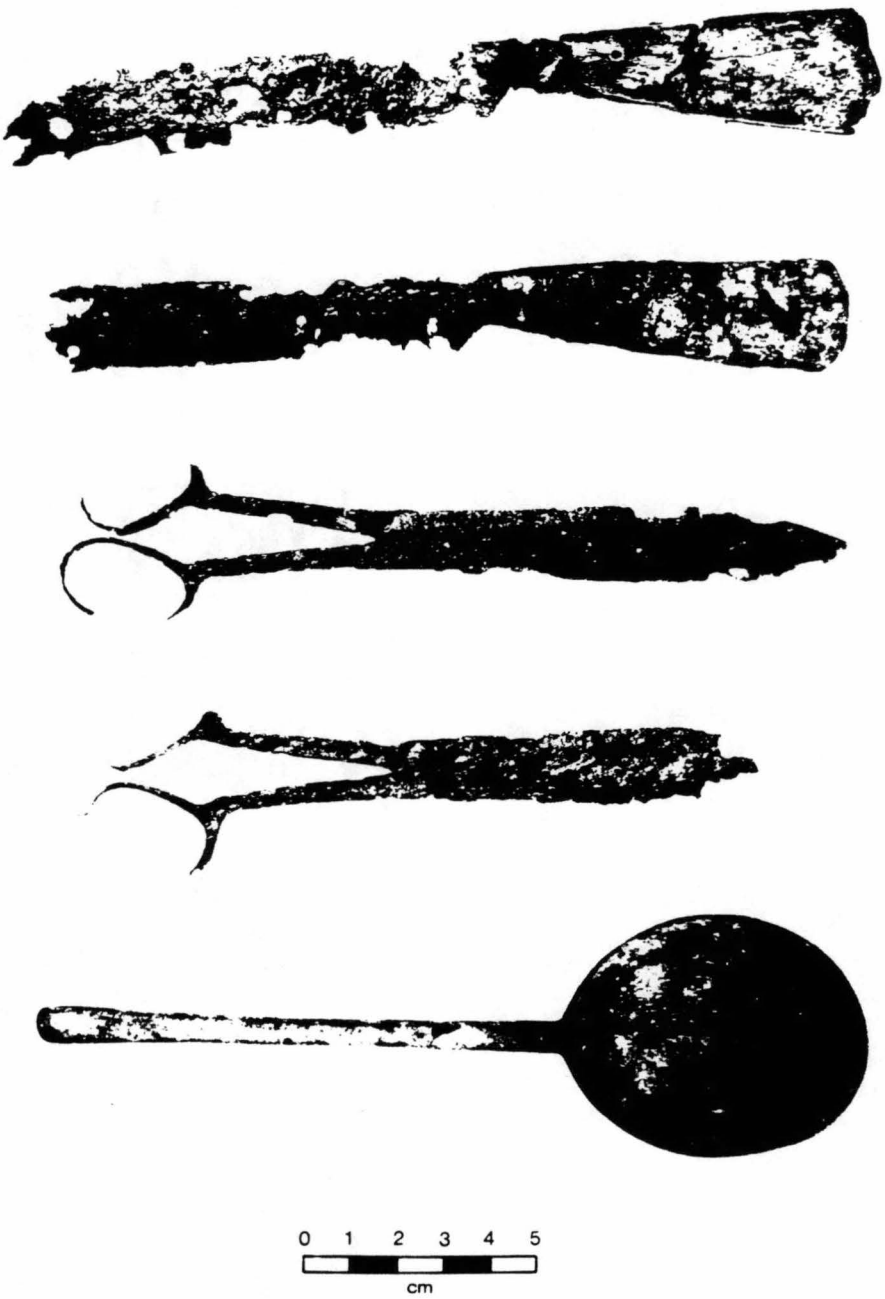


Figure 63. Artifact cluster from Burial 1 at the Fredricks site.

Table 10. Pit dimensions of the Fredricks site burials.

Burial	Length (ft)	Width (ft)	Depth (ft)
1*	3.6	2.6	2.4
2*	3.1	2.6	2.1
3	4.4	3.2	3.0
4	3.2	2.2	2.1
5	5.0	2.9	2.0
6	5.6	4.0	2.3
7*	3.4	2.3	1.4
8*	4.0	2.5	2.5
9	5.1	3.5	2.3
Fea. 1	3.9	2.9	2.3
$Mean_{All}$	4.1	2.0	2.3
$Mean_{Subadult}$	3.5	2.5	2.1
$Mean_{Adult}$	4.7	3.2	2.3

* Subadult

homogeneity of Zone 1 could have resulted only from the intentional filling of the upper portion of the burial pit with refuse-rich soil.

Burial Deposition. The burial was that of a child from four to five years old at death loosely flexed, lying on its left side. The skull was positioned to the southeast. The right arm lay across the chest, whereas, the left arm lay straight along the left side.

Grave Goods. Around the wrist, waist, and shoulders there were numerous shell beads that probably had been sewn to a blanket or garment. A bundle containing a latten spoon with a round pecked stone in the bowl, two bone handled iron knives, two pairs of scissors, seven lead buttons, and numerous glass beads were located between the face and the southwest corner of the pit (Figure 63). Over the sternum were two shell gorgets with punctated designs.

Burial 2 (Figures 64-67)

Pit Morphology. The pit was visible at the base of the plowzone as a rectangular stain comprised of a medium-to-dark brown gritty sandy fill with a large amount of charcoal. A thin mottled orange collar was evident along the northwest and southwest edge of the stain. The pit was oriented northwest-southeast and measured 3.1 ft long and 2.6 ft wide and had a rectangular plan. It extended to a depth of 2.1 ft below the base of the plowzone (Table 10). Two postholes intruded the pit edge, one along the southwest edge and the other midway along the northeast edge. The sides were straight, except for the northeast wall which was undercut to create a bell-shaped bulge at the bottom of the pit. The pit bottom was flat and smooth, which suggests that metal implements were used in its excavation.

The fill was excavated as two separate zones. The top layer (Zone 1) consisted of a brown gritty or sandy humic soil that was rich in



Figure 64. Burial 2 at the Fredricks site.

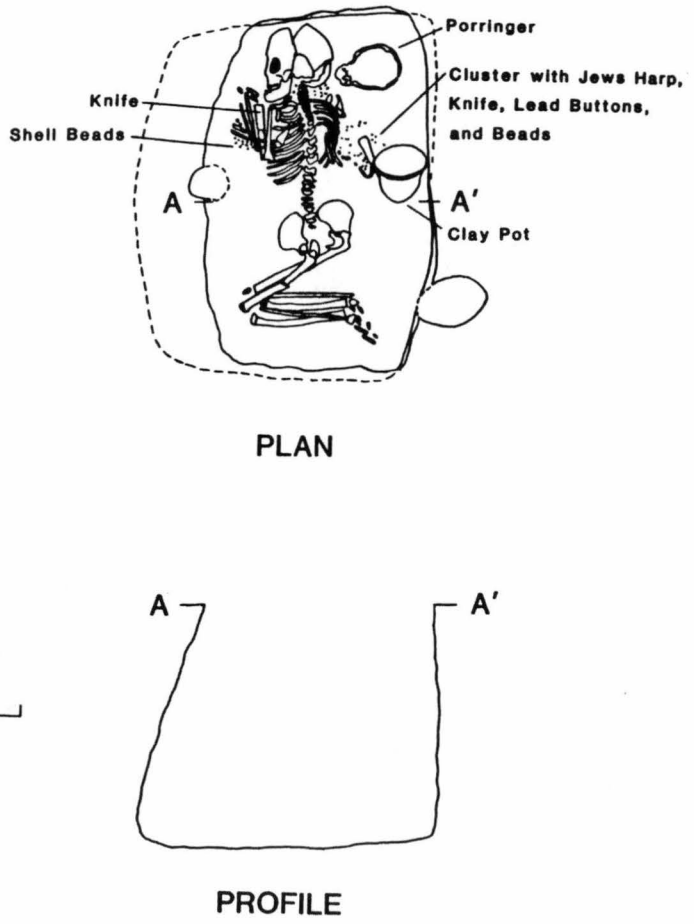


Figure 65. Plan and profile of Burial 2 at the Fredricks site.

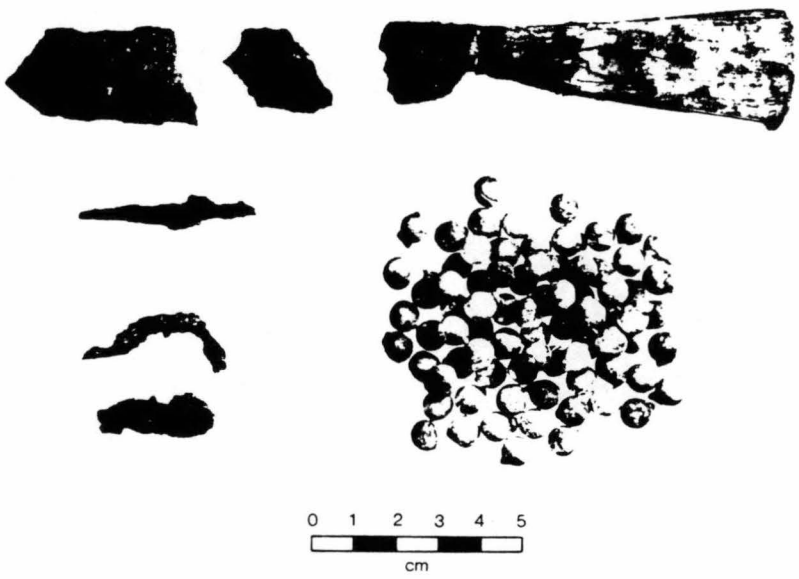


Figure 66. Artifact cluster from Burial 2 at the Fredricks site.

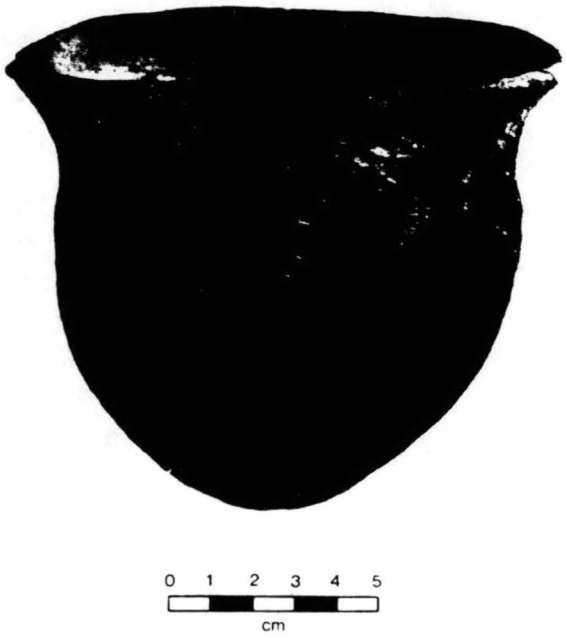


Figure 67. Small check-stamped pottery vessel from Burial 2 at the Fredricks site.

refuse, including ceramics, some animal bone, and ethnobotanical remains. This zone was very similar to Zone 1 in Burial 1 except that it was not as rich in animal bone and was thicker (extended for approximately 1 ft below the top of the subsoil). The bottom of this zone was mottled, containing lens of ash and charcoal. Zone 2 consisted of a mottled yellow clay with some charcoal that extended to the bottom of the pit. It was roughly 1.5 ft thick.

Burial Deposition. The burial was that of a subadult between seven and eight years old at death. The skeleton was loosely flexed, lying on the right side with the skull oriented to the southeast. The arms were bent with the hands lying in front of the face.

Grave Goods. A bundle of artifacts believed to have been contained in a beaded bag was located on the left side of the chest (Figure 66). That bundle contained a Jew's harp, several lead shot, three lead buttons, and three unidentified fragments of iron. Several small white glass beads, thought to have been sewn on the bag, were located in the same area. A bone-handled knife may also have been part of the bundle. Between this cluster of artifacts and the pit wall was a small check-stamped pottery vessel (Figure 67). The pot was lying on its side and contained a dark stain around the orifice, perhaps the residue of food originally placed in the vessel. Adjacent to the back of the skull lay a pewter porringer. Another bone-handled knife and a cluster of small shell beads were observed adjacent to the wrists on the right side of the burial. Large columella beads were found in the neck area.

Burial 3 (Figures 68-71)

Pit Morphology. The pit for this burial was visible at the base of the plowzone as a rectangular area of brown humus that contained charcoal, animal bone, and other food refuse. The major axis of the pit



Figure 68. Burial 3 at the Fredricks site.

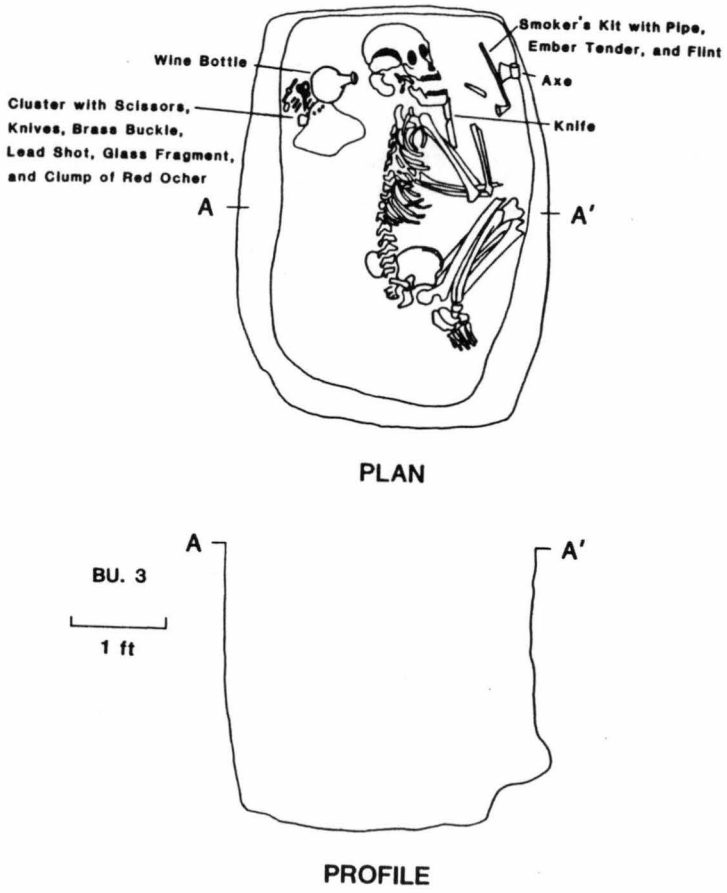


Figure 69. Plan and profile of Burial 3 at the Fredricks site.

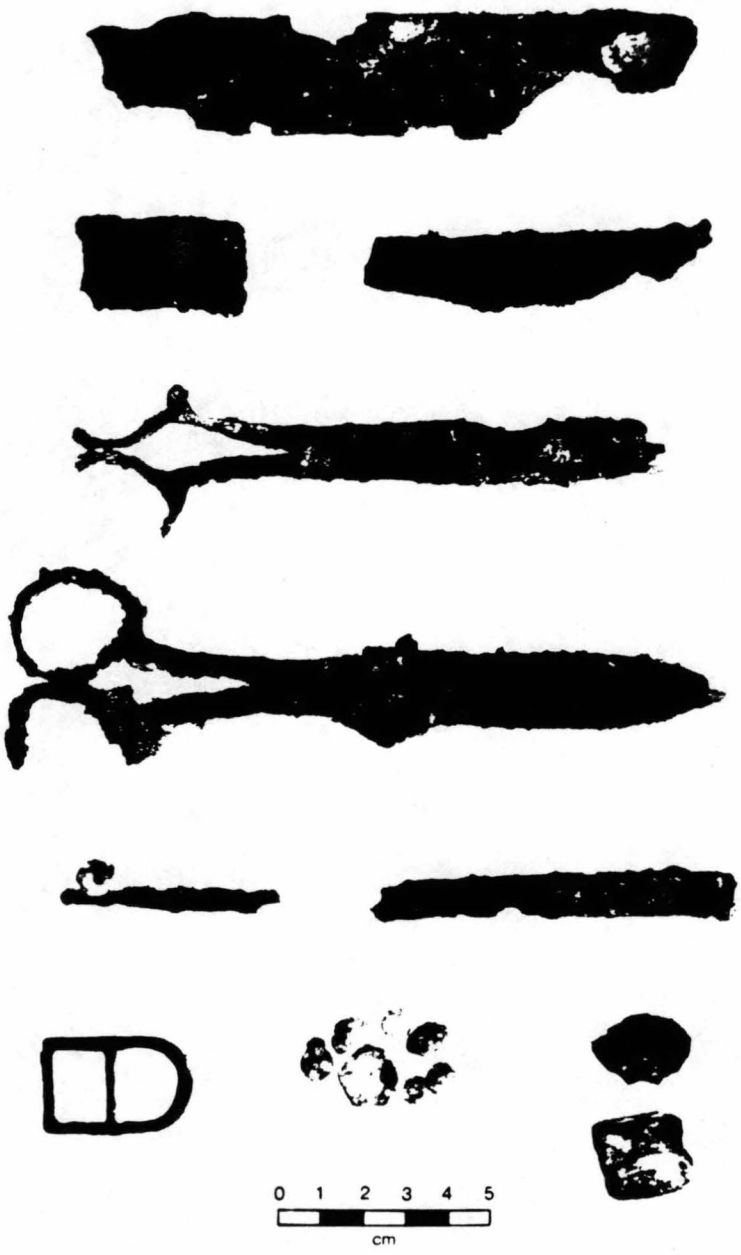


Figure 70. Artifact cluster from Burial 3 at the Fredricks site.

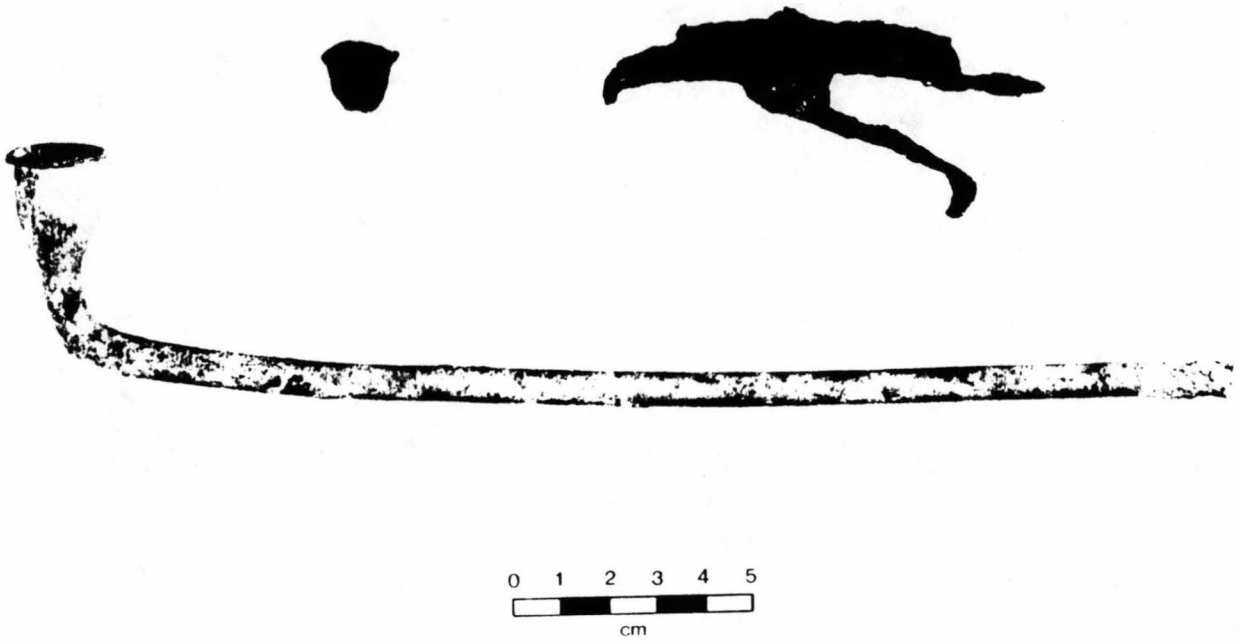


Figure 71. Smoking kit from Burial 3 at the Fredricks site.

was northwest-southeast. It measured 4.4 ft by 3.2 ft and was 3.0 ft deep making it the deepest pit in the cemetery (Table 10). Pit walls usually were vertical; however, the southwest wall of this pit sloped in slightly at the bottom and a narrow ledge was present along the bottom of the northeast wall. Several large rocks, natural inclusions in soil, protruded into the pit at various points along the bottom edge. The flat surfaces of the walls and bottom again indicate that it was excavated with Euroamerican metal tools. As with Burials 1 and 2, this pit contained two major zones of fill. The upper Zone 1 averaged a little over one ft thick and consisted of a dark brown humic soil rich in animal bones, ethnobotanical remains, and ceramics. A layer of small pebbles extended through the middle of this zone. Zone 2 was comprised of a mottled orange clay, which in some areas extended upward around the rim of the pit, thus encircling Zone 1. In places, Zone 2 was nearly 2 ft thick.

Burial Deposition. The skeleton, that of an adult make between 20-25 years at death, was tightly flexed, lying on its right side, with its skull to the southeast. The skeleton occupied only the southwestern half of the pit and was tucked against the southwest wall. The arms were bent at an acute angle with the hands in front of the face.

Grave Goods. A bundle of artifacts located between the back of the neck and the northeast pit wall (Figure 70) was comprised of two pairs of scissors, two bone-handled knives, three pewter buttons, a fragment of dark-faceted glass, a metal tack, a brass buckle with part of a leather strap preserved, lead shot, a dog lock musket spring, several unidentified fragments of iron, and a clump of red ocher. Cloth and wood were preserved as fragments in association with the metal artifacts. All of these items were possibly contained within a wooden

box and/or cloth bundle. A smoking kit containing a pewter pipe, an ember tender, and flint were located opposite the face of the skull (Figure 71). And, an iron axe head was found between the smoking apparatus and the southwest wall. Other grave associations consisted of a rum bottle positioned behind the skull and adjacent to the artifact bundle. Perishable items such as cloth or skins may have been placed on the ledge along the eastern edge at the bottom of the pit (the soil in this area was darker and more organic than the rest of the burial fill).

Burial 4 (Figures 72-73)

Pit Morphology. This burial was visible at the top of the subsoil as a rectangular stain with slightly rounded corners. The center portion of the pit was comprised of the dark brown humic soil with charcoal, animal bone and potsherds. This fill is similar to the Zone 1 fill of the other three burials; a mottled orange clay formed a band around the perimeter of the pit. The pit, whose main axis was northwest-southeast, measured 3.2 ft by 2.2 ft across the top and was 2.1 ft deep (Table 10). The pit walls were straight, and the bottom was flat except for a ledge along the northeast side. It is again proposed that metal implements were used to excavate this pit. A dark brown fill (Zone 1) extended unevenly across the middle portion of the pit to a depth of a little over one foot. This was underlain by a mottled orange clay fill (Zone 2) that contained some of the darker soil near the top.

Burial Deposition. One of two skeletons in the pit was that of an adult male between 25-30 years old that had been disarticulated and placed in a tight bundle lying against the southwest wall of the pit. The ledge at the bottom of the pit paralleled the orientation of the body. Cut marks around the cranium suggests this individual was scalped. Mixed with the bundle were the remains of an infant, which



Figure 72. Burial 4 at the Fredricks site.

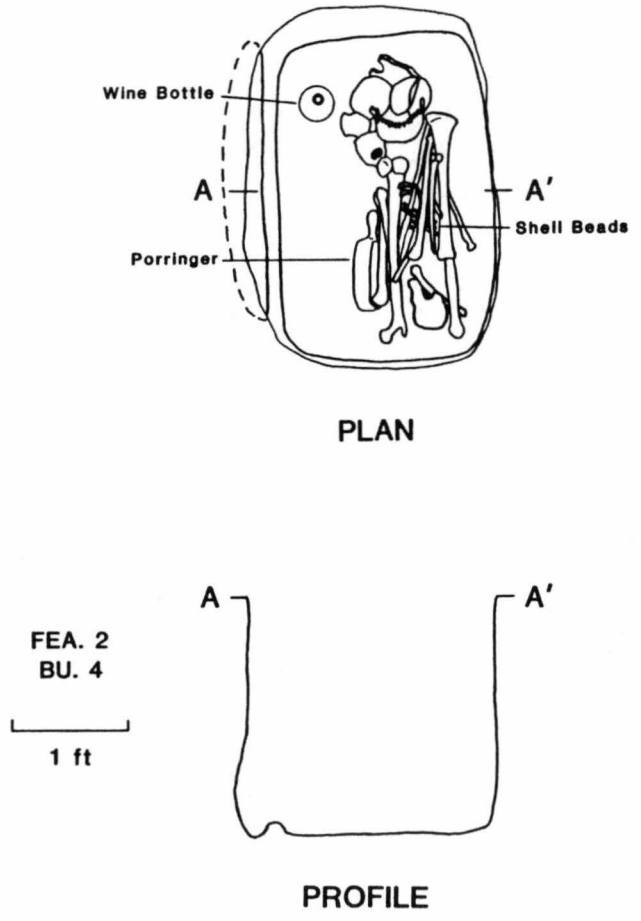


Figure 73. Plan and profile of Burial 4 at the Fredricks site.

because they were not discovered until the adult burial was being cleaned in the laboratory, makes it impossible to know the precise spatial relationships of the two individuals.

Grave Goods. A cluster of 11 long tubular columella beads were located within the chest area of the bundle and unquestionably were associated with it. A wine bottle was found in the southeast corner of the pit next to the adult skull, and a pewter porringer was found at the foot of the bundle adjacent to and on the northeast side of the long bones. Based on the fact that a wine bottle was also found with Burial 3, an adult, it is probably that the bottle in Burial 4 was meant to accompany the adult. The porringer, on the other hand, may have been placed with the infant, because a similar specimen was found with Burial 2, a subadult.

Burial 5 (Figures 74-76)

Pit Morphology. The pit for Burial 5 was visible at the top of subsoil as a rectangular area of dark brown, charcoal-flecked fill surrounded by an irregular band of mottled orange fill. The configuration of this fill resembled in plan that of Burial 4. The pit was rectangular in outline, with its main axis oriented northwest-southeast. It measured 5.1 ft in length, 2.9 ft in width, and had a maximum depth of 2.0 ft (Table 10). The pit corners were slightly rounded, and three of the walls were straight; the northeast wall, however, was undercut at the bottom of the pit creating a small side chamber. The bottom was flat and smooth indicating the use of iron tools.

The burial fill consisted of two primary zones. The upper zone (Zone 1), which comprised the central two-thirds of the pit, was composed of a dark brown loam with an ashy grey lens near the center



Figure 74. Burial 5 at the Fredricks site.

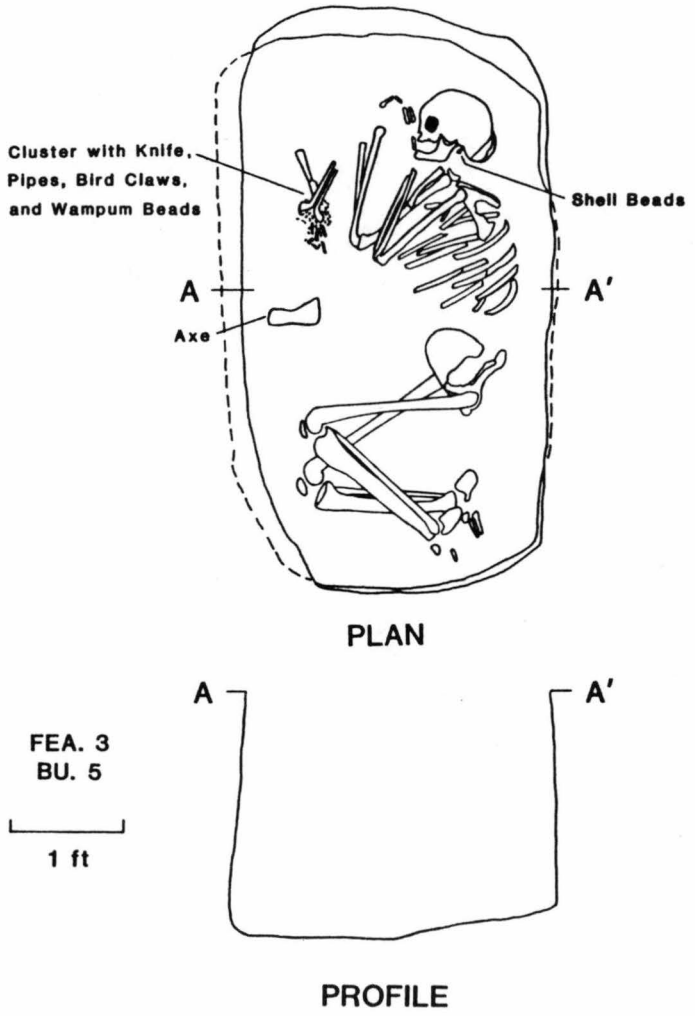


Figure 75. Plan and profile of Burial 5 at the Fredricks site.



Figure 76. Artifact cluster from Burial 5 at the Fredricks site.

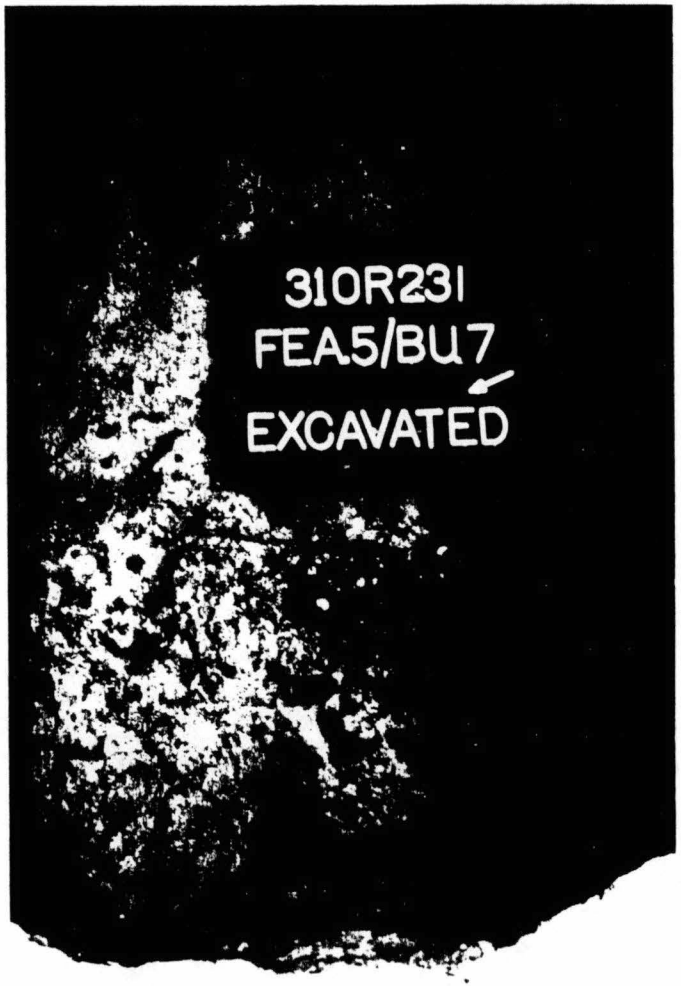


Figure 77. Bells associated with Burial 7 at the Fredricks site.



Figure 78. Burial 6 at the Fredricks site.

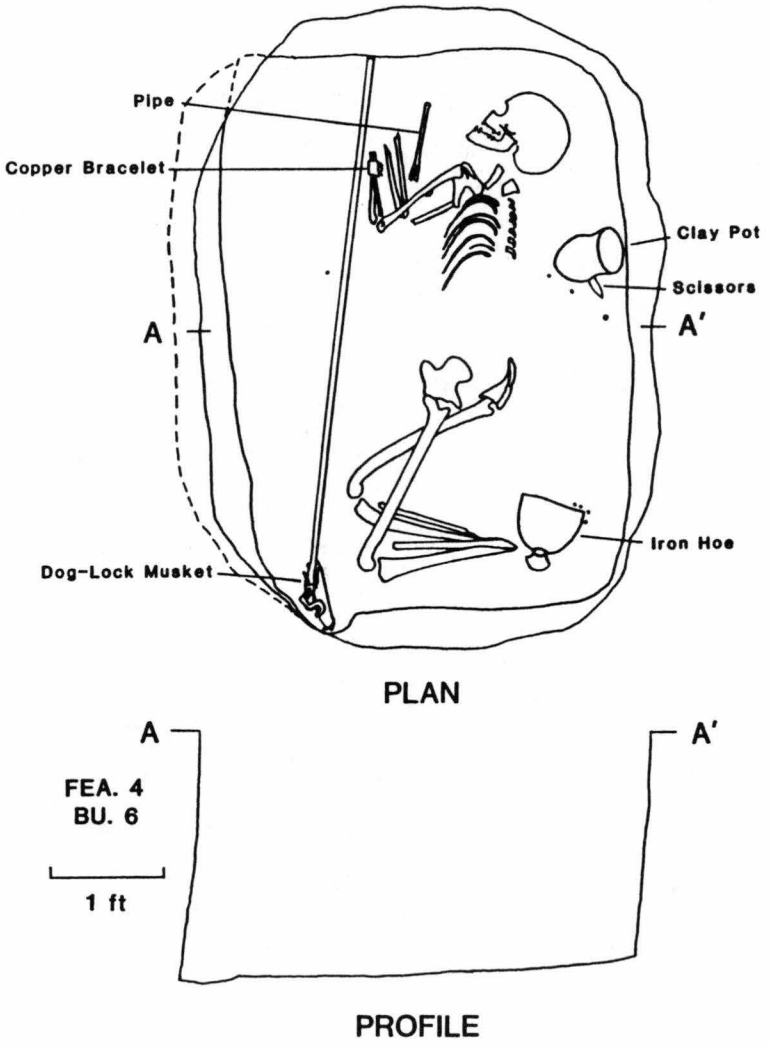


Figure 79. Plan and profile of Burial 6 at the Fredricks site.

that was nearly 1 ft thick. Zone 1 contained charcoal, chunks of burned clay, shell, and burned and unburned animal bone. Although the dark fill was homogeneous, at the top, it became more mottled and blended into a zone of mottled orange clay (Zone 2) near the bottom. Zone 2 contained lens of dark organic fill and ashy deposits similar to Zone 1. These deposits extended down to the top of the skeleton in the area between the arms and skull and near the thoracic vertebra. A group of large mammal bones in this fill made it difficult for the excavators to isolate the human skeletal remains. However, the mottled orange clay comprised the largest volume of fill in Zone 2 and extended over most of the skeleton. It also extended to the surface along the edges of the pit forming a broken ring around the dark organic fill at the subsoil surface of the pit.

Body Deposition. The body was that of an adult male who was over 50 years old at death. It was loosely flexed, lying on its right side with the skull to the southwest. The arms were bent with the hands in front of the face. The body was situated in the northwest half of the pit.

Grave Goods. The remains of a pouch decorated with wampum shell beads and a bird's clay contained two kaolin trade pipes and a bone-handled iron knife (Figure 76). The pouch lay adjacent to the elbow. An iron axe head lay in the area between the elbows and knees.

Burial 6 (Figures 78-79)

Evidence of this burial appeared in the plowzone as an area of dark brown soil containing animal bones, potsherds, and charcoal. At the top of the subsoil, the pit was rectangular in outline and measured 5.6 ft by 4 ft and extended to a depth of 2.3 ft below the top of the subsoil (Table 10). The major axis was northwest-southeast. Three of the walls

sloped slightly inward at the bottom. The northeast wall was undercut at the bottom, creating a long narrow chamber. As with the other burials, it was excavated with iron tools. When first observed at the top of the subsoil, the pit was rectangular in outline and had a central zone of dark brown humic loam with pebbles (Zone 1). The dark zone was surrounded by a collar of mottled orange and brown clay (Zone 2), which in turn, was encircled by more brown humic loam that contained some clay mottling (Zone 3). Beneath these fairly shallow zones with a combined thickness of 0.5 ft was a mottled orange clay (Zone 4) similar to Zone 2 in the other burials. The final zone (Zone 5) lay over the body and consisted of a dark brown humus. The majority of food refuse was found in the west-central band of Zone 1. In general, the zones of fill in this burial were more convoluted and harder to separate than those in the other pits.

Body Deposition. The skeleton was that of an adult make between 25 and 35 years old at the time of death. It was loosely flexed, lying on the right side with the elbows bent and the hands opposite the face. As with the other burials, the skull was pointing to the southwest.

Grave Goods. Accompany the burial were an aboriginal pottery vessel lying behind the skull, a pewter pipe stem and bowl rim between the face and hands, a large iron hoe near the feet, and a dog-lock musket lying parallel to the left side of the body. There was a leather covered copper wire bracelet around the left wrist. A pair of scissors and a lead shot were found beneath and immediately north of the pot. Glass beads were located under the pottery vessel and at each heel. Other glass beads were found under the copper bracelet.

Burial 7 (Figure 77)

Pit Morphology. This burial pit was visible as a nearly oval stain of mottled brown and orange clay at the base of the plowzone. The pit was oriented with its long axes northwest-southeast and measured 3.4 ft long, 2.3 ft wide, and 1.2 ft deep (Table 10). The upper fill of this pit was unique in that it was quite homogenous and did not contain the rich layer of refuse found in the other pits. It was approximately 0.6 ft thick. A small pocket of brown humus in the southwest corner was the only distinct difference and probably represents a small mass of original humus that was incorporated in the final stage of refilling. Zone 2 was very similar to Zone 1 and also contained mottled clay that was roughly 0.6 ft thick. After the floor of the pit was located and troweled, a band of light brown soil was evident along the northeast wall. This layer was excavated, creating a narrow side chamber that dipped slightly below the level of the rest of the pit and undercut the northeast wall. The remaining walls sloped inward slightly at the bottom.

Body Deposition. No skeletal remains were observed in the pit. However, because of the alignment of this pit with the other burials and the inclusion of trade items, it is felt that the pit originally contained the remains of an infant or still-born.

Grave Goods. Two clusters of cast brass bells lay in the northwest half of the pit. Given the orientation of the other burials, they were probably associated with the legs of the individual. There were 10-15 incised bells in each cluster held together by leather thongs, portions of which were preserved, as well as fragments of wood or matting that had been on the floor of the pit.

Burial 8 (Figures 80-83)

Pit Morphology. When first observed at the top of the subsoil, this pit consisted of a rectangular stain of mostly brown loamy soil (Zone 1). The excavated pit measured 4.0 ft by 2.5 ft and was aligned with the long axis running northwest-southeast. A depth of 2.5 ft made it the second deepest pit in the cemetery (Table 10). The sides were straight and were not undercut to form a chamber as with many of the other burial pits. An uppermost brown loamy soil (Zone 1) contained numerous pebbles, and there was a dense concentration of animal bone and charcoal in the northwestern corner. A small patch of mottled orange and brown clay was located near the center of the top of the pit. The dark loamy soil, mixed with lenses of mottled clay comprising four zones, extended to a depth of approximately 1.0 ft. Below this was a thick zone of mottled orange clay that represented the original fill. Although this latter zone was fairly homogenous, a finger of the brown loam comprising Zone 1 continued to the floor of the pit along the southern wall.

Body Deposition. The pit contained the poorly preserved skeleton of a subadult, three to five years old at death. It was loosely flexed on its left side with the skull to the southeast. The hands lay on the chest.

Grave Goods. A copper kettle was positioned between the feet and pelvis. Several small lumps of vermillion or red ochre were found beneath the chin, and a brass buckle with part of a leather strap attached had been placed near the arms. Most interesting was a cluster of artifacts located in the southwest corner of the pit opposite the skull (Figure 82). This cluster consisted of a small check-stamped clay pot flanked by a bone-handled iron knife, a latten spoon, and a brass buckle. All these objects had been placed in a twilled, split-cane



Figure 80. Burial 8 at the Fredricks site.

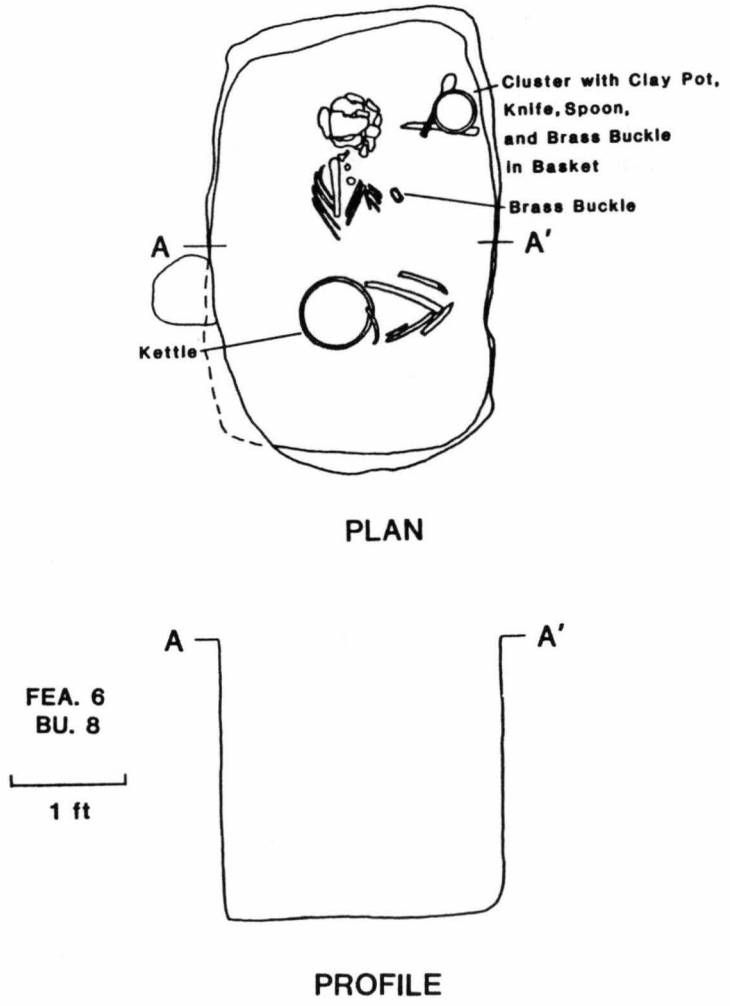


Figure 81. Plan and profile of Burial 8 at the Fredricks site.



Figure 82. Artifact cluster from Burial 8 at the Fredricks site.



Figure 83. Pot with artifact cluster from Burial 8 at the Fredricks site.

basket, a portion of which was well-preserved beneath the spoon bowl (Figure 83).

Burial 9 (Figures 84-85)

Pit Morphology. The fill of this burial was observed at the base of the plowzone as a rectangular stain whose long axis measured 5.1 ft. It was 3.5 ft wide, and extended to a depth of 2.3 ft (Table 10). The sides of the pit were relatively straight, except the northeast side which was undercut at the bottom to create a slight (0.5 ft) side chamber. The upper fill of the pit was comprised primarily of a brown loamy soil (Zone 1). Along the northwest side of the pit, this soil contained pebbles, animal bones, and charcoal. Along the northeast side, it was ashy in texture and not as rich. Patches of mottled clay were also noted in the center of the pit and across the southeast ends. The upper layer of refuse was approximately 1 ft thick near the center of the pit. It rested upon a fairly homogeneous orange mottled clay which represented the original fill. This zone extended to the floor of the pit.

Body Deposition. The poorly preserved skeleton was that of an adult female, 35-40 years old at death. It was loosely flexed on its right side. The skull was oriented to the southeast, and the hands were positioned on and in front of the face.

Grave Goods. Associated artifacts consisted of an iron hoe adjacent to and southwest of the skull (the blade end lay under the shoulder and occipital region of the skull). A bone-handled iron knife was under the right forearm. A possible violent death is indicated by a lead shot flattened against the left fibula. Another lead shot was recovered just above the pelvic area. Because of poor bone preservation, it was not possible to identify the effect of the shot on



Figure 84. Burial 9 at the Fredricks site.

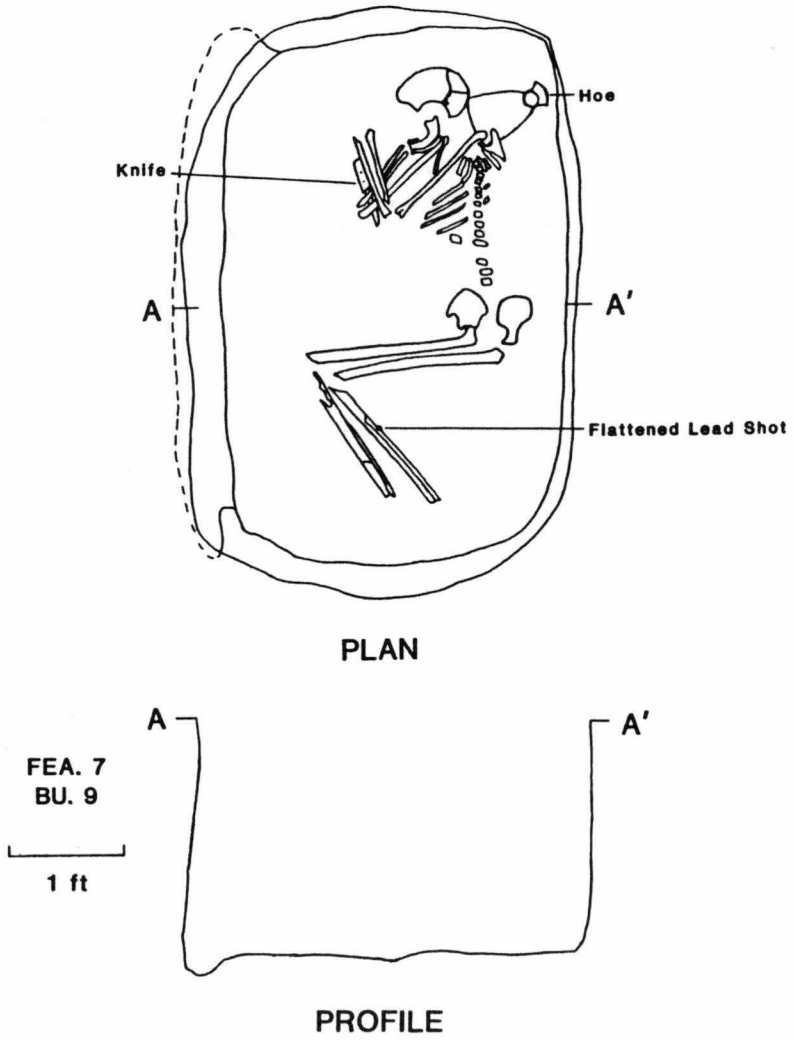


Figure 85. Plan and profile of Burial 9 at the Fredricks site.

the fibula.

DISCUSSION OF FREDRICKS SITE BURIALS

Although there were differences in the content and complexity of fill in burial pits, some attributes were shared. In all but one case, there was an upper zone of brown loamy soil that contained relatively large amounts of animal bone, charred plant remains, pottery, and other refuse. This zone sometimes extended across the entire top surface of the pit, and in most instances, it contained considerable grit and/or pebbles. In some cases, this layer was underlain by or graded into a dark grey ashy layer, which was not as rich in refuse as the upper zone. Nonetheless, there were enough differences in the fill zones of the graves to separate the pits into four groups. The first group is represented by Burials 1, 2, and 3. These pits were tightly grouped in the southeast end of the cemetery. Compared with the other burial pits, these three were rectangular and their edges were more sharply delineated. They also contained a rich dark brown loam that was usually homogeneous across the pit surface, extended to the pit edges, and had an average depth of one foot below the subsoil surface. This homogenous zone lay atop a grey ashy layer that in turn capped the typical mottled yellow burial fill (Figure 86).

Burials 4 and 5 comprise the second group (Figure 86). They are characterized by an upper fill zone that is slightly lighter brown in color and not as rich in refuse as the dark loamy fill of the first group. Neither was this zone homogeneous across the pit tops, as yellowish-orange clay formed a band around the pit edges. The pit outlines also were not as sharply delineated, and they were not as rectangular. The profiles of these burials show a semicircular zone of

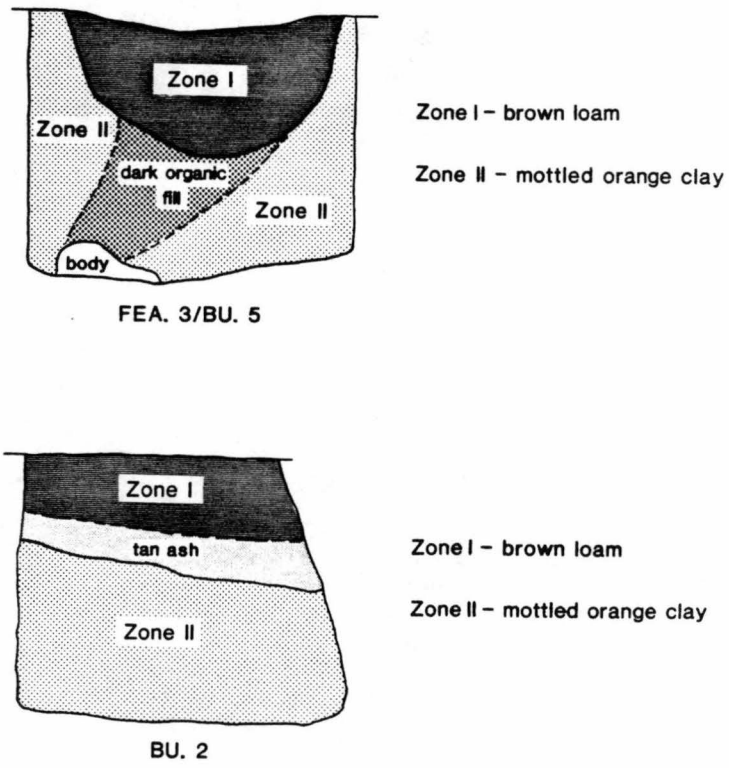


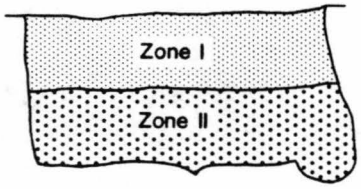
Figure 86. Fill profiles of Burial Groups 1 (below) and 2 (above) at the Fredricks site.

loamy fill sloping toward the center of the pits that does not extend to the pit edges. It is instead surrounded by mottled yellow clay collar which follows the perimeter of the pits.

The pit outlines of Group 3 (Burials 6, 8, and 9) were sharper than those in Group 2, but not as sharp as the first group of pits. The subsoil surface displayed a restricted zone of brown loam with orange clay present in the middle of the pits and around the edges. In profile, the brown humus formed a shallow depression that was surrounded by abundant orange clay (Figure 87). These soils sometimes overlay a fairly thick zone of brown humus that was lensed with orange clay. The latter rested on mottled orange clay burial fill.

The final category of burial fill was represented by a single burial, Burial 7 (Figure 87). An oval stain of light brown soil mottled with yellow clay was approximately 0.6 ft thick across the top of the pit and overlay a zone of mottled orange and brown clay. The pit edges of Burial 7 were not distinct from the subsoil and the fill was not as rich in cultural materials as the other burials.

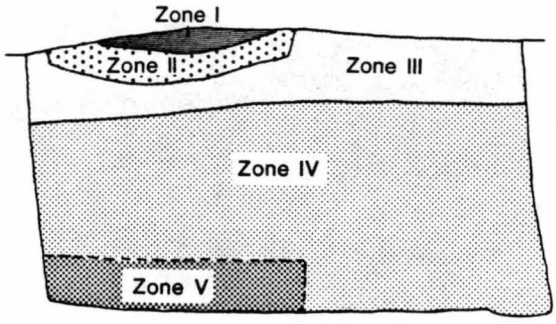
The different categories of burial fill may reflect somewhat different behavioral activities in the final act of covering the bodies with soil. The first group of burials, those with the most distinctive fill profiles, suggest the following sequence of events. At death, the individuals were wrapped, placed in the pits, and covered initially by fill dug from the graves. (That the bodies were wrapped is suggested by the presence of a concentration of dark humic soil immediately over and around the skeletons.) There is no evidence that a vault as described by Lawson was ever constructed. The grey ashy soil overlying the initial burial fill indicates that ashes were cleaned from hearths and deposited in the pits. In situ fire is ruled out since there is no



Zone I – mottled brown and yellow clay

Zone II – mottled orange and brown clay

FEA. 5/BU.7



Zone I – brown loam

Zone II – mottled orange and brown clay

Zone III – brown loam and orange clay

Zone IV – mottled orange clay

Zone V – dark brown humus

FEA. 4/BU.6

Figure 87. Fill profiles of Burial Groups 3 (below) and 4 (above) at the Fredricks site.

evidence of burning on the surface of the fill. After the ashes were thrown into the graves, domestic refuse was deposited on top to complete the filling of the pits. This final layer seems to represent the remains of feasts prepared and served at the time of death. The lenses of pebbles in some of these final fill zones suggest that the food residue was cleaned from in or around houses, where pebbles would have been used as paving. As noted earlier, many ethnohistoric accounts of eastern North American Indians describe feasts as part of burial ritual. And, in the case of the Delaware and Shawnee, there are accounts of food and sometimes fire actually being placed on new graves.

It is surprising that there is no evidence of vaults or house-like structures constructed over the burials. There was, however, a small side chamber in Burials 2 and 3. Apparently, at the Fredricks site, the small chambers were used to hold perishable grave goods such as furs or cloth, which were mentioned as grave offering several times in the ethnohistoric literature. Such materials are indicated by the fact that all of the chambers contained a mottled humic soil, similar to that surrounding the bodies, of the type that would be formed by the decay of a large amount of organic matter.

A set of behaviors different from Burial Group 1 is indicated by the fill in the pits of Groups 2 and 3. The primary differences lies in the fact that the top brown loam or humus layers contained fewer remains and were not homogeneous across the pits. In all cases, this zone(s) sloped inward towards the center of the pits and was partially or totally surrounded by mottled orange clay. In at least one instance (Burial 6), a zone of brown loam with lenses of orange clay overlay the typical mottled clay burial fill. The set of activities responsible for the filling of these pits is not as clear as those for the first group.

More time seems to have elapsed during the filling process, as indicated by the lensing of the fill and the slumped, rather than sharp, profiles of the brown loam. A longer filling period is also indicated by the less distinct outlines of the pit walls. It almost seems as if the pits were originally only partly filled with soil added as previous layers settled. However, the last layer (brown loam) did contain refuse, although not as much as the first three burials. Perhaps the cleaning and feasting activities were delayed for a period of time after the pits were initially filled. It could be further suggested that the feasting rituals involved fewer individuals and were not as intense as those proposed for the first burial group. Three of the graves from Groups 2 and 3 did contain either ledges (Burial 4) or small side chambers (Burials 6 and 9) where organic materials had been placed.

Burial 7 contrasts markedly with the others in the simplicity of its fill. The pit was dug with a relatively deep side chamber which probably also contained organic remains such as cloth or furs. After the infant was placed in the pit, it was apparently quickly refilled, and there was little or no attendant ritual.

An examination of the associated grave goods reveals differences that parallel the spatial and fill clusters described above, and that indicate age and sex parameters. Using Brain's (1979) "acculturation index," the European artifacts were each assigned a value between 1 and 4, and the values were then totaled for each burial (Table 11). If it is assumed that the numbers and kinds of trade artifacts associated with a burial are to some extent a reflection of access to such items and indirectly of status, then Brain's index should provide a mean of numerically expressing the social dimensions of burial ceremonialism. Additionally, all burial-associated artifacts, European and aboriginal,

Table 11. Acculturation indices for Fredricks site burial groupings.

Group 1		Group 2		Group 3		Burial 7
Burial	Index	Burial	Index	Burial	Index	Index
Bu. 1	18	Bu. 4	4	Bu. 6	13	4
Bu. 2	15	Bu. 5	5	Bu. 8	13	
Bu. 3	43			Bu. 9	6	
Total	76		9		32	4
Mean	25.3		4.5		10.7	-
St.Dev.	12.6		0.5		3.4	-

were compared as to whether they were utilitarian or ornamental (Table 12). The glass and shell beads, which, when present, were in great quantities, were compared only on a presence or absence basis. Lead shot, buttons, and nails were treaded in like fashion. Thus, it was assumed that 10 beads or nails were not 10 times more important than one such item. For the beads, in particular, a large group may reflect nothing more than a single decoration on an article of clothing.

Using Brain's index, Group 1 has the highest average at 25.3, followed by Group 3 at 10.7 and Group 2 at 4.5. Group 1 also displays the highest standard deviation because of the extremely high innovative value for Burial 3, which is more than triple that of any other burial (Table 11). Although the overall burial sample is small, there appear to be clusters of artifact associations that parallel the groupings based on fill characteristics. Even if Burial 3 were removed from Group 1, the remaining burials of that group still have the highest scores on the acculturation index. The uniqueness of Group 1 is further enhanced if the large numbers of shell and glass beads are considered by total numbers rather than only by presence or absence. The burials in the other groups contained very few beads. Originally, it was thought that large numbers of beads were a characteristic of subadult burials because the beads were sewn on burial garments special to children. This still may be the case for the subadults in Group 1, i.e., Burials 1 and 2, but Burial 8 (Group 3), also a subadult, had no associated beads, glass or shell. And in terms of fill attributes, Burial 8 was more like adult Burials 6 and 9.

There also appears to be a dichotomy of burial associations based on age. Most of the artifacts associated solely with subadults fall into the ornamental category, whereas, the majority of the artifacts

Table 12. Distribution of artifacts associated with the Fredricks site burials by age categories.

Subadult		Adult		Shared	
Spoons	U	Smoking Pipes	U	Knives	U
Metal Buttons	O	Ember Tender	U	Scissors	U
Glass Buttons	O	Wine Bottle	U	Porringer	U
Jews Harp	O	Gun	U	Lead Shot	U
Kettle	U	Axe	U	Buckles	U
Bells	O	Hoe	U	Ochre	O
Basket	U	Bracelet	O	Beads	O
Shell Gorgets	O	Birdclaw	O	Pots	U
Shell-Beaded Garments	O				
U=3; O=6		U=6; O=2		U=6; O=2	

U = Utilitarian; O = Ornamental.

associated only with adults are utilitarian (Table 12). Those utilitarian artifacts associated with subadults are not tools and are associated with activities that are not technomic in nature. Spoons, kettles, and baskets (associated with children) are used for eating and for containers, which is in sharp contrast to the gun, gun parts, hoes, and axes (associated with adults), which are used in heavy labor and subsistence-related activities. The items shared by adults and subadults, such as knives, scissors, and beads, represent activities and items that probably would be shared by both age groups.

In summary, pitfill characteristics and associated artifacts suggest that at least two levels of treatment were accorded the Fredricks site burials. The first three burials are very distinctive. The upper zone of refuse-laden soil indicates a more intense burial ritual probably having to do with ritual feasting. Apparently similar, but less intense, ceremonies were conducted for the other burials, except Burial 7.

In general, children received the most attention. Burials 1, 2, and 8 all contained large numbers of European artifacts, and Burials 1 and 2 also contained shell gorgets and numerous shell beads. Although most of the beads were probably sewn on garments, the gorgets and some of the larger beads represent deposition of individual items having sociotechnic or ideotechnic meanings. Other historic cemetery sites have also shown a pattern of large numbers of beads and shell artifacts being associated with children (e.g., Witthoft et al. 1959:115).

Although children received much attention, neonates received almost none. Burial 7 contained only a few brass bells, and the infant associated with Burial 4 was accompanied probably by only a pewter porringer. Feature one probably also contained the remains of a small

infant that was not accompanied by any nonperishable grave goods. The chamber of this burial, however, did contain a darker soil indicating that perishable artifacts such as blankets or furs may have been included.

Where children received elaborate treatment, Burial 3, a young adult male contained the largest collection of burial furniture and richest upper fill of any burial in the cemetery. Burial 3, therefore, may represent the highest ranking individual in the cemetery. Burial 6, also a young adult male, appears to have occupied a social position akin to that of Burial 3. Both contained large numbers of primarily utilitarian artifacts, probably personal property. Burial 3 contained a smoking kit, scissors, knives, gun parts, as well as a rum bottle and an iron axe head. Burial 6 contained an almost comparable array of smoking artifacts along with a musket and a large iron hoe.

In contrast with Burials 3 and 6, Burial 4, an adult of similar age, contained very few grave associations, only a group of tubular shell beads and a rum bottle. This burial was unique in the fact that it was bundled, which indicates that the individual died away from the village. Cut marks on the skull also indicate that he died a violent death.

In summary, the burials at the Fredricks site represent a portion of a cemetery that lies immediately northeast of a palisade surrounding at least part of the village. All of the burials seem either to have been made over a short interval of time or to have been precisely located by above-ground markers, or both. Only one burial pit, Burial 2, was intruded by posts which suggest they may have served as markers; however, smaller postholes were found near most of the pits. Interment over a short interval is indicated by the precise orientation of the

skeletons along a northwest-southeast axis and the fact that the heads all point in the same southeastward direction. If a solar reference point was used to align the bodies, they must have been interred over a very brief period of time (cf. Gruber 1971).

WALL SITE BURIALS (1938, 1940-41)

A total of five burials were excavated by Joffre Coe at the Wall site during the 1938, 1940, and 1941 field seasons. The descriptions of these burials will be abbreviated because data pertaining to spatial dimensions and pit fill morphology were not available.

Burial 1. This burial was located near the center of Structure E. The skeletal remains were that of an adult male, over 45 years old at the time of death. It was tightly flexed and placed in a circular pit on its left side. The axis of the body was east-west, with the head to the east. Grave goods consisted of several potsherds, representing two different vessels, and an aboriginal pipe. Burial 1 also contained a rich dark brown refuse layer in the upper level of the pit. In the field, it was originally given a feature number and designated as a "trash pit". Several large rocks separated the refuse zone from a lower zone of mottled yellow burial fill.

Burial 2. This pit contained the remains of a child between two and three years old at death. The burial pit was located in a line of posts forming the northern wall of Structure C. The skeleton was placed in a shaft-and-chamber pit in a flexed position on its left side. The long axis was northeast-southwest with the head to the northeast. In the grave with the body were: one aboriginal pot, left and right arm bands comprised of over 1000 small shell disc beads, a headdress containing over 4000 small shell disc beads and four copper beads, and

three shell gorgets.

Burial 3. This was an adult, about 50 years old at the time of death. The burial was located in a palisade line in the northwest corner of the excavations. The skeleton was placed in a shaft-and-chamber pit, lying on its left side. The axis of the body was northeast-southwest, and the head was to the northeast. Grave associations consisted of only two serriated mussel shells.

Burial 4. This shaft-and-chamber burial contained the remains of an adult male, 18-25 years old at the time of death. The skeleton was tightly flexed on its left side. The main axis of the burial was, again, northeast-southwest, and the head was pointed to the northeast. It was located between Structures D and E. Associated artifacts included: one aboriginal pottery vessel, 52 large columnella shell beads around the neck, over 4000 small shell disc beads (probably sewn to a garment) also in the neck area, 176 small shell disc beads (sewn to a band) around the left ankle; and 75 small shell disc beads comprising a band around the left wrist.

Burial 5. This burial was represented by a fetus that was placed in an unprovenienced posthole. No further information was available.

WALL SITE BURIALS (1983)

Burial 1-83 (Figure 88)

Pit Morphology. This burial pit was visible at the top of subsoil as a circular stain of dark brownish-black loam (Zone 1) that contained a large number of animal bones, potsherds, and shell fragments, including a complete shell scraper. The dark, rich fill averaged approximately 0.8 ft thick. At the base of this zone were 5 large rocks (averaging roughly 30 lbs each) which rested on an almost sterile

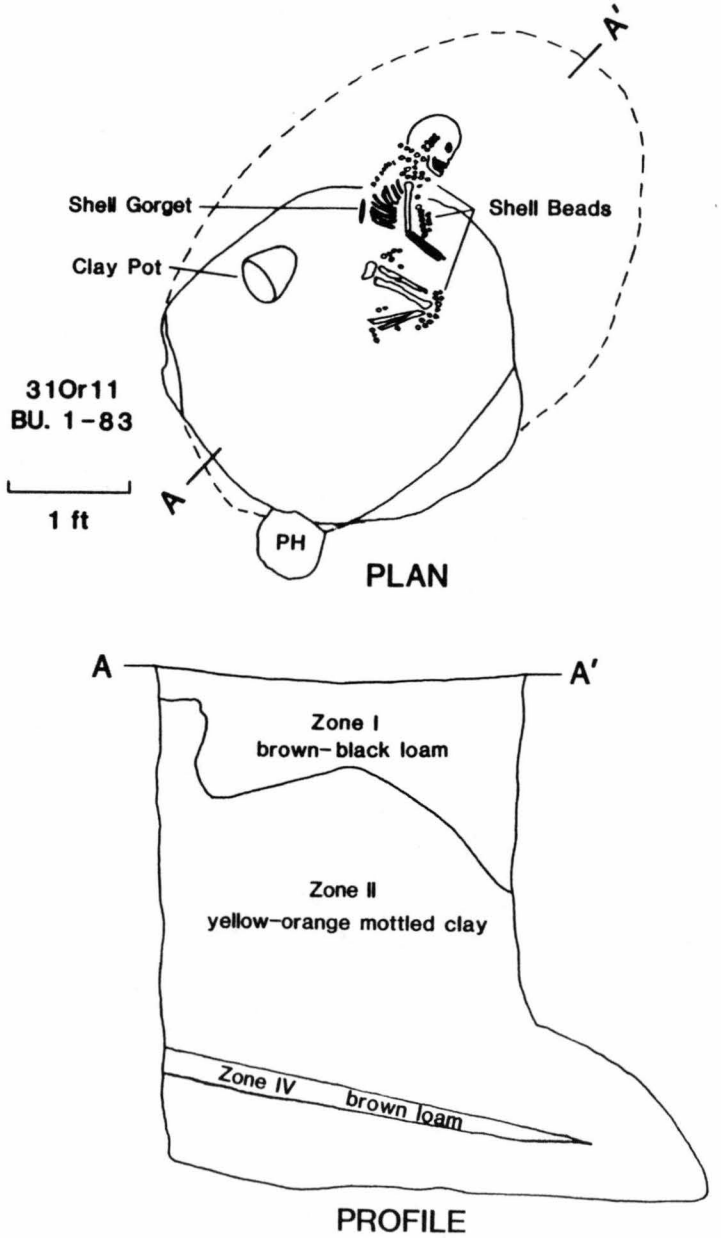


Figure 88. Burial 1-83 at the Wall site.

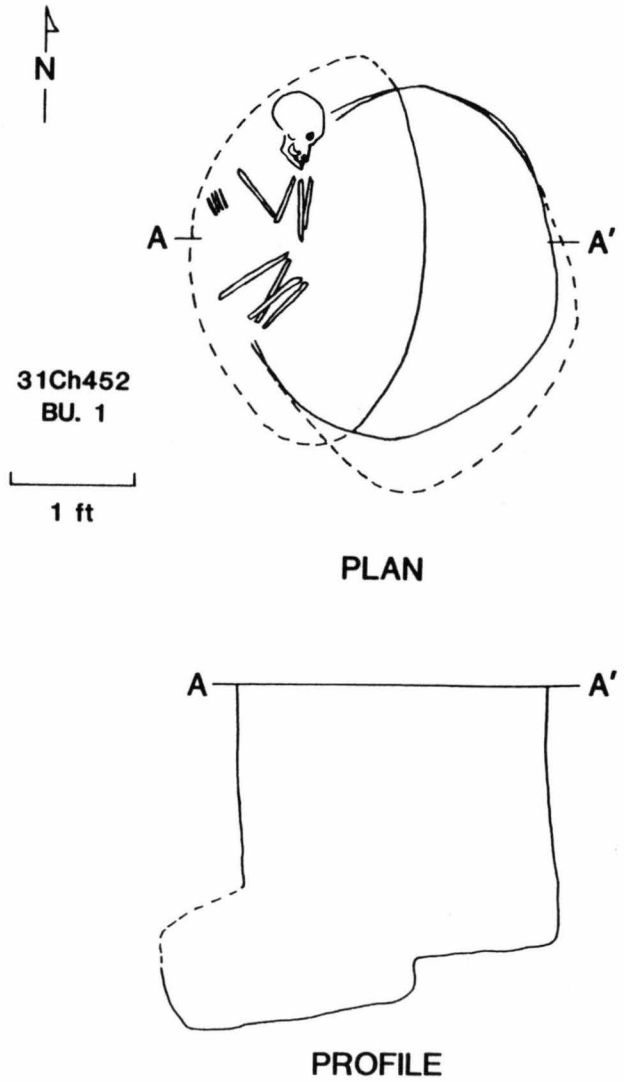


Figure 89. Burial 1 at the Mitchum site.

yellowish orange clay (Zone 2). Zone 2 extended to a depth of approximately three feet, where a brown loamy lens containing charcoal was encountered. Associated with this lens were two long brown log-like stains. The orientation of these stains suggests that the lenses and stains were the remains of a cover over the chamber. The lenses and stains were underlain by a mottled yellow clay that continued to the bottom of the pit and into the chamber. The total depth of the pit was 4 ft. Maximum width at the top of subsoil was 3 ft. The chamber extended 1.5 ft under the southeast wall.

Burial Deposition. The burial was that of a subadult who was between four and six years old at the time of death. The skeleton was loosely flexed on its left side with the head oriented to the southeast. The arms were slightly bent, and the hands lay above the knees. Rather than being tightly tucked into the chamber, the skeleton lay with the head and chest area within the chamber and the lower body on the floor of the pit. The pit and chamber were deep and large compared to other shaft-and-chamber burials from Siouan sites.

Grave Goods. A band of marginella beads represented the remains of a cap or bonnet over the skull. Small shell disc beads and columella beads were strung around the neck. A single tubular copper bead was also found in the neck area. Additional columella beads were present in the leg and pelvic areas. A strand of marginella beads along the left leg may have been attached to leggings. A shell gorget located behind the neck probably had been worn around the neck. North of the feet was a small pottery vessel. When cleaned in the lab, it was discovered that this vessel contained another smaller pot and an unmodified mussel shell.

Burial 2-83

Pit Morphology. The upper fill in this burial consisted of two distinct soil zones. The first zone was a dark brown loam that covered the eastern third of the circular pit outline. The remainder of the pit appeared as a mottled orange clay. The configuration of the pit in plane is typical of shaft-and-chamber burials. Where the dark brown soil represents slump as the burial chamber collapsed, the mottled clay is indicative of the original burial fill placed in the pit shaft. The shaft was dug to a depth of 1.8 ft. In the southeast corner the chamber undercut the pit wall and sloped to a depth of 2.4 ft. Maximum diameter of the top of the pit was 3.3 ft.

Burial Deposition. The skeletal remains were in extremely poor condition and appear to represent the remains of small child 9 to 18 months old at the time of death. The head was oriented to the southwest and the body was flexed on its right side.

Grave Goods. The only burial association was a necklace of large columella beads. The skull was lying on a flat rock.

Burial 3-83

Pit Morphology. At the top of subsoil, this pit had an appearance very similar to Burial 2-83. The southern half of the fill was a dark loamy soil, whereas, the northern half contained a mottled orange clay. The latter soil type defined the burial shaft; the former represented the slump of the chamber which only slightly undercut the southern wall of the pit. The pit measured 2.5 ft wide and 2 ft deep.

Burial Deposition. The burial was that of an infant or still-born. Because only a few small bone fragments were preserved, body position and orientation could not be discerned. It is notable, however, that the body stain was covered by a thin mantle of white clay.

Grave Goods. Two small ceramic vessels were found immediately west of the clay mantle and skeletal remains. The vessels were side-by-side, one upright and the other on its side.

DISCUSSION OF WALL SITE BURIALS

As was the case with the Fredricks site, children and some adult males seem to have received the most attention at death. Three status dimensions are indicated by artifact associations and grave preparation. Burials 1 and 1-83 represent the most elaborate treatment as both were capped by especially rich midden. In fact, both of these burials were originally designated "trash pits" in the field. In both, there were also large rocks separating the upper organic fill from the sterile mottled yellow burial fill. The similarity between these two burials and those at the Fredricks site is striking, particularly when compared with the first three Fredricks site burials. Apparently, these pits were also partially filled with residue from ritual cleaning/feasting activities. Although the activities directly responsible for the refuse filled zones cannot be reconstructed more specifically, it is obvious that these behaviors were similar at both Wall and Fredricks sites. Burials 2 and 4, a subadult, and adult respectively, may represent an intermediate status position. They have an array of grave goods, particularly shell artifacts, but lack a capping of midden. The other child burials only contained a small number of decorative or utilitarian artifacts and do not appear to have been accompanied by as elaborate mortuary ritual as the other burials.

The spatial distribution of the Wall site burials contrasts markedly with that of the Fredricks site. The Wall site graves are more dispersed, with some either inside or adjacent to house structures. Any

hint of clustering into cemetery units is lacking. Another interesting contrast lies in the burial orientations. Most of the Wall site burials have their heads oriented to the northeast, whereas, most of the Fredricks burials are oriented to the southeast. The Wall site also has more variability in orientation with one burial oriented to the southwest, one to the southeast, and one to the east. This variability may indicate that interments were separated by lengthy intervals or that orientation was not as important as at the Fredricks site. All of the Wall site burials were oval in plan and of the shaft-and-chamber type, in contrast with the rectangular, simple-pit burials at the Fredricks site.

THE MITCHUM SITE BURIAL

Burial 1 (Figure 89)

Pit Morphology. At the top of subsoil, this circular pit was 2.9 ft in diameter and had the configuration of most shaft-and-chamber burials. The western two-thirds was defined by a light brown sand that filled the cavity created by chamber collapse and slump, whereas, the eastern one-third contained a mottled light tan sand comprising original burial fill. The shaft extended to a depth of 2.2 ft below subsoil, and the chamber undercut the west wall fo the pit and sloped downward to a maximum depth of 2.8 ft.

Body Deposition. The skeleton was that of a subadult who was between seven and nine years old at death. It was lying within the chamber on its left side with the head oriented to the north. The legs were loosely flexed and the arms were bent with the hands beneath the chin.

Grave Goods. Grave goods consisted of a necklace of hundreds of

small glass trade beads and two copper or brass ear ornaments.

The single shaft-and-chamber burial at the Mitchum site appears to occupy an intermediate chronological position between the Wall and Fredricks sites. The shaft-and-chamber style of pit and the relatively large number of glass beads are characteristics similar to the Siouan burials at Upper Saratown.

SUMMARY OF MORTUARY DATA

During the Late Prehistoric and Protohistoric periods, as evidenced at the Wall site, burials were loosely arranged within a village, with placement usually being in or near a house (Figure 90). Burial pits were circular or oval shaft-and-chambers. Except for clay pots (probably food containers), grave offerings consisted almost entirely of shell ornaments. Shell beads either were sewn on clothing or strung as jewelry. Shell gorgets sometimes were included with children. There is little evidence in the data thus far for status differences in these burials.

In the early part of the Contact period, as evidenced at the Upper Saratown (Navey 1982; Wilson 1983) and Mitchum sites, villagers continued to place burials in and around houses, with no clear indication of clustering, and the most common pit type still was the shaft-and-chamber. At Upper Saratown, there is much greater burial density than at the equivalently-sized Wall site, probably evidence of the effects of European diseases (Figure 90). Also during this period, glass beads replaced those of shell, and copper or brass ornaments became popular. Children still received the most numerous and elaborate grave offerings, and there is still little evidence of different treatments according to status for adults.

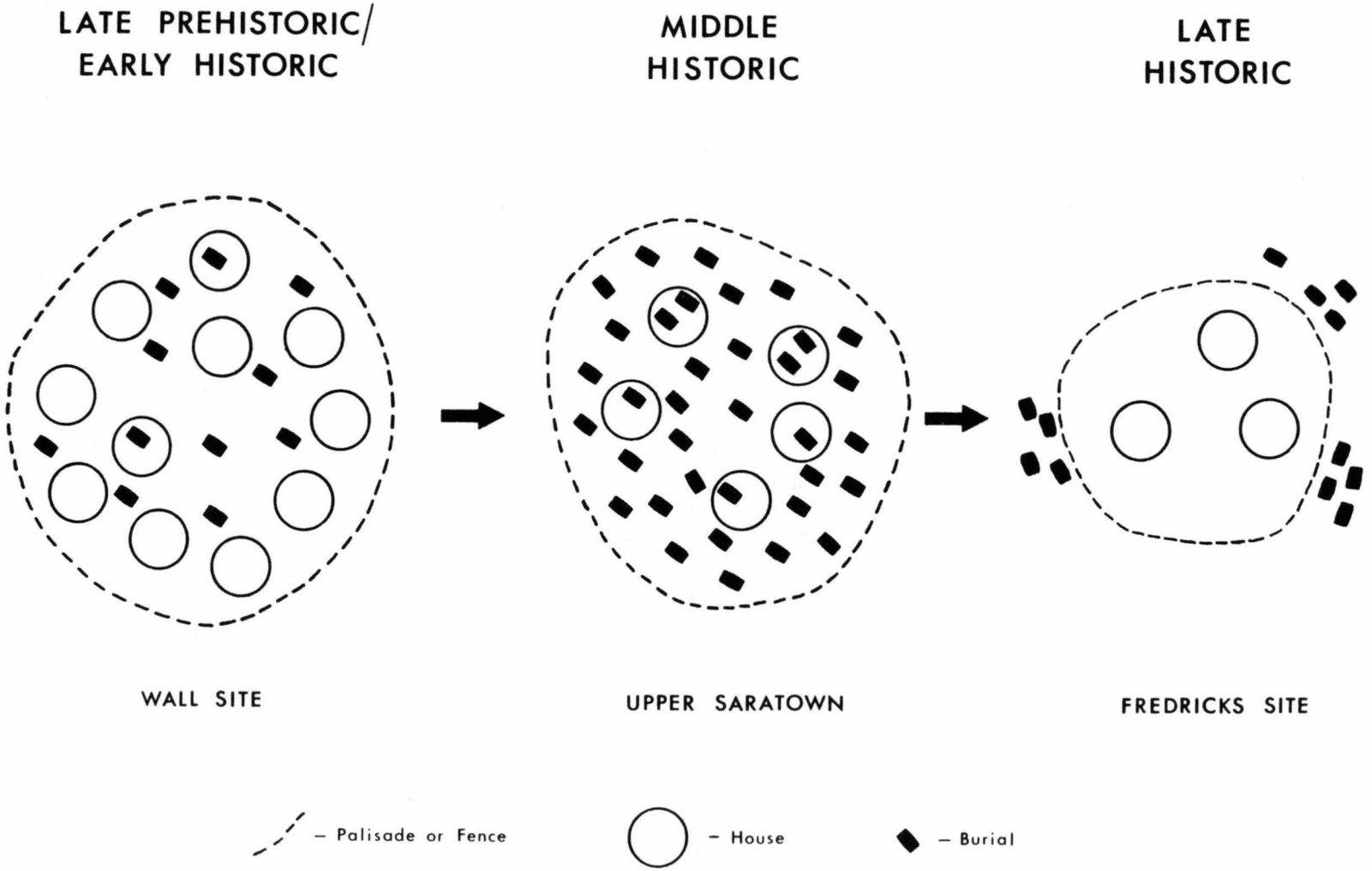


Figure 90. Schematic plan of village-burial spatial relationships.

Later in the Contact period, by the time of the Fredricks site, there is evidence for dramatic changes in the mortuary practices of the Piedmont Indians. Burials were clustered in cemeteries outside the village, rather than being loosely arranged within the village (Figure 60). Metal tools were used to dig rectangular, straight-sided pits. Muskets, hoes, knives, scissors, and spoons replaced many of the metal trinkets of the earlier period. Glass beads remained popular, but their use was primarily with children. Both children and adults occasionally received shell beads or a clay pot as burial offerings. At the Fredricks site, some individuals, usually young adult males, received greater attention at death through feasting rituals and elaborate burial offerings.

SOCIO-POLITICAL IMPLICATIONS OF THE FREDRICKS SITE BURIALS

During the Prehistoric and early Historic periods, mortuary beliefs and practices seem to have been shared by an entire village, which was composed of closely related unilineal descent groups. This pattern is reflected in the scattered placement of burials within villages, such as at the Wall site and Upper Sauratown. During this time, the village itself was, in effect, a "cemetery". The lack of spatial segregation of burials at these villages suggests an egualitarian social structure and may also indicate that village membership was more important than clan or lineage affiliation (cf. Tainter 1978; Bartell 1982). These earlier villages probably represent exogamous residential components of lineal tribes as defined by Service (1964:128-133).

From the ethnohistoric records, it is obvious that by 1700 disease and warfare had decimated Piedmont Indians' populations. Villages had fragmented and remnants of once linguistically and politically distinct

groups were forced to join together in an effort to cope with the constant pressures of colonial expansion and the perpetual hostilities from northern neighbors (cf. Dobyns 1983). During this time, the Keyauwee, Shoccoree, Saponi, and Tutelo combined with the Occaneechi to resist Iroquois raids. In fact, Lawson turned south of the Occaneechi trail because of the threat of an Iroquois attack in Virginia (Lefler 1967:61.

This process of decimation, fragmentation, and recombination of village groups necessitated structural changes in all components of Siouan culture. Large unilineal descent groups (lineages or clans) and sodalities probably lost much of their social significance. The ceremonial and ritual behavior that sanctioned these groups also were lost or drasticaly modified. In short, villages and tribes that had been unified and held together by a deep traditional network of kinship and shared ideology probably vanished as early as 1670. In their places were villages comprised of groups consolidated for expedience rather than on the bases of kinship and a shared system of beliefs. Within these villages, social segments were defined by ethnic and linguistic affiliation, not by unilineal kinship ties. Kindred-like social groups (cf. Speck 1938) formed the primary units of production and consumption, and mortuary ritual and ceremonial beliefs were held in common within these groups.

The cemetery at the Fredricks site may have resulted from the mortuary practices of one of these social units, in which individuals were differentiated by age and sex as well as personal achievement. Children were held in high esteem, and it was possible for adults to achieve positions of high status. By the late 1600s, individuals may have risen to positions of prominance by developing special

relationships with White traders.

Traditionally, tribes are led by "big men" who achieve a high status position by being successful warriors, magicians, and hunters. In short, they are individuals who excell in tribal society (Sahlins 1968:22). Since external political and economic dealings were left to the big men, those individuals who excelled in trade and other dealings with the colonists probably gained added respect, and through their generosity, a degree of social control that exceeded that they would have obtained within the traditional social structure. Based on the Fredricks site data, these big men were young adult males who probably replaced the more elder leaders who had been most influential prior to European contact.

Given the massive depopulation of the Piedmont over a short period of time, acculturation, in the traditional uses of that term (Beals 1962; Spicer 1961), did not take place. Certainly the social and ideological changes postulated above should not be seen simply as a borrowing of colonial customs. They were, instead, internal systemic adjustments made in an effort to adapt to and cope with a very destabilizing cultural environment. Obviously, the Piedmont Indians were borrowing material culture from the Colonists. But as others have pointed out (e.g., Sheehan 1980:135; Merrell 1983:4), the Indians were capable of absorbing great quantities of European trade goods without loosing the integrity of their native culture. On this point, it is interesting to note Service's comments on the evolution of composite tribes:

> One salient consequence of civiliation on a great many tribes has been depopulation through foreign disease, most usually carried by Europeans; another is disturbance of the resource base by such things as economic exploitation and alienation of native lands or outright removal; still another but frequently <u>overemphasized</u> in studies of changes in social

> organization, is acculturation—direct borrowing from the invaders (Service 1964:136, emphasis added).

These comments could not be more applicable had they been directed specifically at the Piedmont Siouans. They suggest that the arrangement of burials in a cemetery at the Fredricks site does not mean that, by the end of the 17th century, the Occaneechi were burying their dead like the Colonists. To the contrary, this shift in mortuary behavior may be interpreted as a consequence of internal changes in Siouan social organization, changes expected in a society evolving from a lineal to a composite tribe. Perhaps if the bodies had been extended instead of flexed, or interred in coffins, an emulation of Colonial mortuary practices might be postulated (cf. Axtell 1982:123-124). Such was not the case, however.

The rectangular shapes and straight walls of most of the burial pits at the Fredricks site do not represent mimicking of colonial burials; rather they were the result of the use of metal tools. Sharp corners and straight sides are a more likely consequence of the use of iron hoes and spades than of wood or stone implements. Though many of the grave goods from the Fredricks site burials are European in orgin, almost all have aboriginal counterparts. Their incorporation in the mortuary complex seems to reflect only replacement of aboriginal items and not changes in native ritual and ideology.

In short, the mortuary evidence suggests that Siouan culture change should not be viewed as increasing accommodation to European ways. Rather, these changes are better interpreted as adaptive responses within societies that remained, in many respects, resistant to change. Although the responses certainly were stimulated by interaction with Europeans and though other indirect effects of European presence, these responses were directed at maintaining traditional cultural systems in

the face of devastating pressures.

CHAPTER V

HUMAN SKELETAL REMAINS FROM THE WALL AND FREDRICKS SITES

by

Homes Hogue Wilson

With Contributions on Dentition by
Bryan P. Sorohan

INTRODUCTION

An investigation of the skeletal remains from the protohistoric Wall site and the historic Fredricks site was undertaken to provide information on the effects of European contact on the Native American cultures of the Carolina Piedmont. Four areas of inquiry comprise this investigation: demographic studies, analysis of pathologies, assessment of trace elements, and examination of biological continuity.

Demographic analyses are conducted to determine the overall health and fitness of the study populations. Changes in the mortality rates of certain groups, based on age and sex, would be expected among the study populations given the disruptions of the natural and cultural environments of the Piedmont Indian groups during the Historic period. Life expectancies would also be expected to change during the Historic period with the introduction of new stresses, such as European diseases, and an increase in existing stresses, such as warfare.

Although some diseases, e.g., mumps and measles, leave no marks on the skeleton, and only preliminary studies have dealt with the effects of smallpox on bone (Jackes 1983), the study of bone pathologies can provide correlary evidence of disease-induced stress. For example, changes in the frequencies of certain types of pathologies, such as cut and puncture wounds, might be expected in an Historic period population faced with a social environment in which warfare was prominant.

Assuming that the natural environment in the vicinity of the Wall and Fredricks sites remained approximately constant from the Protohistoric to the Historic period with respect to food resources, changes in the diet of individuals within the populations can be investigated through trace element analysis of the skeletal remains. Thus, by monitoring the concentrations of such elements as zinc, copper, magnesium, strontium, and vanadium, in the bone, it is possible to estimate the relative contributions of floral and faunal resources to the diet of an individual or group (Szpunar et al. 1978).

To study the possible biological connections between prehistoric/protohistoric and historic populations, and the extent of population disruption and movement following prolonged contact, both metric and non-metric techniques were used on cranial remains. The non-metric traits are used in formulae for measuring population diversity (cf. Lieberson 1969) in order to evaluate the amount of variability within each population. Also, metric indices are compared with other populations to provide information on their similarities and differences.

The prehistoric/protohistoric skeletal series comes from the Wall site (31OR11). A total of eight burials comprise this sample population. These eight burials consist of five individuals excavated between 1938 and 1941, and three recovered during the 1983 excavations at the site. The historic skeletal remains consist of 10 burials excavated at the Fredricks site (31OR231) in 1983 and 1984. An inventory of the skeletal remains from all 18 burials from the two sites is presented in Appendix A.

Because the skeletal samples from the two primary sites are so small, information from two additional samples is incorporated in this

study. One sample of 88 burials comes from the Shannon site (44MY8), a late prehistoric Siouan site in Montgomery County, Virginia (Benthall 1969). The second collection consists of 74 individuals from the Historic period Siouan site of Upper Saratown (31SKla), in Stokes County, North Carolina (Navey 1982). These two skeletal series are included in this study because they are the largest available documented populations from the Carolina and Virginia Piedmont that are comparable in age and general cultural affiliation to those from the Wall and Fredricks sites.

DEMOGRAPHIC ANALYSIS

In any study of the demography of an archaeological population, the first question that must be considered is the representativeness of the sample population. Demographic statements are based on the assumption that the numbers, ages, and sexes of the skeletal sample accurately reflect the original population, and that any biases can be recognized and considered in the analysis. Sources of error that can result in inaccurate interpretations include: 1) differential disposal of particular segments of a population, such as infants; 2) inadequate sampling of the overall mortuary complex; and 3) differential preservation of the skeletons (Ubelaker 1978:91-92). In addition, there are problems unique to each analytical technique utilized in the study of the biological aspects of burial data. These problems will be addressed when the appropriate technique is considered.

The first step in the demographic reconstruction of a population is to obtain the age at death and the sex of each individual. Usually, only adult remains are sexed, as individuals less than the age of 15 at the time of death cannot be accurately sexed. In the present study,

each skeleton in the sample population was subjected to the same set of aging and sexing techniques. All individuals were assigned to an age category, and all adults could be sexed.

Age of Subadults

The subadults were aged using dental eruption and development (cf. Ubelaker 1978:112-113), longbone length (Ubelaker 1978:48-49), and epiphyseal closure (Bass 1971). Where only fragments of the longbones or cranium were present, the remains were compared with subadults of "known" age, and an age was assigned based on this comparison.

Subadults made up 62.5% of the population at the Wall site, and 50.0% of the Fredricks site population. Table 13 presents the age at death for the subadults from both sites, as well as the average age of death for the subadults for each site.

Age and Sex of Adults

Criteria used to age the adult individuals from the two sites are: 1) dental eruption of the third molar (Ubelaker 1978); 2) dental attrition (Molnar 1971); 3) endocranial suture closure (Krogman 1978); 4) epiphyseal closure (Bass 1971); and 5) erosion of the symphyseal face of the os pubis (McKern and Stewart 1957). Each of the adult individuals in the sample population possessed the skeletal elements necessary for these observations, except for the symphyseal face of the pelvis. Only Burials 1 and 3 from the Wall site and Burial 5 from the Fredricks site could be aged using the pubic symphysis. Whenever possible, the adult individuals were placed in five-year age categories.

The sex of the adult individuals was determined primarily from morphological examination of the cranium, mandible (cf. Bass 1971; Krogman 1978), and pelvis (cf. Bass 1971). Sex determination from metric data on each individual was incorporated to support the results

Table 13. Age of subadults from the Wall and Fredricks sites.

Site	Burial	Age in Years	Age in Months
Wall			
	2	1.5-3	18-36
	5	0-.67	0-8
	1-83	1.5-3	18-36
	2-83	.75-1.5	9-18
	3-83	0-.67	0-8
Mean Age		1.26	15.1
Fredricks			
	1	3-5	36-60
	2	6-8	72-96
	4a	0-.67	0-8
	7	0-.67	0-8
	8	3-5	36-60
Mean Age		3.13	37.6
Mean Age 0-5 years		2.16	26

of the morphological analyses. Metrical techniques included: 1) femur midshaft circumference (Black 1978); 2) ischium-pubis index (Bass 1971); 3) femur head diameter (Bass 1971); 4) humerus head diameter (Bass 1971); and 5) the angle of the sciatic notch (Ubelaker 1978). Table 14 presents the age and sex of the adult individuals from both sites.

An examination of the age of all of the individuals and the sex of the adults clearly indicates that a representative population is not present at either site. This is not unexpected given the small number of individuals present in each sample. At the Wall site, very young individuals and very old individuals predominate in the burial population; only one individual is between the ages of 10 and 20 years, and there is none between ages 20 and 45. Furthermore, all the adults are males. Similar biases can be seen in the burial population from the Fredricks site, where many individuals aged 0 to 5 years are present, but few old adults are present. The age group from 20 to 45 years comprises only four individuals, and no individual is present in the 10-to-20-year category. A bias for male sex is also evident at the Fredricks site, where there are four males and only one female.

Another problem that arises in the analysis of the two primary population samples is the spatial context from which they are drawn from within their respective sites. As Ward (this report) notes, the population from the Wall site is drawn from burials scattered throughout the site, whereas all of the burials from the Fredricks site were in a single "cemetery." Given the differences in age, sex, and placement of burials between the two populations, as well as the small sample size of each population, extreme caution should be exercised in drawing general conclusions from the demographic analysis.

Table 14. Age of the adults from the Wall and Fredricks sites.

Site	Burial	Age in Years	Sex
Wall			
	1	45+	M
	3	50+	M
	4	18-22	M
Mean Age		38.3	
Fredricks			
	3	25-35	M
	4	25-30	M
	5	50+	M
	6	20-25	M
	9	35-40	F
Mean Age		33.5	

Demographic Profiles

Frequent infant mortality probably characterized both the Prehistoric/Protohistoric and Historic periods because of the stresses associated with early life. High infant mortality would be indicated by a large percentage of the population being between the ages of 0 and 5 years at death. Because of the high death risk associated with childbearing, adult females aged 18 to 30 years at death also should be relatively common at both sites. Males aged 18 to 40 years, who would have encountered stresses associated with hunting and warfare, probably would have had a moderately high mortality rate in the Prehistoric and Protohistoric periods, and a still higher rate after contact because of increased stress from competition induced by the deerskin trade and from the general animosity that marked relations between the Indians of the Northeast and those of the Virginia and Carolina Piedmont (cf. Lawson in Lefler 1967:49-50,233; and Ward, this report).

The segment of the prehistoric/protohistoric population classified as old (age 45 years and above), should be comprised mostly of males, as they would have been more likely to survive the stress years of 20 to 40. For Historic period populations, both males and females would endure increased stress from exposure to European diseases, increased warfare and competition, and disruption in the existing social system. Few of either sex would be likely to survive the stress years. However, females would probably have a better chance to survive to old age than males if there were a decrease in childbearing and its related stresses.

The presence of European diseases and other stresses might cause an increase in the number of deaths in all age groups among historic Indian populations. This would be marked particularly by an increase in the number of deaths in the 5-to-15-year age group (time of European induced

childhood diseases), an age when mortality appears to decline in a normal population (Droessler 1981). Also, life expectancy at birth and for each age category should be lower for historic populations when compared to prehistoric or protohistoric populations.

In summary, five general demographic trends should be noted when a prehistoric/protohistoric population is compared with an historic population:

1. similar mortality profiles between the populations for infants and females;
2. higher mortality for males aged 20 to 40 years in the historic population;
3. more old individuals in the prehistoric/protohistoric population and more young adults in the historic population;
4. higher mortality among individuals aged 10 to 20 years in the historic population; and
5. higher life expectancies for all age groups in the prehistoric/protohistoric population.

Demographic Propositions

To investigate these five propositions, burial data from two sites with relatively large populations were utilized to construct demographic profiles against which the Wall site and the Fredricks site collections could be compared. The two sites are the Shannon site (44MY8), a prehistoric village site with 88 analyzed burials, and Upper Saratown (31SKla), an historic village site with 74 analyzed burials. Information on the age and sex of the Shannon site population is from Benthall (1969), and that for the Upper Saratown population is from Navey (1982). The demographic reconstructions for these two populations are based on several assumptions (cf. Ubelaker 1974:59). The first assumption, that the skeletal samples are complete, is not fully met, as both sites have been only partly excavated, and therefore only a portion of the total burial populations is represented. The second assumption,

that the age at death can be accurately determined, is probably met. Although the age of each individual was carefully evaluated, there may be some bias present created by the fact that the two populations were aged by different observers. The final assumption is that the size of the living population and its death rate remained constant during the occupation of the site. This third assumption is problematic as regards historic populations where mortality probably fluctuated from year to year under the varying influences of epidemics of European disease and general warfare. Indian warriors also took captives to serve as slaves for the Europeans (Lefler 1967:208-212). This custom would probably cause population fluxuation from year to year. Given these assumptions and the limitations of all the populations used in this study, one can only view the results as preliminary and as a basis for developing future investigations.

The first step in this study is to construct mortality curves and life tables for the four sample populations. Mortality curves will also be constructed for the sexed adults in order to investigate the potential differences and similarities in the mortality of males and females in the Prehistoric/Protohistoric and Historic periods.

Mortality Curves

Mortality curves allow one to compare the percentages of a population that died in particular age groups. Although five-year categories provide the most information (cf. Ubelaker 1978:93), ten-year categories are used here to accomdate Navey's (1982) age groups for Upper Saratown. Figure 91 illustrates the mortality curves for the four populations. The prehistoric/protohistoric sites are represented by the Shannon site (n=88) and the Wall site (n=8). The Historic period sites are Upper Saratown (n=74) and Fredricks (n=10).

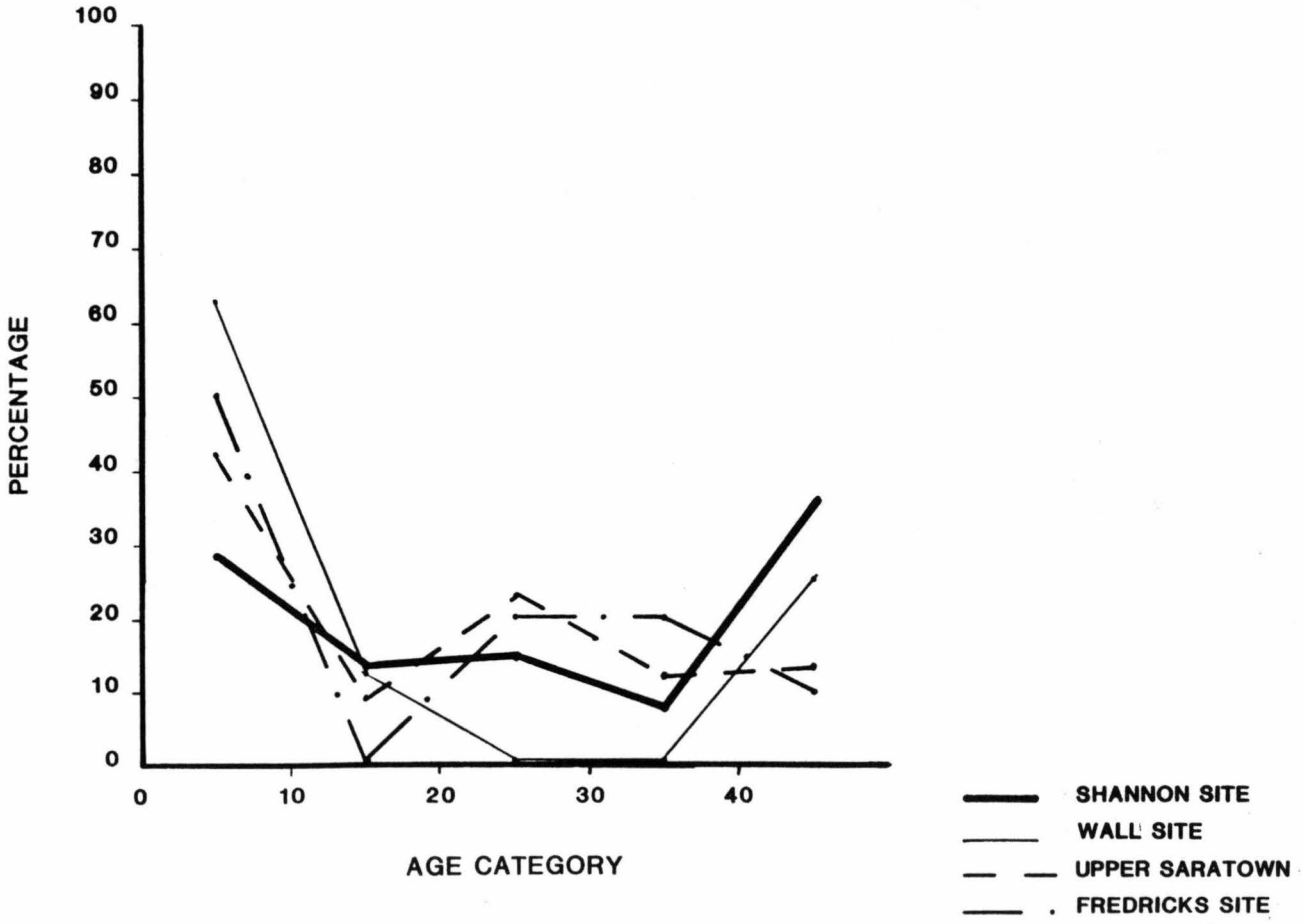


Figure 91. Mortality curves for the Fredricks, Wall, Upper Saratown, and Shannon skeletal samples.

Several similarities can be seen when the two profiles of the prehistoric/protohistoric sites are compared. First, there is a high freguency of deaths in the first 10 years, followed by a decline through childhood into adolescence as represented by the 10-to-20-year age category. A gradual increase in deaths is present in the 20-to-30-year age group at the Shannon site, which gradually declines in the 30-to-40 age group. As no individuals in these last two age groups were found at the Wall site, nothing more can be said about the mortality among the segment of the protohistoric population aged 20 to 40 years. From age 40 up, both populations show a sharp increase in mortality. A pattern of high infant mortality, followed by lower childhood mortality, and subsequent increase in adult mortality are similar to United Nations mortality model curves developed from 158 censuses in 50 countries and published in 1955 (Buikstra 1976:22-23). And, Buikstra (1976:22-24) found a similar pattern in a Middle Woodland skeletal series from the Gibson-Klunk sites in Illinois. Such a pattern is considered to approximate a "normal" mortality curve.

A similar pattern of high infant mortality and low childhood-adolescent mortality was noted for the populations from the Fredricks and Upper Saratown sites. In contrast to the prehistoric/protohistoric sites, however, the two historic sites showed a significant increase in the percentage of deaths in the 20-to-30 age group. Mortality in the Upper Saratown population decreases in the subsequent 30-to-40 age group before increasing slightly in the over 40 category. The Fredricks site population showed a high mortality rate in the 30-to-40 age group with a decrease in the over 40 group. This pattern of a higher mortality rate between the ages of 20 and 40 years, with less people surviving over 40, deviates from the United Nations model and that noted for the two

prehistoric/protohistoric populations.

The previous discussion and the data derived from the mortality curves tend to support two of the propositions stated earlier. First, there was a high rate of infant mortality in both prehistoric/ protohistoric and historic populations. This trend is not surprising given that such a pattern is typical of most Third World populations today (Droessler 1981:48). It is interesting that there is a lower percentage of infant deaths in the prehistoric Shannon site population when compared with the historic Upper Saratown population. The mean age of the individuals in the Shannon site population from age 0 to 5 years is 1.5 years. In contrast, the mean age at Upper Saratown for this age category is 2.78. The mean ages for the protohistoric Wall site is 1.25 years, and that for the historic Fredricks site is 2.16. This suggests that neonates (individuals aged 0 to 12 months at death) are underrepresented at both historic sites. Either the neonates were buried in a different location, were disposed of without burial, or they survived longer in the Historic period.

The first two of these possibilities cannot be addressed. The third, however, can be investigated using the twin concepts of "r and K selection" developed by population biologists for the study of group formation (cf. Horn 1978; Pianka 1978). r and K strategies portray two poles of a continuum of strategies that a population can utilize to insure its survival. In population biology, r-strategy is denoted by large litters, small offspring, little parental care, low parental survival, and high survival of juveniles (Horn 1978:416). K-strategies, on the other hand, are characterized by small litters, large young, much parental care, high parental survival, and low survival of young (Horn 1978:416).

Although all the implications of the model for the study of the demographic changes between prehistoric/protohistoric and historic populations have yet to be fully explored, the following proposition can be made about the observed differences in the average age of the subadults in the study populations. It is probable that in prehistoric and protohistoric times, factors would have tended to favor a population's utilizing a reproductive strategy similar to r-selection. Under conditions where competition and stress are low, as generally would have been the case in the Prehistoric and Protohistoric periods, offspring are weaned at an early age, say between ages 0 and 24 months. In contrast, the "best" reproductive strategy for the Historic period, which would be characterized by increased competition and stress, might be one similar to K-selection, where more energy is put into competition and maintanence, and into the production of offspring with more survival abilities. One behavior trait that might have characterized the K-selection strategy of the Historic period would be prolonged nursing of the individual offspring to insure its survival into childhood and adolescence. This suggestion is supported by Lawson (Lefler 1967:196), who noted that Indian women nursed until the children were "well grown":

> neither does the youngest Wife ever fail of proving so good a Nurse, as to bring her Child up free from Rickets and Disasters that proceed from the Teeth, with many other Distempers which attack our Infants in England, and other Parts of Europe. They let their Children suck till they are well grown, unless they prove big with child sooner.

The second proposition supported by the mortality curves is that older individuals comprise a larger percentage of the prehistoric/protohistoric populations than of the historic populations. Among the two prehistoric/protohistoric populations, 35.7% of the Shannon site sample and 25% of the Wall site sample survived over age 40. In contrast, only 13% of the Upper Saratown sample and 10% of the Fredricks

site sample survived to that age.

Related to the higher percentage of individuals aged over 40 being present at the prehistoric/protohistoric sites is the fact that more individuals between age 20 and 40 died at the historic sites. Only 22.7% of the Shannon site population died between the ages of 20 and 40, whereas 0.0% died during this age at the Wall site. For the historic sites, 35.1% of the population at Upper Saratown and 40.0% at the Fredricks site was between 20 and 40 years at death.

A third proposition, that more individuals would be found in the 10-to-20-year age category of the mortality curve for the historic populations, is not supported by this study. Higher mortality for this age group is seen in the prehistoric/protohistoric populations--13.6% of the Shannon site population and 12.0% of the Wall site population. For the Historic period, only 9.5% of the population at Upper Saratown and 0.0% of population at the Fredricks site are in the 10-to-20-year age group. An explanation for this pattern might be found in the earlier discussion of r and K- strategies. If extra care and protection from competition were afforded subadults in the Historic period, they would have tended to survive better to an age when they would normally be exposed to the stresses of childbirth, providing their own subsistence, hunting, warfare, etc.

Mortality Curves by Sex

Mortality curves by sex were also constructed for the Shannon and Upper Saratown populations (Figure 92). None were computed for the Wall and Fredricks sites because of the small size of the samples and the absence of females at the Wall site. For the prehistoric Shannon site, 26.0% of the males and 48.0% of the females died between the ages of 20 and 30 years. For the age group 30 to 40 years, 9.0% of the males and

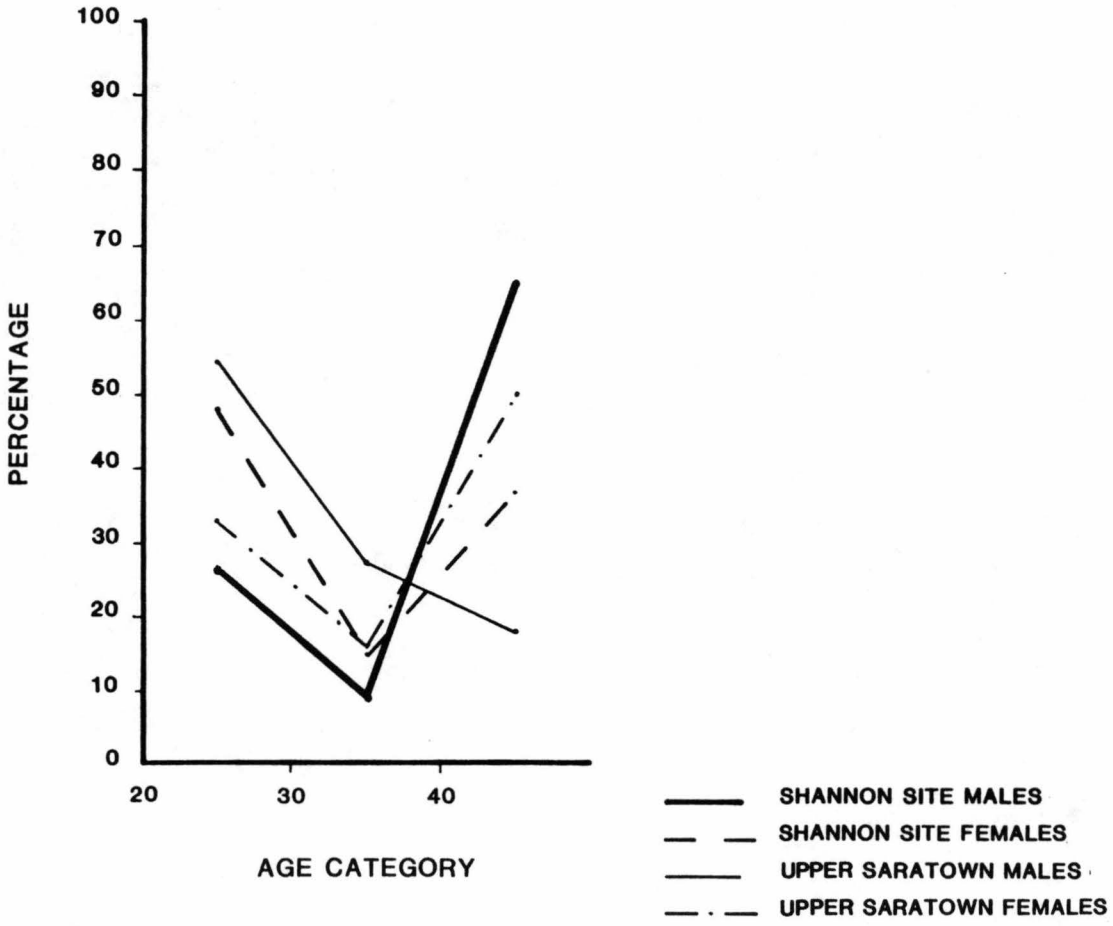


Figure 92. Mortality curves by sex for the Shannon and Upper Saratown skeletal samples.

15.0% of the females died. Males over 40 years at death represented 65.0% of the male population, and females over 40 years represented 37.0% of the female population.

For the Shannon site, a Chi-square test was used to determine whether the number of males and females in two age categories, 20 to 40 years and age 40+, were significantly different. The results were: $X^2=4.61$; df=1; $p<.025$ (Table 15). This indicates that the differences noted for the two age groups by sex are statistically significant. To further test the significance of the age/sex differences for adults aged 20 years and above, a Chi-square test utilizing three age categories--20 to 30 years, 30 to 40, and 40+ --was conducted (Table 16). The results were: $X^2=4.62$; df=2; $p<.10$. Although these results are not statistically significant, they do indicate a possible mortality pattern that should be explored when more data are available.

The results of the Chi-square tests suggest that, at the Shannon site, there is a statistically significant pattern of mortality by sex for adults aged 20 to 40 years and for the adults aged 40+. The pattern is evidenced by the higher mortality rate for females aged 20 to 40 years. This coincides roughly with the stress years for females associated with childbearing.

At Upper Saratown, a different relationship of age and sex is observed. A total of 54.5% of the male population is present in the 20-to-30-year group, as opposed to only 33.3% of the female population. In the 30-to-40-year category, 27.3% of the males are present, and 16.7% of the females. Finally, 18.2% of the males survived to age 40+, whereas 50% of the females survived to that age. A 2x2 contingency table (Table 17) with two age categories, one of 20 to 40 years and the other of 40+ years, was constructed. The results are: $X^2=1.3507$; df=1; $p<.30$. A

Table 15. 2x2 contingency table to test the significance of male and female mortality at the prehistoric Shannon site.

Sex	Age				Total
	20-40		40+		
	o_i	e_i	o_i	e_i	
Male	12	16.16	22	17.84	34
Female	17	12.84	10	14.16	27
Total	29		32		61

$X^2=5.795$, df=1, p=.025

Table 16. 2x3 contingency table to test the significance of male and female mortality at the prehistoric Shannon site.

Sex	Age 20-30 o_i	20-30 e_i	30-40 o_i	30-40 e_i	40+ o_i	40+ e_i	Total
Male	9	12.26	3	3.90	22	17.84	34
Female	13	9.74	4	3.10	10	14.16	27
Total	22		7		22		61

$X^2=4.619$, df=2, p=.10

Table 17. 2x2 contingency table to test the significance of male and female mortality at Upper Saratown.

Sex	Age 20-40 o_i	e_i	40+ o_i	e_i	Total
Male	9	7.17	2	3.83	11
Female	6	7.83	6	4.17	12
Total	15		8		23

X^2=1.3507, df=1, p=.30

Chi-square test (Table 18) on three age categories (20 to 30 years, 30 to 40 years, and 40+ years) yielded: $X^2$2.56; df=2; p<.20. Both tests indicated that the differences between male and female mortality at Upper Saratown are not statistically significant.

One more Chi-square test was conducted. Both 2x2 and 2x3 contingency tables (Tables 19-20) were constructed using the mortality data for just the males from the Shannon site and Upper Saratown. The age groups for the 2x2 test were 20 to 40 years and 40+ years. The result was X^2=7.21; df=1; p<.01. For the 2x3 test, with age groups of 20 to 30 years, 30 to 40 years, and 40+ years, the result was X^2=7.76; df=2; p<.05. Both tests indicate that the change in male mortality from the prehistoric site to the historic site is statistically significant. Chi-square tests computed on mortality data for the adult females from Upper Saratown and the Shannon site (Tables 21-22) suggest that there are no statistically significant differences in age at death.

From these studies, the proposition that female mortality would remain constant in both the prehistoric/protohistoric and historic populations is supported. Also, the proposition that higher mortality would be found in the historic population among males aged 20 to 40 years is supported. Although little can be done at present to test these propositions using the small samples from the Wall and Fredricks sites, it appears likely that similar mortality patterns are present for at least the male populations at the two sites. At the protohistoric Wall site (n=3), one male is between 17 and 20 years at death, and two are aged 40+. This is similar to the ratio noted for the Shannon site. In contrast, at the historic Fredricks site (n=4), three males are aged between 20 and 40 years at death, and only one is 40+, which is similar to the pattern found in the male population from Upper Saratown.

Table 18. 2x3 contingency table to test the significance of male and female mortality at Upper Saratown.

Sex	Age 20-30 o_i	e_i	30-40 o_i	e_i	40+ o_i	e_i	Total
Male	6	4.78	3	4.11	2	3.82	11
Female	4	5.22	2	2.61	6	4.17	12
Total	10		5		8		23

$X^2=2.564$, df=2, p=.20

Table 19. 2x2 contingency table to test the significance of male mortality at the Shannon and Upper Saratown sites.

Site	Age 20-40 o_i	20-40 e_i	40+ o_i	40+ e_i	Total
Shannon	12	15.86	22	18.12	34
Upper Saratown	9	5.14	2	5.86	11
Total	21		24		45

$X^2=7.206$, df=1, p=.01

Table 20. 2x3 contingency table to test the significance of male mortality at the Shannon and Upper Saratown Sites.

Site	Age 20-30 o_i	20-30 e_i	30-40 o_i	30-40 e_i	40+ o_i	40+ e_i	Total
Shannon	9	11.33	3	4.53	22	18.13	34
Upper Saratown	6	3.67	3	1.47	2	5.87	11
Total	15		6		24		45

$X^2=7.4437$, df=2, p=.05

Table 21. 2X2 contingency table to test the significance of female mortality at the Shannon and Upper Saratown sites.

Site	Age 20-40 o_i	20-40 e_i	40+ o_i	40+ e_i	Total
Shannon	17	15.92	10	11.07	27
Upper Saratown	6	7.08	6	4.93	12
Total	23		16		39

$X^2=1.56$, df=1, p=.30

Table 22. 2X3 contingency table to test the significance of female mortality at the Shannon and Upper Saratown sites.

Site	Age 20-30 o_i	e_i	30-40 o_i	e_i	40+ o_i	e_i	Total
Shannon	13	11.77	4	4.15	10	11.07	27
Upper Saratown	4	5.23	2	1.85	6	4.93	12
Total	17		6		16		39

$X^2=0.769$, df=2, p=.70

Life Tables

Using the information on age at death, life tables were constructed for the prehistoric Shannon site (Table 23), protohistoric Wall site (Table 24), and the two historic sites of Upper Saratown (Table 25) and Fredricks (Table 26). These life tables were used to investigate the aforementioned proposition that the life expectancy of an individual would tend to be greater in prehistoric/protohistoric populations than in historic populations. Life tables were determined from the same formulas used by Ubelaker (1974:62) in his analysis of the Nanjemoy ossuaries in Maryland. As noted earlier, 10-year categories had to be employed here instead of the recommended five-year intervals.

Life expectancy at birth for the prehistoric Shannon site population was 25.81 years (Table 23). If an individual reached the age of 10, the life expectancy was 35.06 years. At age 20, this figure was 38.47 years. The Wall site provided a life expectancy at birth of 16.25 years (Table 24). This figure, which is extremely low when compared with the Shannon site and other prehistoric sites in the Southeast, is probably an artifact of sample bias. A comparison of the life expectancies at each of the remaining age categories shows that the Wall site figures are consistently higher than those of the Shannon site.

Life expectancies for the two historic sites are similar. The life expectancy at Upper Saratown is 19.58 years at birth, increases to 30.10 years at age 10, and to 33.04 years at age 20. Life expectancy at birth for the Fredricks site is 19.00 years, 33.00 years at age 10, and 33.00 years at age 20.

It appears that life expectancies are generally higher for the prehistoric/protohistoric populations when compared with the historic populations. Although the population samples from the Wall and

Table 23. Life table for the Shannon site.

Age Interval (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (lx)	Probability of Death (qx)	Total Years Lived Between X and X + 10 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy (ex)
0-10	25	28.4	100.00	.2840	858.0	2581.0	25.81
11-20	12	13.6	71.6	.1899	648.0	1723.0	24.06
21-30	13	14.8	58.2	.2552	506.0	1075.0	18.47
31-40	7	7.9	43.2	.5156	392.5	569.0	13.17
40+	31	35.3	35.3	1.0000	176.5	176.5	5.00

Table 24. Life table for the Wall site.

Age Interval (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (lx)	Probability of Death (qx)	Total Years Lived Between X and X + 10 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy (ex)
0-10	5	62.5	100.0	.6250	162.5	1625.0	16.25
11-20	1	12.5	37.5	.3333	312.5	937.5	25.00
21-30	0	0.0	25.0	.0000	250.0	625.0	25.00
31-40	0	0.0	25.0	.0000	250.0	375.0	15.00
40+	2	25.0	25.0	1.0000	125.0	125.0	5.00

Table 25. Life table for the Upper Saratown site.

Age Interval (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (lx)	Probability of Death (qx)	Total Years Lived Between X and X + 10 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy (ex)
0-10	31	41.9	100.0	.4190	790.5	1958.0	19.58
11-20	7	9.5	58.1	.1635	533.5	1167.5	20.10
21-30	17	23.0	48.6	.4732	371.0	634.0	13.04
31-40	9	12.1	25.6	.4726	195.5	263.0	10.27
40+	10	13.5	13.5	1.0000	67.5	67.5	5.00

Table 26. Life table for the Fredricks site.

Age Interval (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (1x)	Probability of Death (qx)	Total Years Lived Between X and X + 10 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy (ex)
0-10	5	50.0	100.0	.5000	750.0	1900.0	19.00
11-20	0	0.0	50.0	.0000	500.0	1150.0	23.00
21-30	2	20.0	50.0	.4000	400.0	650.0	13.00
31-40	2	20.0	30.0	.6666	200.0	250.0	8.30
40+	1	10.0	10.0	1.0000	50.0	50.0	5.00

Fredricks sites are too small to permit reliable comparisons, the general trend seems to be for a longer life expectancy in the prehistoric/protohistoric groups. It should be noted here that because the Shannon and Upper Saratown samples were not aged and sexed by this author, the results of the comparisons should be viewed as preliminary.

Summary of the Demographic Studies

The information on age-specific mortality and life expectancy presented here has proved valuable in evaluating the overall health and fitness of the four Piedmont Indian populations. Several propositions were introduced and tested using techniques of demographic analysis. The relatively large skeletal samples from the prehistoric Shannon site and historic Upper Saratown site were used to develop "models" against which the smaller (and probably biased) samples from the protohistoric Wall site and historic Fredricks site could be compared. Of the five propositions originally set forth in this section, four were supported by data from the Shannon site and Upper Saratown, with similar patterns being documented for the Wall and Fredricks sites. Support was provided for the propositions that there will be: 1) similar mortality profiles for infants and females at the prehistoric/protohistoric and historic sites; 2) higher mortality for young males at the historic sites; 3) more older individuals in the prehistoric/protohistoric sites,; and 4) higher life expectencies for the prehistoric/protohistoric populations. The fifth proposition, that higher mortality among individuals aged 10 to 20 years would exist in the historic sample, was not supported. Hopefully, larger and more representative samples from the Wall and Fredricks sites will be forthcoming. This will permit a more thorough study of the propositions and suggested patterns.

PATHOLOGIES

The above demographic analysis suggests that European contact led to a more stressfull environment for the aboriginal populations, especially for young males. Examination of the skeletal remains for pathological lesions can furnish information about the susceptability of a population to stress and disease. When used in conjunction with data from other sites, such information can provide insights into stress-related and disease-related changes in behavior patterns. Unfortunately, most disease states, including those of European origin, do not affect the bone, and in those cases where the bone is affected, specific diseases cannot always be associated with the pathology (Buikstra and Cook 1980:439-444). Before considering the pathologies present in the skeletal series from the Wall and Fredricks sites, it is necessary to briefly discuss the diseases, both endemic and European-introduced, that may have acted upon the Indian groups of the Carolina Piedmont during the Historic period.

Epidemic Diseases in the Southeast, 1680-1710

According to Dobyns (1982:8), diseases introduced from the Old World caused numerous epidemics of lethal pathogens in the New World between A.D. 1520 and 1918. The most fatal of these Old World pathogens for Native Americans was smallpox. Following its introduction, smallpox spread rapidly throughout Native American populations, who possessed no immunity to the disease (Dobyns 1983:11). The first smallpox epidemic, which lasted from about 1520 to 1524, was more deadly than any of the later epidemics. Between 1665 and 1667, a second virulent smallpox epidemic struck the Southeast from Florida to Virginia. Another epidemic broke out in 1696 that decimated the Southeastern and Gulf Coast chiefdoms before it ended in 1699 (Dobyns 1983:15).

The smallpox epidemic of 1696-1699 is mentioned by John Lawson during his travel through the Carolina hinterland in the winter of 1701. Lawson (Lefler 1967:231-232) notes that "The Small-Pox has been fatal to them; they do not often escape, when they are seiz'd with that Distemper, which is a contrary Fever to what they ever knew." He (Lefler 1967:232) goes further and proposes that smallpox had probably not been in America before European contact as "it destroy'd whole Towns, without leaving one Indian alive."

The only other European disease that may have affected the Indian groups of the Carolinas and Virginia is influenza, which may have been a component of the smallpox epidemic of 1696 (Dobyns 1983:18). Dobyns (1983:18-19) suggests that the effects of influenza on Native American populations is probably unreported in the historic records, and therefore underestimated, because its symptoms are not readily visible. Influenza may have been the third most lethal disease after smallpox and measles among Indian populations (Dobyns 1983:19). Lawson does not specifically identify influenza as being present among the aboriginal people with whom he was familiar, but he does identify several medicines made of roots, herbs and/or snake-skins used by the Indians to treat "fever" (Lefler 1967:17), one of the symptoms of influenza, smallpox, and measles. There is no historical evidence to support the presence of measles in the Carolina back country.

The final disease discussed in this section is syphilis, although the question of whether it is of Old or New World origin is still debated. Several theories, variously based on biological, environmental, and paloepathological evidence, have been proposed for explaining the presence of syphilis in the New World (Steinbock 1976:87-97). Fortunately, the question of origin does not have to be

addressed here, for whatever its origin, syphilis is considered to have been one of the major diseases responsible for population decline among North American Indians during the Protohistoric and early Historic periods (Dobyns 1983:35). Lawson (Lefler 1967:25, 231) makes several references to individuals that have been affected by the "Pox" (syphilis) and had lost their noses. He (Lefler 1967:25) also notes that yaws, as well as syphilis (both of which are treponemal infections), is present among the Indians and that both have similar symptoms:

> Yawes...is...attended with nocturnal Pains in the Limbs, and commonly makes such a Progress, as to vent Part of the Matter by Botches, and several Ulcers in the Body, and other Parts; oftentimes Death ensuing. I have known mercurial Unguents and Remedies work a Cure, following the same Methods as in the Pox.

Osteological indicators are also similar for both syphilis and yaws, which makes it difficult to positively identify one or the other from only skeletal evidence. The osteological indicators include cranial lesions and nasal destruction, and lesions and swelling of the lower limbs (Steinbock 1976:102-105).

In summary, there are at least three major diseases--smallpox, treponemal infections (yaws and syphilis), and influenza--that may have acted on the Indian groups of the Carolina-Virginia Piedmont during the Historic period. Since influenza leaves no bone lesions to indicate its presence, it cannot be positively identified using only skeletal material. Smallpox (osteomyelites variolosa) deforms the bones of the upper extremities, especially in the area of the elbow, although any joint can be affected (Ortner and Putshar 1981:227-228). At the Grimsby site in Ontario, Canada, deformaties of the bones that comprise the elbow are identified as having been caused by osteomyelites variolosa (Jackes 1983). This Neutral Indian cemetery dates to about 1650, and

provides the first archaeological evidence of smallpox in the New World. Treponemal infections have been documented archaeologically through the presence of lesions particular to this type disease on cranial bones and longbones (e.g., Bullen 1972; Steinbock 1976:86-160).

No evidence of smallpox or treponemal infection is found in the skeletal population from the Fredricks site. Therefore, the presence of these three diseases as additional stresses during European contact can only be inferred from the ethnohistorical accounts of their occurrence, and not directly from the existing skeletal remains.

Pathologies at the Wall and Fredricks Sites

The ultimate goal of the study of the skeletal pathologies at the Wall and Fredricks sites is the comparison of the frequencies of the types of pathologies. Six major categories of pathologies are present: 1) traumatic or violent pathologies; 2) degenerative pathologies; 3) tumors; 4) general stress-indicating pathologies; 5) indicators of dietary stress; and 6) general osteitic pathologies. Details on the pathologies for each burial are given in Appendices B and C.

Traumatic/Violent Pathologies. Pathologies that are considered to be evidence of trauma and/or violence include fractures, cuts, and piercing wounds. A higher incidence of such pathologies would be expected in Historic period populations when compared with prehistoric/protohistoric populations because of the increased amount of warfare, such as Lawson describes (Lefler 1967:49-50,233), and a possible increase in hunting accidents resulting from participation in the European skin and fur trade.

At the Wall site, there is only one instance of traumatic/violent pathology, a healed fracture on the left humerus of a male aged over 45 in Burial 1 (Figure 93). This totals 3.8% of all the pathologies from



Figure 93. Left humerus (top) compared with right humerus (bottom) of Burial 1 at the Wall site.

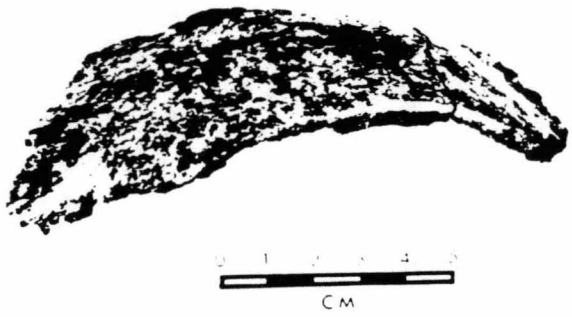


Figure 94. Right parietal fragment of Burial 4 from the Fredricks site, showing the cut mark or traumatic injury.

the Wall site, where 12.5% of the population exhibits evidence of pathologies.

In contrast to the Wall site, 20% of the population from the Fredricks site show evidence of traumatic/violent pathologies, which comprises 7.2% of the total number of pathologies present in the population. Burial 9, a female aged 35 to 40, has a possible pierce wound of the left fibula caused by a gun shot. Although the fibula is extremely fragmented, there is no evidence of bone reconstruction or osteitis, which means that death probably occurred soon after the wound was inflicted. Of special interest are the pathologies exhibited by Burial 4. This male, aged 25 to 30 years at death, had been placed in a disarticulated state in a pit with an infant (Burial 4a). The skull of Burial 4 has cut marks that extend across the frontal bone from left to right and parallel to the sagittal suture. There are three other cuts, two across the occipital bone and one on the right parietal that extends from the sagittal suture to the right temporal bone (Figure 94). The depth of the cuts through the periosteal layer of the cranium intimates that a very sharp instrument was used with much force to inflict the injury. Although scalping is a sound possibility for these injuries, the irregular cuts are not those associated with the usual scalping method whereby the frontal region is cut and the scalp pulled towards the back of the head where it is cut away, sometimes with part of the skull (cf. Lefler 1967:207). Rather, it appears that the individual may have been struck repeatedly with a sharp weapon, possibly a light weight sword. This interpretation is supported by the what appears to be the presence of a separate pierce wound on a segment of the frontal above the left orbit. As the individual had been buried in a disarticulated, bundled state, and had probably suffered (and died) from violent trauma,

it is proposed that Burial 4 represents the remains of a victim of warfare or some other violent act, and that death occurred away from the village. The body was later gathered and returned to the village for burial. In his journals on his life among the "Chikkasahs" (Chickasaw Indians) in 1744, Adair (Williams 1930:181-182) refers to the Choctaw and Creek treatment of war victims:

> Thus all numerous nations of Indians perform the like friendly office to every deceased person of their respective tribe, in so much that those who lose their people at war, if they have not corrupted their primitive customs, are so observant of this kindred duty as to appropriate some time to collect the bones of their relations; which they call bone gathering...

It is posited that Burial 4 had probably been exposed to the effects of the environment for an unknown amount of time (possibly several weeks) before the remains were finally buried in the village. No defleshing marks, which would suggest intentional disarticulation and secondary burial of the individual, are present.

In summary, there is, as originally postulated, an increase in the occurrence of traumatic/violent pathologies from the protohistoric Wall population to the historic Fredricks population. One extreme case of violence is documented by the skeletal material from Burial 4 at the Fredricks site. However, given the small samples, little more can be said at this time.

Degenerative Pathologies. Since more individuals survived to old age at the Wall site, it is proposed that more degenerative pathologies will be present in this protohistoric population when compared with the historic population from the Fredricks site. Burials 1 and 3, which comprise 25% of the Wall site population, exhibit evidence of two degenerative pathologies, arthritis (Figure 95) and tendonitis (Figure 96). These degenerative pathologies total 11.4% of all the pathologies present at the Wall site. From the Fredricks site, two burials, 5 and



Figure 95. Vertebral lipping of Burials 1 (left) and 3 (right) from the Wall site.



Figure 96. Patella and calcaneus of Burial 3 from the Wall site, showing possible tendonitis.

9, display arthritic lipping of the vertebral column. This represents 4.8% of the pathologies and 20% of the population at the Fredricks site. Although the percentages of degenerative pathogens present and the population affected are not remarkably different, more degenerative pathologies occur in the Wall site population. Thus, the postulated difference in the occurrence of degenerative pathologies between the prehistoric/protohistoric and historic populations may be substantiated by a larger sample.

Tumors. No tumors or tumor-like lesions are present in the Wall site population. Two individuals, Burials 2 and 4, from the Fredricks site, however, have unusual bone formations that may be some form of osteoma, although such an identification is uncertain at present. The exterior right side of the mandible from Burial 2, a subadult aged 6 to 8 years, exhibits swelling of the bone with some osteitis in the area below the first permanent molar and developing second molar. On the right interior of the mandible from Burial 4, an adult aged 25 to 30 years, is a small protrusion/lump that shows evidence of bone reconstruction. These examples of tumors tentatively identified as osteoma are manifested in 20% of the Fredricks site population, and they comprise 4.8% of the pathologies in the population.

Mechanical and General Stress. Schmorl's nodes and dental hypoplasia are two pathologies that indicate general stress in a population. Schmorl's nodes, or intervertebral disc hernia, are caused by pressure from constant elastic tension of the spine. Trauma, induced for example by mechanical stress, can cause the centrum to collapse in young individuals and produce Schmorl's nodes. In older individuals, Schmorl's nodes appear as a factor of degenerative change (Schmorl 1971:158-166). Given these causes of Schmorl's nodes, it is postulated

that this pathology will afflict a greater percentage of the adult population between the age of 20 and 40 at the historic Fredricks site than at the protohistoric Wall site. This condition would be associated with an increase in the Historic period of mechanical stress related to obtaining, dressing, and transporting furs and skins for trade with the Europeans and from increased participation in warfare. Conversely, since the level of mechanical stress in the prehistoric/protohistoric young adult population would be less, this segment of the population at the Wall site should exhibit a low incidence of Schmorl's nodes. Most of the occurrences of Schmorl's nodes in the prehistoric/protohistoric population should be among old adult individuals since more of this population would survive to old age and be subjected to degenerative stress. Because of the predicted presence of both mechanical and degenerative stress, those individuals that survive to old age in the historic population should also exhibit a relatively high level of occurrence of Schmorl's nodes.

In the protohistoric Wall site population, both of the old males (Burials 1 and 3) have Schmorl's nodes in the lumbar vertebra. Burial 1 also has Schmorl's nodes in the lower thoracic vertebra. Both individuals exhibit arthritic lipping of the lumbar and thoracic vertebra, which indicates that the herniated discs are probably degenerative and are not related directly to mechanical stress.

Burial 5, an old adult male aged over 50, and Burial 9, a female aged 35 to 40 years, are two of the four individuals from the Fredricks site that have Schmorl's nodes. The pathologies in these two cases are located in the middle to lower thoracic vertebra, and both have arthritic lipping. Burial 3, a young adult male aged 25 to 35, and Burial 4, a young adult male aged 25 to 30, both have a herniated disc

in the lower thoracic area. It is suggested that the latter two cases are related to mechanical stress, whereas the former two cases, especially Burial 5, are related to degenerative stress.

As originally postulated, the occurrence of Schmorl's nodes in the Wall site population is restricted to two individuals aged over 45. These comprise 25% of the total population, and 7.6% of the total pathologies at the Wall site. The one young adult individual, Burial 4, a young adult male aged 18 to 22, does not, as would be expected, exhibit Schmorl's nodes. In contrast, 40% of the Fredricks site population—one adult male aged over 50, one female aged 35 to 40, one adult male aged 25 to 30, and one adult male aged 25 to 35—possess herniated discs (Figure 97), which represents 9.5% of the total pathologies at the site. Thus, the original proposition that young adults in the historic population would exhibit a high incidence of Schmorl's nodes due to mechanical stress, whereas older adults in both historic and prehistoric populations would exhibit the pathology because of degenerative stress, is supported.

Another indicator of stress in a population is enamel hypoplasia, a marker of physiological stress derived from the effects of disease and/or diet. It is defined as a deficiency in enamel thickness resulting from the slowing of enamel formation due to stress (Huss-Ashmore et al. 1982:441). Transverse lines or rings are formed when the stress discontinues and normal development resumes. These transverse lines are not altered or otherwise affected by later events in life, thus they form a record of stress during developmental years (Huss-Ashmore et al. 1982:441).

At both sites, where teeth are present (75% of the Wall site population and 80% of the Fredricks site population), some amount of



Figure 97. Thoracic vertebrae of Burials 4 (left) and 9 (right) from the Fredricks site, with herniated disc or Schmorl's nodes.



Figure 98. Closeup of Burial 4 from the Wall site, with orbits showing cribra orbitalia.

enamel hypoplasia is observed. This condition represents 23% of the pathologies present at the Wall site and 19% of the pathologies at the Fredricks site. Although these samples appear similar in the incidence of enamel hypoplasia and in the percentage of the population affected, Sorohan (1985:51) suggests that shorter periods of stress exhibited by more severe instances of hypoplasia are present in the Wall site population. In contrast, longer periods of less severe stress is noted for the Fredricks site. From the ealier discussion of r and K reproductive strategies the apparent decrease in the severity of enamel hypoplasia in the historic Fredricks site population may be due to the increased care and extended nursing of the young, assuming a move to more of a K reproductive strategy. Thus, whereas stress from disease may have been more prevalent in the Historic period, the young may have been shielded from its effects to some extent by the pattern of care associated with a K reproductive strategy.

Dietary Pathologies. Pathologies related to diet include cribra orbitalia, spongy hyperostosis, periodontal disease, and caries. Elsewhere (Wilson 1983:29), it has been hypothesized that nutritional diseases will be less common in prehistoric populations given the general sociocultural stability present, and the presence of low levels of stress and competition relative to later periods. In contrast, diet related diseases will increase during the Historic period because of the increased incidence of disease in general, an increase in stress and competition, and the disruption of the sociocultural system (Wilson 1983:30-31).

Evidence of cribra orbitalia is manifested by lesions affecting the roof of the eye orbit. Although several conditions may cause such lesions, they are usually attributed to some type of nutritional stress

related iron deficiency anemia (Steinbock 1976:244-246). Spongy hyperostosis is generally found on the parietal and occipital bones of the cranium, and is also related to iron deficiency anemia (Steinbock 1976:230). These two iron deficiency related diseases are exhibited by 25% of the Wall site population (Burial 4, an adult male aged 18 to 22, and Burial 1-83, a subadult aged 1.5 to 3 years at death), and they account for 11.4% of the total pathologies present. At the Fredricks site, cribra orbitalia is found in 40% of the population (Burial 1, a subadult aged 3-5 years; Burial 2, a subadult aged 6 to 8 years; Burial 6, a young adult aged 20 to 25 years; and Burial 8, a subadult aged 3 to 5 years). The two diseases represent 9.5% of the total pathologies present in the Historic period population. In all but one case, Burial 4 from the Wall site, only the porotic type of cribra orbitalia affects the eye orbits. This suggests that the iron deficiency anemia afflicting the other five individuals may have been mild in form. Burial 4, in contrast, possesses a more critical type of cribra orbitalia known as cribrotic (cf. Steinbock 1976:239). The presence of cribrotic cribra orbitalia (Figure 98), with severe spongy hyperostosis of the cranial vault (Figure 99), indicates that Burial 4 suffered from severe anemia that may have contributed to the individual's death.

It is expected that the occurrence of dental caries and periodontal disease in individuals in Historic period populations will generally increase over that found in prehistoric/protohistoric populations. The introduction of new European foods, such as peaches (Lefler 1967:115-116; Gremillion, this report), rum (Lefler 1967:232-233), and a possible increased reliance on maize (Gremillion, this report), resulted in an increase in the amount of sugar in the historic diet.

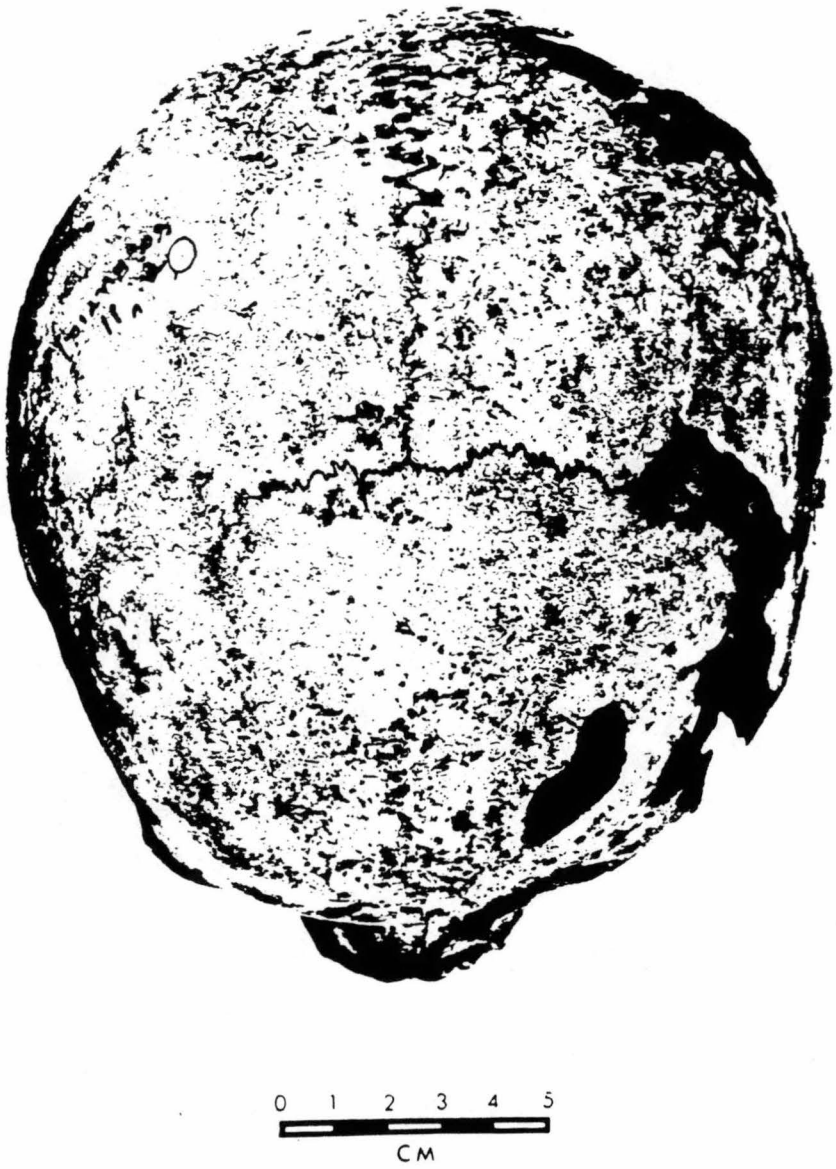


Figure 99. Top view of cranium of Burial 4 from the Wall site, showing frontal and parietal pitting related to spongy hyperostosis.

This would have contributed to an increase in dental caries and periodontal disease during the Historic period.

Sorohan's (1985) preliminary study of the dental remains from the Wall and Fredricks sites tenatively supports this proposition. For the Wall site 37.5% of the population has some form of periodontal disease, which represents 11.5% of all the pathologies in this prehistoric population. In contrast, periodontal disease affects 50% of the Fredricks site population, and it comprises 11.9% of the total pathologies at the site. Caries afflict 62.5% of the Wall site population, and account for 19.2% of the pathologies. The incidence of caries is present in 80% of the Fredricks site population, where they account for 19% of of the total pathologies. Sorohan (1985:56) proposes that the differences in the presence of caries and periodontal disease may be indicative of a higher carbohydrate diet at the earlier Wall site.

It is interesting to note that whereas more individuals from the Fredricks site exhibit periodontal disease and caries (cf. Sorohan 1985:55-56), the percentage of the total pathologies is similar to that found at the Wall site. A similar trend is seen when the occurrences all of the pathologies (cribra orbitalia, spongy hyperostosis, caries, and periodontal disease) related to diet are examined. A total of 42.1% of the Wall site pathogens are diet related as compared to 40.4% of the Fredricks site pathologies. It would appears that both dietary stress and pathologies greatly affected the two populations, with more individuals at the Fredricks site being afflicted. This trend is certainly influenced by the different percentages of neonates present in the two populations (37.5% at the Wall site and 20% at the Fredricks site), for whom dental remains are usually not carious and are generally

not affected by periodontal disease. Although the percentages of the samples that possess diet-related diseases appear to be dramatically different, the two populations are similar when only those individuals with erupted dentition are considered. Therefore, it is difficult to say at this time whether dietary stress changed significantly from prehistoric to historic times. This question will be considered again from a different perspective in the forthcoming section on trace element analysis.

Osteitis. Osteitis, inflamation of the bone, is caused by trauma, infection, and/or disease (Steinbock 1976:60). It is expected that osteitis will increase in historic populations over that found in prehistoric/protohistoric populations. Factors favoring such a change include the presence of European diseases, increased nutritional stress, and the posited increase in overall levels of stress and competition.

In support of this proposition, more cases of osteitis are observed in the Fredricks population (60% of the individuals in the sample) than in the protohistoric Wall site population (37.5%). Also, the percentage of the total pathologies present increases to 14.2% for the Fredricks site from 11.5% for the Wall site. All cases of osteitis identified in both populations represent rather mild instances of remodeling in the longbones. Unfortunately, the direct cause or causes of these lesions cannot be determined.

Summary of Pathologies

Overall, the results of the analysis of pathologies shows that there is a general decrease in the overall health of the historic Fredricks population from that enjoyed by the protohistoric Wall population. Assuming that variables of the natural environment remained relatively constant for both populations, given the proximity of the

sites, the decline in health can be attributed to increased stresses related to European contact. One of these stresses is new diseases such as influenza, smallpox, and possibly treponemal infections, that, according to Lawson (Lefler 1967) and Dobyns (1983), are present in the Southeast at the time Occaneechi Town (Fredricks site) was occupied. Evidence of increased warfare and hunting associated with the European skin and fur trade is suggested by an increase in traumatic/violent pathologies at the Fredricks site. Also, the occurrence of severe mechanical stress among Historic period populations, perhaps related to increased warfare and hunting, is supported in part by the large percentage of young adults at the Fredricks site who were afflicted by Schmorl's nodes. Accompanying the decrease in number of individuals surviving to old age in the Historic period population is a decrease in the percentage of degenerative pathologies at the Fredricks site. The occurrence of pathologies related to disease and/or diet stress that is documented by linear enamel hypoplasia remains relatively constant in both the percentage of total pathologies it represents and in the percentage of population that it affects at both sites (see Sorohan 1985 for a more detailed discussion of the dental pathologies). Similar distributions are exhibited by pathologies, including cribra orbitalia and spongy hyperostosis, related to diet. Finally, there appears to be an increase among the Fredricks site population in general osteitis and tumors from that seen at the Wall site. Although the direct cause(s) for this increase cannot be determined, the change is possibly due, at least in part, to the general increase in stress brought about by European contact.

The increase in the presence of pathogens and in the percentage of the population affected by such pathogens at the Historic period

Fredricks site is far from conclusive. Larger and more representative samples for both the Wall and Fredricks sites will be necessary before substantative conclusions can be put forth. For example, one question of great importance that cannot be addressed here concerns the differential incidence of pathologies by sex at the Fredricks site. Data for investigating this question would also provide a better understanding of the pattern of increased male mortality seen in the mortality curves for the historic Upper Saratown site. Therefore, until such time as better samples are available, the conclusions and trends documented in this discussion of pathologies have to remain strictly preliminary.

DIET, HEALTH, AND TRACE ELEMENT ANALYSIS

Trace element analysis is used to consider questions pertinent to the diet and general health of the protohistoric Wall site and the historic Fredricks site populations. Techniques that measure the relative concentrations of trace elements in human bone have come to enjoy increasing favor among anthropologists interested in the reconstruction of diet, disease states, and the general health of archaeological populations (Bahou 1975; Blakely and Beck 1981; Lambert, Szpunar, and Buikstra 1979). Another use of trace element analysis has been for determining differential access to certain foods, such as meat, or the relative contribution of meat resources and plant foods to the diet of various segments of a population, and how such a pattern relates to status (Brown 1974; Schoeninger 1979; Hatch and Guidel 1982;).

For trace element analysis to be meaningful, it is essential that the subsistence patterns of the study population(s) be reconstructed

from the archaeological record. The analysis of the faunal remains from the Wall and Fredricks sites by Holm (this report) suggests that the major animal resources for both sites were deer (Odocoileus virginianus) and catfish (Ictaluras sp.). The historic Fredricks site possesses the remains of European mammals including the horse (Equus caballus) and pig (Sus scrofa), but only in very small quantities. Rabbit (Sylvilagus sp.) and beaver (Castor canadensis), present at the Wall site, are absent from the Fredricks site. Holm concludes that the role of faunal resources in the overall subsistence strategy at the Fredricks site is not significantly different from that at the protohistoric Wall site.

Gremillion's study (this report) of the plant foods utilized at the two sites suggests a similar lack of change. Although peach is the only European-introduced food at the Fredricks site, the relative and actual amounts of acorn and hickory nut differs for the two sites also. Acorns, and all nuts in general including hickory, are present in greater quantities at the Wall site. In contrast, there are less acorns present in the later Fredricks site, and hickory nuts predominate. Differences in the contribution of maize to the overall subsistence is also suspected, as slightly larger amounts of this cereal are present at the Fredricks site. However, Gremillion (this report) feels that these differences cannot, at this time, be interpreted as representing a greater dependence on maize for the Fredricks site occupants. Both Holm and Gremillion caution that sample bias may affect their studies, as the remains from the Wall site are mostly from the site midden, whereas those from the Fredricks site are from the fill of features and burial pits.

Diet

Several propositions about possible changes in diet can be tested

by identifying the relative and absolute amounts of zinc, copper, magnesium, strontium, and present in the skeletal series from the Wall and Fredricks sites. Zinc and copper are found to predominate in meats, seafood, and nuts (Gilbert 1977). Vanadium, strontium, and magnesium are highest in grains, cereals, and nuts (Gilbert 1977). High levels of strontium are also found in molluscs (Schoeninger and Peebles 1981).

The central proposition about diet to be considered at this time is that if there was little difference in the relative amounts of meat and plant foods consumed by the Wall and Fredricks populations, the relative amounts of trace elements will be similar in the two populations. If, however, more meat was available for consumption by the historic Fredricks site population as a consequence of increased hunting of fur and skin bearing animals for trade to the Europeans, there will be a relative increase at the Fredricks site in the amounts of zinc and copper and a corresponding decrease in the other three elements. The possible shift from a greater reliance on nuts, especially acorns, at the Wall site to less reliance at the Fredricks site may be documented by higher overall levels of all five elements at the prehistoric Wall site. If maize is a more important component in the subsistence of the Fredricks site population, as Gremillon's results imply, higher levels of magnesium, strontium,and vanadium, and lower levels of zinc and copper, will be present in the bones at the historic site.

The use of trace element analysis in the reconstruction of diet is fraught with difficulties. Although the trace elements usually can be associated with either plants or animals, only a few can be specifically restricted to being derived from a particular plant or animal food. Nuts are an excellent example of this problem, as, like meat resources from animals, nuts are high in zinc. Another problem encountered in the

analysis of trace elements is the antagonistic characteristics of zinc and copper. When levels of zinc decrease, copper levels increase (Gilbert 1977:89-90). The interpretation of the levels of zinc present is uncertain as zinc decreases in the presence of increasing amounts of phylate, a component of grains and cereals (Sever 1975; Gilbert 1977). Also, levels of zinc are decreased by sweating and parasitic infestations (Sever 1975).

Technique of Trace Element Analysis

The actual bone samples that are used in the analysis weigh about six (6) grams, and are composed of fragments of ribs, phalanges, vertebrae, and femur from each burial. The levels of trace elements in each bone sample is assayed using neutron analysis, a non-destructive technique that is extremely accurate in its measurements. In neutron activation analysis, the sample is exposed to radioactivity, which creates a high energy state in the material. As the radioactive isotopes decay, the amounts of each trace element are calculated (Gilbert 1977:96). Unfortunately, the measurement of the level of zinc in the bone sample requires a large amount of radioactivity, which prohibits the retention of any bone sample tested for this element. Therefore, no test for zinc is conducted for the Fredricks site population as it is considered destructive under terms of the Unmarked Burial Act of North Carolina, and tests for zinc are only made for those burials excavated from the Wall site prior to the initiation of the act in 1981.

Four burials from the 1938-1940 Wall site excavations are assayed for all five trace elements, and six burials from the Fredricks site are assayed for all the trace elements except zinc. The deer and raccoon bone sample assays provides a scale against which the results of the

human sample analysis can be compared. The inclusion of the bone from deer, a known herbivore, also provides a check on the reliability of the strontium assay for the human bone samples. If the human bones exhibit higher levels of strontium than the deer bone samples, it is probable that mollusc are an important part of the human diet (cf. Schoeninger and Peebles 1981). When such a high strontium level in the human bone is documented, no conclusions based on the variation in strontium levels within and between the study populations are possible.

Results of Trace Element Analysis

Tables 27-28 present the results (in parts per million, or ppm) of the trace element analyses for the Wall site and the Fredricks site, respectively. With one exception, the assay of the deer (Odocoileus virginianus) and raccoon (Procyon lotor) samples from both sites are similar, which is expected given that the two sites occupy virtually the same natural environment. One exception is the marked increase in magnesium in the raccoon remains from the Fredricks site. This forshadows the increased measures of magnesium among the human burial population from this site. Recall that magnesium increases with higher consumption of grains and cereals. One explanation for the increased raccoon magnesium is that they, like the humans, consumed more cereals and grains during the Historic period at the Fredricks site. Lawson (Lefler 1967:126) noted that raccoons were easily tamed when young, and it may have been that raccoons were tolerated in the vicinity of the village, at least until they were required for a meal. If raccoons were tolerated around the village, they might have enjoyed greater access to cornfields and store houses.

In general, the trace element levels within the Wall site population (Table 27) show little variation between individuals. The

Table 27. NAA of trace elements* in bones from the Wall site (parts per million, ppm).

Sample Description	Trace Element Sr	Mg	Cu	V	Zn
Burial 1	452	813	<20	41	<20
Burial 2	627	878	59	30	616
Burial 3	761	701	<20	26	24
Burial 4	762	885	39	41	<20
Procyon lotor	778	514	<20	23	30
Odocoileus virginianus	923	659	<20	40	135

* parts per million are rounded off and ± factors omitted.

Table 28. NAA of trace elements* in bones from the Fredricks site (parts per million, ppm).

Sample Description	Trace Element Sr	Mg	Cu	V
Burial 1	974	3047	<20	77
Burial 3	1007	5110	<20	88
Burial 4	415	5383	<20	84
Burial 5	527	3124	<20	51
Burial 6	604	3574	<20	86
Burial 9	913	4951	<20	134
Procyon lotor	882	2115	<20	29
Odocoileus virginianus	964	656	<20	34

* parts per million are rounded off and ± factors omitted.

levels of strontium are consistently lower (< 922.61 ppm) than either the deer or raccoon levels. This suggests that the diet at the Wall site was a mixed one composed of both meat and plant foods. The most obvious differences in the trace element measures occur in Burials 2 and 4. Burial 2 is a subadult aged 1.5 to 3 years at death. The high levels of magnesium, copper, and zinc suggest that the individual was nursing or had recently been weaned at the time of death. Burial 4, as noted earlier in the earlier discussion of pathologies, probably suffered from an anemia-related disease. This supposition is supported by the high level of copper (39.246 ppm) coupled with a low level of zinc (< 20.00 ppm). Gilbert (1977:92) states that copper serum levels are elevated during severe chronic disease disorders and anemia.

Differences can also be observed when the the two Wall site males old males over the age of 45 (Burials 1 and 3) are compared. Burial 3 has higher levels of zinc and strontium, but lower levels of magnesium and vanadium in comparison to Burial 1. This is somewhat confusing, as a diet higher in meat protein rather than nut protein is reflected. The lower strontium level in Burial 1 may be due to old age, as this trace element has been shown to decline naturally after age 50 (Lambert et al. 1979:125). Also, individual variation cannot be ruled out given the small population sample under study. Burial 1 also has a broken left humerus. Perhaps this injury prevented this individual from fully engaging in hunting activities, which limited the amount of meat he could obtain for his diet. The low levels of zinc and high vanadium levels exhibited by Burial 1 suggest that the protein in his diet was from nuts rather than meat.

Unlike the general uniformity of levels of trace elements seen among the Wall site burials, the Fredricks site population possesses a

great amount of variability. An excellent example is the strontium levels at the Fredricks site. Two individuals, Burials 1 and 3, have levels higher than that for the known herbivore (deer) from the site. Two explanations for this factor can be isolated. First, both individuals may have been from another area/region where strontium levels were naturally higher than at the Fredricks site. Schoeninger (1979:306) notes that one of strontium's empirical properties is its uneven geographical distribution. Another possible cause for the high strontium levels in Burials 1 and 3 may have been the inclusion of molluscs, which are strontium-rich, in the diet (cf. Schoeninger and Peebles 1981:391-397). Schoeninger and Peebles (1981) found that Archaic period populations from northern Alabama, who consumed molluscs as an integral part of their diet, had higher levels of strontium than the agricultural Mississippian population that later inhabited the same area.

The possibility that Burial 3 may have come from another area is supported by the greater height calculated for the individual--5'8" to 5'11"—, which is taller than the mean height (5'8") of the other males at the Fredricks site. Coastal populations such as the Algonquians, and the Iroquoian Meherrin and Nottoway, were typically taller and more robust than the Piedmont populations (cf. Neumann 1952). Thus, the high strontium level exhibited by Burial 3 would be explained if the individual were from a coastal area where molluscs were more readily available and more often consumed.

Strontium levels for the three other males at the Fredricks site (414.9 ppm) are all lower than that of Burial 3 (603.56 ppm). Although this may be due to environmental variation, as suggested above, this difference suggests that these three males enjoyed more meat in their

diet (cf. Brown 1974; Schoninger 1979). Lawson (Lefler 1967:231) notes that the Indians "boil and roast their Meat extraordinary much, and eat abundance of Broth, except the Savages whom we call the naked Indians, who never eat Soups." Lawson implies that these "Savages" fought the northern Senecas and Iroquois Indians. If these "Savages", because of their status as warriors, had preferred access to roasted meat over boiled meat, an explanation would be found for the low levels of strontium (and low magnesium) in Burials 5 and 6.

In contrast to the low strontium levels of Burials 5 and 6, the one female, Burial 9, has the highest level of vanadium of any individual at the Fredricks site, and very high levels of strontium and magnesium. The levels of these three trace elements suggest that the diet of Burial 9 is higher in cereals, grains, and especially nuts. This pattern fits a hypothesized difference in access to meat resources among the Fredricks site population, with males being favored over females.

It is possible to compare the results of the trace element assays conducted for the Wall and Fredricks sites, as they are located within 200 yards in the same bend of the Eno River. Because of their comparability of location, one can assume that the potential occurrence of trace elements in the natural environment is not biased by differing environmental conditions, and that any differences noted probably will be due to cultural factors. In general, there appears to have been a significant increase in the contribution of grains, cereals, and nuts to the diet of the Fredricks site population. The higher overall levels of magnesium, derived from grains and cereals, and to a lesser extent, vanadium, found in nuts, evidenced by the burials at the Fredricks site supports this generalization. The mean parts per million (ppm) for magnesium among the adult population at the Fredricks site is 4428, as

opposed to a mean ppm for adults at the Wall site of 799. Vanadium levels, which increase from consumption of protein sources such as nuts, average 88 ppm for the adult population at the Fredricks site and 35 ppm at the Wall site. Also, the increased vanadium levels tentatively support an increase in the amount of protein-rich nuts consumed by the population at the Fredricks site.

Summary of Trace Element Analysis

The results of the trace element analysis shed important light on questions of diet and status among the Wall site and Fredricks site populations. They support a conclusion that there was a change in diet following European contact, which can be seen in the increased utilization of cereal/grain food (maize) and of nuts higher in protein (hickory) at the Fredricks site. Consistently low levels of copper in the Fredricks site population suggest that zinc levels may have been "normal", given the inverse relationship that these trace elements have. Unfortunately, this proposition cannot be investigated further until levels of zinc in the Fredricks site population can be assayed.

Differences in the levels of strontium at the later Fredricks site may be related to preferential access to meat by males, as warriors and hunters, over females. Burial 9, a female, at the Fredricks site corroborates this posited difference in male and female access to meat resources. This individual has a very high level of vanadium, which suggests a diet rich in nut (probably hickory) protein, and high levels of strontium and magnesium which suggest a diet richer in cereals than in meat. The presence of individuals who migrated to the Fredricks site from areas where the environmental strontium levels were different, or individuals who came from regions where molluscs were an important food resource, also may account for a portion of these differences.

In comparing the results of the trace element assays with the study of the floral and faunal remains, several convergences with the above findings can be seen. First, as Gremillion (this report) notes, there is a higher percentage of acorn nut in the floral samples from the earlier Wall site. The occurrence of acorn decreases at the Fredricks site, and is accompanied by an increase in the hickory nut. The higher vanadium levels at the Fredricks site may be due, at least in part, to the increased utilization by the inhabitants of this site of protein rich nuts such as hickory. Furthermore, the significant increase in magnesium at the Fredricks over that noted at Wall site may document an increased dependence on corn at the historic site. Although this increase in magnesium does not support Sorohan's hypothesis that carbohydrates were more prevalent in the Wall site diet, it does shed new light on Gremillion's study of the floral remains. Although Gremillion finds larger quantities of maize at Fredricks, she hesitates to conclude that this is an indicator of a greater dependance on maize. The overall increase in the levels of magnesium at the Fredricks site from those found at the Wall site, however, tends to support such a conclusion.

Unfortunately, this discussion of diet, status and trace element analysis has to remain incomplete at this time because of the small skeletal samples available for study. Some differences in the diet and status within and between the two sample populations, however, are suggested. With the recovery of a larger sample and the inclusion of an assay for zinc, a more indepth study of the questions and hypotheses raised in this section can be conducted. Comparison of age and sex groups by different levels of each trace element with amounts and types of grave associations is just one example of the numerous investigations

that could be undertaken. In closing this section, it is again stressed that the findings presented here are preliminary and serve more as a focus for future research than as answers to any particular questions.

BIOLOGICAL DISTANCE AND DIVERSITY

Biological distance is the expression of the genetic similarities between two or more populations. In biological distance studies one assumes that among a collection of individuals, those displaying the most similarities are more closely related. Thus, it should be possible to investigate biological relationships between the Wall and Fredricks site populations through the analysis of biological distance. Were the Historic period Fredricks site occupants descendants of the earlier Wall site occupants? Since the two sites are located in the same bend of the Eno River, and studies of their respective pottery assemblages (Davis 1984 and this report) have revealed that potters of both sites participated in a common ceramic tradition, we might expect there to be little biological distance, and thus little diversity, between the two populations.

Conversely, the Fredricks site inhabitants may represent a population from a foreign area, or a mixture of different populations, some local and some foreign. The first case could be marked by either high or low within-group diversity, depending on the amount of pre-existing biological diversity. If the Fredricks site population were a mixture of peoples, then diversity would be expected, and the amount of similarity to the Wall site population would depend to some extent on whether descendants of the Wall site occupants were included in that mixture.

Direct evidence of combining of previously separate Indian groups

in the Middle Atlantic area during the Historic period is provided by the ethnohistoric record. For example, at the time of Bacon's Rebellion in Virginia in 1676, reports show that several Indian groups resided with the Occaneechi at their stronghold on the Roanoke River (Sainesbury 1893:414; Billings 1975:267-269). Among these groups were the Manakins, Annalectins, and Susquehannock. The Susquehannock were Iroquoian speakers from the upper Chesapeake Valley, and the Manakens are thought to have been remnants of a Piedmont Virginia Siouan group (J. Wilson 1984:102-105). The Annalectins cannot be identified with any known group at this time. A similar pattern of amalgamation probably characterized the Occaneechi after their move to the Eno, especially given the casualities inflicted on them by Bacon's forces (J. Wilson 1984:104-105, 112-114).

A third question to be considered is how do the Wall and Fredricks site populations compare with other populations from the Piedmont region of North Carolina that have been previously identified as "Siouan." No biological distance information is available for the prehistoric population from the Shannon site, identified with the Siouan-speaking Tutelo Indians of Virginia (Benthall 1968). However, a limited amount of biological/genetic information is available for the skeletal collection from Upper Saratown, a Siouan site located on the Dan River in the northern Piedmont of North Carolina (Navey 1982; J. Wilson 1984).

The accuracy with which biological relationships can be explored is dependent on the representativeness of the skeletal samples and the selection of traits that are purely genetic and that are not affected by environment, or by age or sex of the individuals (Ubelaker 1978:87). The first requirement presents a problem, as the two samples from the

Wall and Fredricks sites are not representative of a normal (i.e., both sexes represented by all age groups) population. Ubelaker (1978:87) states that a sample of 100 or more adults is sufficient for study, given that no biases are present in the selection of the sample. As only four crania from the Wall site and seven crania from the Fredricks site comprise the study sample, the results of this biological distance study are highly preliminary, and can be used only to suggest directions for future research.

Two techniques are used here to determine the degree of similarity between the Wall and Fredricks site samples. One involves combining a non-metric trait study similar to that employed by Buikstra (1976) in her investigation of prehistoric Illinois River population samples with a formula for measuring population diversity (Lieberson 1969). The other technique consists of the comparing selected cranial and post-cranial indices and stature estimates in order to determine similarities and differences. Information useful to this study is provided by the Upper Saratown skeletal samples, where four crania from burials provide comparative cranial indices and non-metric traits, and 14 burials have data from which post-cranial indices and stature estimates can be obtained.

Non-Metric Traits and Diversity

The analysis of the non-metric data involves coding the presence/absence of six discrete traits suggested by Buikstra (1976:53, 84). A total of eight variants can be extracted using the six discrete traits: 1) asterionic bone, 2) parietal notch bone, 3) supraorbital foramen, 4) mylohyoid arch, 5) divided hypoglassal canal, 6) multiple zygomatic facial foramina, 7) ossicle at lambda, and 8) superior sagittal sulcus flexes right. These traits are used, as they have been

shown to be unaffected by age, sex, trait intercorrelation, or cultural deformation (Buikstra 1976:49-51). As the population samples are too small to compute Chi-square and the mean measure of divergence values similar to those used by Buikstra (1976:53-54), another measure of diversity, Lieberson's (1969) diversity formula, is utilized to explore the degree of similarity within the study populations. Lieberson's measure of diversity, a variation on Simpson's formula (Lieberson 1969), describes the position of a population along a continuum from homogeneous to heterogeneous with respect to the trait under study. The formula for calculating the within-sample diversity is expressed as $D_w = 1-S = 1 - ((X_1) + (X_2) + (X_3) \ldots\ldots + (X_n))$, where D_w is the diversity within the population, and X_n is the percentage of a particular trait in the population. The sum of the squared percentages (S) is subtracted from 1 to give the probability that two randomly paired traits of the population will be different. If D_w=0.375, a low diversity index, there is only a 37.5% chance that two observations in the population will be different. A diversity index of 0.875 is very high and indicates that there is a 87.5% probability that two observations will be different.

Biological Diversity within the Study Populations

Within-sample diversity indices calculated for each population using the eight discrete biological variants noted above indicates that the most diverse sample is from the Fredricks site ($\bar{X}$=.400), and that the Upper Saratown sample has the least diversity ($\bar{X}$=.229). The within-sample diversity index for the Wall site population is $\bar{X}$=.317. The greater diversity at the Fredricks site may be an indication of the increased interaction between and admixture of groups during the Historic period. The index for the protohistoric Wall site is, as would be expected, lower than that of the Fredricks site, as there was less

interaction and admixture with other populations during protohistoric times. What is not expected is the low within-sample diversity index (.229) for the Upper Saratown sample. As the Upper Saratown population was also disrupted by European contact and enjoyed increased interaction with other Indian groups during the early Historic period, a higher diversity value, similar to that computed for the Fredricks site, was expected.

Metric Analyses

Cranial and post-cranial indices determined for the three study populations are presented in Tables 29-30. The mean cranial indices indicate that the Fredricks site population is more similar to the Upper Saratown population than to the Wall site population. It is interesting to note that, of the three standard deviations of the means for the cranial indices, the one calculated for the Upper Saratown population is greater than the other two. That there is more diversity in the cranial indices of the Upper Saratown sample is somewhat unexpected given the low within-sample diversity index calculated for the non-metric cranial traits.

Comparison of the post-cranial measurements from the three sites does not yield any identifiable patterns of similarities or differences. In general, the males from all three sites are similar in robusticity but differ when other indices are compared.

Stature estimates, calculated using Genoves (1967) formula, for males from the three sites are very similar. At the Wall site, males range in height from 162.4±3.4 to 175.1±33.4 cm, with an average of 169.8 cm (5'6"). The three males from the Fredricks site for whom measurements could be taken average 172.8 cm (5'8") in height with a range between 170.2±3.4 and 176.7±3.4 cm. The one female from the

Table 29. Mean cranial indices.

Population	Sex	No.	Cranial Index	No.	Cranial Module	No.	Cranial Length-Height Index	No.	Cranial Breadth Height Index	No.	Mean Height Index	No.	Fronto-Parietal Index
Wall Site	M	3	88.05 (5.748)	3	152.67 (4.839)	3	83.78 (3.416)	3	95.26 (2.738)	3	89.09 (1.218)	3	64.98 (.834)
Fredricks Site	M	2	78.97* (4.88)	2	156.66* (2.355)	2	72.47* (.848)	2	91.92* (4.603)	2	81.01* (1.258)	2	68.14 (1.153)
	F	1	74.46	1	152.67	1	69.15	1	92.86	1	79.27		-
Upper Saratown	M	3	80.47 (11.86)	2	151.50 (.707)	2	73.36 (2.527)	2	96.03 (15.634)	2	82.78 (4.281)	3	66.52 (5.461)
	F	1	77.14	1	149.33	1	78.86	1	102.22	1	89.03	1	69.63
Iswanid[1]	M	33	76.25	33	150.23	33	78.27	33	102.89	33	89.00		-
Lenapid[2]	M	24	75.39	24	153.50	24	77.76	24	103.65		-		-
Munsee[3]	M	4	73.90	7	155.60	4	73.10	4	98.90	4	83.86		-
	F	5	75.80	9	147.50	5	73.10	5	96.40	5	83.23		-

[1]Neumann 1952:17-19, 32.

[2]Neumann 1952:23, 24, 32.

[3]Hrdlicka 1916:21, 22, 26, 31.

* Estimated. "( )" Standard Deviation.

Table 30. Post-cranial indices.

Population	Sex	No.	Humerus Robusticity Index	No.	Femur Platymeric Index	No.	Femur Pilastric Index	No.	Femur Robusticity Index	No.	Femur Platycnemic Index
Wall Site	M	3	18.45 (1.56)	2	81.54 (12.84)	3	111.29 (4.74)	3	11.07 (.511)	3	64.53 (6.65)
Fredricks Site	M	2	20.74 (.179)	4	86.86 (2.90)	4	117.32 (6.340)	4	12.46 (.923)	3	65.98 (5.07)
	F	1	16.98	1	92.86	1	121.74	1	10.74		-
Upper Saratown	M	3	18.06 (1.39)	7	78.03 (4.90)	7	118.87 (8.656)	4	12.24 (.712)	4	60.72 (5.27)
	F		-	4	75.94 (4.72)	5	107.67 (3.345)	2	12.36 (1.40)	3	60.66 (3.65)

"( )" Standard Deviation.

Fredricks site, Burial 9, is estimated to have been 171.5±3.8 cm (5'7") tall. Similar heights are seen for the males from Upper Saratown, with four femurs providing a stature range between 165.2±3.4 and 175.1±3.4 cm, and an average of 170.7 cm (5'7"). The average female at Upper Saratown is estimated to have been 163.2±3.8 cm (5'4") tall.

Summary of Biological Distance Study

The following interpretations of biological distance between the Wall, Fredricks, and Upper Saratown sites are based on the non-metrical and metrical analyses of the skeletal series from the three sites. Several patterns are recognized. First, the Wall and Fredricks site populations appear to be the least similar of the three. It is felt that biological continuity between the two is not supported at this time, although the effects of admixture on the historic Fredricks site population and small sample size may be masking such a relationship. Figures 100-102 compare two of the old males from these two sites. Second, the Fredricks and Upper Saratown populations seem to be the most similar of the three (Figures 103-105). This may be due to interaction of these two groups with similar populations during the Historic period. Alternately, this similarity between the Fredricks site and Upper Saratown may document the effects of interaction and admixture between two related Siouan populations at different points in the Historic period. The populations from the Wall and Upper Saratown sites are less similar. Skulls from these two sites are compared in Figures 106-108. In general, the Fredricks site population is similar to the more robust, long-headed populations (the Algonquians and the Iroquois) of the Coast than the Siouan populations of the Piedmont (see Table 29). This is somewhat unexpected given that the Occaneechi Indians have long been considered Siouan (cf. J. Wilson 1984). What may be represented here



Figure 100. Front view of crania from the Fredricks site Burial 5 (left) and Wall site Burial 1 (right).



Figure 101. Top view of crania from the Wall site Burial 1 (left) and Fredricks site Burial 5 (right).



Figure 102. Side view of crania from the Wall site Burial 1 (left) and Fredricks site Burial 5 (right).



Figure 103. Front view of crania from Upper Saratown Burial 73 (left) and Fredricks site Burial 5 (right).

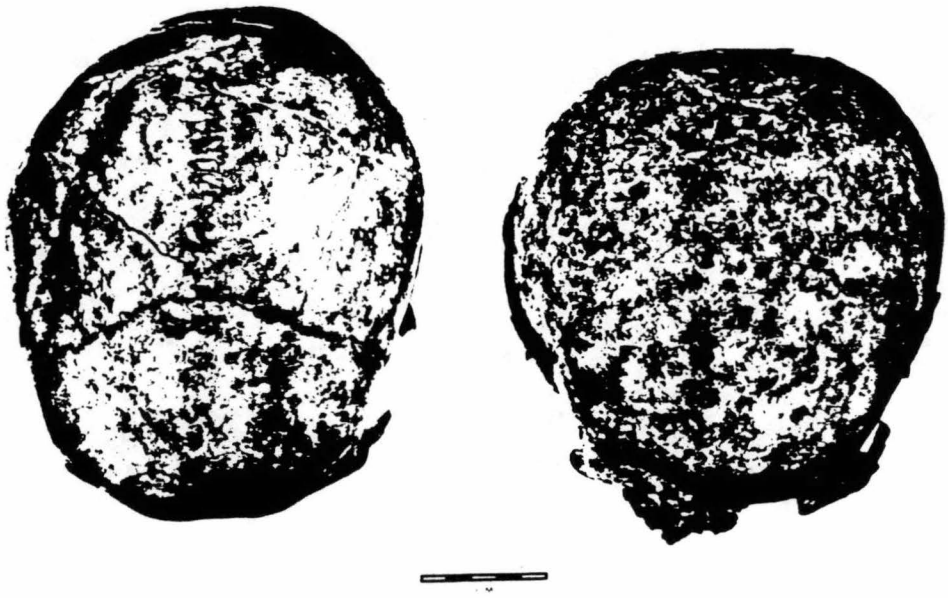


Figure 104. Top view of crania from the Fredricks site Burial 5 (left) and Upper Saratown Burial 73 (right).



Figure 105. Side view of crania from Upper Saratown Burial 73 (left) and the Fredricks site Burial 5 (right).



Figure 106. Front view of crania from Upper Saratown Burial 73 (left) and the Wall site Burial 1 (right).

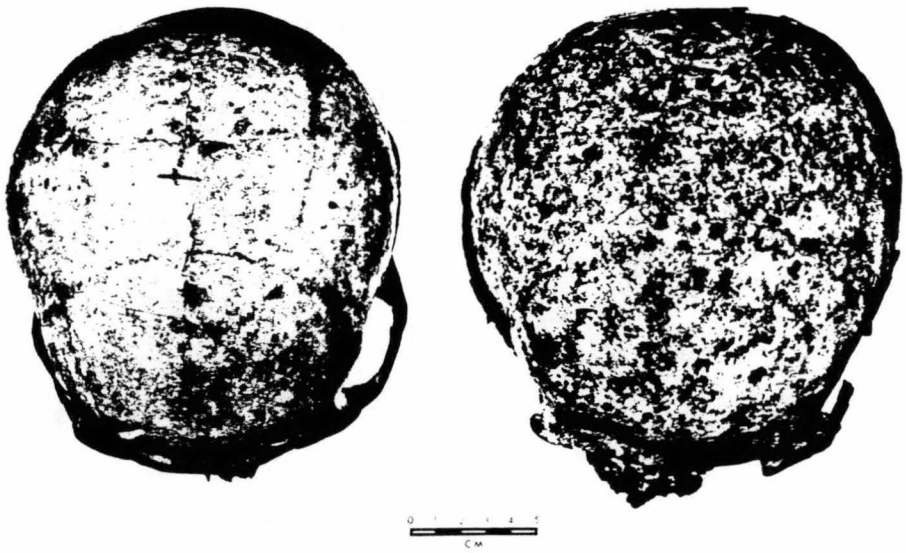


Figure 107. Top view of crania from the Wall site Burial 1 (left) and Upper Saratown Burial 73 (right).



Figure 108. Side view of crania from Upper Saratown Burial 73 (left) and the Wall site Burial 1 (right).

are the results of interaction and admixture of the Siouan Occaneechi with Algonquian-speaking and Iroquoian-speaking groups of the Coastal plain and the Middle Atlantic Piedmont during the Historic period. There is also the possibility that the Occaneechi were not Siouan.

As with the other sections of this study, it has to be borne in mind that patterns suggested here must be treated as non-conclusive given the very small size of the skeletal samples from the three sites under consideration. The patterns discussed in this section will be supported, modified, and/or discarded as larger samples are made available for study by future research.

CONCLUSIONS

This study of the human skeletal remains from the Wall and Fredricks sites has utilized demographic profiles, pathologies, trace element assays, and biological data. Information from two other sites, Upper Saratown in North Carolina and the Shannon site in Virginia, has been used for comparative purposes. The samples have also been examined for adaptive trends using the model of r and K reproductive strategies and within-site and between-site diversity.

The most important considerations for each of the four areas of inquiry can be summarized as follows. At the Wall site, there is a high frequency of deaths in the first ten years, followed by a decline through childhood and into adolescence. A pattern of high infant mortality and low childhood-adolescent mortality appears to be present in the Fredricks site population. The increase in the average age of death for young subadults from 1.3 years at the Wall site to 2.16 years at the Fredricks site may indicate a change in reproductive strategy from the Late Prehistoric/Protohistoric period to the Historic period.

In the former, a more r-oriented reproductive strategy was marked by low levels of stress and competition and an early weaning of offspring. A K reproductive strategy, where more energy was put into competition and maintenance and the production of better survival abilities, which may have been marked by extended nursing of the young, seems to be characteristic of the Historic period. The propositions concerning r and K reproductive strategies will be more fully developed in future work now planned for the burial material from the Shannon site and Upper Saratown.

Another demographic pattern suggests that older individuals may have comprised a larger percentage of the population at the protohistoric Wall site than at the Fredricks site. Related to this is the fact that more individuals aged 20 to 40 years died at the Historic sites. This is probably due to the increased stress and competition, including increased warfare and hunting, and the presence of European introduced diseases, among the Indian groups of the Historic period.

A total of six general categories of pathologies were considered in this analysis: traumatic or violent pathologies, degenerative pathologies, tumors, general stress-indicating pathologies, indicators of dietary stress, and general osteitic pathologies. It was hypothesized that the occurrence of traumatic or violent pathologies, including fractures, cuts, and piercing wounds, would increase in the Historic period population at the Fredricks site when compared with the protohistoric population at the Wall site. This was supported by the fact that only 3.8% of the Wall site pathologies, which afflicted 12.5% of the population, were categorized as violent. Traumatic pathologies increased to 7.2% among 20% of the population at the Fredricks site. Again, the increased stress and competition that marked the Historic

period provides a reasonable explanation for this increase.

For the mechanical and general stress pathologies, it was postulated that these would afflict a greater percentage of the adult population between the age of 20 and 40 at the Fredricks site than at the Wall site. Most of the occurrences of Schmorl's nodes, caused by the collapse of the centrum of the vertebra, at the Wall site would be in the population aged over 40 years, although the old adult population segment at the Fredricks site would also possess this pathology related to stress. As postulated, Schmorl's nodes occur only in individuals aged over 45 years at the Wall site. And, most of the occurrence of mechanical stress pathologies at the Fredricks site are among individuals aged 25 to 40, with the one individual aged 50+ also afflicted.

For dietary pathologies--cribia orbitalia, spongy hyperostosis, dental caries, and periodontal disease--it was thought that nutritional disease would be less common in prehistoric and protohistoric populations given the general sociocultural stability present, and the presence of low levels of stress and competition when compared with the Historic period. This proposition was supported by an increase from the protohistoric Wall site to the Fredricks site in the occurrence and percentage of population affected for the four diseases.

For the final pathology, osteitis, it was hypothesized that a general increase in the incidence of this disease would be noted in the Historic period. As expected, more cases of osteitis were observed in the Fredricks site sample than in the Wall site sample. Factors that favored such an increase included the presence of European diseases, increased nutritional stress, and the overall increase in physical stress and competition that marked the period.

One of the more informative analyses conducted for this study involved the assay, by burial, of the trace elements strontium, magnesium, vanadium, zinc, and copper. This investigation is, as with the use of r and K reproductive strategies, still at a very preliminary stage. The results of the assays conducted on the small skeletal samples from the Wall and Fredricks sites do, however, indicate promising directions for future research. The differences noted within and between the levels of trace elements at the Wall site and Fredricks site suggest that there was a change in diet from the Protohistoric period to the Historic period, with corn and possibly high protein nuts (such as hickory) being more important in the Historic period. Also, differences in the levels of strontium at the Fredricks site indicate the presence of differential access to meat between males and females, and among males. The possibility of identifying individuals from other Indian groups of the Middle Atlantic Piedmont and Coastal Plain is another research potential for trace element analysis.

This last question also served as the major focus of the biological distance/diversity investigation. Besides comparing the general morphological characteristics of the two populations, the question of the ethnic-linguistic affiliation of the Fredricks site population was considered. Analysis of the skeletal remains was conducted utilizing the same non-metric traits used by Buikstra (1976). Variability in the occurrence of these non-metric traits within the sample was investigated using Lieberson's (1969) diversity measure. The historic Fredricks sample displays the most within-site variability when compared with the Wall and Upper Saratown sites. This may indicate that this population experienced greater admixture during the Historic period. A pattern similar pattern of increased interaction, however, is not supported by

the historic Upper Saratown sample where a low diversity index for non-metric traits was calculated. A greater amount of diversity is seen in the results of the metrical analysis of Upper Saratown. The metrical studies also suggest that Fredricks and Upper Saratown are the most similar of the three sites. Possible explanations for this similarity are that the Fredricks and Upper Saratown populations represent different ethnic-linguistic groups who interacted with similar populations during the Historic period, or that they represent two genetically similar populations. Lastly, the morphological traits indicate that either the Occaneechi population at the Fredricks site interacted and intermarried with Algonquian- and Iroquoian-speaking groups, or that the Occaneechi were not Siouan people.

CHAPTER VI

EUROAMERICAN ARTIFACTS FROM THE FREDRICKS, WALL, AND MITCHUM SITES

by

Linda F. Carnes

INTRODUCTION

In this section, 10,182 artifacts of European or Euroamerican origin from the Fredricks (31Or231), Wall (31Orll), and Mitchum (31Ch452) sites are described, dated (where possible), and organized typologically and functionally. The descriptive analysis is followed by a discussion of the distributions of these artifacts at each site and an interpretation of the trade assemblage at the Fredricks site.

South's (1977:95-96) functional scheme is employed to provide an organizational framework for comparative purposes and is not intended to suggest that the objects in question functioned in the aboriginal context in the same way as they were intended to function in the European context. It was necessary to modify South's original scheme in order to incorporate categories for glass trade beads, construction materials, metal resources, and some ethnobiological items such as carved wood and leather. Modifications of South's format have been used to study successfully other aboriginal-European Contact assemblages from sites in Tennessee (Carnes 1983; Ford 1979; Newman 1977; and Polhemus 1984).

METHODS

All artifacts of European and Euroamerican origins recovered from the 1983 and the 1984 excavations at Fredricks and Wall sites, and the 1983 excavations at the Mitchum site were analyzed. In addition,

aboriginal pipes believed to date to the Historic period from the Fredricks and Mitchum sites were also examined. Four separate coding formats were created to facilitate computerized data manipulation: 1) aboriginal and historic pipes, 2) historic ceramics, 3) glass beads, and 4) a general format for all other historic items (e.g., metal, glass, non-vessel ceramics, and cloth). This analysis included measurements, functional classification, quantification by type, and dating (where possible). Context categories included plowzone from 29 excavation units at the Wall site plowzone from eight excavation units, one burial, 14 features, and a few postholes from the Mitchum site and surface collections, plowzone from 35 excavated units, six features, nine burials, and several postholes from the Fredricks site.

Of the 255 historic artifacts from the Wall site, all but three were from the plowzone; the other three were from the top of the midden and probably were intrusive from the plowzone. Of the 1,990 European artifacts from the Mitchum site, 1,960 (98%) were glass trade beads recovered from six features and one burial. From the Fredricks site there were 7,937 Euroamerican items, of which 6,632 (84%) were glass trade beads, the majority of those from Burial 3 (5,686 total). Most of the Euroamerican artifacts or artifact fragments were identifiable. Only a small number of items (i.e., ceramics, some beads, gun parts, pipe stems, whole bottles, and spoons), however, could be accurately dated; others could only be assigned a broad temporal range of manufacture and/or utilization (i.e., kettle, knives, scissors, iron nails, and iron implements).

To follow is a description of each artifact by type, group, and class. These descriptions are by 1) functional group (Architecture, Arms, Clothing, Food Preparation/Consumption, Personal, Construction

Tools, Farm Tools, Miscellaneous Hardware, Metal Resource, Other, and Indeterminate); 2) condition (whole, broken, corroded, cut, drilled, etc.); 3) period of manufacture/use (pre-1730, post-1680, etc.); and 4) archaelogical interpretive significance in the overall cultural assemblage for that site. There is also a discussion of the recycled or aboriginally modified artifacts from the Fredricks site.

Table 31 is a compilation of Euroamerican trade items and their value in deerskins at the Fredricks and Mitchum sites that appear on trade records of the Contact period. For comparison, a list of trade goods from the Upper Saratown site, located on the Upper Dan River, is also included. Perishable items, which appear in great quantities on the trade lists but are not often recovered archaeologically, include cloth items (such as blankets, shirts, hats), leather straps, rum (which was usually sold from a keg), snuff and tobacco, gun powder, and sometimes paints and pigments such as vermillion and red lead. Though the trade good inventories provide an indication of the availability, shipping modes, quantities, and values of some trade items, the Indians' personal choices must be recognized as a critical factor in trade good selection. Wholesale substitution of European trade items for their native counterparts was probably more conservative among the traditional Southeastern Indians groups than among Northern tribes such as the Susquehannock Indian groups or the Iroquois (Watts 1985:1). James Merrell (from Watts 1985:4), in a discussion of the influence of trade on the Catawba Indians, cautions that "all of these products were less disruptive to native life, more enjoyable than we might think; in part at least, this was because the Indians did not immediately or abruptly abandon their own goods or skills. In some cases, the Catawba simply placed new merchandise into old, familiar slots."

Table 31. Euroamerican trade items from trade lists (with deerskin values) for the Fredricks, Mitchum, and Upper Saratown sites.

Trade List Item	Value in Skins*	Fredricks	Mitchum	Upper Saratown
Gun	25-35	+	-	+
Pistol	12-20	-	-	-
Powder	1-"as you can"	-	-	-
Bullets	1	+	-	+
Flints	1	+	+	+
Steel	1	-	-	-
Hatchet	2-3	+	-	-
Cutlass	8	-	-	-
Sword	10	-	-	-
Knife	1	+	-	-
Hanger	7-10	-	-	-
Scissors	1	+	-	-
Axe	4-6	+	-	+
Hoe (Narrow)	2-3	+	-	-
Hoe (Broad)	4-6	+	-	-
Kettles (Brass)	"as you can"	+	-	-
Looking Glasses (Mirror)	"as you can"	+	-	-
Pipes	1 lb.	+	-	+
Rum (Bottles)	4 lbs.	+	-	+
Beads	1/3 lb.	+	-	+
Salt	"as you can"	-	-	-
Vermillion (Red Ocher)	20 lbs., if mixed	+	-	-
Red Lead	"	-	-	-

*after Crane (1928:Appendix B, pp. 332-333).
Note: (+) = Present; (-) = Not Recovered.

EUROAMERICAN ARTIFACTS BY FUNCTIONAL GROUP

Table 32 summarizes the Euroamerican artifacts from the Fredricks, Wall, and Mitchum sites, and relates them to the modified version of South's functional scheme.

Architecture Group

Items belonging to this functional group were subdivided into two classes, Construction Fasteners which consist of iron nails, tacks, nuts, bolts/spikes, and Construction Materials which consist of brick, glazed brick, flat glass (pane ?), and mortar. Flat glass fragments were distinguished from mirror glass by several criteria: 1) the absence of silver backing, which, according to Polhemus (1984:1189), "is very fugitive and is frequently eliminated during water screening or artifact processing"; 2) thickness of the glass (panes usually are thinner); 3) surface finish of the glass (polished or not); 4) edge color (typically smokey gray for mirror and more green to yellow-green for pane); and 5) edge treatment (typically mirrors have ground or smoothed edges).

Bricks also needed careful examination. During preliminary laboratory processing, daub, fired clay (possibly chinking), rocks, and even unglazed or slightly glazed coarse red earthenware sherds were inadvertantly classified as "bricks." During analysis, however, care was taken to discriminate real brick fragments from these other items. Attributes for brick identification included: 1) composition of paste (iron and quartz inclusions) for brick as opposed to a typically gritty or sandy paste for daub; 2) edge treatment (most bricks of this period were hand-made in a press-mold box and smoothed over the top edge with a board or trowel, which resulted in linear striations and some edge

Table 32. Frequency of historic artifacts by site, context, and functional classification.

Functional Group Class/Element	Fredricks		Wall		Mitchum	
	PZ	Fea/Bu	PZ	Fea/Bu	PZ	Fea/Bu
Architecture						
(Construction Fasteners)						
Nail	27	19	33	-	-	-
Tack	-	2	-	-	-	-
Nut	2	-	-	-	-	-
Bolt/Spike	1	-	2	-	-	-
(Building Materials)						
Brick	251	4	41	-	-	-
Glazed Brick	25	5	8	-	-	-
Window Pane	8	-	3	-	-	-
Mortar	1	-	1	-	-	-
Sub-Totals	315	30	88	0	0	0
Arms						
(Ammunition)						
Lead Ball	2	-	-	-	-	-
Lead Shot	15	132	3	-	-	-
Lead Sprue	-	6	1	-	-	-
Shotgun Shell	2	-	1	-	-	-
Brass Cartridge	1	-	-	-	-	-
Lead Scrap	-	2	-	-	-	-
(Gun Parts)						
Gun	-	1	-	-	-	-
Mainspring	-	1	-	-	-	-
Frizzen Spring	1	-	-	-	-	-
Lock Plate	1	-	-	-	-	-
Trigger Guard	-	1	-	-	-	-
Trigger Pull	1	1	-	-	-	-
Frizzen	1	-	-	-	-	-
Gunflint	19	12	1	-	-	1
Sub-Totals	43	156	6	0	0	1
Clothing						
(Sewing Implements)						
Awl	-	1	-	-	-	-
Needle	-	1	-	-	-	-
Scissors	1	5	-	-	-	-
(Clothing Fasteners)						
Button	-	22	2	-	-	-
Buckle	-	4	-	-	-	-
(Material Resource)						
Fabric	-	3	-	-	-	-
Leather	-	7	-	-	-	-
Sub-Totals	1	42	2	0	0	0

Table 32 Continued.

Functional Group Class/Element	Fredricks PZ	 Fea/Bu	Wall PZ	 Fea/Bu	Mitchum PZ	 Fea/Bu
Food Preparation/Consumption						
(Glass Containers)						
Whole Bottle	-	2	-	-	-	-
Bottle Fragment	42	13	22	-	-	-
Container (Indet.)	23	2	5	-	-	-
Canning Jar	2	-	-	-	-	-
Tumbler	1	-	-	-	-	-
(Ceramics)						
Ceramics	108	-	80	-	4	-
(Kitchenware)						
Kettle	-	2	-	-	-	-
Porringer	-	2	-	-	-	-
Metal Container (Indet.)	-	1	-	-	-	-
Bale Handle	-	1	-	-	-	-
(Utensils)						
Spoon	-	3	-	-	-	-
Sub-Totals	176	26	107	0	4	0
Personal						
(Ornamental)						
Bead	70	6562	2	-	-	1960
Bell	-	24	-	-	-	-
Bracelet	-	2	-	-	-	-
Coiled Wire	-	1	-	-	-	-
(Grooming)						
Mirror	1	1	-	-	-	-
(Entertainment)						
Jews Harp	-	1	-	-	-	-
Pipe	87	117	1	-	17	6
Ember Tongs	-	1	-	-	-	-
Sub-Totals	158	6709	3	0	17	1966
Construction Tools						
Axe	3	-	-	-	-	-
Sub-Totals	3	0	0	0	0	0
Farm Tools						
Hoe	3	-	-	-	-	-
Sub-Totals	3	0	0	0	0	0
Miscellaneous Hardware						
Knife	-	12	-	-	-	-
Knife Blade	-	8	-	-	-	-
Knife Handle	-	4	-	-	-	-
Knife Bolster	1	-	-	-	-	-
Hook	1	1	-	-	-	-
Fish Hook	-	2	-	-	-	-

Table 32 Continued.

Functional Group Class/Element	Fredricks PZ	 Fea/Bu	Wall PZ	 Fea/Bu	Mitchum PZ	 Fea/Bu
Horseshoe	1	-	-	-	-	-
Lamp Part	-	-	1	-	-	-
Rod/Bar	3	-	1	-	-	-
Sub-Totals	6	27	2	0	0	0
Metal Resource						
Metal Scrap	8	6	-	-	-	-
Cut/Strip/Sheet	1	15	-	-	-	2
Wire	-	9	-	-	-	-
Sub-Totals	9	30	0	0	0	2
Other						
Coal	7	1	1	-	-	-
Cinder	15	2	7	-	-	-
Slag	1	-	1	-	-	-
Fired Clay	34	4	-	-	-	-
Daub	11	-	3	-	-	-
Rock	1	-	-	-	-	-
Sub-Totals	69	7	12	0	0	0
Indeterminate						
Indeterminate	44	74	35	0	0	0
Sub-Totals	44	74	35	0	0	0
Totals	7937		255		1990	

lipping); and 3) weight (typically bricks are slightly heavier per cubic inch than daub or pottery). Glazed brick fragments were readily identifiable with all specimens exhibiting at least one flat surface. The glàze appeared to be a thin salt glaze, which is more likely to have resulted from hearth burning than from kiln burning. Historically, salt has been used to clean out built-up residue in a chimney, with the result being a thin salt-glaze deposit on the interior bricks of the hearth and chimney.

All nails, tacks, bolts, and nuts were made of iron, and most were extremely corroded which restricted identification by type and manufacture (wrought cut, machine-made, etc.). Despite this fact, all nails recovered from undisturbed contexts (i.e., burials and features at the Fredricks site) were wrought and possessed "T", "L", or "Rose" heads. Each type of nail was manufactured to serve a particular purpose. Rose-head nails, for example, were employed as an all-purpose nail; L-head nails were used to fasten trim and flooring; and T-head nails, usually also used for flooring, had a flattened disc head hammered over opposite sides of the shaft (Noel Hume 1969:252). Wrought nails date from the beginning of European contact to as late as 1790, when cut nails became popular. The presence of wrought nails in undisturbed contexts at the Fredricks site suggests that they were available as a trade good by at least 1700. Another explanation for the presence of these nails would be that they functioned as primary fasteners on wooden crates or boxes used to ship trade goods. It is unlikely that the Indians used these nails as construction fasteners; rather, they probably used them as punches for leather working, or as engraving tools. Later varieties of nails (machine-cut and wire nails) were recovered from plowzone contexts at both the Fredricks and Wall

sites. Spatial distribution of the architectural items recovered from plowzone will be discussed in the second part of this section.

In summary, there was a total of 433 items in this functional category--345 (80%) from the Fredricks site, and 88 (20%) from the plowzone at the Wall site.

Arms Group

Ammunition, gun parts, and gunflints comprised the Arms artifact group. Trade inventories and ethnohistorical accounts suggest that trade guns were an important and valuable trade item (France 1985). Guns were used for defense, as status symbols, and to increase hunting efficiency. They were probably the Euroamerican trade item most prized by the Indians.

One hundred fifty-six pieces of ammunition, nine pieces of lead sprue, 33 gunflints, one nearly complete gun, and seven other gun parts compose the Arms artifact group. Lead ammunition was divided into three size categories as illustrated in Figure 109: 1) balls (15 mm in diameter or .59 caliber) (Figure 109:a), 2) buck shot (7 to 9 mm in diameter or .30 caliber) (Figure 109:b), and 3) swan shot (4 to 6 mm diameter or .20 caliber) (Figure 109:c). Three brass shotgun shell cartridges were recovered from plowzone context (two from Fredricks and one from Wall) and were identified as 12 gauge Winchester shells. One small .22 caliber, rimfire, brass cartridge was also found in plowzone at the Fredricks site. All 132 pieces of lead ammunition retrieved from burial or feature context at the Fredricks site were of the buck shot variety, averaging 7.5 mm in diameter. Most of these exhibited stem remnants typical of shot manufactured in a gang mold (Figure 109:b). Also, most of the recovered shot were unfired or undeformed, with prominent equatorial mold seams. Lead shot this size would be packed

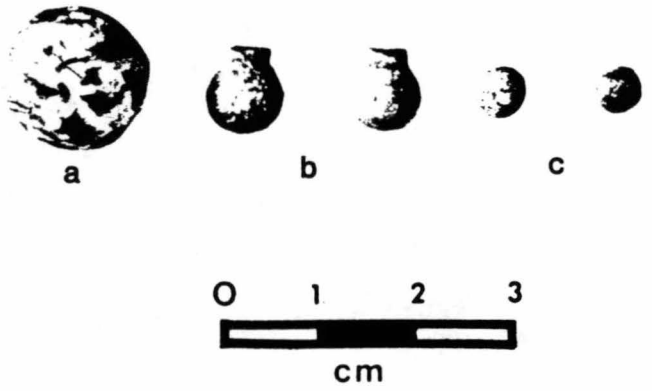


Figure 109. Sample of spherical lead ammunition from the Fredricks site.

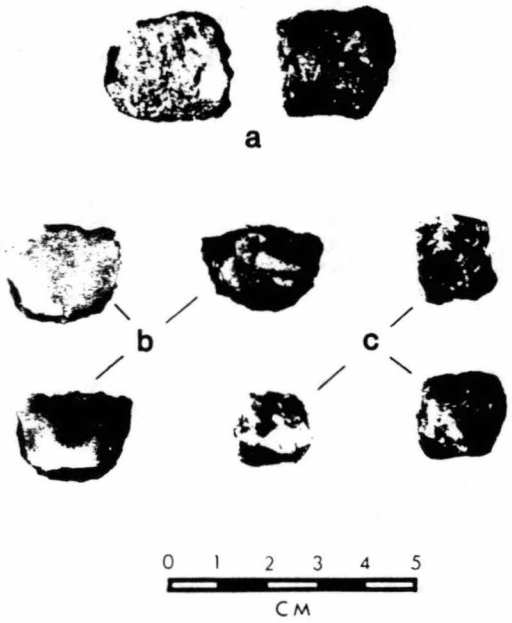


Figure 110. Gunflints from the Fredricks site: aboriginal (a); Eueopean spall type (b); and European "chip" style (c).

into the gun barrel and fired as multiple projectiles. It was confirmed by an expert on Colonial weaponry (John Bivins, personal communication) that this size shot would be suitable for hunting turkey, other fowl, deer, and rabbit.

Nine pieces of lead sprue or cut-lead scrap were recovered: eight pieces from burial/feature contexts at the Fredricks site, and one piece from the plowzone at the Wall site. The sprue pieces provide some evidence for on-site ammunition casting. The cut-lead pieces may represent sprue, or trimming from hand-carved lead pipe stems, such as the one recovered from Burial 6 at the Fredricks site.

Thirty-three gunflints were also part of this artifact group. A sample of these flints is illustrated in Figure 110. Of the total, 31 came from the Fredricks site (19 from plowzone and 12 from burial/feature contexts), one from the plowzone at the Wall site, and one from a posthole at the Mitchum site. Seven aboriginally manufactured gunflints were also found at the Fredricks site. Morphologically, aboriginal gunflints are square to rectangular in shape, thin in cross section, and bifacially worked on all four edges (Hamilton 1960:73) (Figure 110:a). Tippitt (this report) has identified the lithic resource for these gunflints as local (Orange County). Average measurements for the aboriginal flints were 20.9 mm long, 21.9 mm wide, and 6.8 mm thick. Twenty-one of the European gunflints could be measured by length, width, and thickness. All were of the spall-shaped variety (Figure 110:b). The average length was 18.6 mm, average width 21.1 mm, and average thickness 7.1 mm. Many of these exhibited "exhausted" edges. Three "chip-shaped" gunflints were also recovered from the Fredricks site (Figure 110:c). Kent (1984:248) speculates that these chip-style chunks of chert may have been the first

type of European gunflint to arrive with the earliest trade guns. He (Kent 1984:250) has recovered both spall and chip type gunflints from early Susquehannock Indian sites dating to the late 1600s. The single gunflint recovered from plowzone at the Wall site (unit 350R640) was also identified as an aboriginal gunflint of local chert (17 mm long, 28 mm wide, and 8.1 mm thick). A single gunflint of honey-colored chert was recovered from a posthole (unit 300R650) at the Mitchum site; it measured 16 mm long, 20.5 mm wide, and 8 mm thick.

Eight gun parts, including one nearly whole dog-lock, long-fowler musket, were found at the Fredricks site. All gun parts appear to be iron. Dog-locks were a transitional design between the snaphaunce and flint-lock. A "dog" or safety catch was engaged to hold the heel of the haunce in a half-cock position (Peterson 1956:23). Long-fowler refers to an early style of hunting weapon with a very long, round barrel. The nearly whole gun was found in Burial 6 at the Fredricks site. Observations in the field and subsequently in the laboratory revealed that the butt-end of the gunstock had been broken off prior to its placement in the burial. The lock plate was severely bent and the butt-end of the trigger guard broken off. Also, both ends of the gun abutted the walls of the burial pit leaving no room for a butt stock. Some wood from the barrel stock was preserved and identified as maple (Yarnell, personal communication). The hardware (firing mechanism and barrel) were identified as British and dated to 1625-1640 (John Bivins, personal communication). Other sources (Peterson 1956:31, and Neumann 1967:10) confirm this temporal placement for such an early dog-lock style of gun. Peterson (1956:31) states that this was the most popular trade gun during the 1625 to 1675 period. Dog-locks were sometimes used by the British army until after 1700. These later dog-locks had

vertically attaching sear springs, and often the tumbler had notches for half and full-cock positions. The cock (or hammer) was long and slender in style. Two hammers of nearly identical shape to the Fredricks site specimen were recovered from excavations at Upper Saratown, located on the Dan River in North Carolina and believed to date 1660-1680 (Figure 111). Early dog-lock long-fowlers were introduced to North American Indians with the first white settlers in Ralph Lane's Company in 1586 and with the Plymouth and Jamestown settlements in the early 1600s (Peterson 1956:42-44). Peterson also suggests that during the last half of the seventeenth century, long-fowlers were frequently assembled in America using barrels and locks made in Holland or England and stocks of American curly maple. Although botanical analysis of the wood preserved on the gun barrel from the Fredricks site was identified as maple, a determination of origin (Europe or America) was not possible.

Measurements on the gun from the Fredricks site are as follows: the barrel is 55-3/4 (141.6 cm) inches long; base diameter is calibrated at .55; the lock plate measures 6 inches (15.2 cm) long; and the hammer (or cock) is 2-3/4 inches (7.0 cm) high. As shown in Figure 112, the hammer is frozen in an engaged position, the frizzen extended, and the pan exposed. A flint clamped in the jaws of the hammer appears to be of the spall type. A small brass "butterfly" rear sight is located on the top rear of the barrel. The mainspring, lateral sear spring, and "dog" are all intact. The trigger pull and a portion of the trigger guard are also present. No manufacturer's marks are visible on the weapon.

A frizzen, frizzen spring, lock plate, and trigger pull, all of which appear to be from a dog-lock musket were recovered from the plowzone at the Fredricks site. One other gun part, a mainspring fragment, was found in a "bundle" associated with Burial 3. The context

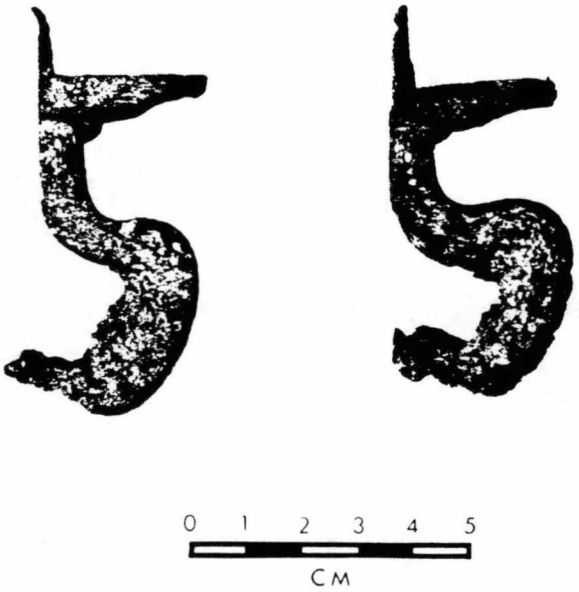


Figure 111. Dog-lock hammers from Upper Saratown (31Skla) that are similar in style to gun from Burial 6 at the Fredricks site.

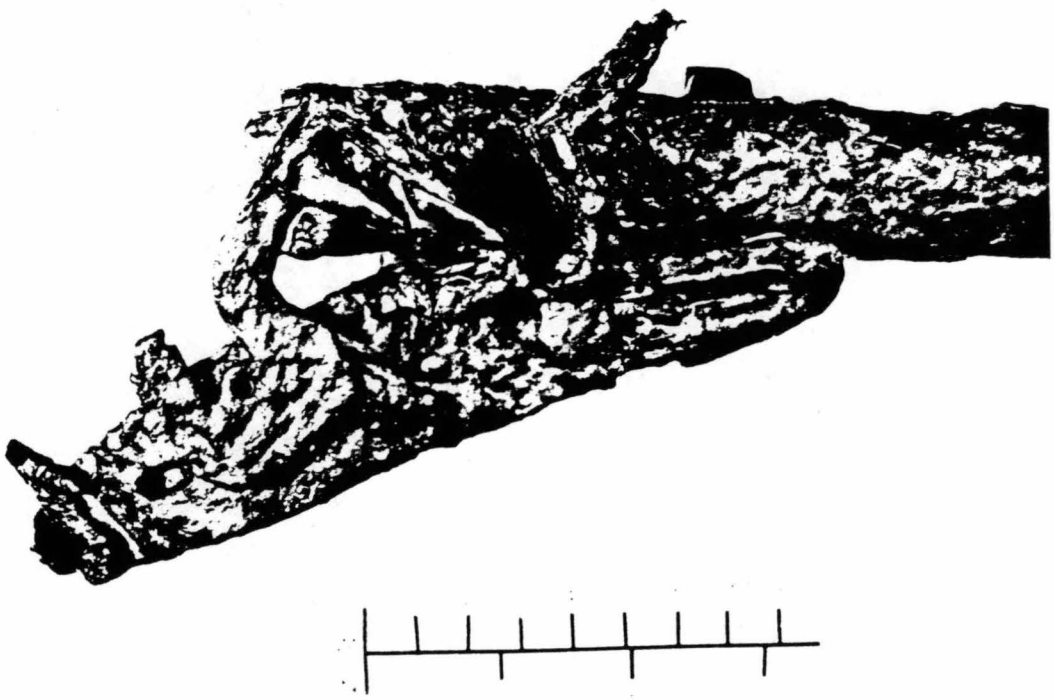


Figure 112. Close-up of dog-lock firing mechanism from Burial 6 at the Fredricks site (Note gunflint in situ in jaws of hammer).

of this item suggests that it was curated by its owner. No aboriginal modification of this gun part was observed. No gun parts were recovered from the Wall or Mitchum sites.

In summary, this functional artifact group comprised 25% of the total artifacts from the Fredricks site, 2.3% of the total from the Wall site, and .05% of the total from the Mitchum site.

Clothing Group

This artifact group is divided into three classes: 1) Clothing Fasteners, 2) Sewing Implements for the construction and repair of clothing articles, and 3) Material Resources used for clothing construction. Artifacts related to this functional group appear frequently on trade lists and were popular commodities among the Indians throughout the Historic period. France (1985) has also discussed the prevalance on trade lists of yard goods and ready-made clothing, which sometimes comprised nearly half of the total inventories. Since textiles are not often preserved archaeologically, their importance as trade items can easily be underestimated.

Clothing Fasteners consisted of four brass buckles and 24 buttons, a sample of which is illustrated in Figure 113. Two of the buttons are from the plowzone at the Wall site; the remaining 22 are from Burial 1 (19) and Burial 2 (3) at the Fredricks site. The two buttons from the Wall site were identified and dated by reference to South's (1964:115) button classification scheme. One was South's Type 32, which dates 1837-1865 (mean of 1851); the other was identified as South's Type 18, which dates 1815-1830 (mean of 1822.5). Combining the mean dates for these two items, a date of 1836 is obtained for the plowzone context at the Wall site. The buttons recovered from Burial 1 consisted of 12 black glass buttons with iron wire eyelets (some missing) (Figure

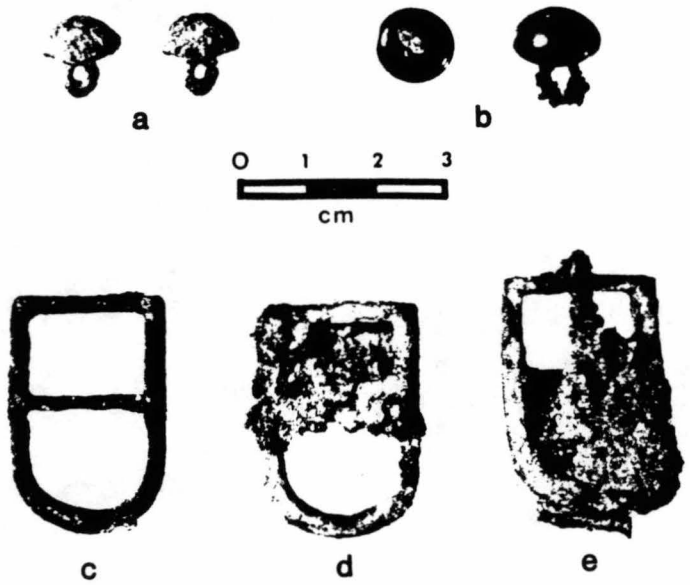


Figure 113. Sample of clothing fasteners from the Fredricks site.



Figure 114. Scissors from burials at the Fredricks site (Top pair has been cleaned and treated).

113:b), and seven solid cast pewter buttons (Figure 113:a). The black glass buttons (not typed by South) measure 11.6 to 14 mm in diameter. Ten of the 12 black glass buttons were found in the neck area of Burial 1 which suggests three possible functions: 1) strung on a necklace like beads, 2) sewn onto a garment for decoration, or 3) used as fasteners on a European trade garment. The other two black glass buttons were found in the fill of Burial 1. The seven solid cast pewter buttons, also from Burial 1, measure 12 mm in diameter and have the dome and eyelet cast as one piece. They were found in association with a "bundle" of artifacts interred with Burial 1, and were possibly used as ornamentation sewn to the outside of this bundle (see Ward, this report). All of these buttons appear to have a tri-part floral motif on the "face" or dome of the button. A similar decorative motif has been found on slightly larger buttons (14 to 16 mm diameter) from the Fort Michilimackinac site and have been dated by Stone to the early 1700s (1974:46-48). Cast pewter buttons, most of which date to the 1720s, have also been recovered at many Overhill Cherokee sites in Tennessee (Carnes 1983:192).

Three hollow-cast pewter buttons were found in Burial 2. Noel Hume (1982:89) suggests that hollow-cast buttons, of either white metal (pewter) or brass, were common during the early 18th century. A floral motif is slightly visible on these three specimens, which are more eroded than the solid cast pewter buttons previously described. These buttons were also associated with a "bundle" of other artifacts and may have been, along with numerous glass beads, used to decorate a bag.

Four brass buckles (3 complete and 1 partial) comprise the other clothing fasteners. All of these buckles were recovered from the Fredricks site and all are of standard brass construction, have a

D-shaped frame, and iron tangs (missing on two specimens). Three buckles are illustrated in Figure 113, the two on the right from Burial 8 (Figure 113:d-e) and the one on the left from Burial 3 and associated with a "bundle" (Figure 113:c). The two from Burial 8 have the remnants of leather adhering to the metal, which makes them belt or strap fasteners. One buckle fragment was recovered from the plowzone at the Fredricks site. Brass buckles of a similar style were recovered from Fort Michilimackimac where they were interpreted as being of French or British military issue (Stone 1974:32-34) and given a broad temporal range.

Sewing Implements from the Fredricks site include one iron awl from Burial 3, one iron needle from Burial 1, and six pairs of steel scissors, two pairs from Burial 1, two from Burial 3, one from Burial 6, and a scissor-handle fragment from the plowzone. The iron awl from Burial 3 was found in association with a bundle of other artifacts. Following Stone's (1974:155) criteria for identification of awls, this specimen is pointed on one end, has the remains of a wooden handle on the other end, and appears to have a squarish shank when viewed in cross-section. Awls were popular leather working tools and appear on trade lists of the period (France 1985). Often, iron nails were modified to be used for the same purposes.

The iron needle recovered from Burial 1 was missing the end with the "eye" and, therefore, could not be identified as a specific variety (Stone 1974:159). Although needles appear on trade lists, they are not often recovered from archaeological context because of their fragile nature and small size. Needles, probably used for clothing construction and beadwork, were popular among the Overhill Cherokee in the early 1700s (Newman 1977:45).

The five pairs of scissors from burial contexts at the Fredricks site appear to be of the same style, with wide blades, equal-sized oval-shaped eyes, and a central rivet well below the handle branches. As shown in Figure 114, the blade tips and eye loops of these specimens were not well preserved. In both Burial 1 and Burial 2, two pairs of scissors were found in association with "bundles". The pair of scissors in Burial 6 did not appear to be in a bundle. The individuals in Burials 1, 3, and 6 all were adult males, which may suggest sex or status indicators for these scissors. Scissors appear frequently on early trade inventories (France 1985). Considering the quantities of yard goods and clothing traded to the Indians, the presence of these scissors as clothing construction implements is not surprising. Brain (1979:274), in his discussion of acculturation by technological innovation, has placed a high "value" on scissors as tools because they have no native counterpart and represent a "new technique of use."

The Material Resources class of the Clothing group is represented by seven pieces of leather, (or hide), three pieces of a coarse-woven fabric, and two leather strap fragments fastened to the brass buckles, all recovered from burial contexts at the Fredricks site. The leather fragments were preserved by being in contact with two copper wire bracelets found on the left arm of Burial 6. The fabric was preserved by being in contact with a pair of scissors in Burial 3. Although the fiber of this fabric could not be positively identified, the weave appears to be a simple one-over and one-under pattern, and the texture resembles a coarse canvas or duck type of cloth. It is suggested that this cloth, found in association with a "bundle" of artifacts, represents the remains of a bag or tote sack, rather than an article of clothing.

In summary, the Clothing group artifacts comprise 0.5% of the Fredricks site assemblage and 0.8% of the Wall site total.

Food Preparation and Consumption Group

Items related to food preparation, serving, and storage comprise this artifact group. Classes consist of Glass Containers, Non-aboriginal Ceramics, Metal Containers, and Utensils. Included in the Glass Container class were two whole wine bottles, 77 bottle glass fragments, 30 indeterminate glass container fragments, two canning jar pieces, and one tumbler fragment. A total of 192 non-aboriginal (mostly European) ceramic fragments were analyzed, 108 from plowzone at the Fredricks site, 80 from plowzone at the Wall site, and four from plowzone at the Mitchum site. Two brass kettles (one nearly whole with an iron handle, and one small fragment), two badly decomposed pewter porringers, one indeterminate metal container fragment comprise the Metal Container class. Two latten spoons (an alloy of copper, zinc, and iron), and one broken spoon handle represent the Utensils class in the Food Preparation/Consumption artifact group.

The two dark green English wine bottles from the Fredricks site were found in burial contexts—one in Burial 3 (Figure 115) and one in Burial 4 (Figure 116). Both bottles were analyzed using Carrillo's (1974) statistical model, Baker's (1974) modification of Carrillo's model, Dumbrell's (1938) descriptive information, and Noel Hume's (1974) comparative summary. A series of 32 measurements was recorded for each specimen, including basal ring width, mouth radius, height, width, and height of kickup. A vessel profile of each bottle was constructed to facilitate comparison (Burial 4 bottle is shown in Figure 117). In summary, the measurements produced a date of 1688-1700 (mean of 1694) for the Burial 4 bottle and a date of 1700-1704 (mean of 1702) for the



Figure 115. Wine (rum) bottle from Burial 3 at the Fredricks site.

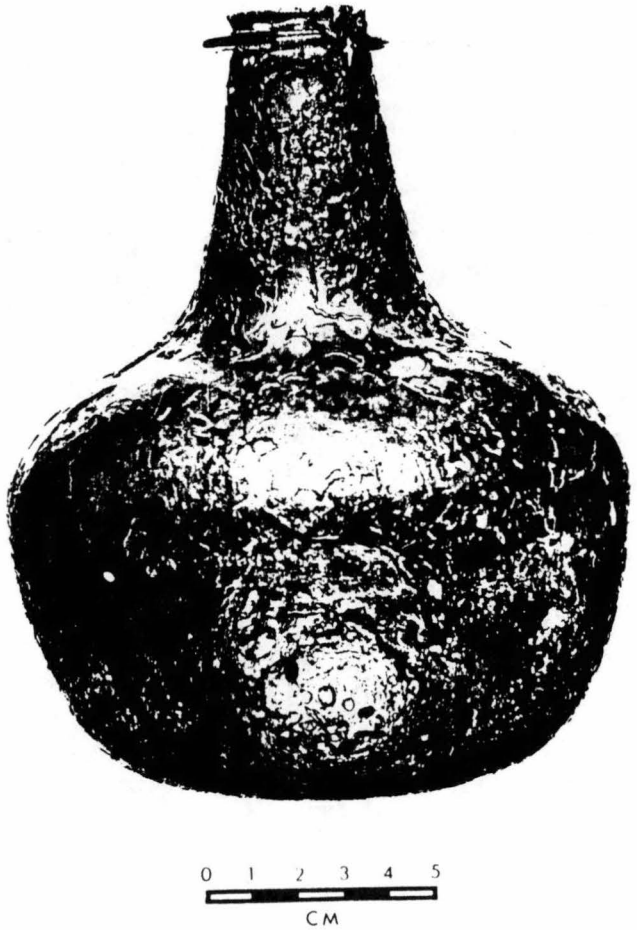


Figure 116. Wine (rum) bottle from Burial 4 at the Fredricks site.

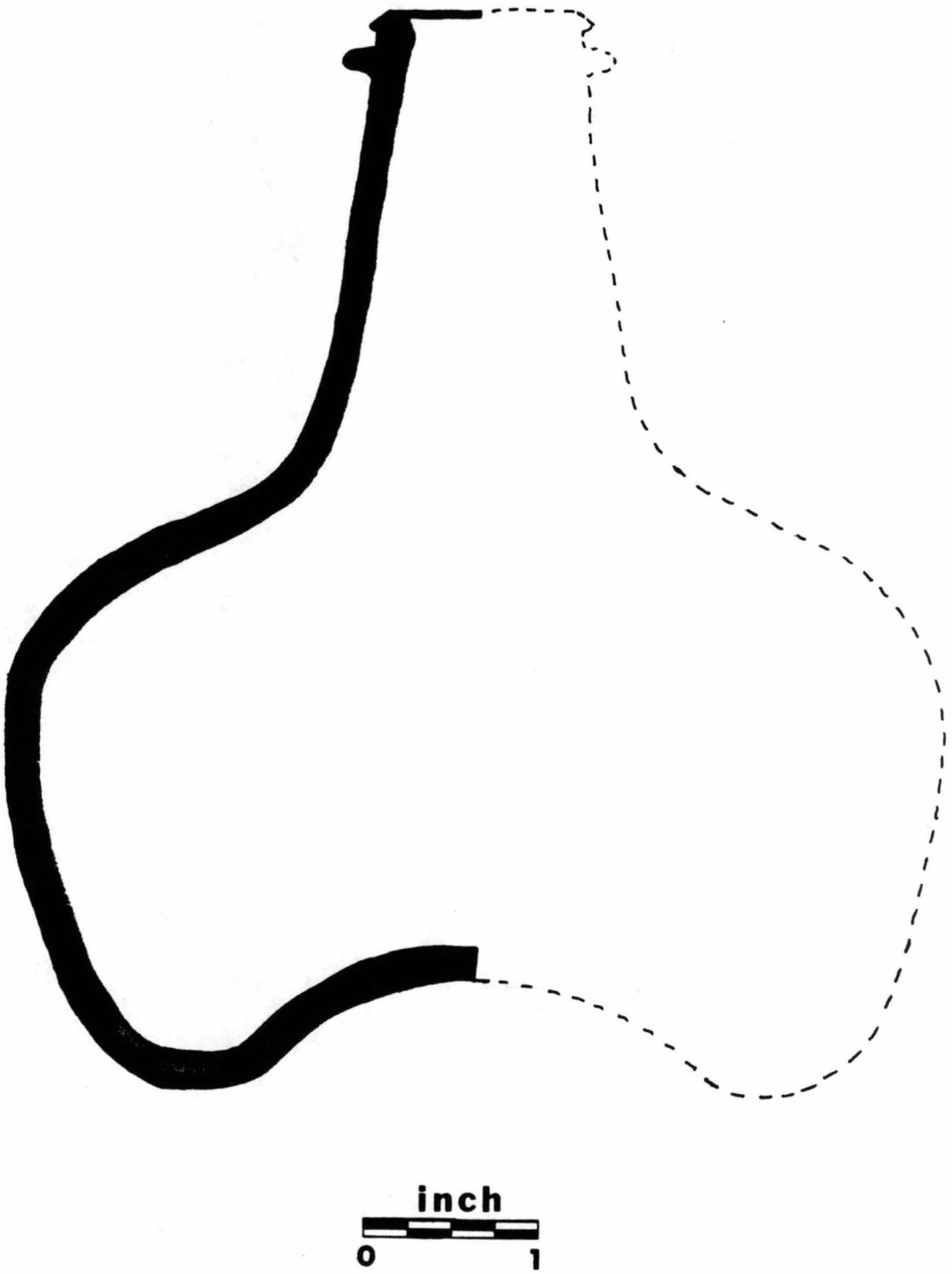


Figure 117. Profile of whole wine bottle from Burial 4 at the Fredricks site.

Burial 3 bottle.

The Burial 3 bottle, analyzed originally by Wilson (1984:7), measures 16.5 cm in height, with a maximum diameter of 43 cm. The shape short and squat with straight sides, narrow neck, and a broad, slightly domed kickup. An incised mark (possibly the initial "M" or "W") is present on the shoulder of this bottle. It could not be determined if this initial was of European or aboriginal origin. Wilson (1984:7) proposes that "this symbol may have been a trader's mark, or the mark of a European who could not afford a proper seal."

Visual comparison of the Burial 4 bottle with examples illustrated by Dumbrell (1983:36) suggested a 1680 date for this specimen. Also, lip and neck profiles were compared to those illustrated by Noel Hume (1974:195), and these provided a date of 1685. Compared to the Burial 3 bottle, this specimen is slightly shorter (15.8 cm or 6-1/4 inches) with more rounded sides and a thicker, shorter neck, and an overall width of 13.7 cm or 5 3/8 inches. Whole bottles, as containers for rum and other liquids, appear on trade lists of the period (France 1985). These bottles probably also served as water containers when rum was not available.

Fifty-five glass bottle fragments were recovered from the Fredricks site (42 from the plowzone and 13 from feature/burial contexts), and 22 pieces came from plowzone at the Wall site. Bottle glass was determined by the presence of diagnostic attributes, i.e., lip, rim, shoulder, base, kickup, wall thickness, and color. At the Fredricks site, Features 1, 9, 10 and 13 and Burials 3 and 5 contained fragments of dark green bottle glass. In Burial 3, two thick basal fragments were found in a "bundle" association. Whereas these two glass fragments represent curated items, their exact function remains undetermined. Twenty-five

glass container fragments from the Fredricks site and five fragments from plowzone at the Wall site could not be attributed to any specific type of bottle. Among the artifacts from the plowzone at the Fredricks site were two canning jar fragments (aqua in color and with threaded rims) and one clear press-molded, hexagonal tumbler. The jar and tumbler date to the mid-nineteenth century.

A total of 192 sherds of non-aboriginal ceramics were analyzed according to South's (1977:210, 217) ceramic typology and mean ceramic dating formula. All non-aboriginal ceramics were recovered from the plowzone; 108 from the Fredricks site, 80 from the Wall site, and 4 from the Mitchum site. Of the 108 sherds from the Fredricks site, only 64 (59%) could be positively identified and assigned a manufacturing range and median date. The resulting mean ceramic date was 1810.48. From the Wall site, only 56 (70%) of the 80 sherds could be identified and assigned a manufacturing date range, which produced a mean of 1811.87. The four specimens from the Mitchum site were identified but not assigned a mean ceramic date because of the small size of the sample.

One crushed but nearly whole sheet brass kettle was found in Burial 8 at the Fredricks site. The diameter of this peice was 19.5 cm, and its estimated height was 12 to 14 cm. Six fragments of an iron bail handle go with this kettle. The bail "ears" were of sheet brass and were attached to the kettle walls with paired rivets. The rim appears to have been rolled over a circular iron wire. Similar kettles have been found at the Guebert site in Illinois, dating 1670-1730 (Good 1972:166), the Tunica site (Type A, Variety 2) dating 1718 (Brain 1979:173), and the Conestoga site in Pennsylvania, dating 1676-1680 (Kent 1984:209). One kettle patch, identified by the presence of

rivets, was found in the fill of Feature 1 at the Fredricks site. No type could be determined for this fragment; however, it appears to have been aboriginally modified or cut. Sheet brass scraps without diagnostic attributes (i.e., patches, rolled rims, or "ears", etc.) were placed in the Metal Resource artifact category and will be described later. For some Southeastern Indians, it has been found that kettles were a primary source of sheet brass from which to make items of personal adornment or metal projectile points (Carnes 1983:199). Kettle parts are more common at early 18th-century sites than late 18th-century sites, which may reflect a decline in the availability of brass kettles and probably some replacement of them by tin containers (Carnes 1983:199; Newman 1977:32; and Polhemus 1984:1206).

Two badly decomposed pewter porringers were also included in the metal container subgroup. Both of these items were recovered from burial contexts at the Fredricks site. The porringer from Burial 2 was analyzed by Wilson in 1984 (Wilson 1984:8), and described as circular in shape with a single pierced handle; measuring 14 cm in diameter, a depth of 4 cm, and a 3.8 mm handle. The porringer from Burial 4 appeared to have a tapered scallop-shaped handle and measured 14.5 cm in diameter. Although both specimens probably are of British origin, no positive identification could be made. Similar porringers have been recovered from the Tunica site (Brain 1979:160), Fort Michilimackinac (Stone 1974:192), and Jamestown (Cotter and Hudson 1957:45), all dating from the early 1600s to early 1700s. Unlike brass kettles, pewter porringers are not often listed on trade inventories; however, they were popular domestic items among the White settlers in the Coastal Plain region according to personal estate records (Brad Rauschenburg, personal communication). For the inhabitants of the Fredricks site,

these porringers may have served as liquid or food containers.

Three latten spoons (two whole specimens and one handle) represent the Utensils category of artifacts from the Fredricks site. Latten, which is composed of 73% copper, 25% zinc, and 2% iron, was not made in England until the latter part of the sixteenth century (Raymond 1952:228). The latten spoon recovered from Burial 1 has a round bowl with an unadorned straight handle that is hexagonal in cross-section. There is residue of tin plating on the bowl and a small circular maker's mark on the concave bowl portion of the spoon. The mark appears to consist of a circular cartouche surrounding three spoons (the outer two pointing in the opposite direction from the center oen) flanked by two undistinquishable initials. Price (1908:35-37) contends that the three-spoon mark with initials is a common trade mark. Unfortunately, however, no guild for whitesmiths had yet been established in England in the 17th and early 18th century (Merry Outlaw, personal communication). A second complete latten spoon was found in Burial 8. Stylistically, it is different from the one described above, in that it has a seal-top finial on the handle and a fig-shaped (or oval) bowl (Figure 118). It also exhibited traces of tin plating. The touch mark, clearly visible on this specimen, consisted of a circle surrounding three spoons and the initials T and S (Figure 119). Again, no maker or exact date could be determined for this spoon. The bowl of the spoon had aboriginal modification in the form of incised geometric designs. The interior designs resembled scriptive "L"s, arranged in a series around the bowl rim. The exterior patterns (not visible in Figure 118) appeared to be a stylized chevron, again arranged in a series around the bowl perimeter. Similar geometric patterns were noted on a shell gorget from Burial 2 at the Fredricks site (see Hammett, this report). Whether this spoon was

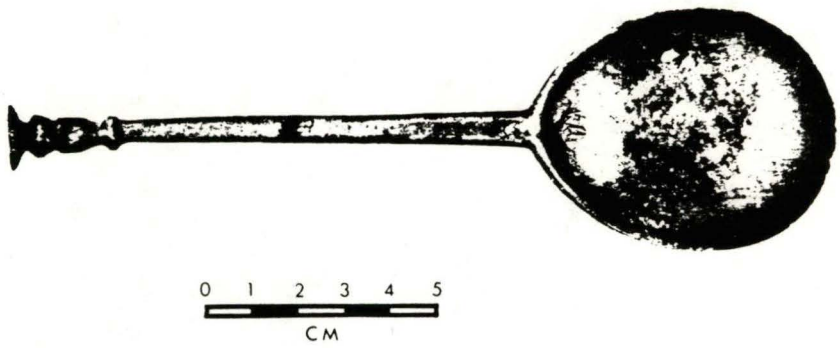


Figure 118. Latten spoon from Burial 8 at the Fredricks site.

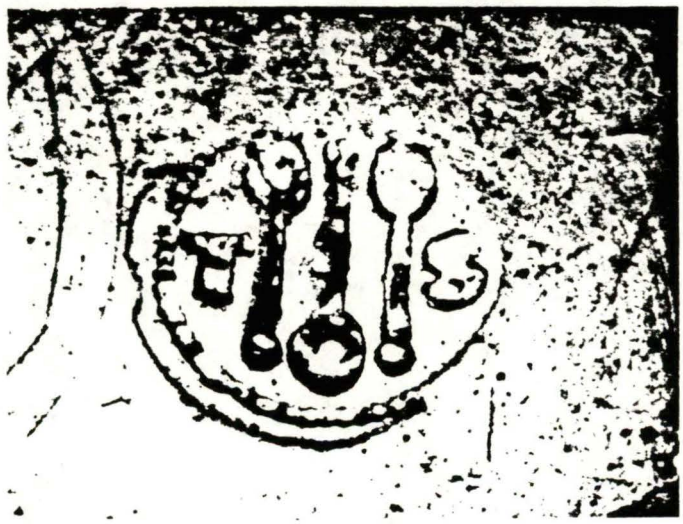


Figure 119. Close-up of touch mark on Burial 8 spoon bowl.

worn as an ornament or was just a vehicle for artistic expression is problematic. Similar spoons with similar touch marks are reported for Susquehannock sites in Pennsylvania and are believed to date to 1660-1700 (Kent 1984:287-293). Noel Hume (1982:180-181) proposes that tin plating replaced silver plating around 1650.

Finally, the mid-section of a hexagonally-shaped latten spoon handle was found in the fill of Feature 13 at the Fredricks site. The finial and bowl were missing, and the handle was bent, which suggests aboriginal modification.

In summary, the Food Preparation and Consumption artifact group comprised 2.5% of the total Euroamerican artifacts from the Fredricks site, 41.9% of the artifacts from 31Or11, and 0.2% of the artifacts from the Mitchum site.

Personal Group

This artifact group contained the greatest number and variety of Euroamerican trade items. The Personal group was divided into three classes including, 1) Ornamental, 2) Grooming, and 3) Entertainment. The Ornamental class, which represented the largest class at the Fredricks and Mitchum sites, consisted of jewelry (e.g., glass beads, brass bells, wire bracelets, and coiled wire used for ornamentation or as hair tweezers). A few of the artifacts from the Personal group were datable.

There were 8,594 glass trade beads from the three sites: 6,632 from the Fredricks site, 1,960 from the Mitchum site, and two from the plowzone at the Wall site. There also were three ivory beads from the Fredricks site. Wampum beads and other aboriginally manufactured shell beads were analyzed by Hammett (this report) and will not be discussed in this section. A sample of the trade beads is illustrated in Figure

120.

The three ivory beads were found, one each, in Burial 2, Burial 3, and Feature 13 fill. All three of the specimens are 6 mm in diameter and 5 mm long, spherical, and have polished exteriors Figure 120:h). All were yellowed with age. Beads of this type, often called "rosary beads," and have been found at Fort Michilimackimac (Stone 1974:114-115), the Tunica site (Brain 1979:221), the site of the Cherokee town of Tomotley (Carnes 1983:202), and the Guebert site (Good 1972:123). Stone (1974:115) suggests that these beads were traded individually as well as being attached to religious apparel (1974:115), and that they were present as early as 1680 and lasted through the mid-1700s.

Glass beads were present in most contexts at the Fredricks site (none were recovered from Feature 8): 32 were from surface collections, 6,146 from nine burials, 416 from six features, and 38 from 15 units of plowzone. At the Mitchum site, glass beads were found in Burial 1 (1,775) and six features (185). A special coding format created for historic bead analysis combined information from Kidd and Kidd's (1970) typology, Karklins (1982) analysis format, and Carnes (1983:203) analysis of beads from the site of the Cherokee town of Tomotley. Using this combined format, all beads were examined for 1) manufacturing techniques (drawn, wound, molded, carved, etc.); 2) size (very small - <2 mm dia., small - 2-4 mm dia., medium - 4-6 mm dia., large - 6-10 mm dia., very large - 10-17 mm dia., and very, very large - >17 mm); 3) diaphaneity (opaque, transparent, translucent, burned, etc.); and 4) color (an attempt was made to match color with Kidd and Kidd's color chart for consistency). Bead types were assessed as to compound or simple construction, and surface decoration (stripes, glass inlay,

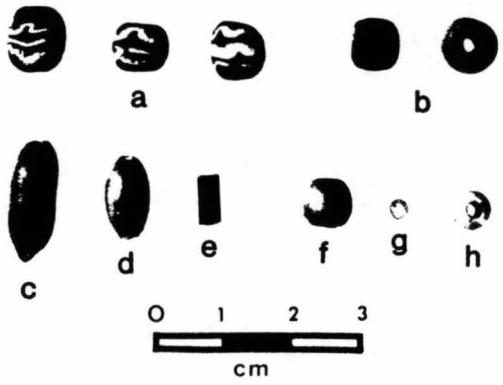


Figure 120. Sample of glass (a-g) and ivory (h) beads from the Fredricks site.

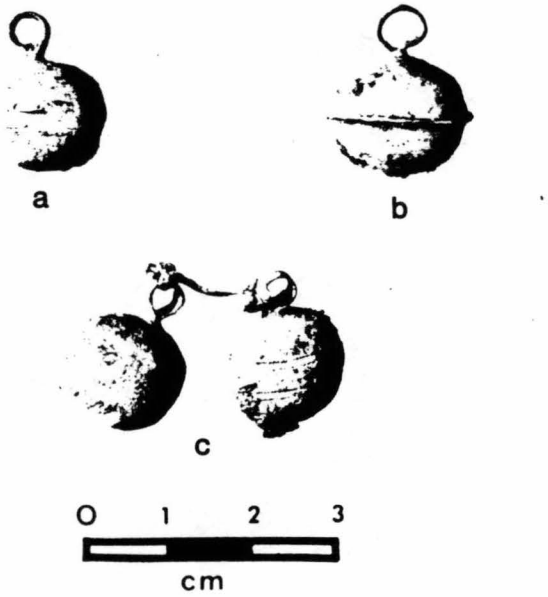


Figure 121. Sample of brass bells from Burial 7 (a, c) and Feature 13 (b) at the Fredricks site.

etc.). Color was difficult to determine in cases where patination was extreme. Following a technique described by Polhemus (1984:1180), bead clarity was determined by dampening each specimen and placing it under a consistent light source. This technique reduces the opacity created by weathering and patina and allows true (or nearly true) bead color to be revealed. Once dry, the protective patina returns. The "original" condition of the glass, whether opaque or translucent, presented another critical attribute for color determination. As pointed out by Carnes (1983:203), "true" black beads are opaque in diaphaniety, whereas translucent black beads actually appear to be a dark burgundy or dark rose brown when held under illumination. "White" beads also vary in shades and opacity. Heavy patination observed on a few colored beads, namely bright mint green, light gold, and some turquoise, was observed, which suggests a rapid decomposition of the glass due to the particular coloring agents through chemical reaction to acidic soils.

Seed beads (ranging in diameter of 2 to 4 mm) were the most abundant size and probably sewn on articles of clothing, as well as strung for necklaces. For comparative purposes, all beads were regrouped and quantified into the four most popular colors, white, black, blue, and redwood over green. Of the total beads from the Fredricks site, the breakdown was: 6,111 (92%) white; 210 (3%) redwood over green/gray core; 189 (3%) black (transparent and opaque combined); 81 (1%) blue (all shades); 22 (0.5%) were fancy (striped, inlaid, etc.); and 19 (0.5%) other colors. Obviously, white beads were, by far, the most abundant. For the Mitchum site the breakdown was: 1,894 (97%) blue (all shades); 40 (2%) white; 12 (0.7%) black (transparent and opaque); 9 (0.3%) redwood over green/gray core; and 5 (0.1%) yellow. No fancy beads were found at this site. Kent

(1984:211-223) has placed the peak popularity for blue seed beads at 1575 to 1760, with a major increase from 1600 to 1665. The popularity of white beads seems to have remained fairly consistent throughout the Historic period. For the most part, however, the trade records lack details of glass beads. With only the beads from the Fredricks and Mitchum sites to compare, a more detailed trade bead chronlogy for this region could not be attempted. Comparative bead studies on other Piedmont North Carolina Contact period sites hopefully will be the focus of future research.

A few of the fancy beads did provide additional chronological information. "Roman" beads (Figure 120:a) recovered from Burial 1 at the Fredricks site were as opaque black with yellow glass inlaid lines, and of wire-wound construction (Kidd and Kidd's Type IIj). Brain (1979:113) contends that these beads originated in Amsterdam, and he reports dates of 1669 to 1799 for the type. They have been found at the Tunica site (Brain 1979:113), the Guebert site (Good 1972:115), Fort Michilimackimac (Stone 1974:99), the Tomotley site (Carnes 1983:206), and Susquehannock sites in Pennsylvania (Kent 1984:214-215). A large blue bead (translucent) (Figure 120:c), identified as Kidd and Kidd's Type IIa 55 was found in Burial 6 at the Fredricks site. These are dated 1600-1800 by Brain (1979:112). An opaque turquoise bead with a compound white/red stripe, found in Burial 2 at the Fredricks site, is dated 1680-1836 (Brain 1979):104). It is Kidd and Kidd's Type IIb 7. Several varieties of Cornaline de Allepo beads, identified as Kidd and Kidd's Type IVa were found at both the Fredricks and Mitchum sites. In general, these beads have a redwood colored opaque slip over a gray, green, clear, or white core and occur in all sizes (Figures 120:b). They range in date from 1600 to 1836 (Brain 1979:106). A single dark

red-purple tubular bead, found in Feature 13 at the Fredricks site, may represent glass wampum (Figure 120:e). Good (1972:120) found similar beads at the Guebert site, and assigns them a date of 1660-1677. Three translucent navy blue beads with alternating red- and white stripes (Figures 120:d) were found in Features 9 and 13 at the Fredricks site and can be dated to 1700-1740 (Good 1972:109).

Finally, Kent (1984:213) offers a few critical observations on the use of bead types as chronological indicators. At Susquehannock sites, straw beads (tubular or cane beads) had their greatest popularity between 1630 and 1670; sites dating after 1670 contained fewer straw beads and more tumbled seed beads. Also, numbers of wire-wound beads (all sizes) increased on sites dating to the mid to late 18th century. Polhemus' (1984:1187) observations at Overhill Cherokee town sites confirm these temporal trends in bead popularity. The only wire-wound bead found at Fredricks site were the "Roman" beads previously mentioned. Based on the above information, a date between 1670 and 1740 for the historic occupation of the Fredricks site is reasonable.

Twenty-four sheet brass bells were also included in the Personal artifact group. Twenty-three of these bells were found in Burial 7 at the Fredricks site. The bells appear to have been sewn together on straps (Figure 121:c) or on a garment and fastened around the knees of the individual, 12 around one knee and 11 around the other. A sample of these bells, along with a single bell found in Feature 13 fill, is shown in Figure 121. The bells from Burial 7 are identified as flush-edge type, made of stamped sheet brass by flush-loop construction, and measure 15.5 mm in diameter (Figure 121:a,c). A small iron sphere was visible through the holes of the lower hemisphere of each bell. Brain (1979:197) reported finding identical bells at the Tunica site that date

1699-1730. The single bell from Feature 13 is also made from stamped sheet brass, cut the equatorial seam is flanged rather than flush (Figure 121:b). It measures 18 mm in diameter and has a flush loop for attachment. This variety, which is often referred to as a "Saturn Bell," has been found at the Fatherland site (1699-1730), Fort Michilimackimac (1700-1730), and other sites dating 1659-1681 (Brain 1979:202). Bells appear frequently on trade inventories and apparently were popular ornamental items to the Indians. A chronology for bells in the Piedmont region of North Carolina could be attempted by incorporating bells from Upper Saratown (31Sk1a) and western Cherokee sites into a comparative framework.

Two copper wire bracelets were found in Burial 6 at the Fredricks site. Both bracelets are of the same style and gauge of wire but are of slightly different size (Figure 122). These compound C-shaped bracelets were found on the left forearm of the individual and appeared to be partially covered with leather (possibly the remains of a garment lying on the bracelets). Bracelets of a similar style but constructed of iron wire were found at the Upper Saratown site (31Sk1a) and one made of brass wire was found at the Madison site (31Rk6). All of these others were found in burial contexts. C-Bracelets are diagnostic of the early to middle period of Indian trade (Brain 1979:193), when they were common ornamental items. Often bulk quantities of metal wire (brass, iron, copper, etc.) were traded to the Indians specifically intended for modification into ornaments, fishhooks, or coils. A single brass wire coil was found in Feature 13 fill at the Fredricks site (Figure 123:d). Similar coils have been found at the Tunica site (Brain 1979:196) and at many of the Cherokee sites in Tennessee (Carnes 1983:208; Polhemus 1984:1206), again mostly in burial contexts. It has been suggested that

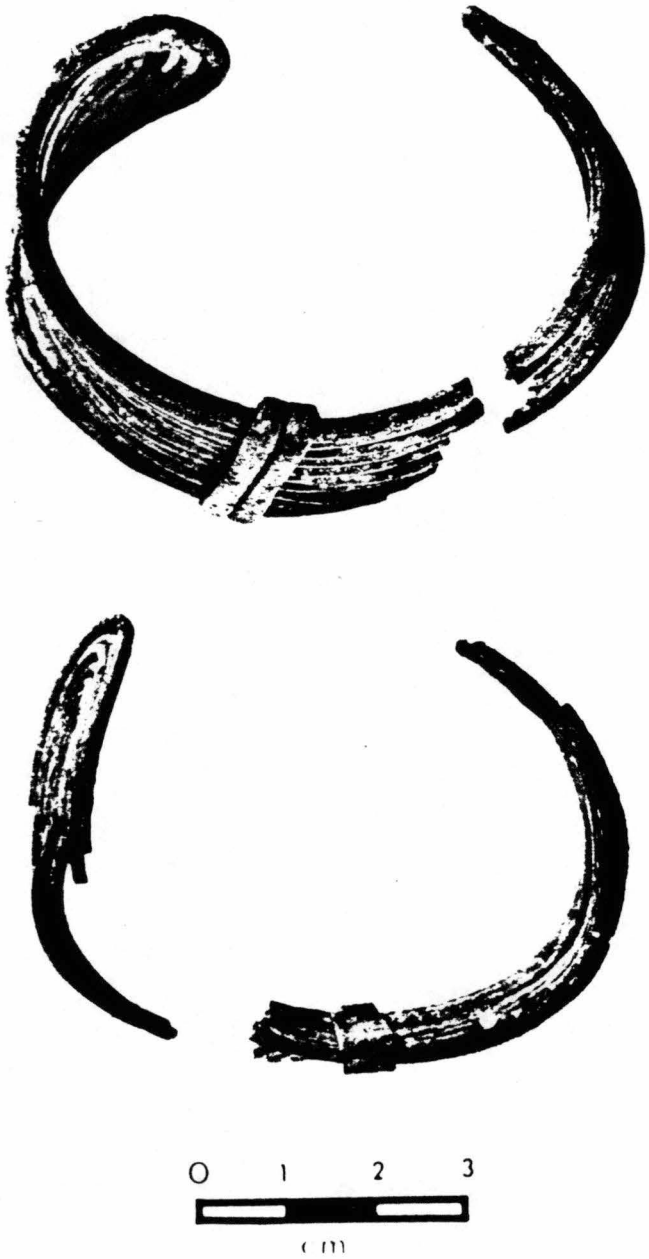


Figure 122. C-shaped wire bracelets from Burial 6 at the Fredricks site (after cleaning).

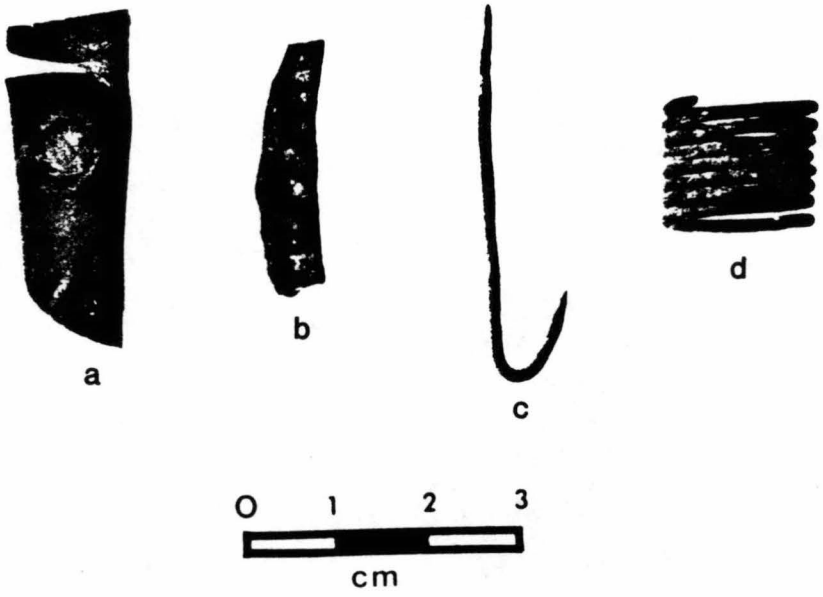


Figure 123. Sample of aboriginally modified metal artifacts from the Fredricks site: brass kettle fragments (a-b); brass wire fish hook (c); and brass wire coil (d).

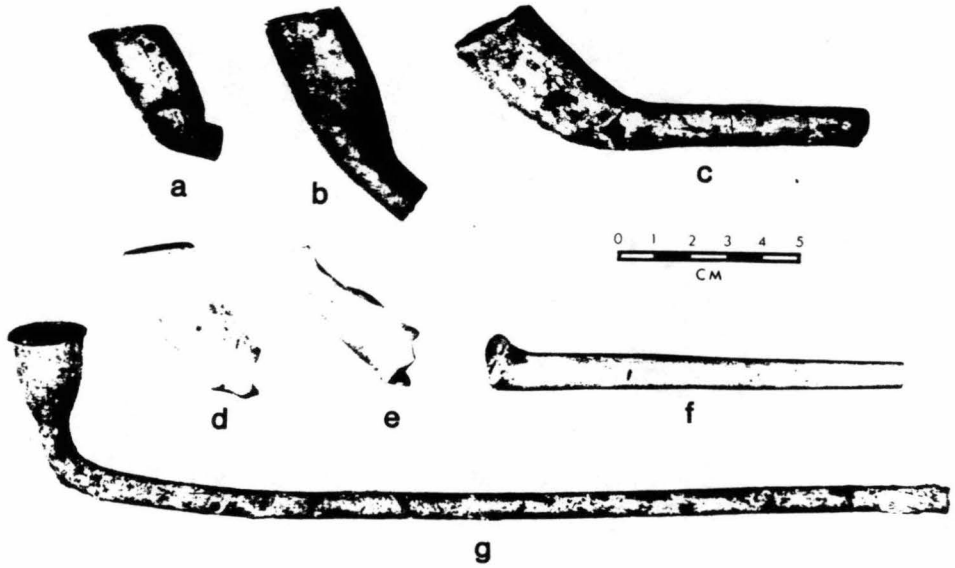


Figure 124. Sample of pipes from the Fredricks site: aboriginal pipes (a-c); European kaolin pipes (d-f); and European pewter pipe (g).

these coils functioned either as ornaments or sometimes as hair pluckers (tweezers) or ear ornaments (Brain 1979:196). A specific function of this coil from the Fredricks site, however, could not be determined from its context or appearance.

Two pieces of flat glass, both identified as mirror fragments, were found at the Fredricks site, one from the plowzone and another from the fill of the wall trench of Structure 1. No mirror fragments were recovered from burial contexts. These mirror fragments comprise the Grooming Implement class of Personal artifacts. Mirrors, or looking glasses, show up frequently on trade lists (France 1985). It has been noted at Cherokee sites, however, that mirrors sometimes functioned as personal adornment, suspended from the neck or sewn on clothing, rather than as grooming implements (Carnes 1983:208).

The third class of Personal artifacts have been collectively termed Entertainment and include smoking pipes, ember tongs, and an iron Jew's harp. In the category of smoking pipes, there were 204 pipe fragments (103 European or kaolin, and 101 of aboriginal manufacture) from the Fredricks site. From the Mitchum site, there were 23 pipe fragments (1 European and 22 aboriginal). One molded, stub-stemmed pipe fragment from the plowzone at the Wall site probably dates to the early 19th century. From the Fredricks site, in addition to the Kaolin pipes, there were two pewter pipes, a whole pipe from Burial 3 and a carved pewter stem from Burial 6. A sample of pipes from the Fredricks site, to illustrate bowl shape, stem size, and decorative elements, is provided in Figure 124.

Stem fragments of kaolin pipes from the Fredricks site were sorted by context and by bore diameter (Table 33). A general period of manufacture was calculated for each bore diameter using the formula of

Table 33. Kaolin pipe stem fragments by context and bore diameter.

Context	Bore Diameter 5/64th	6/64th	7/64th	8/64th	Total
Plowzone	0	8	9	1	18
Bu. 1	-	1	-	-	1
Bu. 3	-	2	-	-	2
Bu. 4	-	-	1	-	1
Bu. 5	-	1	3	-	4
Bu. 9	-	1	-	-	1
Fea. 1	-	1	-	-	1
Fea. 9	2	1	2	-	5
Fea. 10	-	-	3	-	3
Fea. 11	-	-	2	-	2
Fea. 12	-	1	-	-	1
Fea. 13	-	-	3	-	3
Total	2	16	23	1	42
Percent	5	38	55	2	100
Period	1710-1750	1680-1710	1650-1680	1620-1659	

(Harrington 1954:6-8). Of 42 measurable mid-section fragments, 55% belong to a 1650-1680 period of manufacture, whereas 33% date to 1680-1710. When Binford's (1962:19-21) regression formula was applied to the sample, a date of 1678.95 was determined for plowzone pipe stems, and a date of 1683.16 was calculated for pipe stems from burial/feature contexts. This finding strongly suggests that the pipe stems recovered in the plowzone can be identified with the same occupation that is responsible for the burials and features. Because of the small sample (18 stems from plowzone and 24 from burial/feature contexts), and criticisms of the validity of pipe-stem dating, however, caution must be exercised in the interpretation of these dates.

Aboriginally manufactured clay pipes from the Fredricks and Mitchum sites were analyzed for form, decoration, composition, completeness, and dimensions of stem length, bore diameter, and bowl-to-stem angle. A single reconstructable pipe was recovered in the fill of Feature 13 (Figure 124:c). Decorations on a few of the bowls and stem sections included incised bands, roulettes, punctations, and dentate designs. Paste consisted of micaceous clays, sometimes with fine-grain grit tempering. Although none was glazed, many exhibited evidence of burning through soot deposits. A few specimens, like the one shown in Figure 124:a, revealed marks of metal tools. An attempt was made to correlate bore diameters of the finer-made, or tooled, aboriginal pipes to the bore diameters of European kaolin pipes. Using the same gauges as were used on the aboriginal specimens, an average bore diameter of 8/64 in (3.7mm) was obtained from 26 specimens. Binford's (1962:19-21) regression formula was used on 13 specimens to obtain a date of 1673.21 for burial/feature contexts.

The cast pewter pipe recovered from Burial 3 at the Fredricks site

was identified as a tulip-bowl style, possibly of Dutch or British origin (Figure 124:g and Figure 125). Although cast pewter pipes could not be found on any of the trade lists reviewed (France 1985), they have been found archaeologically at Iroquois sites in New Jersey dating to 1650-1687 (Heye and Pepper 1915:50), and Kent (1984:287) reported a pewter pipe stem from the Conestoga site (ca. 1680s). It is also possible that this pipe could be of Anglo-American origin and was produced specifically for trade among the Indians. Noel Hume (1982:308) has noted that metal pipes were popular items among White hunters and travelers in the latter part of the 18th century because clay pipes tended to be too fragile for travel. Archaeological remains of lead ammunition manufacturing at the Fredricks site suggests that the natives themselves were knowledgeable about casting methods and could have made this pipe. A second, hand-carved pewter pipe stem found in Burial 6 strengthens this observation (Figure 126). The stem consists of a hollow tube of pewter encased in an outer sleeve with geometric cut-outs decorating the bowl end. Three small spurs were noticed at this end and may have served to attach a wooden bowl (not archaeologically preserved). Observations in the field during excavation of this object suggested the deteriorated remains of a metal bowl rim or liner were present. A funnel-shaped, hand-made pewter object was found in Feature 13 which has been tentatively identified as a pipe bowl liner for a wooden bowl. This artifact is shown in Figure 126. A similar pipe bowl liner made of copper was found at an historic Indian cemetery known as the Grimsby site (Kenyon 1982:108). It seems likely that a bowl liner of this type would have been used with the carved pipe stem from Burial 6. An artist's reconstruction, Figure 127, helps to visualize this possible combination; although no direct archaeological association of

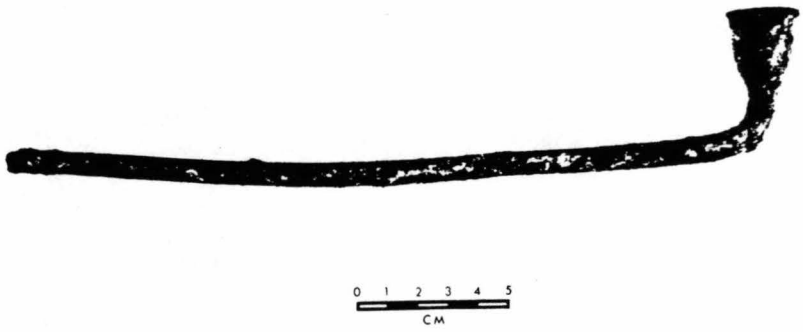


Figure 125. Cast pewter tulip bowl style pipe from Burial 3 at the Fredricks site.



Figure 126. Hand-carved pipe stem from Burial 6 (left) and pewter pipe bowl liner from Feature 13 (right) at the Fredricks site.

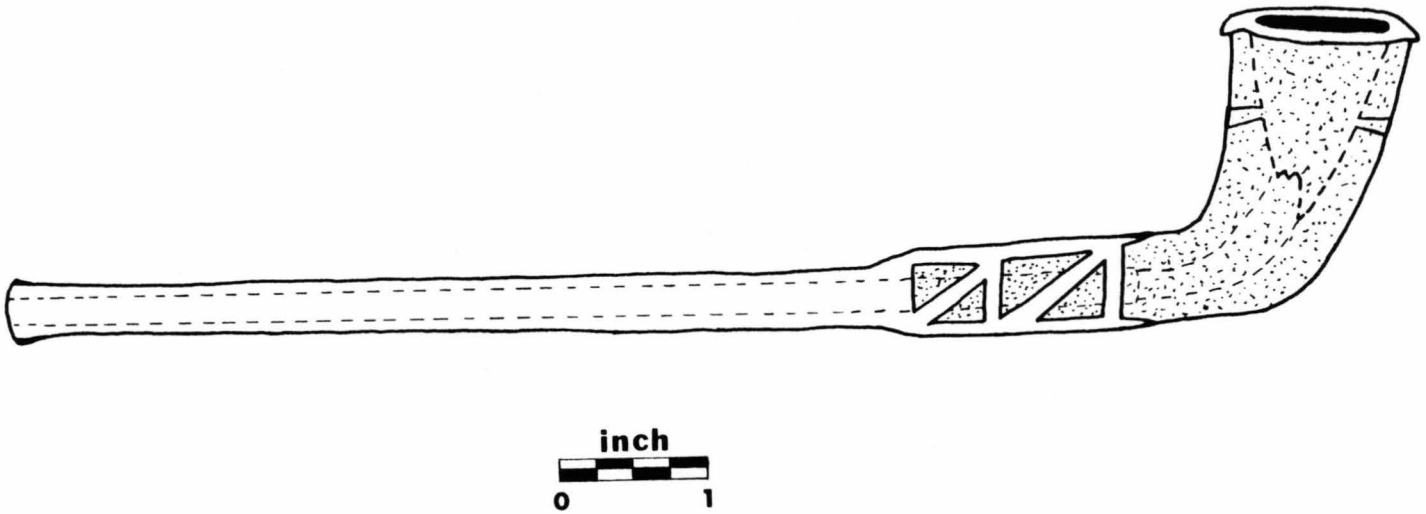


Figure 127. Artist's reconstruction of pewter pipestem with wooden bowl and pewter bowl liner, based on artifacts from Burial 6 and Feature 13 at the Fredricks site.

these two specimens is proposed.

An iron ember tong (Figure 128), also known as a "smoker's companion" or spring tong, was found in Burial 3 at the Fredricks site. Wilson (1984:4) has suggested that this item was associated with a smoker's kit or bundle in this burial. Ember tongs or "tobacco tongues" are described in ethnohistorical accounts of this period and appear on trade inventories (France 1985). Noel Hume (1982:309) suggests that ember tongs were used throughout the 17th and 18th century. This tong is made of iron and has rounded pincher arms and flattened handle ends for easy gripping. The spring clip found with the specimen was broken off.

The last item in the Personal artifact group to be discussed is an iron Jew's harp recovered from a bundle of artifacts in Burial 2 at the Fredricks site. This item was very corroded and fragmentary and had to be drawn in situ and then removed in pieces. Jew's harps have been found archaeologically at other contact Indian sites, i.e., the Guebert site (Good 1972:132).

In summary, the Personal group of Euroamerican artifacts comprised 86.5% of the total assemblage from the Fredricks site; 1.1% of the artifacts from the Wall site and 99.6% of the artifacts from the Mitchum site, with glass trade beads being the most abundant artifact in this category.

Construction Tool Group

Three iron axe heads comprise this artifact group. The specimens are from Burial 3, Burial 5, and the bottom of Feature 9 at the Fredricks site. The specimen from Feature 9 was the blade portion only and may have been discarded when it broke and could not be repaired. The two axes from Burials 3 and 5 were complete and nearly identical in

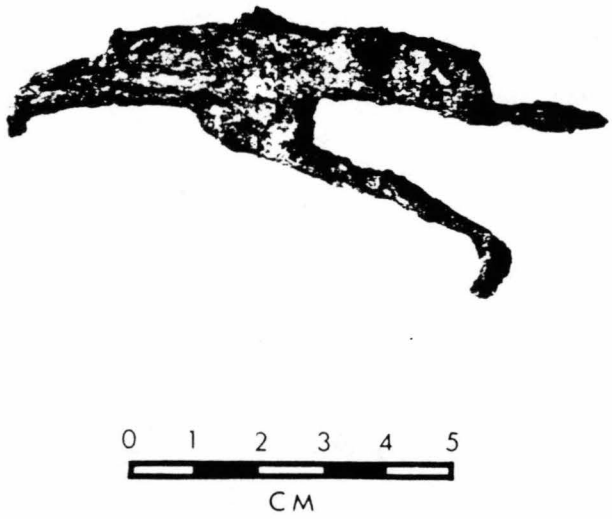


Figure 128. Iron ember tongs from Burial 3 at the Fredricks site.

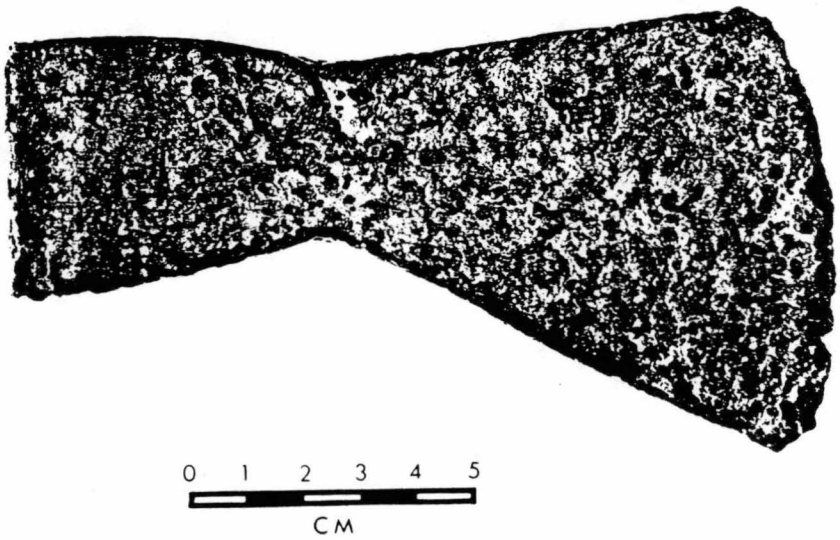


Figure 129. Cleaned and treated iron axe head from Burial 5 at the Fredricks site.

style. Figure 129 shows the axe from Burial 5 after cleaning. The broken, discarded axe fragment indicates that recycling of metal was not always practiced, and may further indicate that replacement tools were readily available from traders. The two intact specimens have oval eyes, and the blades have a maximum width of approximately 3 inches (7.7 cm) and length of 5-1/2 inches (14.3 cm).

Axes of this type were made by bending a thick sheet of iron around a mandrel to form the eye of the haft, then forging the two ends of the sheet together into a blade, and finally spreading and thinning the blade toward the bit which was ground to a sharp edge. Sometimes a steel bit was added to the working edge to prolong sharpness. Similar axes have been found at the Tunica site (Brain 1979:140), the Guebert site (Good 1972:162), Fort Michilimackinac (Stone 1974:301), and Susquehannock sites in Pennsylvania (Kent 1984:236). Also called hatchets or tomahawks on trade inventories, small axes of this variety were popular commodities in the Indian trade (France 1985). Brain (1979:140) notes that "while axes were distributed widely throughout the Historic period there was little or no change in basic styles, which renders them of little use for dating or other correlations."

The Construction Tool category comprised less than .03% of the total assemblage from the Fredricks site, and was missing from the other two sites.

Farm Tool Group

Three iron hoe blades from the Fredricks site comprise this artifact group. There were two complete blades, one each from Burials 6 and 9, and a broken blade from the bottom of Feature 13. The specimen from Burial 6 is a broad-blade variety with a blade width of 8 inches (20 cm) and blade length of 6-1/2 inches (16.5 cm). As shown in Figure

130, this piece has a cylindrical haft which is heavily reinforced by a strong ridge at ridge at the bottom, at which point a prominent tang extends approximately half-way down the inner surface of the blade. The blade has rounded shoulders and a flaring bit. This hoe is identical to the type found at the Tunica site and classed by Brain (1979:144) as Type A, Variety 1. Broad hoes have also been recovered from many of the Overhill Cherokee towns (Carnes 1983:176), where they replaced stone and wooden tools for digging and farming. On period trade lists, broad hoes appear to have a higher value in deerskins than narrower hoes (France 1985).

The second intact iron hoe was recovered from Burial 9 and is a narrow-blade variety (Figure 131). This type of hoe has been described at the Tunica site by Brain (1979:146) as Type C. It was constructed in a similar fashion to the Type A hoe except that the haft was not reinforced and the central tang was not pronounced. The blade is six inches (15 cm) wide and eight inches (20 cm) long. Another hoe of this type was found at Jamestown (Cotter and Hudson 1957:74) and dates to the late 17th century.

The broken hoe from Feature 13 seems to be the broad-blade variety, but the blade is missing. No evidence of retouch or reuse was noted on this hoe fragment.

Farm Tools comprised less than 0.03% of the total artifact assemblage at the Fredricks site, and was missing at the Wall and Mitchum sites.

Miscellaneous Hardware Group

Several miscellaneous hardware items were included in this artifact group: 25 knife parts, two iron hooks, two brass wire fishhooks, two iron horseshoes, one lamp part, and three unidentified rod/bar



Figure 130. Broad-bladed iron hoe from Burial 6 at the Fredricks site.

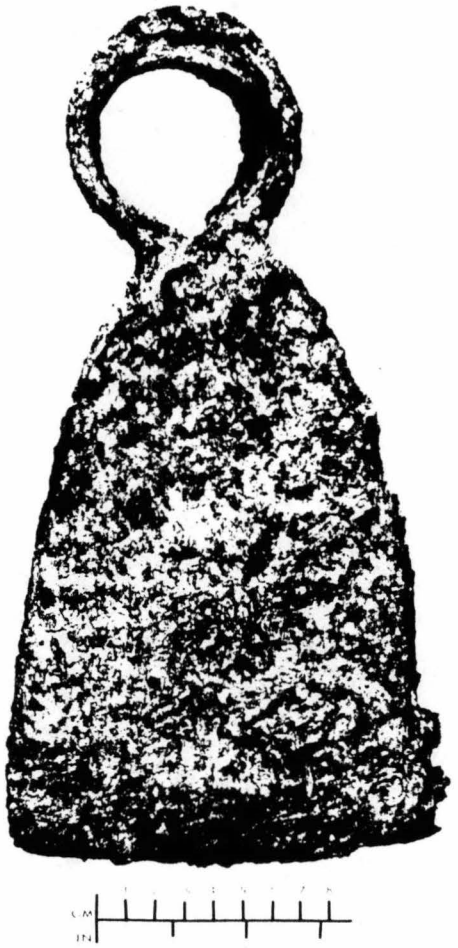


Figure 131. Narrow-bladed iron hoe from Burial 9 at the Fredricks site.

fragments. All items in this group came from the Fredricks site, except one horseshoe and the lamp part which were found in the plowzone at the Wall site. Most numerous in this group were knives and knife parts: 12 whole (or nearly whole) case knives, eight case knife blade fragments, four handle fragments, and one possible bolster fragment. All of these items were found in feature and burial contexts, except the bolster which was found in the plowzone. All knives were the case knife type, with steel blades and handle sidings of bone or wood. Pairs of knives were recovered from Burial 1 (Figure 132) and Burial 3. Two knives were found in Burial 2, but not together; also a single knife was found in Burial 5. Seven other knife parts, each representing a single knife, were found in Burial 8 and Burial 9. The two knives from Burial 3 appear to have wooden handle sidings. Measurements taken on the more complete knives indicate that blade lengths ranged from 3 to 5 in (8 to 12 cm), and blade width from 1/2 to 1-1/4 in (1.5-3 cm). Handle shape also varied from a rounded end to a beveled apex. Most blade tips were missing. Knives were common trade items, typically sold or traded in bulk quantity (France 1985). Brain (1979:153) states that metal knives were the first European item to replace a native counterpart (stone knives).

Two brass wire fishhooks were recovered from undisturbed contexts at the Fredricks site, one from the upper fill of Burial 1 and the other from the fill of Feature 13. The specimen from Feature 13 is shown in Figure 123:c. Both fishhooks had tapered tips and flattened tops for attachment. European-made fishhooks appear on trade inventories and were sold by the dozen (France 1985). One iron snap hook, made to be attached to a leather strap, was recovered from the plowzone at the Fredricks site. Another nonspecific iron hook was found in the fill of

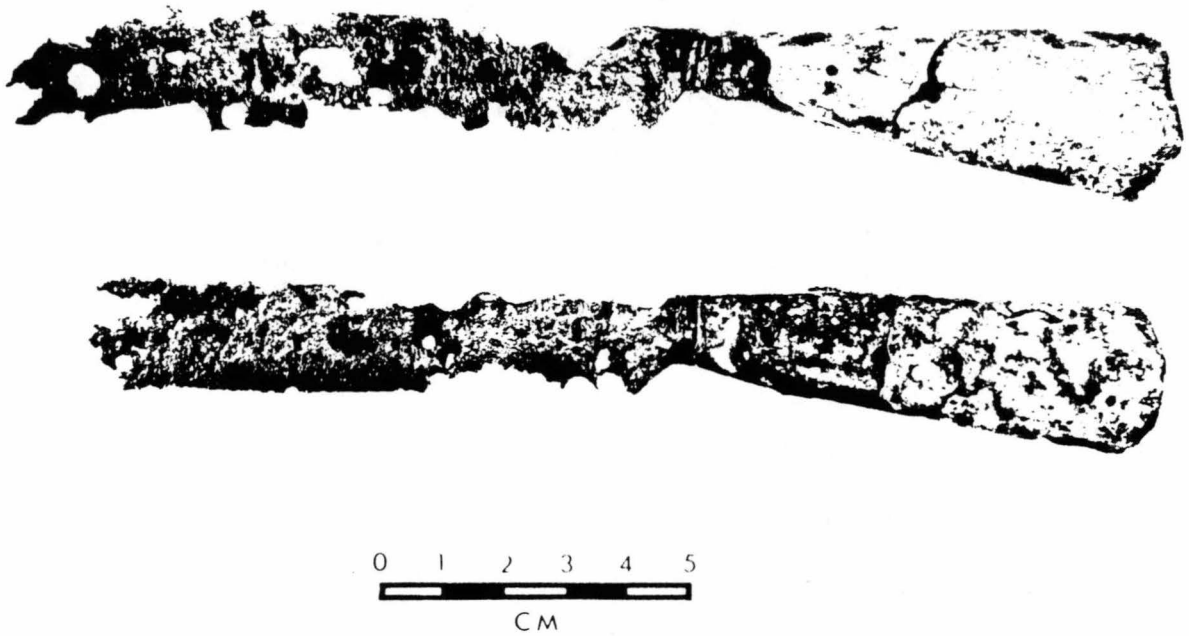


Figure 132. Two bone-handled, steel-bladed case knives from Burial 1 at the Fredricks site.

Feature 12.

Miscellaneous Hardware items comprised .4% of the Euroamerican artifact assemblage from the Fredricks site, less than 0.8% of the assemblage from the Wall site, and none of the assemblage from the Mitchum site.

Metal Resource Group

A Metal Resource group was created for this analysis to include all functionally indeterminant metal artifacts from the excavations at the Fredricks and Mitchum sites. Two sheet copper ear spools, probably of aboriginal manufacture, and constructed of native materials, are included in this category from the Mitchum site and, therefore, are not considered Euroamerican in origin. The remaining artifacts, all from the Fredricks site, consist of nine pieces of wire, 14 pieces of metal scrap (lead and iron), and 16 pieces of cut sheet-metal strips, mostly of brass. Many of these pieces probably represent by-products of aboriginally modified Euroamerican artifacts. The Metal Resource category made up 0.5% of the Euroamerican artifacts from the Fredricks site, and 0.1% of the artifacts from the Mitchum site.

"Other" Group

This artifact group was created to contain by-products from heat-generating activities and construction debris, i.e., coal, slag, cinders, daub, fired clay, and rock, some of which were of Euroamerican origin and some aboriginal. Most of these items occurred in plowzone context at the Fredricks site and the Wall site. Three pieces of coal and cinders were recovered from the upper mixed fill of features and burials.

In total, 76 pieces of by-products/debris came from the Fredricks site representing (0.9% of the total Euroamerican artifacts), and 12

pieces came from plowzone at Wall site (4.7% of the total); there were no such items found at the Mitchum site.

Indeterminate Group

This group mostly consisted of corroded metal objects, fragments, and "globs" that could not be identified. A total of 118 pieces make up this group at the Fredricks site (1.4% of the total), and 35 pieces from the plowzone at the Wall site (13.7% of the total), and none at the Mitchum site.

INTERPRETATIONS

Spatial Distributions

Archaeological evidence, to date, suggests that the aboriginal occupants at the Wall site lived there in the Protohistoric period (ca. 1545). Historical documentation indicates that activities associated with Anglo-American settlement could be expected in the vicinity of this site by the mid 1700s. A 1768 map of the town of Hillsborough, drawn by C. J. Sauthier, shows an oval "race ground" in the area of the Wall site. No specific archaeological materials or features, however, could be positively identified with this activity. Euroamerican ceramic sherds, glass fragments, and architectural debris indicate farming and/or domestic activities on or near the site by the first quarter of the 1800s. All historic artifacts from this site were recovered in the plowzone. Generally, brick fragments and iron nails, representing architectural debris, tended to concentrate in the northern portion of the site. Bottle glass and ceramics appear to cluster in the eastern portion of the site. No discernable pattern was noted for the other artifact groups. In view of known historic disturbances of this site, e.g., erosion, plowing, and previous archaeological excavations,

patterns of spatial distribution of historic artifacts at the Wall site should be cautiously considered.

At the Mitchum site, four Euroamerican ceramic sherds, one piece of glass, one cinder, and a few possible brick fragments were found in the plowzone. These artifacts probably can be attributed to date 19th to 20th century activities related to farming and/or to a house in the immediate area. All other historic artifacts recovered from this site came from buried, undisturbed contexts and are related to the aboriginal occupation. From the small sample of early Euroamerican artifacts, especially the trade beads, a tentative placement of the aboriginal occupation at 1660-1680 is proposed.

At the Fredricks site, three contexts must be examined: plowzone, features, and burials. Artifacts from the plowzone were combined into nine general categories to investigate spatial distributions. These were iron nails (all types), brick fragments (glazed and unglazed), glass (container fragments, plus eight flat-glass pieces), historic ceramics, miscellaneous metal artifacts (lead shot, four gun parts, horseshoe fragment, etc.) gunflints, other by-products (coal, slag, cinders, etc.), Euroamerican trade pipes, and aboriginal pipes. Figures 133-141 illustrate the frequency and spatial distribution of historic artifacts recovered from plowzone at the Fredricks site.

The plowzone distribution if iron nails (Figure 133) was uniform, with a slight increase in density in the south half of the site. Iron nails also were recovered from buried contexts at this site, which suggest that some of the plowzone specimens could be from the aboriginal occupation. The corroded nature of most plowzone nails, however, prevented a positive identification of type or variety. Also, wrought nails remained stylistically similar from the early 1600s to about 1790.

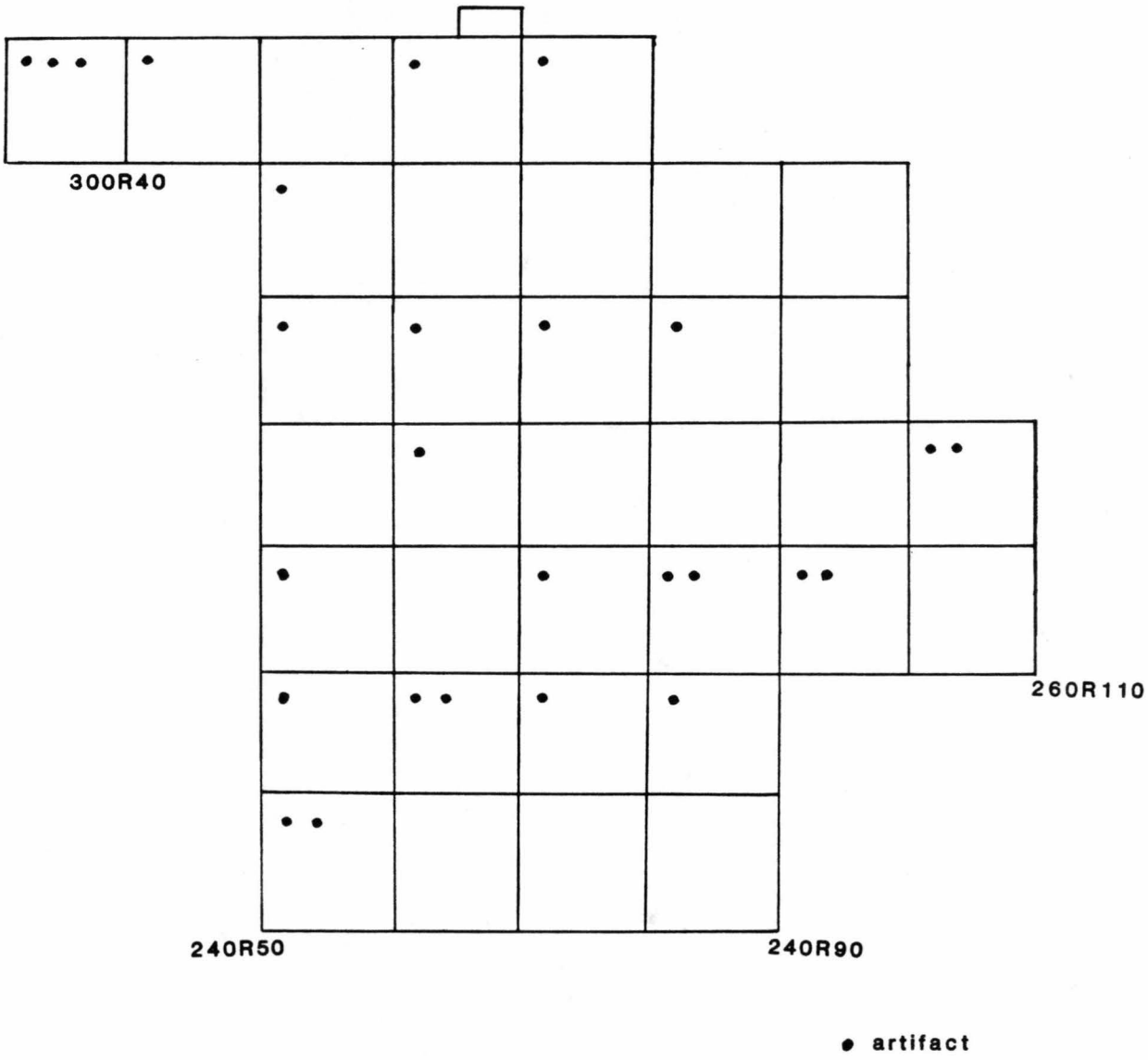


Figure 133. Spatial distribution of iron nails at the Fredricks site.

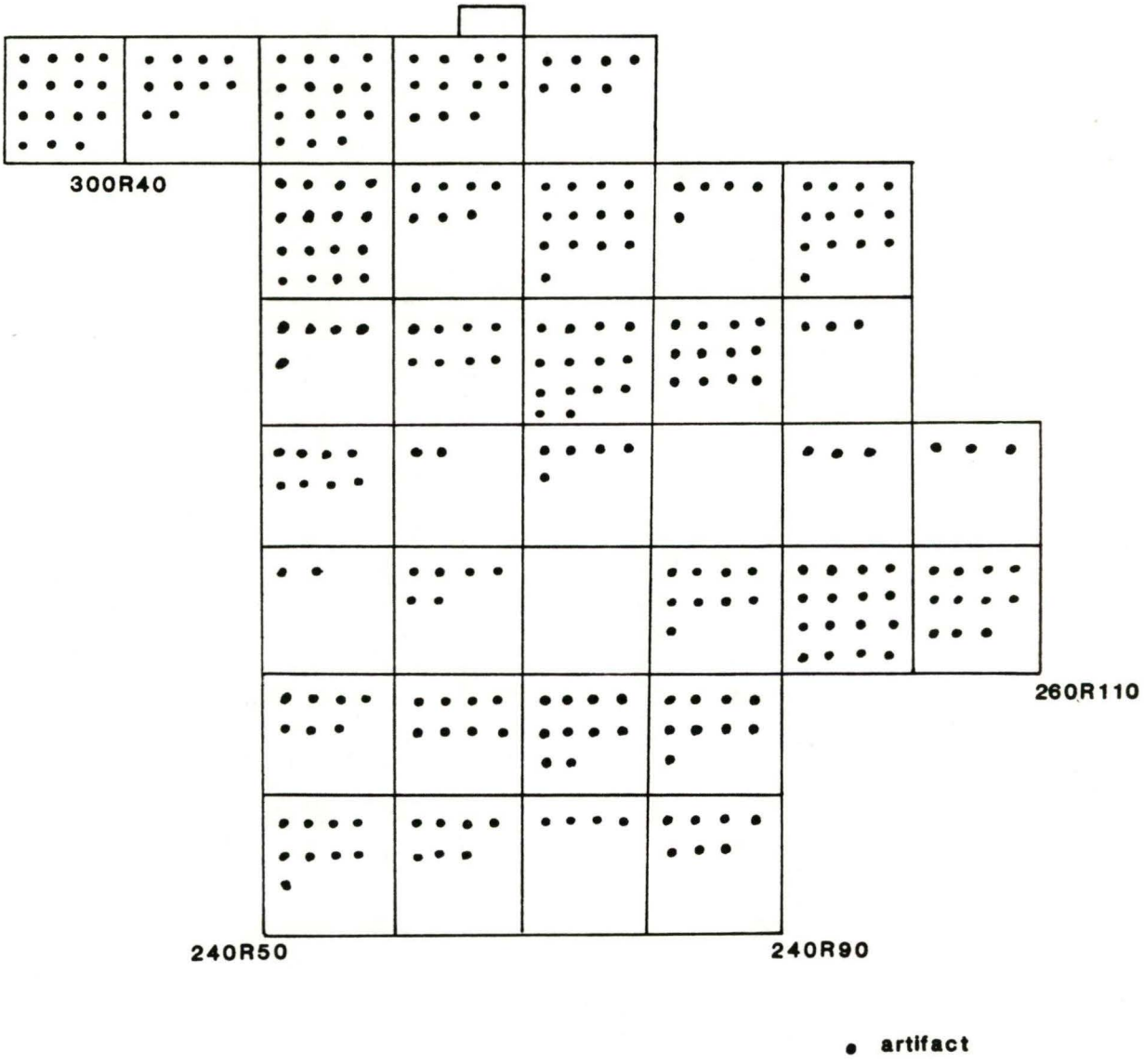


Figure 134. Spatial distribution of brick fragments at the Fredricks site.

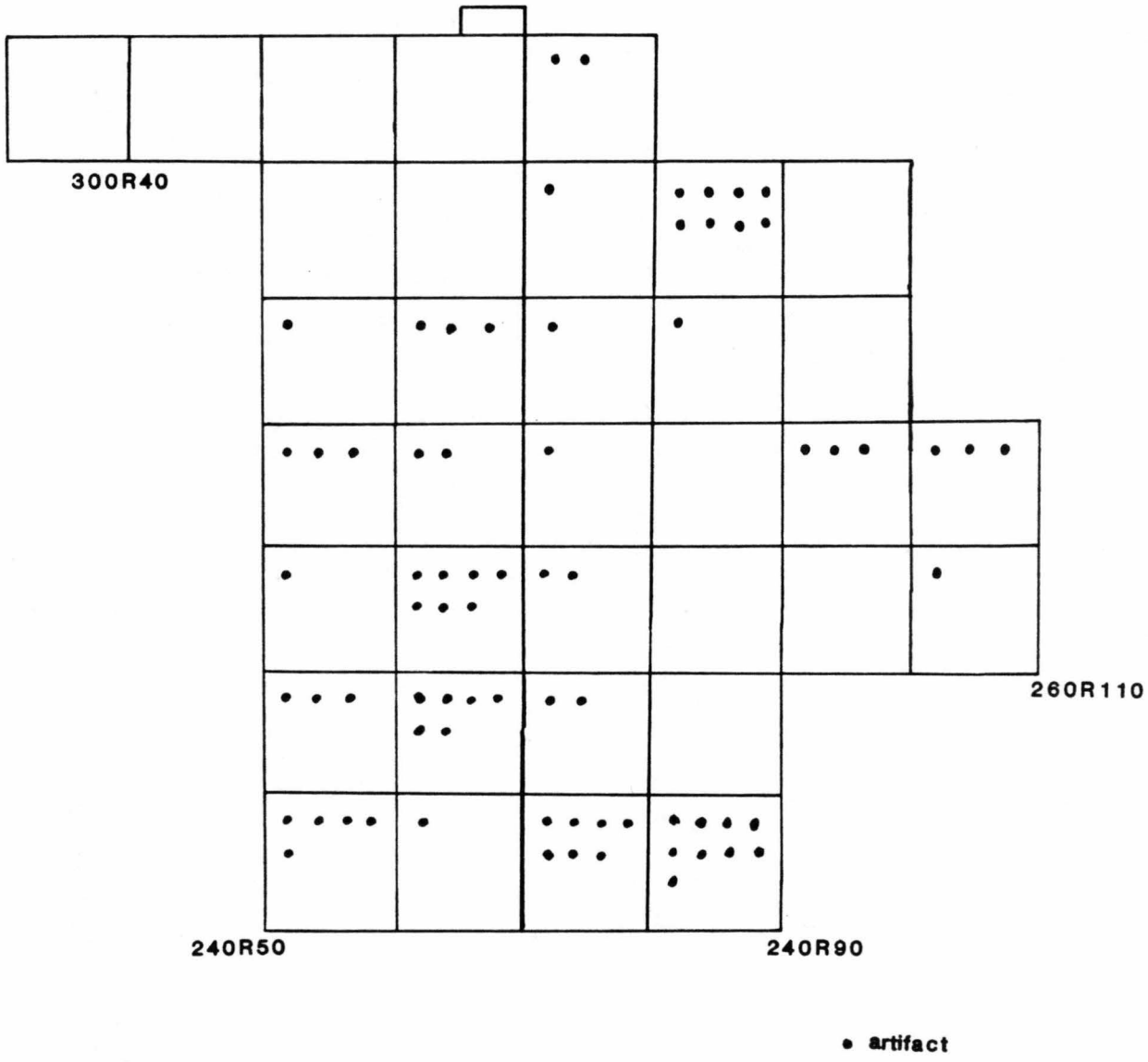


Figure 135. Spatial distribution of glass artifacts at the Fredricks site.

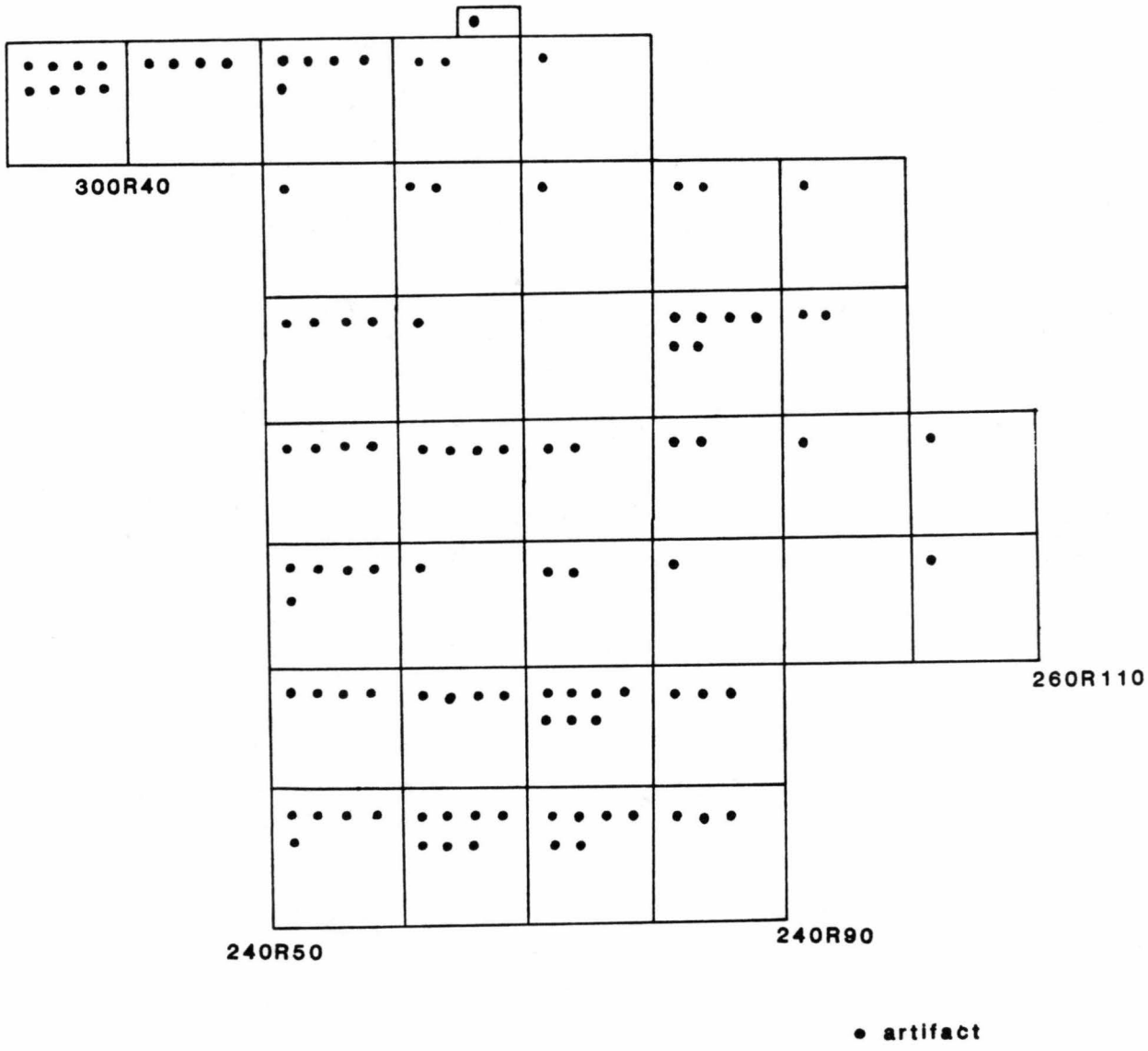


Figure 136. Spatial distribution of European ceramics at the Fredricks site.

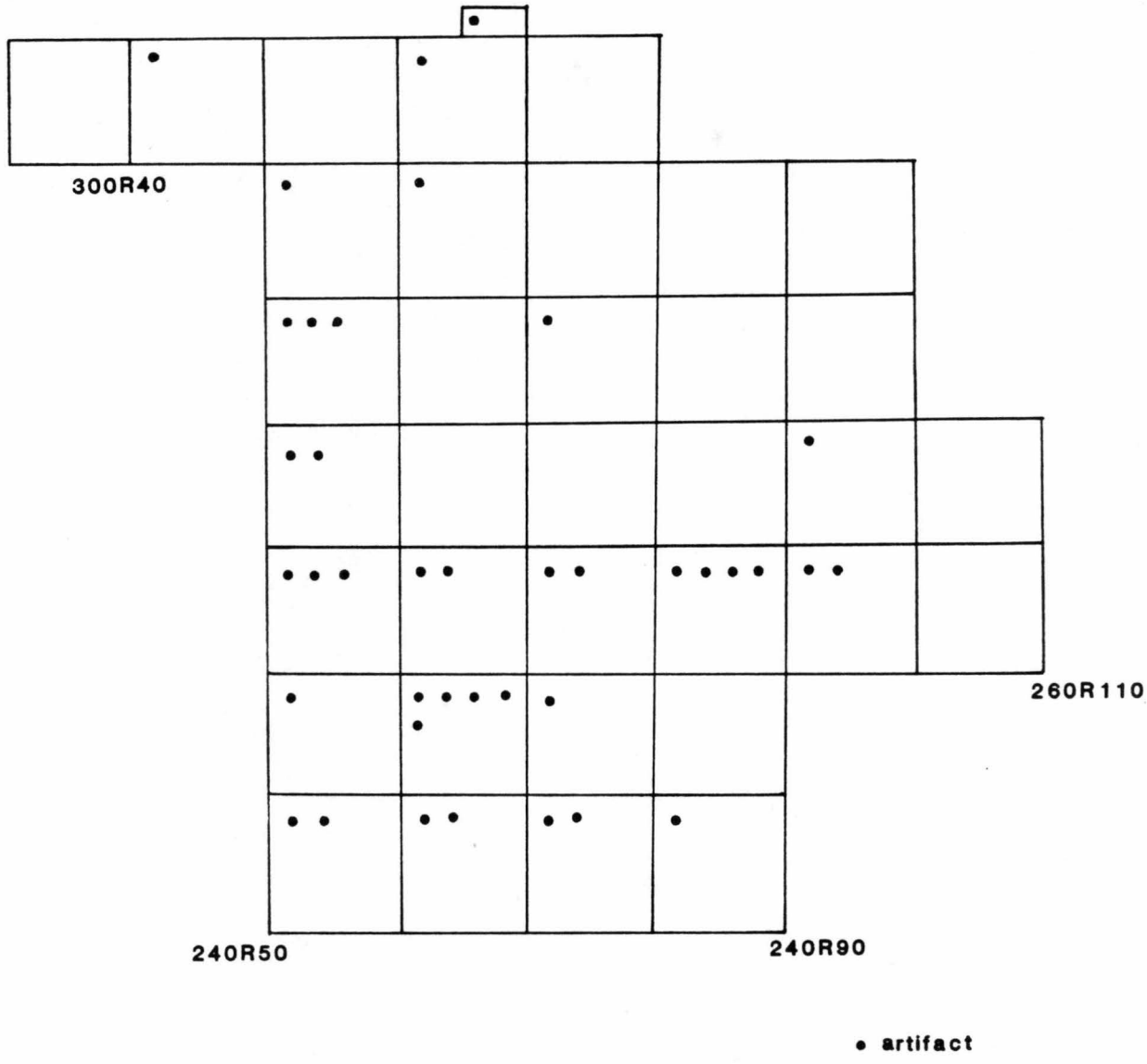


Figure 137. Spatial distribution of metal artifacts at the Fredricks site.

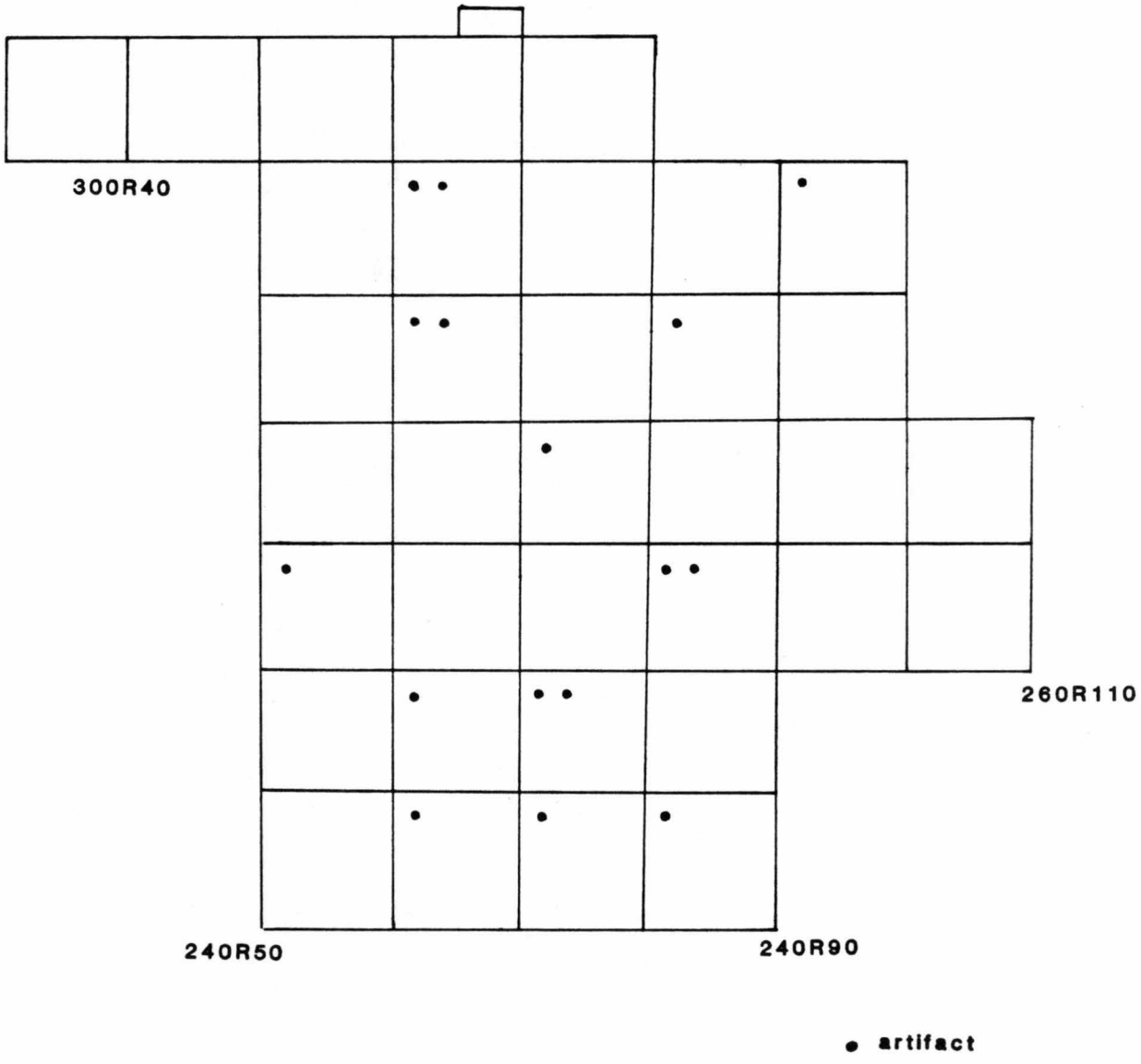


Figure 138. Spatial distribution of gunflints at the Fredricks site.

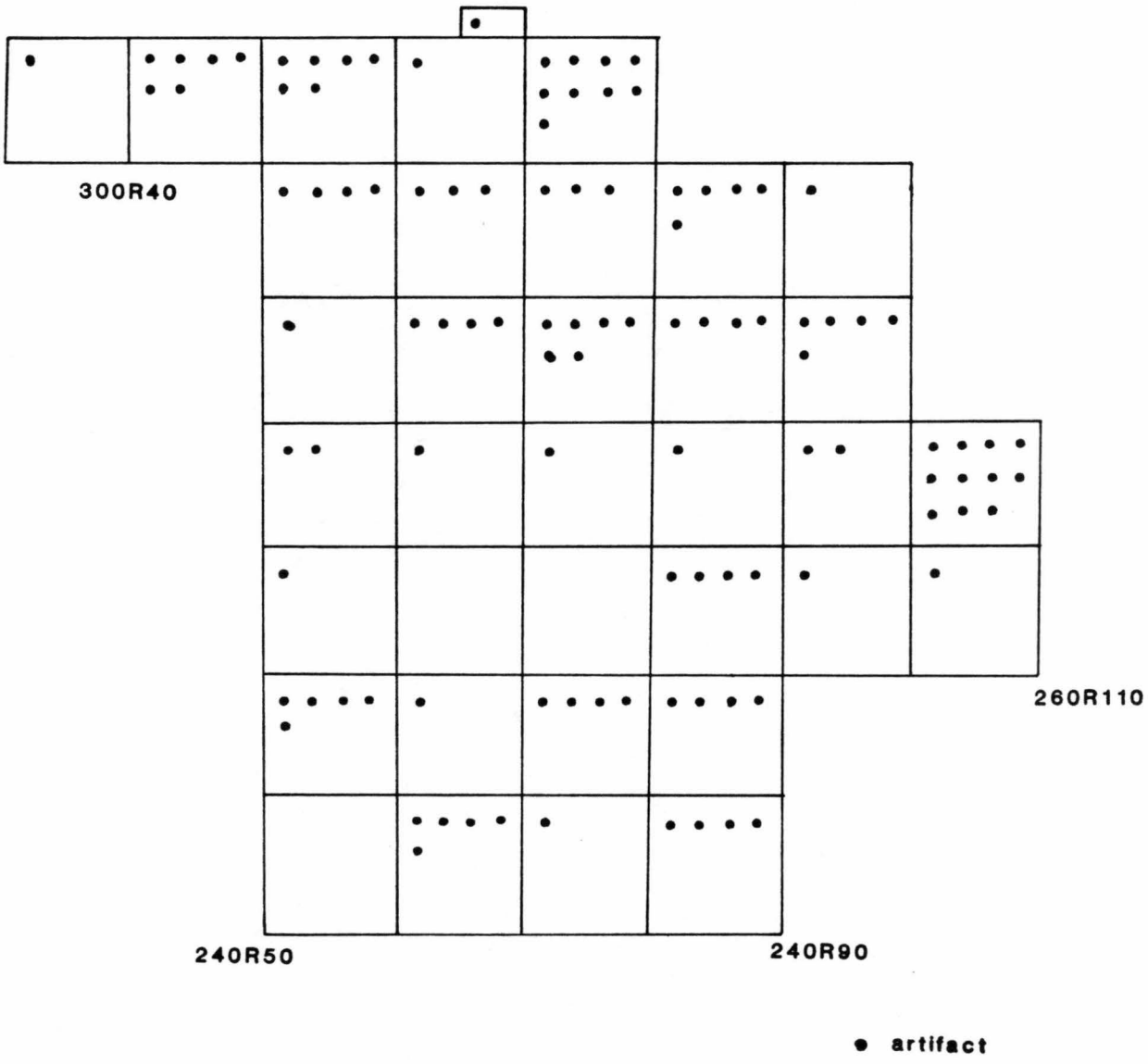


Figure 139. Spatial distribution of miscellaneous historic artifacts at the Fredricks site.

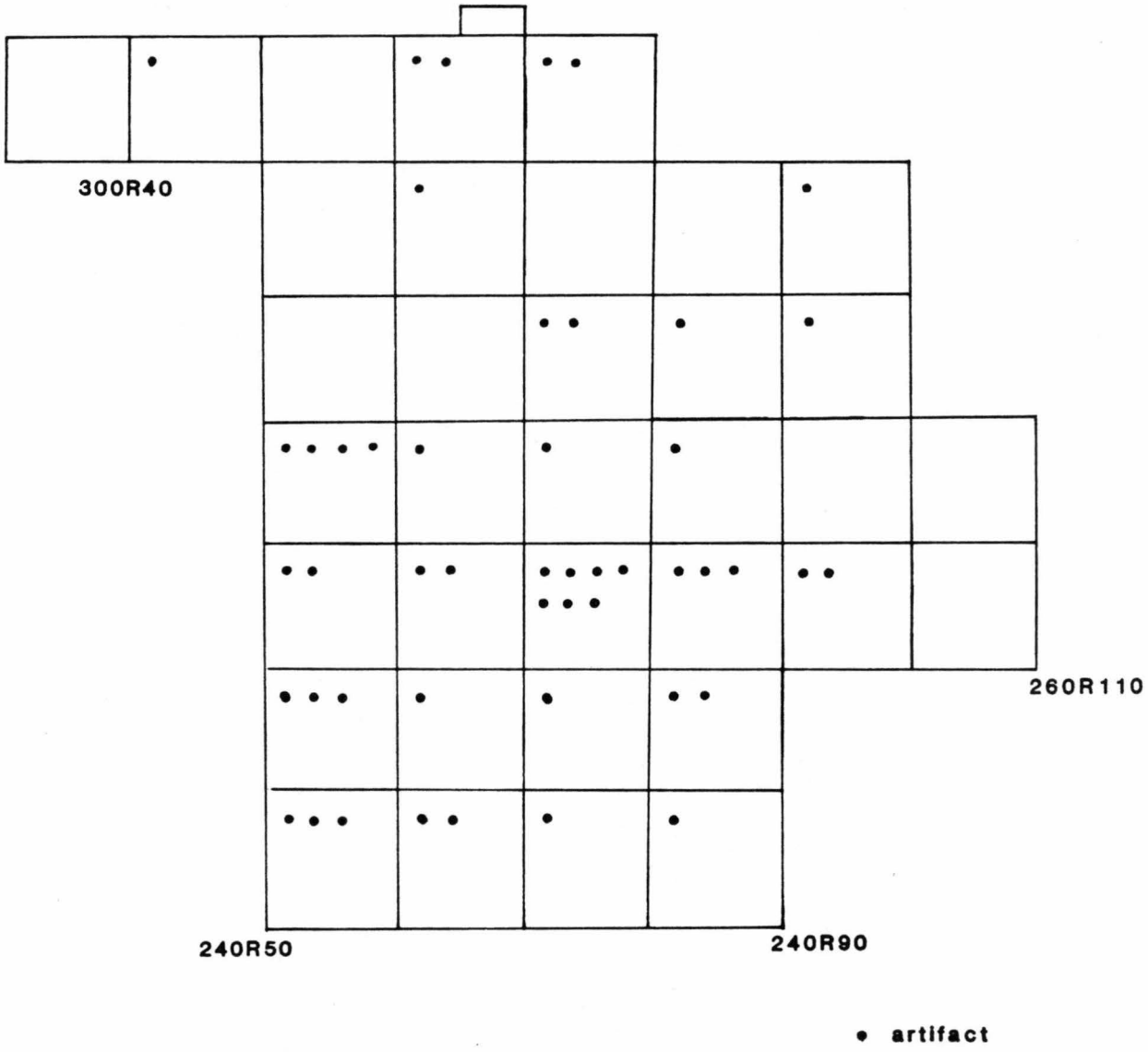


Figure 140. Spatial distribution of European trade pipes at the Fredricks site.

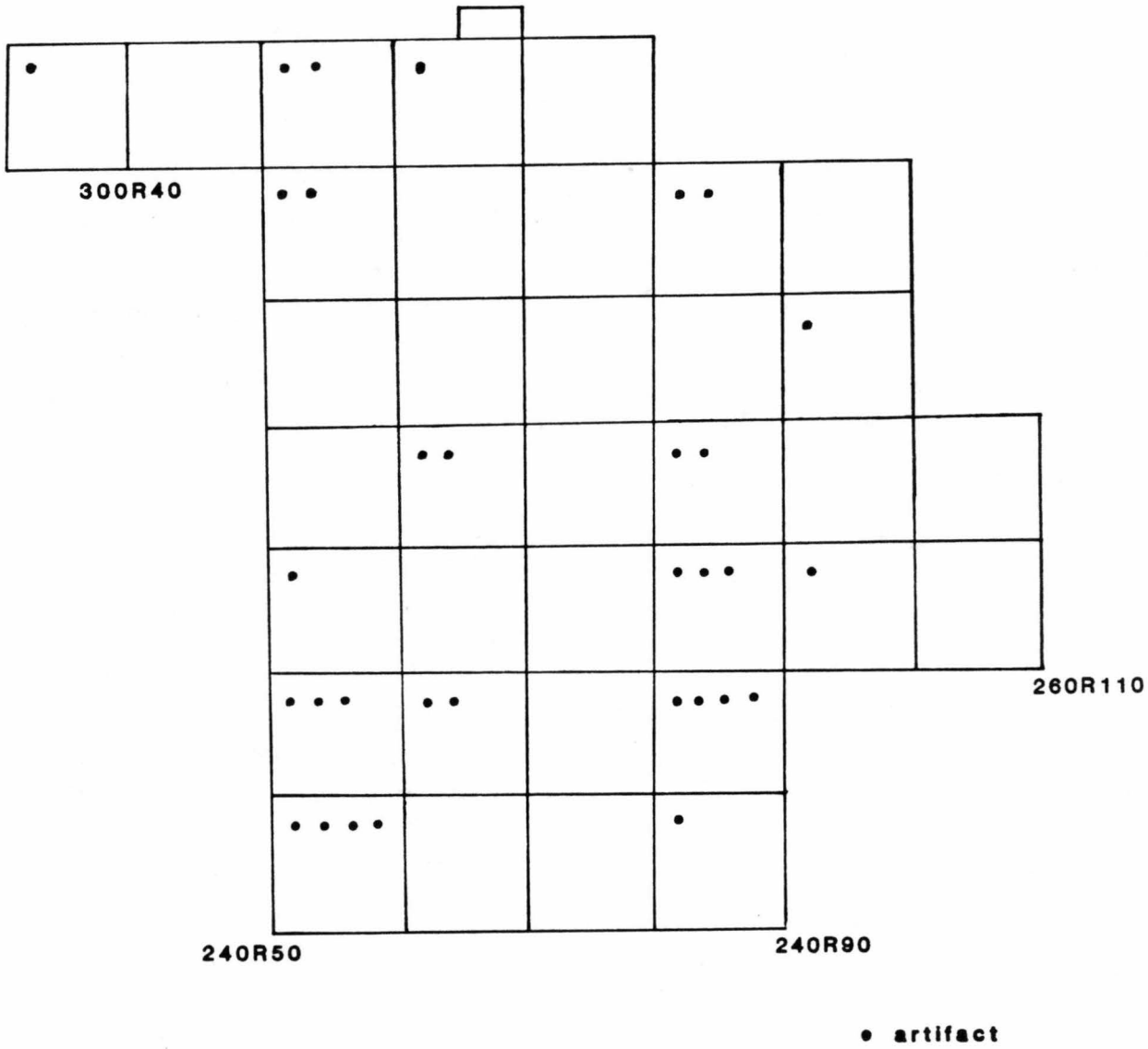


Figure 141. Spatial distribution of aboriginal pipes at the Fredricks site.

Thus, the plowzone nails could represent either aboriginal or early Euroamerican activities at this site.

Brick fragments were more numerous in the plowzone (Figure 134) than any other category of historic artifact. There were concentrations in the northwest corner and the southern half of the excavation. As architectural remnants, these brick fragments strongly suggest a nearby structure. The brick may have been used for a chimney, hearth, or piers for a log structure. The frequency of glazed brick fragments indicate the presence of a hearth. Without additional architectural features (foundation walls, chimney base, etc.), it would be difficult to propose a date or cultural affiliation for the structure. It should be noted that glazed-brick fragments were also recovered from buried contexts at this site (one from the fill of Feature 1, five from the fill of Burial 4, one from the fill of Burial 5, and two from the fill of Feature 9. These remains may have been derived from an Indian structure or a trader's house, of they could represent recycling activities by the Indians of discarded architectural materials from a nearby trading post or cabin. Future excavations hopefully will help to clarify this aspect of the artifact assemblage.

Glass artifacts tended to concentrate in the southern half of the excavation (Figure 135). Eighteenth-19th-20th-century glass fragments were mixed in the plowzone. Dark green bottle glass fragments, similar to the pieces recovered from buried contexts were noted in the plowzone. Dark green glass of this type, however, has a broad temporal span of manufacture, and without diagnostic attributes (e.g., lip, kickup, or moldseam) it is difficult to segregate 18th-century specimens from those of the 19th century.

Euroamerican ceramics were recovered from plowzone context only and

are, therefore, attributed to post-aboriginal activities on or near the site. Spatially, there was a fairly even scattering, with two possible concentrations in the northwest corner and south end of the excavation (Figure 136). As previously noted, 64 of the 108 ceramic sherds (59%) could be identified by type and assigned a mean manufacture date of 1810.48, which suggests an early 19th-century Anglo-American activities on or near the site.

Miscellaneous metal artifacts in the plowzone also tended to cluster in the southern half of the excavation (Figure 137). Since the gun parts date to the historic aboriginal occupation, their plowzone distribution may be important in interpreting village patterns. The same is true for the gunflints, which also have a distributional trend toward the southern end of the excavation (Figure 138).

The "other" by-products category of plowzone artifacts have a fairly uniform distribution (Figure 139), with a possible concentration in northeast portion of the excavation. Dating of this material is difficult; however, the coal, cinders, and slag probably are associated with 19th-century and 20th-century activities on or near the site. The daub and fired clay could be either aboriginal of Anglo-American.

Pipe fragments (Figures 140-141) show a concentration in the southern end of the excavation. As previously discussed in the artifact analysis section, 18 of the 48 kaolin pipe fragments recovered from plowzone were datable stem pieces. A date of 1678.95 was derived, which suggests that the pipe fragments are associated with the 17th-century Indian occupation at this site.

Overall, plowzone distributions of Euroamerican artifacts that definitely or probably date to the historic aboriginal occupation of the Fredricks site tend to show concentrations in the southern, and

secondarily in the western, portions of the present excavations. Such distribution are not surprising, since other evidence strongly suggests that the present excavations lie on the northeast edge of the village. As more of the domestic area is revealed, the plowzone artifact distributions may begin to show spatial patterning more detailed than just the direction of greatest general activity. In short, the larger distributions may reveal areas of specialized activities such as tool repair, metal working, ammunition manufacture, and merchandising of trade goods.

The Trade Assemblage from the Fredricks Site

Schiffer (1972, 1975, 1977) has described the cultural and natural processes by which objects and materials are transformed from the systemic context to the archaeological context, and he has noted that a particular context and its artifact associations reflect the behaviors that contributed to the transformation. In order to provide an initial interpretation of the functions of Euroamerican trade items and groups of items in late 17th-early 18th-century Occaneechi society, a comparison is now made of these items by archaeological context at the Fredricks site.

At the Fredricks site, there are three basically different archaeological contexts in which Euroamerican trade artifacts are found. There are those items that occur as burial associations, those that are found as part of the refuse fill of pits, and those found in the plowzone. Most of the latter items probably were originally in pitfill and have been pulled into the topsoil zone by modern plowing. The pitfill context can be subdivided into burial pitfill and non-burial pitfill.

The burial associations constitute objects and materials that were

intentionally selected from the systemic context to be deposited with the dead. It should be noted, however, that in the minds of the participants, these items probably were considered to continue to function in the system of the afterlife (Ward, this report). In contrast to the burial associations, most objects and materials that reached pitfill contexts got there by having been lost, discarded, or abandoned. These objects, therefore, represent both intentional (discarded and abandoned) and unintentional (lost) deposition, probably far more of the former than the latter (except for glass beads).

First, frequencies of artifacts occurring as burial associations are compared with frequencies of the same artifacts occurring in combined pitfill-and-plowzone contexts (Table 34). The artifacts are grouped by the same functional categories used earlier in this section. (Most Euroamerican artifacts—gunflints, pipes, musket shot, beads, etc.—from the plowzone have already been demonstrated to be contemporaneous with the Occaneechi occupation of the site.) This comparison is designed to determine what, if any, categories of trade goods were more likely to have been selected from the overall trade assemblage to become burial inclusions, and, conversely, which items were more likely to be retained in day-to-day use and ultimately to be lost, discarded, or abandoned. In making this comparison, it is recognized that the relative frequency of whole items within an assemblage (i.e., burial associations) may not correspond well with a similar assemblage comprised of mostly fragmentary items (i.e., pitfill).

A Chi-square test on the overall 22-cell matrix, with 10 degrees of freedom, yielded a Chi-square statistic of 1915.0, significant at $p<.001$. Eight of the 10 functional groups showed significant

Table 34. Frequency of Euroamerican artifacts as burial associations and in pitfill-plowzone contexts.

Functional Group	Burial Associations	Pitfill-Plowzone
Architecture	11	323
Arms	108	112
Food Preparation/Consumption	17	13*
Clothing	41	3
Personal	5799	1019
Construction Tools	2	1
Farm Tools	2	1
Miscellaneous Hardware	22	16
Metal Resources	12	39
Other (By-products)	7	73
Indeterminate	38	93
Totals	6042	1680

* Plowzone items for this group excluded (n=176).

differences; only the Construction Tool and Farm Tool groups were not significantly different between the two contexts, and these two groups had only 3 items each for the combined contexts.

Architectural items (nails, bricks, flat glass, etc.) were associated significantly more with pitfill-plowzone than with burials. All eleven of the "architectural" items found with burials were iron nails, which probably were used by the Indians as engravers or punches rather than as construction fasteners.

Arms-related artifacts (shot, gun flints, gun parts, etc.) overall were associated significantly more with pitfill than with burials. However, musket shot were associated significantly with burials. The relative scarcity of shot in non-burial contexts, together with the fact that most of the shot from both contexts are unfired, suggests that the dog-lock trade weapon, because of its length, weight, noise, awkward loading features, and probable overall poor quality, was not a popular hunting weapon among the Indians. Such an interpretation is further supported by the numbers of traditional chipped-stone arrow points from all contexts at the Fredricks site (Tippitt, this report). Also, it should be noted that Burials 2 and 6 contained most of the arms-related items from burial contexts--77 lead shot with Burial 2 and an almost complete gun with Burial 6. Only discarded (broken or worn out) gun parts and lost or abandoned lead shot were found in pitfill contexts.

Food Preparation and Consumption items were associated significantly with pitfill rather than burials (items in this category from the plowzone were excluded from the Chi-square test because most of them, especially ceramics and glass, date to the 19th and early 20th centuries). Although the only whole items in this category--two rum bottles, two pewter porringers, two latten spoons, and one brass

kettle--were found in burials, there were fragmentary examples (bottle sherds, brass kettle scraps, pieces of spoons, etc.) in pitfill. Obviously these items were highly prized (see value in deer skins, Table 31) and were not often selected for inclusion in burials. They were only discarded after they were broken beyond repair and had been fully recycled.

The Clothing group, represented by buttons, buckles, scissors, and material resources, were significantly associated with burial contexts. In fact, all of the scissors, buckles, and leather straps, and most of the buttons were found as burial associations. Such a distribution suggests that clothing items were not commonly lost, abandoned, or discarded, but were valuable possessions that were highly curated and deliberately placed with deceased individuals. As proposed earlier in this section, the buttons and buckles seem to have functioned as ornamentation on "bundles" or on necklaces (buttons), rather than as clothing fasteners in the Euroamerican style.

Although Food Preparation and Consumption artifacts were omitted from the Chi-square test because of the presence of post-aboriginal ceramics and glass in the plowzone, a few comments about the distributions of these items in undisturbed contexts are in order. The only whole specimens in this category--two rum bottles, two pewter porringers, two latten spoons, and one brass kettle--were found as burial associations. All other examples were fragmentary (bottle sherds, brass scraps and cut fragments, pieces of spoons, etc.) and were found in pitfill and plowzone contexts. Obviously, these items were highly prized and were not discarded or abandoned until they were broken beyond repair and the materials recycled.

The Personal Artifact group (beads, bells, tobacco pipes, etc.) was

the most numerous at the site. Although there were significantly more of these items in burials than pitfill, the expected frequencies were closer to the actual frequencies than most of the other groups. The proportionally greater number of glass beads in burials probably also was enhanced by the fact that burial and pitfill soils were all waterscreened, whereas, plowzone soils were dryscreened through 1/2 inch mesh screen. Nevertheless, personal items stood a somewhat better chance of reaching burial contexts than being lost, discarded, or abandoned. This was especially true of bells and whole pipes. A greater number of beads, because of their small size and presence en masse on clothing, were lost and thus became incorporated into pitfill. It is also worth noting that the Occaneechi personal assemblage of ca. 1680-1710 lacks some of the items common in other Southeastern trade assemblages. Conspicuous by their absence, for example, are the silver ornaments of the early to middle 18th-century Cherokee. Such assemblage differences may reflect different preferences, different sources (temporal and spatial) of trade goods, or different functions of trade items in the respective social structures. In the latter case, there may have been a need among the Cherokee for high-status ornaments (e.g., silver earrings, armlets, brooches, gorgets) that was lacking among the tribal Siouans.

Construction Tools and Farm Tools were rare in both contexts. This absence of items commonly reported on trade lists (France 1985) suggests that their route through the systemic context to the archaeological context had some distinctive features. Only two whole iron axes and two whole iron hoes were found in burial contexts, and one identifiable fragment each of an axe and a hoe was found in pitfill contexts. It can be suggested that hoes and axes were highly valuable working tools

(second only to weapons in deerskin value), providing considerable advantages over their stone counterparts, and that they would have been maintained in the systemic context for as long as possible. They seldom were selected out of the system for burial (except possibly with influential adults), and they were not discarded until they were worn or broken beyond further use. Even in the latter cases, it is probable that the remaining iron was recycled, thus making the material unidentifiable as to its original form and function.

Miscellaneous Hardware, which consisted mostly of knives and knife parts, were associated significantly with pitfill contexts rather than burials. Nevertheless, all whole items in this category were found as burial associations (Burials 1, 2, 3, 5, 8, and 9 all contained one or two knives). Pitfill and plowzone contexts contained broken knife parts and two brass fishhooks. As with the axes and hoes, knives were valuable tools in day-to-day situations and probably would have been maintained as long as possible in the systemic context.

Items in the Metal Resource group, represented by aboriginally modified cut metal scrap and brass wire, were associated significantly with pitfill and plowzone. This distribution suggests that these materials were important to maintaining the technological system and were seldom used as grave goods.

Of artifacts in the Other group, only vermillion was present in burials. All other items in this group--coal, slag, and cinders, was found in pitfill and plowzone (although most of these materials in the plowzone probably are post-aboriginal, some examples of each were found in undisturbed pitfill). Vermillion probably would not have reached the archaeological context unless it was placed in a burial. Otherwise, it would have been ground and mixed as paint, which seldom survives

archaeologically.

Finally, items in the Indeterminate category (unidentifiable metal objects, mostly iron) had a significant association with non-burial contexts. These objects probably represent mostly recycled pieces of axes, hoes, knives, gun parts, and the like. Their distribution is not surprising given previous observations about their functions in the systemic context.

A second comparison, this time between pitfill contexts, is in order. The frequencies of items in all groups, except those having no examples in one or the other context (Table 35), are compared between burial pitfill and feature pitfill (burial associations and plowzone artifacts are not included). This comparison is made to determine if there are significant differences in the kinds of items occurring in one kind of pitfill as opposed to the other. Such a comparison is warranted given Ward's (this report) suggestion that the upper fill of the burial pits was associated with death feasting and intentional deposition over graves.

A Chi-square test on the overall 16-cell matrix, with seven degrees of freedom, yielded a Chi-square statistic of 10.56, $p<.20$. Thus, overall, the two pitfill assemblages are not significantly different. Two categories--Architecture and Food Preparation and Consumption--that have divergent actual and expected frequencies also have too few examples to warrant interpretation. Thus, it appears from the present data that activities producing fill for burial pits were essentially the same as those for other types of pits.

In order to determine if the Euroamerican assemblage at the Fredricks site would be different from other historic Piedmont sites, a comparison was made, by functional category, between the burial

Table 35. Frequency of Euroamerican artifacts in burial pitfill and non-burial pitfill.

Functional Group	Burial Pitfill	Non-Burial Pitfill
Architecture	9	3
Arms	19	25
Food Preparation/Consumption	3	10
Personal	445	448
Miscellaneous Hardware	2	3
Metal Resources	8	4
Other (By-products)	3	1
Indeterminate	20	16
Totals	509	510

assemblage at the Fredricks site and the Upper Saratown site. The latter site appears to represent a slightly earlier period than the former and is located in a position about 60 miles more remote from trade sources. To obtain a comparative sample from Upper Saratown, five adults and four subadults from 87 burials previously analyzed by Navey (1982) were randomly selected. The distributions by age category and the total number match those of the Fredricks sample.

Three of the Upper Saratown burials (two adult and one subadult) contained no artifacts. The remaining six burials contained a total of 13,391 Euroamerican trade items. These were 13,345 glass beads, 21 brass (or copper) beads, 18 brass "hairpins" (tubular beads), three brass bells, one clay pipe bowl, and one iron axe head. When grouped by the same functional categories used to analyze the Fredricks site assemblage, the total was 13,390 artifacts in the Personal group and one (iron axe) in the Construction Tool group. This comparison clearly shows that at the Upper Saratown site far more items of personal (mostly ornamental) use were selected for inclusion in burials than items in other categories, as compared with a more varied assemblage at the Fredricks site. A cursory examination of the artifact catalog for the Upper Saratown site indicates that a bias for personal items would also be found in non-burial contexts.

CONCLUSIONS

In summary, this research has examined the Euroamerican artifacts from three archaeological sites in the Piedmont region of North Carolina, the Fredricks site (31Or321), Wall site (31Or11), and Mitchum site (31Ch452). The distribution of various classes of historic material from the Fredricks site indicates that the aboriginal occupants

of the site were the recipients of Euroamerican trade goods that date from the mid-seventeenth century to the first decade of the eighteenth century. This dating strongly supports an interpretation of the Fredricks site as John Lawson's Occaneechi Town. An analysis of datable Euroamerican artifacts from burial and feature contexts suggests that the trade good assemblage remained consistent throughout the probable 20 to 30-year occupation of the site. A more secure interpretation of possible temporal variation, however, will have to await excavation of larger portions of the site.

A comparison of the trade items by functional category between types of pitfill (burial fill vs feature fill) at the Fredricks site did not reveal significant differences. The same comparison between the contexts of burial association vs pitfill (burial and feature combined), however, did show several significant differences. If one ignores the problem of comparing mostly whole items in the burials with mostly fragmented items in the pitfill, a statement can be made that items in the Personal and Clothing categories were more often selected for inclusion in burials, relative to their frequency in the overall site assemblage, than items in other categories.

When the Fredricks site burial assemblage was compared to a sample burial assemblage from the Upper Saratown site, it was discovered that almost no non-personal items were present in the latter assemblage. This finding suggests that more utilitarian (i.e., construction, farming, food preparation, architectural, and arms) items were traded to the Occaneechi in ca. 1700 than to the Sara in ca. 1675. At least, more utilitarian items reached burial contexts at the later Fredricks site.

At the Wall site, the historic artifacts suggest a late occupation, probably early nineteenth century, of white settlers who farmed in the

area of the river bend. Some plowzone items (e.g., Euroamerican ceramic sherds, glass fragments, and nails) from the Fredricks site also indicate some nineteenth-century activities on or near this site. Based on the historic artifact analysis, the Mitchum site (31Ch452) seems to represent an early period of Euroamerican trade (1660-1680) and/or a smaller settlement geographically removed from major trade routes.

A broader data base is needed to study the effects of Euroamerican contact among the Piedmont Indian groups and changes in their material culture. As Kent (1984:293) points out, culture contact and its results—acculturation and culture change—can cause very abrupt shifts in the frequencies of certain artifacts, especially when compared to systems in which there are no major outside influences. The measurement and display of these changes can be illuminated through intersite patterning within a larger geographical region.

CHAPTER VII

SHELL ARTIFACTS FROM THE CAROLINA PIEDMONT

by

Julia E. Hammett

INTRODUCTION

The shell artifacts from the Wall site (31Or11) and the Fredricks site (31Or231) are made up of two basic kinds: tools and ornaments. Only one tool type, the serrated shell, has been identified in the artifacts recovered thus far, and it will be discussed at the end of this section. Because of their greater number and complexity, the ornaments will be discussed at length.

Anthropologists have long known that human ornamentation reflects economic, political and other types of social information (e.g., Spencer 1886; Bunzel 1933). More recently, Binford (1972) has addressed the potential for studying the relationships of artifacts to the maintenance of social relationships. He defined "sociotechnic" artifacts as "material elements having their primary functional context in the social subsystems of the total cultural system" (Binford 1972:24).

In western North America, shell beads and other ornaments recovered from archaeological contexts have proven useful not only for dating purposes (Bennyhoff and Heizer 1958), but they have also produced important information on intergroup and intragroup dynamics and more generally on the evolution of social organization in that region (King 1982). Although shell ornaments are a fairly common occurrence in burials at late prehistoric, protohistoric and historic Indian sites in North Carolina, little attention has been devoted to these artifacts. Recently, pioneer work to establish a bead typology for the Tennessee

mountain area was initiated by Polhemus (1983).

The present study is devoted to establishing shell ornaments as a significant class of artifacts for addressing questions about changing social interactions from the Late Woodland period until historic times in the Carolina Piedmont area. Following the presentation of a preliminary bead typology, several issues regarding the changing relationships between shell ornaments, their makers, traders and holders will be addressed. These issues will be approached through the examination of 1) beadmaking techology and 2) distributions of various ornament types and styles within specific site contexts and between sites.

Ornaments from the Fredricks and the Wall sites will be used as the focus of this study, to provide a qualitative and quantitative characterization of the ornament types and their uses and to ascertain differences between prehistoric and historic social contexts. Finally, ornaments from other sites in western North Carolina will be examined and compared with the ornaments from the two Piedmont sites to determine the place of shell ornaments in social interactions on a regional scale.

BEADMAKING TECHNOLOGY

At the Wall site, a protohistoric village, many ornaments, e.g., segments, tubes and spherical beads were made from the columella of large marine gastropods, probably of the Melogenidae (Crown Conch) family which occur along the Atlantic seaboard from Massachussetts to Florida (Percy 1972). Other items, consisting of small disks, gorgets and pendants, were made from the outer whorl of these large univalves. A small univalve called marginella (of the Marginellidae family) which occurs along the coast from the West Indies to the southern beaches of

North Carolina (Percy 1972) was also used as a form of ornament.

On the whole the coastal univalves were the source material for the greatest proportion of ornaments. To a much lesser extent bivalve shells (presumably mussel), and stone fragments were made into small disk beads, and native copper and mica were used for other types of ornaments.

By the time the Fredricks site was occupied, many of the previously available bead forms (pendants, tubes, and sphericals) had been modified and others (columella segments and marginellas) had been all but dropped from use. Several new types—runtees and cylinder/barrels made from columella, and wampum made from quahogs (Mercenaria mercenaria)—had appeared. Quahogs occur from the Gulf of St. Lawrence to Florida (Percy 1972). Although small disk beads appear to have retained both their form and function through this time, they too show indications of the impact of European influence. Aboriginal beadmaking and its transformation through the introduction of European technology is a topic worthy of lengthy consideration. For purposes here, however, discussion will be confined to ethnohistorical accounts of beadmaking and the use of this information for 1) characterizing aboriginal beadmaking kits and beadmaking detritus, and 2) the identification of changes in the technology that may be manifest in the differences between the two Piedmont Carolina sites.

Even though many of the early historical descriptions of beadmaking focus on wampum, and thus are most relevant to the New England area, these accounts can serve as a general model for approaching beadmaking technology. In 1634, William Wood called the Naragansett the "mintmasters" of "wampompeag and mowhacheis, which they form out of the inmost wreaths of periwinkle shells". This group appears to have been

been the traditional providers of money beads in New England (Vaughan 1977:81). In 1643, Roger Williams of New England published A Key Into the Language of America which was primarily devoted to the language of the Naragansett. In his key he gave a list of Indian words pertaining to bead money:

Naragansett Word	William's Translation
Wauompeg	Give me white
Wauompesichick-mesim	Give me white
Assawompatittea	Come, let us change
Anawsuck	Shells
Meteauhock	The Periwinckle
Suckauanausuck	The blacke Shells
Suckauaskeesaquash	The blacke eyes, or that part of the shel-fish called Poquauhock (or Hens) broken out neere the eyes, of vvhich they make the blacke.
Puckwheganash	Awl blades
Mucksuck	Awl blades
Papuckakiuash	Britle, or breaking, which they desire to be hardened to a britle temper.
Natouwompitea	A coyner or Minter
Nnanatouwompiteem	I cannot coyne
Natouwompitees	Make money or Coyne
Puckhummin	To bore through
Puckwhegonnautick	The awl blade sticks
Tutteputch anawsin	To smooth them, which they doe on stones.
Qussuck-anash	Stone, Stones
Cauompsk	A Whetstone
Nickautick	A kinde of wooden Pincers or Vice
Enomphommin	To thread or string
Aconaqunnauog	Thread the Beads

Williams (1936:156-157) added this observation to his list of words:

> Before ever they had awle blades from Europe they made shift to bore this their shell money with stone and so fell their trees with stone set in a wooden staff, and used woden howes: which some old & poore women (fearfull to leave the old tradition) use to this day.

In 1709 John Lawson (Lefler 1967:204), who had travelled through North Carolina described Indian beadmaking:

> This [the shell preform] the Indians grind on Stones and other things, till they make it current but the Drilling is the most difficult to the Englishmen, which the Indians manage with a Nail stuck in a Cane or Reed. Thus they roll it continually on their Thighs, with their Right-Hand holding the Bit of Shell with this Left, so in time they drill a Hole quite through it, which is a very tedious Work; but especially in making their Roanoak, four of which will scarce make one Length of Wampum.

Based of the above ethnohistorical information, we can expect to see several manifestations in the archaeological record. The basic beadmaking process appears to have involved first obtaining a preform from the shell by breaking or the groove-and-snap technique, then reducing the piece, and finally drilling, grinding, and smoothing. Prehistoric tool types for this work would have included hammerstones, stone drills, burins, chisels, and anvils, grinding stones, and stone or pottery abraders. At historic beadmaking stations one should find many of the components of the prehistoric tool kit along with the replacement or addition of metal tools such as awls/drills/needles, pinchers/tongs/vices for holding preforms, and perhaps also hammers and saws for reducing the shells. Where the purple wampum were made, we should expect to find Quahog shells (Mercenaria mercenaria). Where other types of beads and ornaments were manufactured, there should be refuse from univalve shells (called periwinkles in the 1600-1700s).

Beadmaking was probably limited to only a few sites within a region. It is also probable that in areas where beads and other ornaments were used as a medium for exchange, there would have been standardization of bead forms and specialization of manufacture by only a few groups or even individuals within a group. Such was the case not only for the Naragansett in New England, but also in the western United States where the Chumash were the major producers of beads for a region that extended from the California coast to the Great Basin and into the

Southwest (Bennyhoff and Heizer 1952; King 1982). One might hypothesize that the degree of beadmaking specialization, may reflect the extent of devotion to a money-type economy. It would follow that the fewer the sites of manufacture and the greater the standardization of a form or style, the greater the investment into this type of economic system. These suggestions will be considered when reviewing the data from the Siouan Project area.

ORNAMENTS FROM THE SIOUAN PROJECT

Pendants

Pendants were made from either shell or mica. Some of the shell pendants from the Siouan Project have previously been described by Sizemore (1984), and her work is extensively drawn upon here. All the shell pendants in the present study sample are of a ground circular discoidal form, and have either a single central perforation or a pair of central perforations. The double holed style has been called elsewhere "gorget" (e.g., Benthall 1969; Polhemus, 1981). The shell gorgets from the Wall site were found with two subadults (Burials 2 and 1-83). Burial 2 (1940-41 excavations) had three relatively small pendants, two having the double perforation of gorgets and one having a single hole. Burial 1-83 (1983 excavations) had one larger pendant. All of these are plain, meaning that they bear no evidence of any superficial design (Figure 142:a-e). They are strikingly similar to other pendants and gorgets found at two sites in southwestern Virginia, the Shannon site (44My8) (Benthall 1969) and RLA-Vir196 (Figure 142:b).

The two pendants from the Fredricks site were found with Burial 1 in 1983. Both of these pendants have single holes (Figure 143). The hole in the larger one is slightly elongated and appears to have once

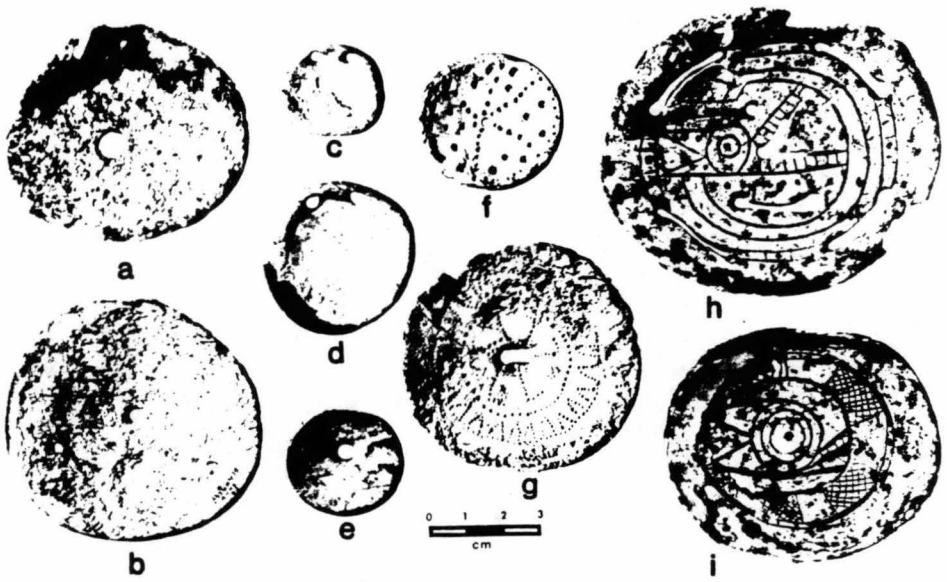


Figure 142. Pendants and gorgets: plain pendants from Burial 1-83 at the Wall site (a), Virl96 (b), and Burial 2 at the Wall site (c-e); drilled dot pendants from Burial 1 at the Fredricks site (f-g); rattlesnake gorgets from Upper Saratown (h-i).

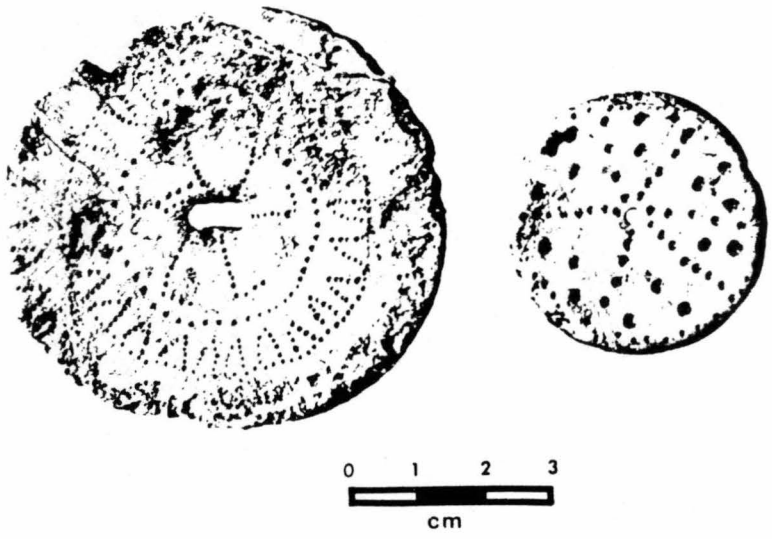


Figure 143. Close-up of pendants from Burial 1 at the Fredricks site.

been two holes so close together that after some wear they broke through, making the two holes one. The designs on both of the pendants are of the drilled dot technique. Sizemore (1984) gave the following description of the design on the larger pendant:

> Beginning from the center are six punctated lines, each with a short segment hooking to the left at the line's end, thereby making a swastika-like design. The swastika is included within the Cross design category of Fundaburk (1957:39), and is one of the most common designs on Southeastern gorgets. It is usually enclosed within a "Sun Circle" design. The swastika on this gorget is closely surrounded by a punctated circle, making up the inner border of a band of punctated chevrons or triangles with their apices pointing inward. Fifteen chevrons are visible; the rest have eroded. The bases of these figures rest on another punctated circle which almost completely encircles the gorget, with on segment in the top right portion having been eroded away. Outside of this circle there are three distinct punctated triangles similar to the others, and what seem to be parts of other triangular designs that are mostly eroded.

Sizemore also described the smaller pendant:

> On the concave side, and emanating from the central perforation, is a six-pronged star design made of punctations. Encircling the end of these prongs seems to be two, possible three, circles of punctations, the inner circle(s) made up of larger depressions than the outer and partially eroded circle of small dot-like punctations.

Sizemore noted that a pendant with a design very similar to the smaller pendant was found at the Irene Mound Site near Savannah, Georgia (Caldwell and McCann 1941:Plate XIX). Other pendants of the drilled dot technique were also found there, as well as specimens of the incised (and sometimes painted) rattlesnake style of gorget (Figure 142:h-i), which was found at Early Upper Saratown (31Sk1). The latter style has been found a numerous sites to the south and west from Tennessee to St. Catherine's Island off the coast of Georgia (Ann Tippitt, personal communication). The drilled dot pendants, on the other hand, have been found exclusively to the north, primarily in Virginia, with the exception of the Irene Mound specimens (Sizemore 1984). The

distribution of these pendants suggests that the area of the Siouan Project may have been at or near the boundary between southern and northern spheres of influence.

A badly corroded design resembling the one on the larger of the two pendants, was scratched or incised onto the back of the metal spoon from Feature 6/Burial 8, another subadult (Figure 144). Other examples of pendants with similar designs made by this drilled dot technique were recovered from the Potomac Creek site, in northeastern Virginia (Stephen Potter, personal communication), and the Irene Mound site near Savannah, Georgia (Caldwell and McCann 1941). None of the pendants from the Wall or Fredricks sites are of the incised and painted "rattlesnake" style mentioned above.

In 1701, John Lawson (Lefler 1967:204) noted that:

> they oftentimes make...a sort of Gorge, which they wear about their neck on a string; so it hangs on their collar, whereon sometimes is engraven a Cross, or some odd sort of Figure, which comes next in their Fancy.

If his observation is taken literally, one would expect there to be no limits to the stylistic variation on these pendants, except those bounded by the individual's imagination, yet there do seem to be set styles. If pendant blanks were being traded than people at specific localities could have individualized their ornaments within the limits ascribed by their group, be they techniques, style elements or motifs. It remains unclear whether or not specific elements or motifs were owned or controlled by groups or even individuals, yet these pendants may well have served as social identity markers that would probably have been worn while traveling. This would have allowed the wearer to transmit information about their cultural affiliations, place of origin and quite possibly any associated allegiances as well.

Overall there appear to have been standard forms of shell pendants

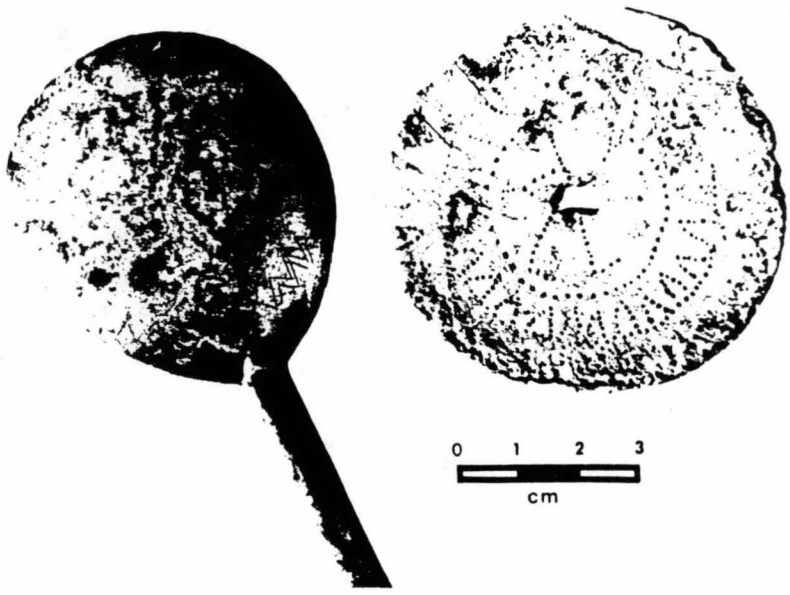


Figure 144. Comparison of designs on large pendant from Burial 1 and on spoon from Burial 8 at the Fredricks site.

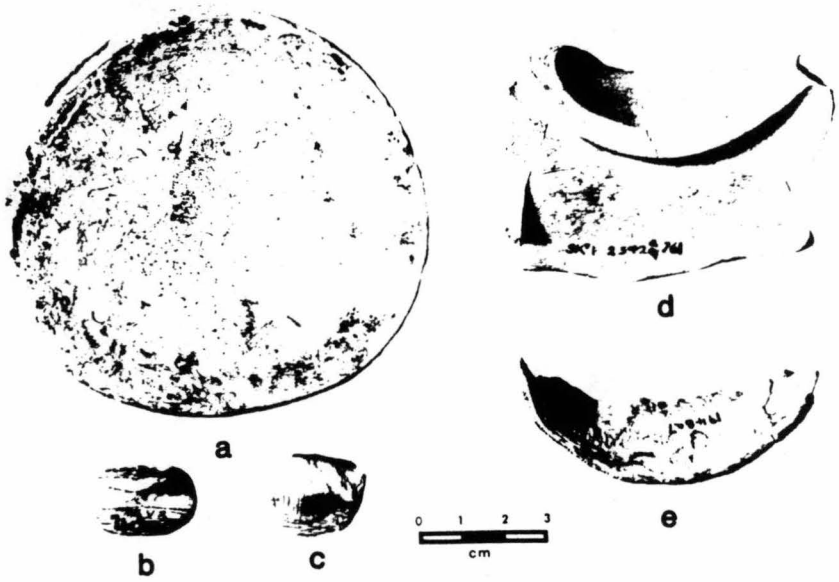


Figure 145. Evidence of beadmaking: pendant blank (a); ground fragments of large univalve shell (b, d-e); reground segment bead (c).

in the region, the plain discoidal shape being the most common. A pendant blank found at the Sharp site (31Rk12) may indicate they were traded in this unfinished form (Figure 145:a). The residents of the Wall site shared in this regional exchange of gorget-style pendants prehistorically. The subadult from the Fredricks site (or his or her kin) either had access to even longer distance trading, or perhaps originally resided outside the local area.

Tube Beads

Tube beads have been found only at the Fredricks site. Tubes made from columellas have been recovered from other sites in the region sharing many other bead forms with the Wall site such as Early Upper Saratown (31Sk1) to the northwest and two southwestern Virginia sites, the Shannon site and RLA-Vir196 (Table 36). The absence of this type at the Wall site may be more a result of small sample size than the lack of use of this form. The tubes from both of the Virginia sites were drilled down the center of the tube from either end of the long axis. Two of the tubes from RLA-Vir196 demonstrate the difficulty of drilling a narrow hole through these tubes. Where the columella is at its narrowest, the artisan's drill came through the tube along the silca groove. One of the tubes from this site was broken diagonally at some point. The well ground edges of this break suggest that this did not deter its owner from continuing to use the ornament (Figure 146). This suggests there was a high value placed upon the ornament form despite any imperfections. At Early Upper Saratown all the finished tubes were drilled at an angle from the end of the tube to a side. This corner drilled technique would have drastically reduced the time and energy investment and risk of drilling out the long axis.

The eleven tubes from the Fredricks site were all recovered from

Table 36. Preliminary inventory of shell artifacts from selected Southeastern sites.

	SHELL PENDANTS	TUBE BEADS	BARRELS/ CYLINDERS	SPHERICAL BEADS	EAR ORNAMENTS	COLUMELLA SEGMENTS LARGE	MEDIUM	SMALL	OLIVE SHELLS	BEADMAKING EVIDENCE	SMALL DISK BEADS	LARGE DISKS	WAMPUM	RUNTEES	MARGINELLA	NATIVE COPPER	MICA	SERRATED SHELL	OTHER
NORTH CAROLINA SITES																			
Warren Wilson (31Bn29)	X	-	X	X	X	X	-	-	-	-	X	-	-	-	-	-	X	-	-
31Cy42	-	-	-	-	-	-	-	-	-	univalve detritus	-	-	-	-	-	-	-	-	-
Town Creek (31Mg3)	-	-	X	-	-	1 reground	-	-	-	univalve detritus	-	-	-	-	X	-	-	-	-
Wall (31Or11)	X	-	-	-	-	X	X	X	-	-	X	X	-	-	X	X	X	X	perforated clam shell
Fredricks (31Or231)	X	X	X	X	X	-	X	-	-	-	X	X	X	X	-	-	-	-	-
Sharp (31Rk12)	1 blank	-	X	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-
Early Upper Saratown (31Sk1)	X "rattlesnake" gorgets	X including 1 blank	X	X	-	-	-	-	-	univalves: detritus; whole (hoes?)	X	X	-	-	X	-	-	X	-
Late Upper Saratown (31Sk1a)	-	-	X	-	X	-	X	-	-	-	X	-	X	-	-	X	-	X	-
VIRGINIA SITES																			
Vir150	15 triangular	-	X	X	-	-	-	-	-	-	X	X	-	-	X	X	-	-	-
Leatherwood Creek (44Hr1)	X	X	X	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	-
Shannon * (44My8)	-	-	-	-	-	X	X	-	X	-	X	-	-	-	X	-	-	-	-
SOUTH CAROLINA SITES																			
SoC28	-	-	-	-	-	-	-	-	-	univalve detritus	-	-	-	-	-	-	-	-	-
GEORGIA SITES																			
Irene Mound *	X	-	X	-	-	-	-	-	X	whole univalves (hoes?)	X	-	-	-	X	-	-	-	ear pins; awls

* Shannon Site: Benthall (1969)
Irene Mound: Caldwell and McCann (1941)

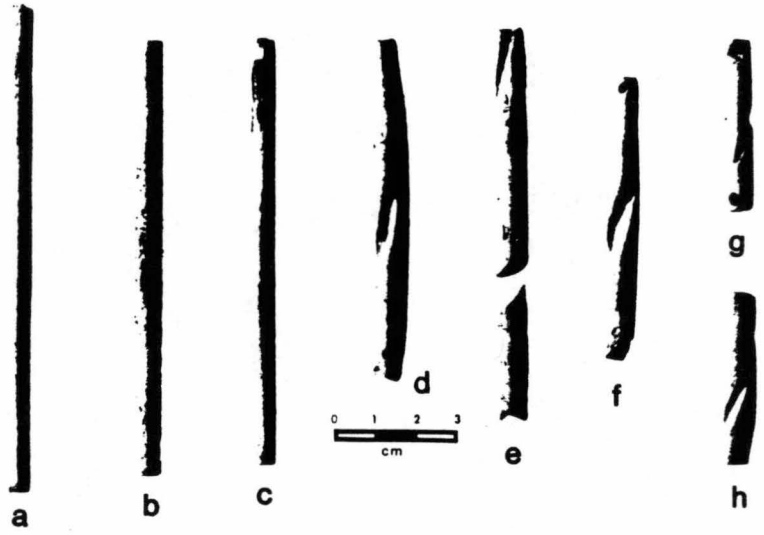


Figure 146. Tube beads from the Fredricks site (a-c), Virl96 (d-e), and Upper Saratown (f-g); tube blank from Upper Saratown (h).

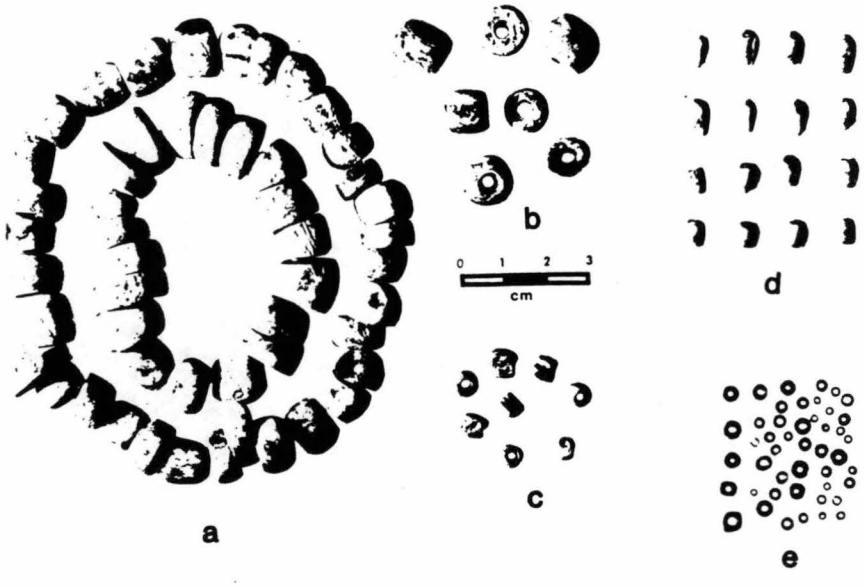


Figure 147. Bead types from the Wall site: columella segments from Burial 1-83 (a); medium-sized (b) and small (c) loose segments; marginellas (from top to bottom: shoulder ground, spire ground, and spire and base ground) (d); and disks (e).

the chest area of Feature 2/Burial 4 which was a bundle burial containing a male adult and an infant (Wilson, this report). The tubes were found lying together in parallel order on the adult's chest. The nine tubes that were complete ranged in size from 105-123 mm in length and 6.0-7.4 mm in diameter. Their hole diameters ranged from 2.0-2.7 mm. These measurements demonstrate the uniformity of these tubes. On none of them is the silca groove very apparent, unlike all the tubes from earlier contexts. No doubt the use of a metal drill enabled the artisan(s) of these historic tubes to produce a much more refined product with much less energy expenditure, however, even so some evidence of the groove should be apparent no matter how narrow the tube given the depth of this groove on other tubes from the area.

These historic tubes actually resemble the hair pipes used by Plains Indians which were manufactured commercially by Dutch settlers in Bergen County, New Jersey from the West Indian conch, Strombus gigas, (Ewers 1957). These tubes were made from the thick lip of the outer whorl of the conch. If the tubes from Fredricks site were made from this thicker lipped West Indian conch, it would explain the absence of a silca grove which only occurs on the inner columella part of the shell. Although the evidence suggests that commercial manufacture of these articles by the Dutch was begun between 1776 and 1798 (Ewers 1957:42), it is possible that the tubes at the Fredricks site represent a somewhat earlier example of trade for this distant source of shell. If this is true, then tubes, like the pendants, indicate a longer distance trade network historically than there is evidence for prehistorically at this locality.

Columella Segment Beads

Segment beads were made from the columella of large univalves by cutting or by a "groove-and-snap" technique. The resulting beads were then smoothed, drilled and strung. This bead type varies considerably in size and shape within specific contexts at each site, and to an even greater extent between sites. Their overall shape maintains the basic form of the columella although they are variable in size and length; hence they range from almost a tubular shape to a disk shape. As segments of quite different forms were worn together (Figure 147:a) with no indication of shape distinction, they were lumped under the single class of "segment," with only a size distinction of small, medium and large noted.

At the Wall site, medium segments ranged in length from 4.7-13.9 mm, in width from 10.7-18.7 mm, and in thickness from 7.4-15 mm. The small-sized segments ranged in length from 2.2-6.5 mm, in width from 4.9-7.7 mm, and in thickness from 4.0-6.5 mm. No segments of this "primary" style were recovered from the Fredricks site. A majority (75%) of the large segments and all of the small segments came from Burial 1-83 at the Wall site. For the most part, the segments occurred in long rows (presumably strings) around the neck as a necklace and around the arms and legs as bracelets and anklets. The remainder of the segments from the Wall site, which were recovered from Burial 2-83 and Burial 4 (1940-41 excavations), were also worn as necklaces.

The preform nature of this basic bead type allowed these segments to be modified into more finished forms of beads, some of which also were found at the Fredricks site. Also, the larger segments could be ground down and reworked into a smaller form if they were broken. This was exhibited in a reground large segment fragment from Town Creek

(31Mg3) (Figure 145:c). Two beads made from segments having a more finished, symmetrical form and leaning toward the discoidal end of this bead form's spectrum were present in Feature 3/Burial 5. These beads were found above the left temporal, next to the left ear and are believed to have been a form of ear ornament.

Spherical Columella Beads

Spherical columella beads were present in burial contexts at both sites. The specimens from the Wall Site appear to have been made by roughly grinding a segment bead into a fairly spherical shape. These occurred with marginella ornaments on the headdress of Burial 2 (1940-41 excavations).

At the Fredricks site spherical beads occurred with barrel/cylinders, runtees, and wampum (all discussed below) around the neck and chest area of Burial 2. All of these spherical beads were very badly preserved (Figure 148:d). It appeared from the few intact surfaces, that they were of a more finished quality (i.e. smoother and more polished) than those from the Wall site. Measurements ranged from 4.6-7.2 mm in length and from 5.4-7.3 mm in diameter.

Barrel/Cylinder Beads

Like the other beads discussed so far, barrel/cylinder beads were made from the columella. They vary from segments in that they are characteristically longer than wide, and they have been ground along their long axis so that they are more symmetrical than the segments. For the Tennessee area, Richard Polhemus has outlined several discrete classes including, cylinders, barrels, elongate, flattened elongate, which he considers to have specific temporal and contextual placements (Polhemus 1981); however, a preliminary study of beads from North Carolina mountain sites (Hammett 1983) indicated that while these

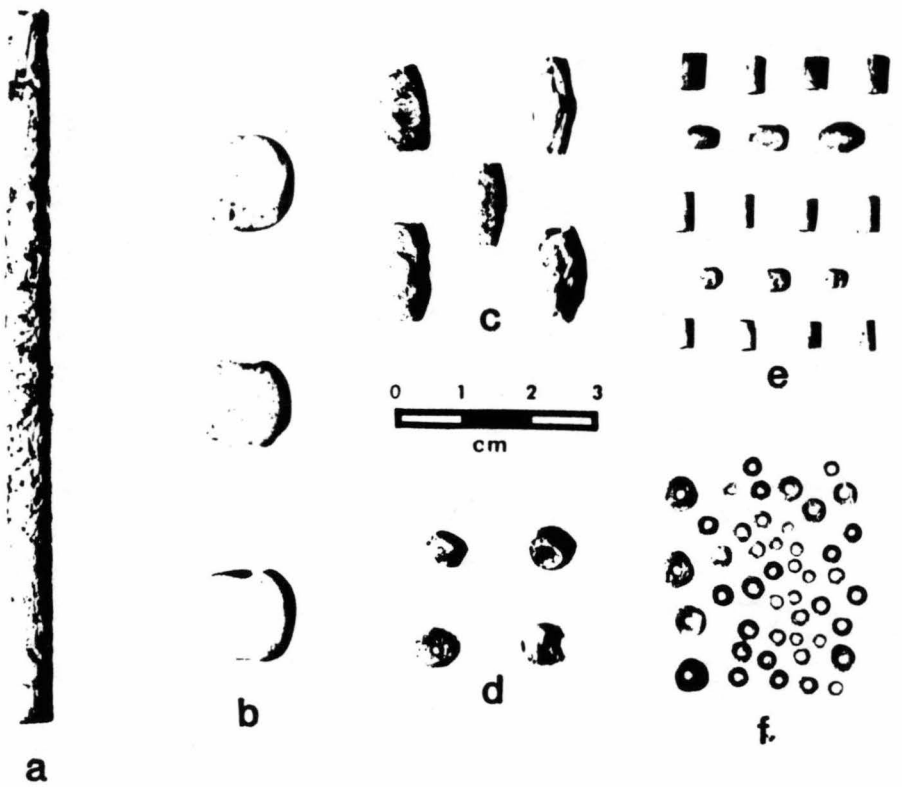


Figure 148. Bead types from the Fredricks site: tube bead (a); runtees (b); barrel/cylinders (c); spheres (d); wampum (e); and disks (f).

morphological attributes did occur in these Carolina sites, the measurements of these bead types overlapped too much to be quantified. Fifty-four barrel/cylinder beads were recovered from around the chest and neck of Burial 2 at the Fredricks site. They range in length from 12.2-15.4 mm, in diameter from 5.0-8.5 mm, and thickness from 4.9-7.5 mm. All are badly damaged.

Small Disks

Small disk beads, most of which were probably made from the wall sections of large univalves, occurred at both sites in large numbers, comprising approximately 90% of each site's ornament assemblage. Small white beads made up 90% of the total glass bead assemblage at Fredricks site as well (Carnes, this report). Apparently there was a continuous use and demand for this general bead form (first shell and then of glass and shell) throughout the period under consideration. Only two small disks were made from a dark stone, possibly argillite. Both occurred in contexts with shell disk beads, suggesting they were a rare variation on the more commonly occurring type.

In studies of shell disks in California, Chester King (1982) observed that, through prehistoric times, a gradual reductions in shell disk in size were corrolated with increased social status differentiation. He explained this change with a cost/benefit model in which a greater energy investment was demonstrated by reduced bead size, and a higher the value was placed on the item and more prestige accorded to it. Shortly after European contact the Spanish disrupted the traditional beadmaking and exchange system. For example, manufacture, which had formerly been limited to residents of Santa Cruz Island, became a more widespread craft. This dispersion of the craft resulted in a drastic reduction in the standardization of this medium of

exchange. There was also a decline in bead value. Disk beads, which had been getting smaller and smaller, suddenly became larger and cruder.

Using King's model, a hypothesis was developed for the Siouan Project disk beads, stating the expectation that they would pass through changes similar to the California beads. Preliminary observations of disks revealed that the Wall site disks were all stone drilled. Many of the Fredricks site disks, on the other hand, were drilled or punched with a small cylindrical object, presumably a metal nail, needle, or awl. The use of metal tools was suggested by the sharp sides of the bead holes as opposed to the hourglass concavity present on beads which had been slowly drilled from both sides (Figure 149). Also, a few of the Fredricks site beads revealed a larger, seemingly "unfinished" form similar to the rough disks from historic contexts in California. Several also revealed a triangular or quadrangular shaped hole which suggested they were not drilled but driven through by a very hard object, again a sign of the use of metal tools.

To test the King hypothesis, disk beads from each site were sorted by size using U.S. standard screens with mesh diameters of 4.0 mm, 2.83 mm, 2.38 mm, 2.0 mm, and 1.0 mm. Beads caught in each screen were counted and the condition of each bead was noted. For each sample, the number of complete beads (with all edges complete), the number of damaged beads (that may have fallen through the screen catching complete beads of the same size range), and the number of fragments (fragments which were 1/2 of a complete bead were given a MNI of .5; fragments which were at least 3/4 of a bead were given an MNI of 1) were quantified. Complete beads were distinguished from fragments and damaged beads to determine if the condition of the bead skewed their distributions by screen sizes. Total counts of mussel disk beads were

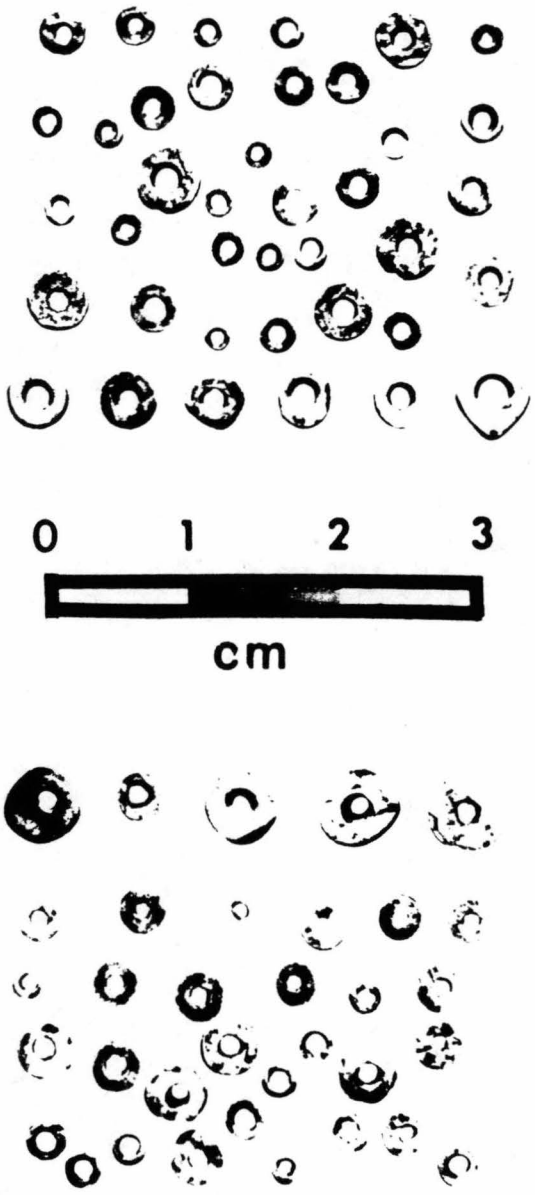


Figure 149. Shell disk beads from the Wall site (top) and Fredricks site (bottom).

tabulated separately because beads of this material tended to separate in layers which distorted their total numbers.

The bar graphs in Figure 150 show the results of the disk bead test. The top graph gives frequencies for only the complete specimens; the bottom graph gives frequencies for all specimens no matter what their condition. It is evident from these graphs that with a sufficiently large sample the condition of the beads does not significantly skew their distribution. The graphs demonstrate that although there does appear to be a slight trend toward larger bead size over time, the differences are fairly neglibible. At both sites, there does appear to be a standardization of disk size at around 2 mm to 3 mm, (but one should keep in mind that screen sizes are based on the diameter length between mesh wires and beads of a slightly greater size can slip through diagonally). This evidence suggests that energy/time costs may not have been as critical to these people as they were to the Californian beadmakers and traders.

Marginella Ornaments

Marginella shell ornaments were found primarily in two types of contexts at the Wall site, burials and the midden. No marginella shells were recovered from the Fredricks site. This suggests that either this type was more accessible or more desirable to the Wall site inhabitants. All marginella ornaments occurring with burials were ground near the spire at the top of the shell (Table 37). The most common place for grinding was on the shoulder of the whorl adjacent to the canal opening and a couple of millimeters down from the spire. A few more were ground on different horizontal plains, but keeping the same relationship to the spire tip. Only a very few (.01%) were spire ground, i.e., ground from the spire tip at a perpendicular angle to the long axis of the shell.

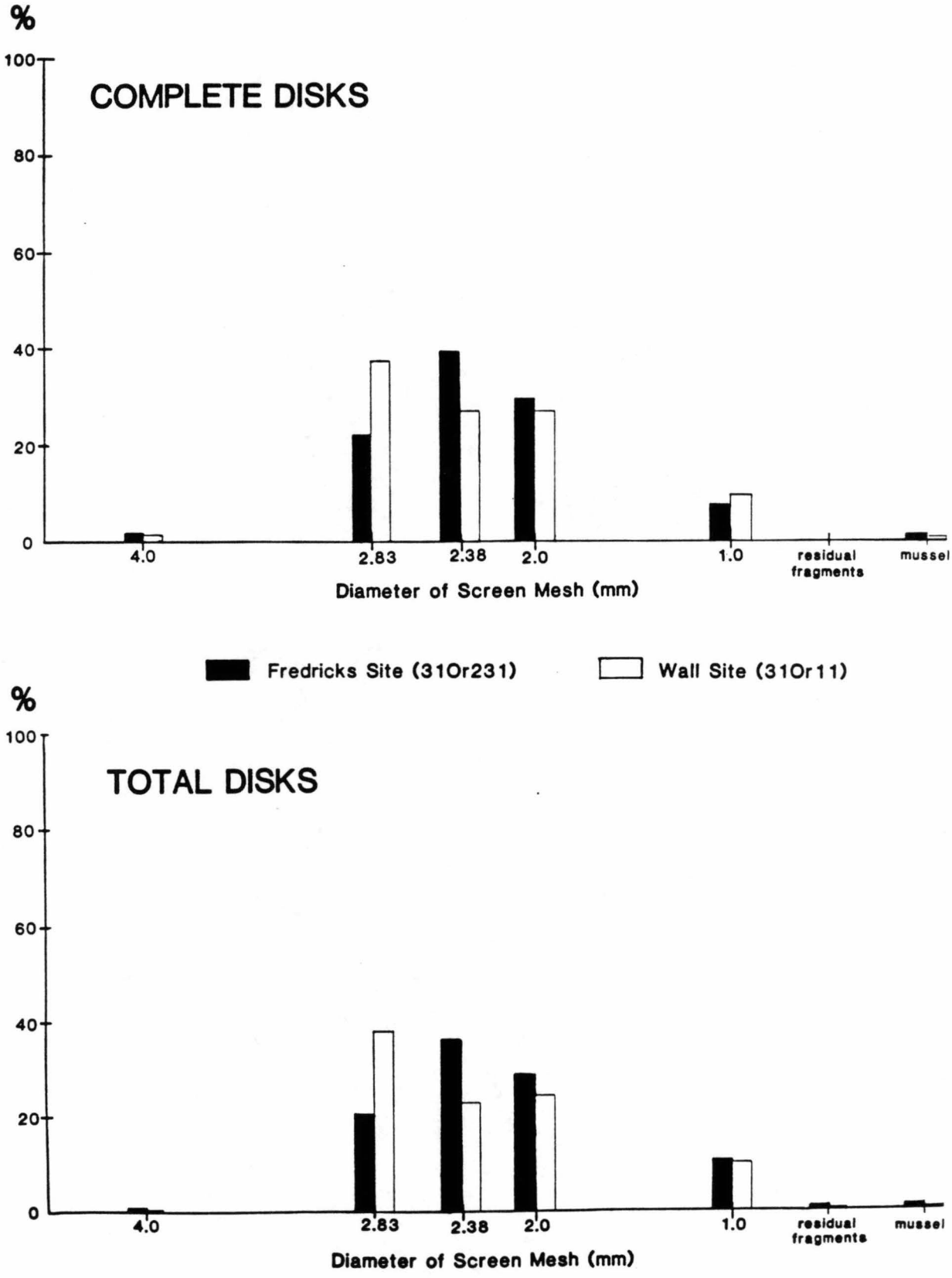


Figure 150. Frequency distribution of shell disk beads by screen size.

Table 37. Summary of marginella ornaments from the Wall site.

	CONTEXT	SHOULDER GROUND	SPIRE GROUND	SPIRE AND BASE GROUND	INDET.	WHOLE	DETRITUS (MNI)	TOTAL MARGINELLA	PERCENT MARGINELLA	TOTAL ORNAMENTS	PERCENT ORNAMENTS
PRIOR EXCAVATIONS											
(1938 and 1940-41)	Burial 2	406	9	10	128	-	-	553	88.91%	7932	63.14%
	Burial 4	-	-	-	1	-	-	1	0.16%	4536	36.11%
	Feature 7	-	-	-	18	-	-	18	2.89%	18	0.14%
	Feature 12	6	-	-	-	7	-	13	2.09%	16	0.13%
	Feature 45	-	-	-	1	-	-	1	0.16%	1	0.01%
	Feature 50	3	-	-	-	-	-	3	0.48%	3	0.02%
	Midden	2	1	1	14	14	-	32	5.14%	38	0.30%
	Other	-	-	-	1	-	-	1	0.16%	18	0.14%
	TOTAL	417	10	11	163	21	-	622	100.00%	12562	100.00%
	%	67.04%	1.61%	1.77%	26.21%	3.38%	0.00%	100.00%			
1983-84 EXCAVATIONS											
	Burial 1-83	193	2	18	118	1	-	332	93.00%	10463	99.17%
	Burial 2-83	-	-	-	-	-	-	-	-	10	0.09%
	Midden	5	-	1	-	6	13	25	7.00%	77	0.73%
	Other	-	-	-	-	-	-	-	-	1	0.01%
	TOTAL	198	2	19	118	7	13	357	100.00%	10551	100.00%
	%	55.46%	0.56%	5.32%	33.05%	1.96%	3.64%	100.00%			
BOTH EXCAVATIONS											
COUNTS	Burials	599	11	28	247	1	-	886	90.50%	22941	99.26%
	Midden	7	1	2	14	20	13	57	5.82%	115	0.50%
	Other	9	-	-	20	7	-	36	3.68%	57	0.25%
	TOTAL	615	12	30	281	28	13	979	100.00%	23113	100.00%
	%	62.82%	1.23%	3.06%	28.70%	2.86%	1.33%	100.00%			
PERCENTAGES	Burial	97.40%	91.67%	93.33%	87.90%	3.57%	0.00%	90.50%	90.50%	99.26%	
	Midden	1.14%	8.33%	6.67%	4.98%	71.43%	100.00%	5.82%	5.82%	0.50%	
	Other	1.46%	0.00%	0.00%	7.12%	25.00%	0.00%	3.68%	3.68%	0.25%	
	TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Presumably this latter technique would be preferable if the shells were to be worn as beads. The former technique would be preferable for making ornaments to be sewn onto garments. By grinding the surface nearest the natural slit in the shell, the artisan allowed the greatest unmarred surface area to be exposed after the ground side had been sewn to a backing (Figure 147:d, outer beads). At the Wall site, it appears that the ornaments were sewn on articles of clothing, since, for the most part, they occurred over chest areas (shirts), around the head (headbands), around the waists (girdles or belts), and over legs (leggings) (Table 38).

Conversely, the majority of marginella shell from midden contexts were either unmodified shells or broken shells. The broken shells may represent disposal from manufacture or breakage from wear. The presence of unmodified whole shells suggests that either: 1) they were traded whole and were then ground into ornaments in the village; or 2) a few unground shells were found among shipments of the finished ornaments, which were then discarded along with the fragments broken during the process of sewing the finished ornaments onto garments. Why the whole shells were not ground remains a mystery since the only tool necessary for this precedure would have been some form of grinding slab.

Wampum

Wampum has been treated in great detail elsewhere (Speck 1919; Orchard 1929; Brown 1948). For the Siouan Project, a study of the wampum recovered in 1983 was previously initiated (Sizemore 1984). So far wampum have only been recovered from the Fredricks site. Two basic types of wampum have been identified: 1) a cylindrical form, which has frequently been described in the literature; and 2) a morphological variant on the former type which will be called oval wampum (Figure

Table 38. Inventory of shell ornaments from the Wall site.

PROVENIENCE		PENDANTS/ GORGETS	LARGE SEGMENTS	SMALL SEGMENTS	ROUGH SPHERICALS	OTHER ORNAMENTS	MICA PENDANTS	NATIVE COPPER	TOTAL MARGINELLA	TOTAL DISKS	TOTAL ORNAMENTS	PERCENT ORNAMENTS
	1938 EXCAVATIONS											
Feature 7		-	-	-	-	-	-	-	18	-	18	0.08%
Feature 12		-	-	-	-	-	-	-	13	3	16	0.07%
Stk60	N3'10",W1";L1	-	-	-	-	-	-	-	1	-	1	.00%
Stk80	N4'6",W3';L2	-	-	-	-	-	-	-	1	-	1	.00%
Sq90	L2 of L3	-	-	-	-	-	-	-	-	1	1	.00%
	1940-41 EXCAVATIONS											
Burial 2	FS#80-118	-	-	-	-	-	-	4	-	-	4	0.02%
Burial 2	Headdress/FS#80-117	-	-	-	119	-	-	-	41	5255	5415	23.43%
Burial 2	Right arm band/FS#80-116	-	-	-	-	-	-	-	-	1050	1050	4.54%
Burial 2	Left arm band/FS#80-115	-	-	-	-	-	-	-	-	944	944	4.08%
Burial 2	Girdle	-	-	-	-	-	-	-	512	4	516	2.23%
Burial 2		3	-	-	-	-	-	-	-	-	3	0.01%
Burial 4	Neck area/FS#80-139	-	52	-	-	-	-	-	1	1	54	0.23%
Burial 4	Left wrist	-	-	-	-	-	-	-	-	75	75	0.32%
Burial 4	Left ankle/FS#80-140	-	-	-	-	-	-	-	-	176	176	0.76%
Burial 4	Neck area/FS#80-138	-	-	-	-	-	-	-	-	4231	4231	18.31%
Feature 11	FS#28	-	-	-	-	-	-	-	-	11	11	0.05%
Feature 28		-	-	-	-	-	-	-	-	2	2	0.01%
Feature 29		-	-	-	-	-	-	-	-	3	3	0.01%
Feature 45	FS#131	-	-	-	-	-	-	-	1	-	1	.00%
Feature 50	FS#141	-	-	-	-	-	-	-	3	-	3	0.01%
Sq0R50	Plowed soil	-	1	-	-	-	-	-	-	-	1	.00%
Sq0R60	Plowed soil	-	-	-	-	-	-	-	1	-	1	.00%
Sq60R70	Undisturbed soil	-	-	-	-	-	-	-	4	-	4	0.02%
Sq70R50	Undisturbed soil	-	-	-	-	-	-	-	-	1	1	.00%
Sq75	L2	-	-	-	-	-	-	-	-	1	1	.00%
Sq90R50	Undisturbed soil	-	-	-	-	-	-	-	1	-	1	.00%
Sq90R60	Undisturbed soil	-	-	-	-	-	-	-	16	-	16	0.07%
Sq90R70	Undisturbed soil	-	-	-	-	-	-	-	2	-	2	0.01%
Sq100R60	Undisturbed soil	-	-	-	-	-	-	-	7	3	10	0.04%
		3	53	-	119	-	-	4	622	11761	12562	54.35%
	1983/84 EXCAVATIONS											
Sq330R520	Old backfill	-	-	-	-	-	-	-	-	1	1	.00%
	BURIALS											
BU1-83	Zone 1;NE1/2	-	-	-	-	-	-	-	1	4	5	0.02%
BU1-83	Zone 1	-	-	-	-	-	-	-	1	2	3	0.01%
BU1-83	Clean.round bone	-	-	-	-	-	-	-	41	739	780	3.37%
BU1-83	Cleaning pit	-	-	1	-	-	-	-	-	10	11	0.05%
BU1-83	Assoc.w/Pot#1	-	-	-	-	1	-	-	-	-	1	.00%
BU1-83	Around head (hand)	-	-	-	-	-	-	-	74	-	74	0.32%
BU1-83	Behind lower skull	-	9	-	-	-	-	-	14	289	312	1.35%
BU1-83	Front lower skull	-	-	-	-	-	-	-	-	170	170	0.74%
BU1-83	In skull	-	-	-	-	-	-	-	4	105	109	0.47%
BU1-83	Below skull	-	3	-	-	-	-	-	4	197	204	0.88%
BU1-83	Clean. round skull	-	-	-	-	-	-	1	9	323	333	1.44%
BU1-83	Around neck	-	32	-	-	-	-	-	-	49	81	0.35%
BU1-83	Head/chest area	-	2	-	-	-	-	-	45	2018	2065	8.93%
BU1-83	Around chest area	-	26	-	-	-	-	1	1	957	985	4.26%
BU1-83	Back area	1	-	-	-	-	-	-	-	-	1	.00%
BU1-83	Near gorget	-	19	-	-	-	-	-	-	-	19	0.08%
BU1-83	Upper arm area	-	1	-	-	-	-	-	9	308	318	1.38%
BU1-83	Arm area	-	40	20	-	-	-	1	-	1840	1901	8.22%
BU1-83	Lower arm	-	10	-	-	-	-	-	1	1304	1315	5.69%
BU1-83	Below ribs & arms	-	-	-	-	-	-	-	-	620	620	2.68%
BU1-83	Clean. ribs & vert.	-	7	-	-	-	-	-	-	73	80	0.35%
BU1-83	Clean. hip area	-	12	-	-	-	-	-	1	-	13	0.06%
BU1-83	Cl.low.back/leg area	-	-	-	-	-	-	-	-	168	168	0.73%
BU1-83	Dirt around legs	-	15	-	-	-	-	-	47	38	100	0.43%
BU1-83	Left tibia/fibula	-	3	-	-	-	-	-	59	2	64	0.28%
BU1-83	Below lower legs	-	7	-	-	-	-	-	14	-	21	0.09%
BU1-83	General cleaning	-	-	-	-	-	-	1	7	702	710	3.07%
BU2-83	Around neck	-	10	-	-	-	-	-	-	-	10	0.04%
	MIDDEN											
Sq360R530	Midden Lev.1	-	-	-	-	-	-	-	17	39	56	0.24%
Sq360R530	Midden Lev.1;NW Quad	-	-	-	-	-	-	-	-	2	2	0.01%
Sq360R530	Midden Lev.1;SW Quad	-	-	-	-	-	-	-	-	1	1	.00%
Sq350R500	Midden Lev.1	-	-	-	-	-	-	-	-	1	1	.00%
Sq370R540	Midden Lev.1	-	-	-	-	-	1 cut frag.	-	-	-	-	0.00%
Sq370R540	Midden Lev.2	-	-	-	-	-	1 cut frag.	-	-	-	-	0.00%
Sq370R560	Midden Lev.2	-	-	-	-	-	-	-	4	3	7	0.03%
Sq360R530	Midden Lev.2	-	-	-	-	-	-	-	4	3	7	0.03%
Sq360R520	Midden Lev.2;NE Quad	-	-	-	-	-	-	-	-	2	2	0.01%
Sq320R620	Plow zone	-	-	-	-	-	-	-	-	-	-	0.00%
Sq320R620	Flat shovelling	-	-	-	-	-	1	-	-	-	1	.00%
Sq320R620	Flatshov. top subsoil	-	-	-	-	-	-	-	-	-	-	0.00%
	1983/84 WORK	1 0.01%	196 1.86%	21 0.20%	- 0.00%	1 0.01%	1 0.01%	4 0.04%	357 3.38%	9970 94.49%	10551 100.00%	45.65%
	PREVIOUS WORK	3 0.02%	53 0.42%	- 0.00%	119 0.95%	- 0.00%	- 0.00%	4 0.03%	622 4.95%	11761 93.62%	12562 100.00%	54.35%
	COMBINED WORK	4 0.02%	249 1.08%	21 0.09%	119 0.51%	1 .00%	1 .00%	8 0.03%	979 4.24%	21731 94.02%	23113 100.00%	100.00%

148:e). The oval wampum were made by grinding the sharp corners from the ends of the cylinders. Both purple and white varieties of both types have been identified, although only five purple oval wampum have been recovered so far from this site. Overall, the wampum range in length from 4.8-7.0 mm and in diameter from 3.2-4.6 mm, with the white wampum making up a higher proportion of the smaller sizes. All of the white oval wampum were made from smaller white wampum, and they occurred exclusively with this small white cylindrical form. All the purple wampum, including the oval form, were larger than the white oval wampum.

The majority of the wampum (68%) was found with Burial 1 (Table 39), occurring around the neck, chest, and the lower arms areas where they were arranged in closely spaced parallel rows. The wampum with Burial 2 were found around the neck and chest in a similar pattern. The wampum with Burial 1 appeared to have been strung around the neck. The rest of the wampum were found with Feature 3/Burial 5. These latter specimens, probably decoration on a small bag or pouch, were lying over a cluster of two ceramic pipes, a knife and a bird claw. The contextual relationship of the wampum at this site suggest they were used as ornaments sewn onto garments and other personal gear, and were strung as necklaces worn around the neck.

Runtees

In 1722, Robert Beverley of Virginia described this type of bead as being made "of the Conch Shell, as the Peak is, only the Shape is flat and like a Cheese, and drill'd Edge-ways" (1722:145). Runtees from the Siouan Project ranged from 12.8-17.2 mm in length, 12.8-17.5 mm mm in diameter, and 4.1-6.4 mm in thickness. They occurred in very small numbers (n=21) and only at the Fredricks site. They were found exclusively around the neck and chest areas of Burials 1 and 2. Those

Table 39. Summary of wampum from the Fredricks site.

		CYLINDRICAL PURPLE	CYLINDRICAL WHITE	INDET.	SUB TOTAL	OVAL PURPLE	OVAL WHITE	TOTAL WAMPUM	TOTAL ORNAMENTS
COUNTS									
	1983 EXCAVATIONS								
	Burial 1	206	217	76	499	3	57	559	6315
	Burial 2	101	9	6	116	2	-	118	2112
	Burial 3	-	2	18	20	-	-	20	48
	Other	-	-	-	-	-	-	-	1
	1984 EXCAVATIONS								
	Feat.3/Burial 5	-	126	-	126	-	-	126	174
	Other	-	-	-	-	-	-	-	97
	TOTAL	307	354	100	761	5	57	823	8747
	% WAMPUM	37.30%	43.01%	12.15%	92.47%	0.61%	6.93%	100.00%	
PERCENTAGES									
	1983 EXCAVATIONS								
	Burial 1	67.10%	61.30%	76.00%	65.57%	60.00%	100.00%	67.92%	72.20%
	Burial 2	32.90%	2.54%	6.00%	15.24%	40.00%	0.00%	14.34%	24.15%
	Burial 3	0.00%	0.56%	18.00%	2.63%	0.00%	0.00%	2.43%	0.55%
	Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
	1984 EXCAVATIONS								
	Feat.3/Burial 5	0.00%	35.59%	0.00%	16.56%	0.00%	0.00%	15.31%	0.00%
	Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.99%
	TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%

with Burial 2 occurred with spherical and barrel/cylinder beads (Table 40). In both instances, they occurred in association with wampum. No other runtees are known to have been found at Piedmont sites.

Clam Shell Artifact

One possible shell ornament is left for consideration. It is a clam shell with a perforation in its cup which exhibits wear on two sides of the hole. This shell may have been worn as a pendant. On the other hand it may have affixed to a wooden handle and used as a spoon. It was found within a pot associated with Burial 1-83 at the Wall site. At this time the function of this artifact remains uncertain.

Non-Shell Ornaments

The only non-shell ornaments, aside from the stone disk beads discussed above, were small tubes made from copper and a single mica pendant. A few tubes of native copper were identified from the Wall site, four from Burial 1-83 and four from Burial 2 (1940-41 excavations). All were in poor condition. The tubes were approximately 1-2 mm in diameter and were all less than 5 mm long. Their short lengths were at least partially due to poor preservation. All were of a rolled technique, a form which has also been found at Late Upper Saratown and RLA-Vir150. They appeared to have occurred with strands of shell disks beads and were probably strung with them.

One mica hexagonal pendant, measuring 40 cm between opposite sides, was found in the plowzone over Structures G-H at the Wall site along with several pieces of mica that were apparently unmodified. Two cut fragments were also recovered from the midden. No other mica has been found at these two sites thus far.

Table 40. Inventory of shell ornaments from the Fredricks site.

PROVENIENCE		GORGETS	TUBE BEADS	CYLINDER/ BARRELS	RUNTEES	MEDIUM SPHERICALS	EAR ORNAMENTS	COLUMELLA SEGMENTS	TOTAL WAMPUM	TOTAL DISKS	TOTAL ORNAMENTS	PERCENT ORNAMENTS
	1983 EXCAVATIONS											
FE1	Finding edge	-	-	-	-	-	-	-	-	1	1	0.01%
BU1	Zone 1; NW 1/2	-	-	-	-	-	-	-	2	6	8	0.09%
BU1	Brown soil at bone level	-	-	-	-	-	-	-	18	10	28	0.32%
BU1	Cleaning around the bone	-	-	-	-	-	-	-	42	84	126	1.44%
BU1	In orange clay around bone	-	-	-	-	-	-	-	-	19	19	0.22%
BU1	Skull area	-	-	-	-	-	-	-	8	452	460	5.26%
BU1	West of mandible	-	-	-	-	-	-	-	1	8	9	0.10%
BU1	Around right shoulder	-	-	-	-	-	-	-	-	22	22	0.25%
BU1	Around right scapula	-	-	-	-	-	-	-	-	1	1	0.01%
BU1	Around neck and chest area	-	-	-	8	-	-	1	162	4332	4503	51.48%
BU1	Cleaning bone, chest area	2	-	-	4	-	-	-	76	511	593	6.78%
BU1	Around ribs	-	-	-	-	-	-	-	1	27	28	0.32%
BU1	Over right elbow	-	-	-	-	-	-	-	3	11	14	0.16%
BU1	Around lower right arm	-	-	-	-	-	-	-	129	-	129	1.47%
BU1	Around right hand	-	-	-	-	-	-	-	97	242	339	3.88%
BU1	Around left arm	-	-	-	-	-	-	-	20	8	28	0.32%
BU1	Cleaning around scissors	-	-	-	-	-	-	-	-	2	2	0.02%
BU1	Zone 3A;under striped beads	-	-	-	-	-	-	-	-	2	2	0.02%
BU1	Zone 3A;under pewter buttons	-	-	-	-	-	-	-	-	4	4	0.05%
BU2	Cleaning around bone	-	-	-	-	-	-	-	2	3	5	0.06%
BU2	Around neck and chest area	-	-	54	9	16	-	-	115	1	195	2.23%
BU2	Right arm area	-	-	-	-	-	-	-	-	1889	1889	21.60%
BU2	Right arm area	-	-	-	-	-	-	-	1	-	1	0.01%
BU2	At left radius/ulna	-	-	-	-	-	-	-	-	3	3	0.03%
BU2	Right femur area	-	-	-	-	-	-	-	-	2	2	0.02%
BU2	Beaded area beside body	-	-	-	-	-	-	-	-	10	10	0.11%
BU2	With knife, east of body	-	-	-	-	-	-	-	-	7	7	0.08%
BU3	Zone 1	-	-	-	-	-	-	-	2	28	30	0.34%
BU3	Strung around neck	-	-	-	-	-	-	-	16	-	16	0.18%
BU3	With knife, under mandible	-	-	-	-	-	-	-	2	-	2	0.02%
	1984 EXCAVATIONS											
FE2/BU4	On chest area	-	11	-	-	-	-	-	-	-	11	0.13%
FE3/BU5	Trowelling Sq290R70	-	-	-	-	-	-	-	-	13	13	0.15%
FE3/BU5	Trowelling Sq290R80	-	-	-	-	-	-	-	-	6	6	0.07%
FE3/BU5	Zone 1	-	-	-	-	-	-	-	-	4	4	0.05%
FE3/BU5	Zone 2 w1859,a1885,	-	-	-	-	-	-	-	1	18	19	0.22%
FE3/BU5	Zone 3	-	-	-	-	-	-	-	3	3	6	0.07%
FE3/BU5	Left temporal (near ear)	-	-	-	-	-	2	-	-	-	2	0.02%
FE3/BU5	East of arms (in situ)	-	-	-	-	-	-	-	103	-	103	1.18%
FE3/BU5	Cleaning in situ pedestal	-	-	-	-	-	-	-	19	2	21	0.24%
FE4/BU6	Zone 1, NW 1/2	-	-	-	-	-	-	-	-	1	1	0.01%
FE4/BU6	Zone 5	-	-	-	-	-	-	-	-	4	4	0.05%
FE4/BU6	W/copper bracelet on wrist	-	-	-	-	-	-	-	-	71	71	0.81%
FE4/BU6	From bracelet soil	-	-	-	-	-	-	-	-	6	6	0.07%
FE6/BU8	Trowelling	-	-	-	-	-	-	-	-	1	1	0.01%
FE13	Zone 1	-	-	-	-	-	-	-	-	3	3	0.03%
	TOTALS	2 0.02%	11 0.13%	54 0.62%	21 0.24%	16 0.18%	2 0.02%	1 0.01%	823 9.41%	7817 89.37%	8747 100.00%	100.00%

A REGIONAL PERSPECTIVE

Most of the major bead types at the Wall site have been recovered from other sites in the general region (Table 36). Their distribution suggests a degree of continuity of the exchange of ideas and goods through late prehistoric times between groups. Evidence of fragments of the large univalve used for manufacturing many of the beads and other ornaments has been found at only two sites in the area, Early Upper Saratown and Lower Saurotown, both excavated by the Research Laboratories of Anthropology. Of these, only the fragments of shell from Early Upper Saratown can really be considered reasonably reliable indications of onsite beadmaking. Here, several pieces of univalves and whole univalves were found as well as pieces of shell indicated partial ornament preforms (or blanks). The whole shells were perforated in a fashion similar to the shells recovered from the Irene Mound on the coast of Georgia (Caldwell and McCann 1941) which have been posited elsewhere to be some form of digging tool, such as hoes. Broken and ground fragments of large univalve shells, presumably shell artifact manufacture detritus, were also found at the Irene Mound site. The archaeological work at Lower Saurotown produced one large rounded blank (undrilled) which could have been traded from a village such as Upper Saratown or even the Irene Mound. Upper Saratown is equidistant between the Wall site and the Shannon site, located in Montgomery County, Virginia. Early historic records suggest that the Upper Saratown sites were on a major north/south trail which intersected a east/west trail that extended from the western foothills to the coast via Occaneechi (at or near the Wall and Fredricks sites; Simpkins 1984). From the ornament distribution it appears likely that by late prehistoric times sites in southwestern Virginia and northwest and north central North

Carolina were already connected by such trails.

Historically, the introduction of wampum and other bead types in this region is an indication an expansion of trade networks. It is evident from the literature that the beadmakers of New England had taken care to standardize their medium of exchange and had been able to put a high value on their beads. This is demonstrated by the continued use of these beads well into the contact period. Yet it is not entirely clear what part, if any, that the aboriginal New England economic system played in bead manufacture and exchange in the Carolina area.

Between the times of occupation of Wall and Fredricks sites we see the addition of several bead types (wampum, runtees, barrel/cylinders) and the disappearance of others (marginellas and segments). Certainly these changes indicate increasing ties to the north and lessening ties southward. Also, however, a comparison of their contextual relationships suggests that some of the new types also served as replacements for previous types. It appears from the record that marginellas and wampum functioned quite similarly, in terms of their placement on similar parts of the body and with similar types of individuals (subadults and to a lesser extent adult males; see Wilson, this report). The columella segments appear to have been replaced by runtees and barrel/cylinders. Disks, however, seem to have maintained a similar function through time, based on the distribution and frequencies of both shell and glass forms.

At a regional level, there are indications that shell artifacts were manufactured prehistorically at only a few villages and were traded from these centers to other villages throughout the Piedmont and western Appalachian foothills. This is a pattern seen elsewhere prehistorically in North America, although in the other areas the beadmaking centers

were along the coast. The present study suggests that the raw materials were being traded to interior villages where beadmaking occurred. Another difference is that the Piedmont forms appear to have been larger and overall less finished than the standardized trade products from the other beadmaking centers. This information, along with the comparison of the disks discussed above, may indicate that a time/energy constraint was less critical in the Carolina interior than some other constraint, such as for example access to resources. It would seem that access to coastal resources, which is implied symbolically by the material traded, would be assumed where the beadmakers were coastal residents. Perhaps there was a secondary criterion for transmitting information regarding access restrictions was necessary for this medium of exchange. In the interior, access to coastal resources alone might have been sufficient to allow a standardization of exchange values, without the additional expenditure of reducing these ornamnents.

An alternative explanation is that the Piedmont residents were less directly tied into a money economy than the California Chumash or the Naragansett of the Northeast. In the Carolina Piedmont, populations were relatively small and not very dense and there was less social ranking than in the coastal areas. To the Piedmont residents, transmission of information about access to rare resources may have been more crucial than demonstrating control over human labor. Such a distinction may be reflected in the large and unfinished size of many of the Piedmont ornaments. Also the large original size of some forms would have allowed for reuse through reduction after breakage, a practice observed for the columella tubes and segments. To have a large, less finished product would symbolically affirm more direct access to the rare commodity than a reduced more refined product. There

is a small amount of evidence to suggest that blanks rather than the finished products were traded. This would allow purchasers to customize their own ornaments and wearers to transmit the information that they had access to a larger trade network, while at the same time having allegiances to a more specific group. In any event it is evident that a fairly standardized medium of exchange existed aboriginally in the Piedmont. It is noteworthy that the one beadmaking center that has been isolated for the Piedmont region so far is near the territory of the more populated groups of the mountains.

SERRATED SHELLS

The serrated shell tools from the Wall site were made from a freshwater bivalve (Sharon Clausen, personal communication), which had been notched along their edges to produce a cutting edge. The specific use for these shells is not fully understood. There is ethnographic information that suggests they may have been used to scrape excess clay out of the interior of ceramic vessels prior to firing (Figure 151). The problem with this explanation is that scrape marks produced from such tools rarely occur on the ceramics from this site (Davis, this report) although they do occur from earlier sites in the region. The use of these tools may have been followed by a smoothing shell which would have erased the traces of the serrated shells. Smoothing shells would show little or no evidence of manufacture and would be difficult to identify in the archaeological record. Other fresh water shells were collected from the Wall site but so far none have been found that reveal evidence of wear or modification perhaps partly due to their poor preservation.

It is quite possible that these serrated shells had another purpose

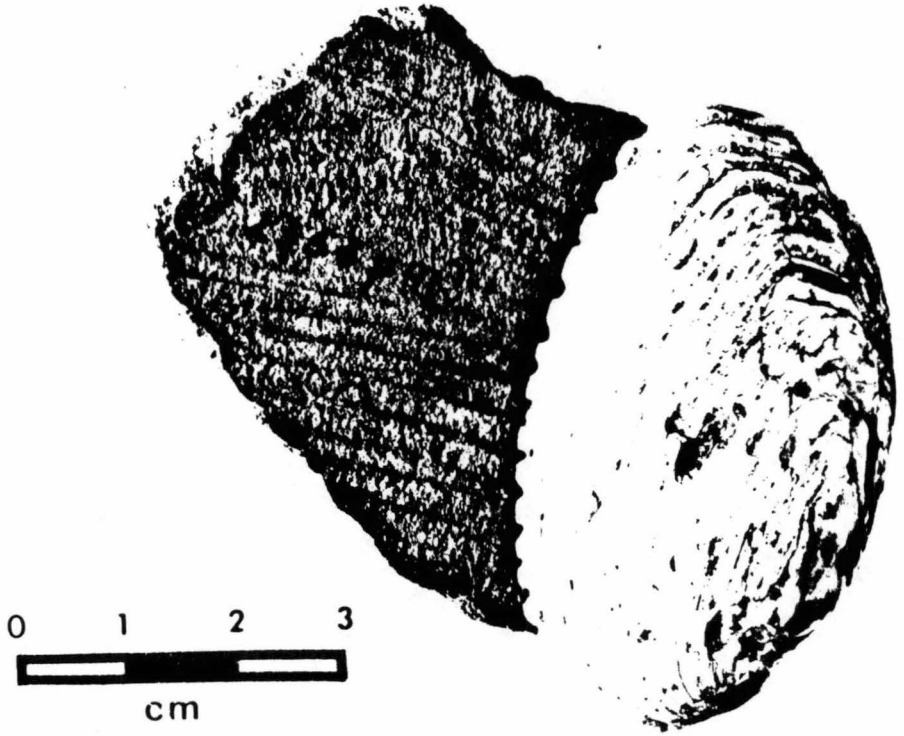


Figure 151. Serrated shells from the Wall site showing similarity of edge form to scrape marks on inside of pottery sherd.

or that they were multiuse tools, however, this remains to be demonstrated. Their absence thus far from the remains recovered at the Fredricks site indicates that after contact they were either replaced by another tool or tools, or the function that was performed with them no longer occurred. Either way, it appears the need for this tool type ceased to exist.

CONCLUSIONS

Shell artifacts from the Wall and Fredricks sites provide substantial information about changes and continuity in the region from protohistoric to historic times. A shell artifact classification has been developed and changes through time have been demonstrated. The evidence indicates that a regional trade network with fairly standardized forms of ornaments serving as mediums of exchange was present in the area prehistorically. The impact of European contact resulted in a longer range trade network with increasing ties northward and decreasing ties southward. Overall, there is evidence for reuse and curation of shell ornaments and for replacement of traditional types with newer, similar types during the Historic period. The latter observation leaves the question of whether there were changes in ethnicity or exchange networks, or both. It could be that the same ethnic groups imposed their preconceived models on new items, or that new people brought in similar models of function for similar forms.

CHAPTER VIII

POTTERY FROM THE FREDRICKS, WALL, AND MITCHUM SITES

by

R.P. Stephen Davis, Jr.

INTRODUCTION

One of the most perplexing problems in North Carolina archaeology has been the identification and interpretation of the historic Piedmont Siouan cultures. Despite almost fifty years of relatively continuous scientific archaeological study within the region, much of which has been specifically directed toward this problem, the Historic period remains poorly understood. Moreover, very few of the several ethnohistorically-described villages of the Piedmont Siouans have been positively identified; and most of those located by early research during the 1930s and 1940s can now be shown to predate the Historic period. Given this situation, the methodological problem of recognizing Historic period sites remains one of fundamental importance to addressing other questions of culture change and adaptation. The problem of temporal placement is equally relevant to studies of earlier occupations as well.

The usefulness of ceramics as a basis for establishing cultural relationships has long been appreciated by archaeologists working in the eastern United States (Holmes 1903:18-19). This usefulness derives from three primary qualities which ceramics possess: 1) their relative ubiquity on Woodland and Mississippian period habitation sites; 2) their durability; and 3) their amenability to variable, culturally-prescribed stylistic and technological expression. Consequently, it is not surprising that previous studies of ceramics

from Woodland period sites in the Siouan Project study area have focused on using ceramics to establish culture historical relationships. The present study also has a similar focus in that it seeks to define the configuration of particular ceramic assemblages and to determine their relationships to other assemblages. However, unlike previous work, which considered ceramic variability from a purely typological perspective (Coe and Lewis 1952; Coe 1964; Gardner 1980; Smith 1965), the present study approaches variability from the attribute level rather than from the artifact level (see Clarke 1968 for an elaboration of this distinction). A recent and similar study by Wilson (1983) has made substantial progress toward a synthetic, regional depiction of Late Woodland ceramic traditions of the North Carolina and southern Virginia Piedmont and an interpretation of their historical relationships. The present study adds new and significant information for advancing our understanding within one area of this region.

During 1983-1984, archaeological excavations were undertaken by the Research Laboratories of Anthropology at the Fredricks (31Or231) and Wall (31Or11) sites near Hillsborough in Orange County and at the Mitchum site (31Ch452) in Chatham County, North Carolina. These investigations document the protohistoric and historic Indian occupation of the Eno and Haw River valleys and provide an empirical basis for studying synchronic and diachronic variability in Piedmont Siouan ceramic technology (e.g., Davis 1984). Specifically, the primary components at the three sites represent villages that were occupied from the Protohistoric (Wall site) to the Middle Contact (Fredricks site) period. Based upon historic artifact assemblages, the Mitchum site represents an Early Contact period village that immediately preceded the major occupation of the Fredricks site.

From the three sites, a total of 33,033 ceramic artifacts (excluding clay pipes and daub) have been recovered and analyzed. Most of these represent non-conjoining fragments or sherds of fired-clay storage, cooking, or eating vessels. Because of a paucity of whole vessels and reconstructable sections of broken vessels, this analysis is based primarily upon potsherd assemblages.

Three questions will be addressed by the following analysis. All of these questions focus on the interpretation of the Fredricks site artifacts and how they compare with the other two analyzed samples. First, which artifacts comprise the ceramic assemblage associated with the Middle Contact period Indian occupation at the Fredricks site, and how can this assemblage be defined in terms of stylistic/technological/morphological attributes? Second, is there any evidence for other Woodland components at the Fredricks site? Finally, what are the relationships between the Historic period ceramic assemblage at the Fredricks site and other late prehistoric/historic ceramic assemblages identified within the study area, and what implications do they have for interpreting the Fredricks site as an intrusive Occaneechi village? The first two questions will be considered by an analysis of covariability among ceramic attributes and their intrasite spatial patterning. The last question will be examined through comparative analyses of the Fredricks site collection with ceramic collections from the Wall and Mitchum sites, as well as from several other Woodland sites in piedmont North Carolina and Virginia, including sites located in the area of Occaneechi Island where the Occaneechi resided prior to 1676 (Alvord and Bidgood 1912).

ANALYTIC METHODS

Analysis of ceramic artifacts from the Fredricks, Wall, and Mitchum sites was accomplished within the context of a computerized data recording system developed by the Research Laboratories of Anthropology. Other comparative data used to evaluate the Fredricks site assemblage were derived from published and unpublished site reports. Ceramic artifacts were computer-coded according to seven contextual/provenience variables, four morphological attributes, two technological attributes, three stylistic attributes, and size. Vessels and reconstructable vessel sections were further coded for additional morphological attributes and size measurements. Measured sherd attributes and attribute states relevant to the present study are briefly described below.

Morphological Attributes

Four separate attributes, which provide information about morphological characteristics of the parent vessel assemblage, were coded. First, the portion or portions of a vessel represented by a sherd was identified. Three vessel portions--rim, neck, and body--are recognized and defined in Figure 152. Classification by vessel portion is considered important since it provides an indirect measure of similarity and difference in vessel morphology within and between ceramic assemblages in the absence of sufficiently large vessel samples. Second, sherds were measured according to average thickness. Six thickness attribute states are used and include: <=4 mm, >4-6 mm, >6-8 mm, >8-10 mm, and >10 mm. Thickness was measured using a block of wood which had been slotted to the appropriate thickness sizes. As with vessel portion, thickness measurement provides an indirect means for assessing variability in vessel morphology. Two additional

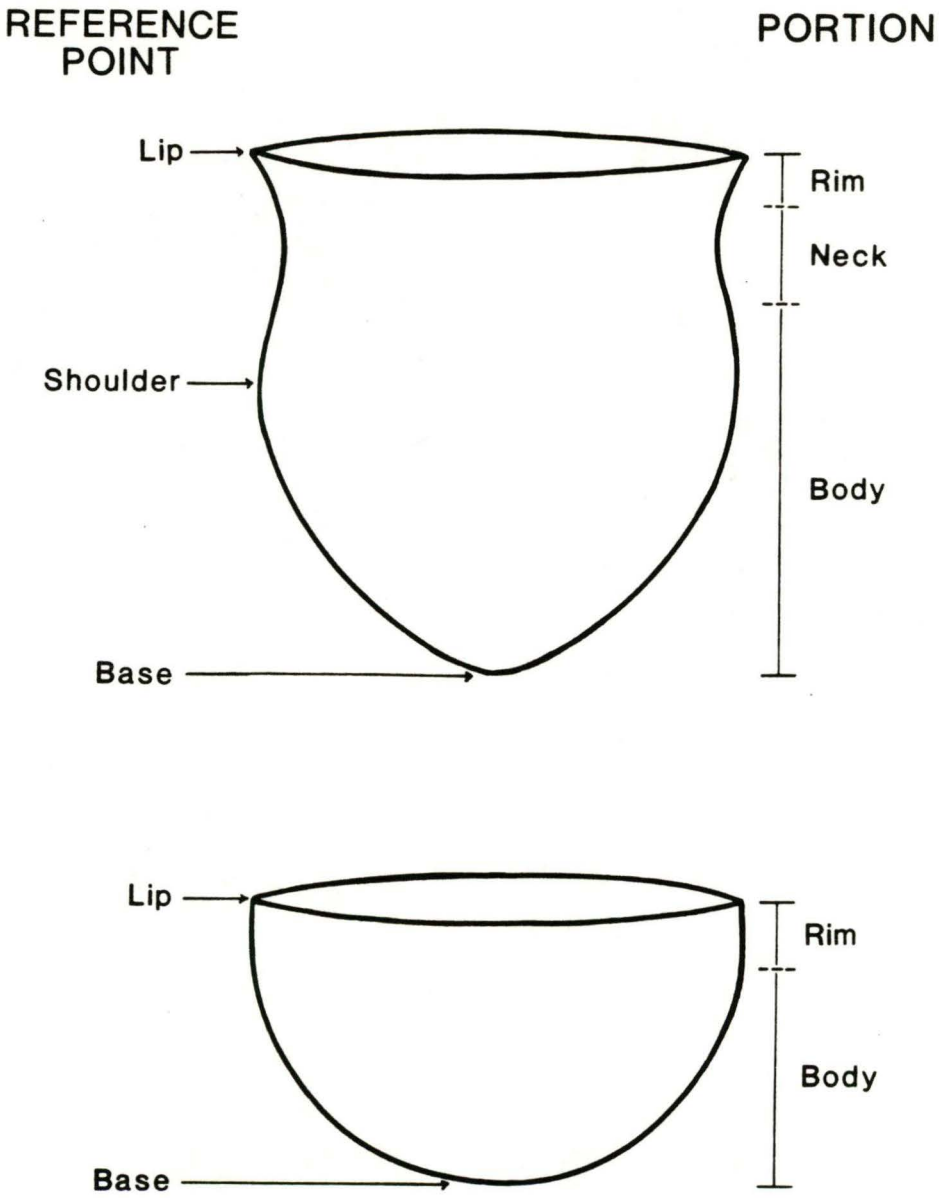
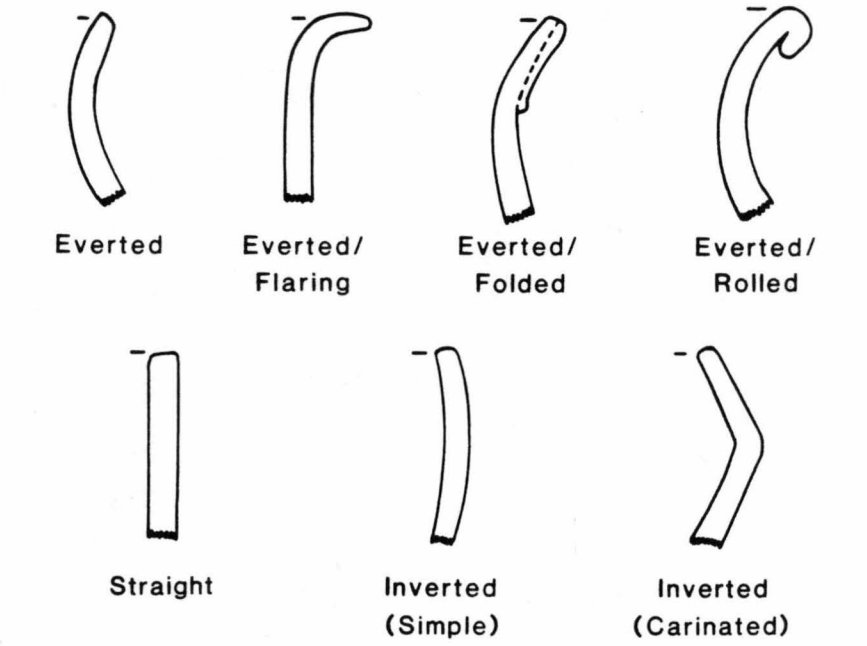


Figure 152. Definition of vessel portion attribute states.

morphological attributes of rim sherds--rim form and lip form--were measured. Rim form refers to the configuration of the upper portion of a vessel, as viewed in profile and terminated at the lip, and provides direct information about rim morphology. Lip form refers to the configuration in profile of the lip itself. Attribute states for rim and lip forms are defined in Figure 153.

Technological Attributes

Observations of vessel breakage patterns made during the course of analysis indicate that the majority of vessels at all three sites were constructed by a coiling method. Coils were subsequently welded together by scraping, pinching, or by use of a malleating paddle and an anvil. Two technological attributes that relate to the method of vessel manufacture were coded. First, sherds were classified according to the type of temper or aplastic material which was added to the clay in order to provide strength and control shrinkage during firing. Attribute states identified during the analysis include: coarse quartz sand (water-rounded particles up to 2 mm in dia.), medium quartz sand (visible particles <=1 mm in dia.), fine quartz sand (sandy texture but no visible particles), coarse crushed quartz (angular particles >5 mm in dia.), medium crushed quartz (particles 2.5-5.0 mm in dia.), fine crushed quartz (particles <2.5 mm in dia.), coarse crushed feldspar (angular particles usually 2-6 mm in dia.), fine crushed feldspar (finely pulvarized particles or feldspar sand usually <2 mm in dia.), mixed crushed quartz and feldspar (not differentiated by particle size), coarse grit (misc. crushed rock particles >=2 mm in dia.), and fine grit (misc. crushed rock particles <2 mm in dia.). Ethnohistoric and ethnographic accounts of pottery-making among Southeastern Indians clearly indicate that temper selection varied according to



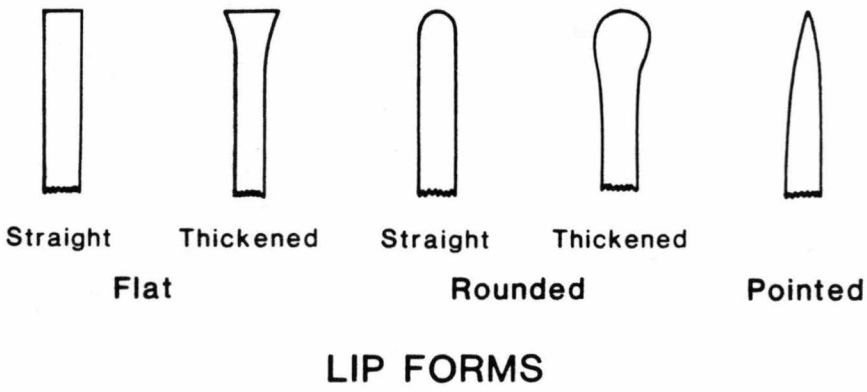


Figure 153. Definition of rim and lip form attribute states.

culturally-prescribed rules and was not a random process (Swanton 1946:549-555; Stern 1951). Moreover, temper has proven to be an extremely useful attribute in general ceramic classification in the North Carolina Piedmont (Coe 1964:26-34).

The second technological attribute considered is interior surface treatment. This attribute refers to the method by which a vessel interior was modified prior to firing rather than the damage to the interior resulting from use. Interior surface treatment attribute states include: plain (uniformly smoothed), scraped (displaying shallow to deep, wide, parallel striations, possible reflecting the use of a serrated shell for thinning the vessel wall), smoothed/scraped (a scraped interior which was subsequently but incompletely smoothed), and burnished (a highly smoothed surface produced by rubbing with a slick stone). Previous archaeological studies of ceramic variability in piedmont North Carolina suggest that, during the Late Woodland period (after ca. A.D.1000), interior scraping was gradually replaced by smoothing (Coe and Lewis 1952). Coe (1952:308, 310) considers interior scraping with a serrated-edged tool to be a diagnostic characteristic of his Uwharrie and Dan River ceramic series.

Stylistic Attributes

Three stylistic attributes were coded. The first, exterior surface treatment, represents the predominant type of exterior surface modification prior to firing. The specific type of surface treatment used is considered here to reflect the stylistic expression of the potter; however, it is recognized that the general process of modifying the exterior surface has certain technological benefits for vessel construction using the techniques of coiling and paddle-and-anvil. In an experimental study to determine the function of textiles in

pottery-making, William Holmes (1903:73) observed that

> the imprintings were in many cases not made by textiles used as supports, but were applied wrapped about the hand or a modeling tool as a means of knitting or welding together the clay surface. Experiment shows that the deeper and more complex the imprintings, if properly managed, the more tenacious becomes the clay...Scarifying, combing, pinching with the fingernails, or malleating with engraved paddles, served the same purpose.

It is also likely that wrapping or carving of malleating paddles facilitated the removal of the impressed paddle without damaging the exterior surface through adhesion to the clay.

Eight surface treatment attribute states reflecting four separate methods of treatment--smoothing or scraping, impressing, stamping with a wrapped wooden paddle, and stamping with a carved wooden paddle--are represented in the sherd samples. Because of the importance of exterior surface treatment to existing typological studies of ceramics, these attribute states are more fully described below.

Plain. The exterior surface has been smoothed, obliterating any evidence of previous stamping to shape the vessel or weld adjoining coils. Although the majority of the plain sherds analyzed were completely smoothed (Fredricks - 93.2%, Wall - 90.1%, Mitchum - 97.3%), a small number of sherds were only roughly smoothed and even fewer (<0.5% at each site) were burnished.

Brushed. The exterior surface has been scraped with a stiff twig brush or possibly a serrated shell following stamping and prior to firing, producing parallel but irregular lands and grooves. Brushing or scraping may have served to weld coils and help thin and even out the vessel wall in addition to producing a textured exterior (Holmes 1903:54; also see Harrington 1908:404).

Cob Impressed. The surface has been impressed with a dried corncob, applied by rolling across the vessel exterior. Although one

completely-impressed vessel has been reported from the early excavations at the Wall site (Wilson 1983:Plate XVIII), this type of surface treatment appears to be associated more specifically with the rim and neck areas of later vessels from the Mitchum and Fredricks sites.

Cord Marked. The exterior surface has been stamped with a cord-wrapped paddle. Direction of cordage twist (S or Z) was coded during initial analysis; however, this information is not used in this study due to the small number of cord-marked sherds recovered. Cord marking is a predominant surface treatment in Coe's (1952:306-308; 1964:27-32) Badin, Yadkin, and Uwharrie ceramic series, all of which predate the primary occupations at the Wall, Mitchum, and Fredricks sites.

Fabric Marked. The exterior surface has been stamped with a fabric-wrapped paddle. Sherds having simple-plaited fabric impressions comprise major ceramic types within the Badin (Early Woodland) and Yadkin (Middle Woodland) series (Coe 1964:28-32).

Net Impressed. The exterior surface has been stamped with a net-wrapped paddle. Both loop and knotted nets are represented in the samples. As a technique, net impressing has been previously associated with the Uwharrie and Dan River ceramic series (Coe and Lewis 1952). Although net-impressed sherds comprise a significant portion of the Mitchum and Fredricks site samples, their association with the historic occupations at these sites is uncertain. This question is explored in greater detail later.

Simple Stamped. The exterior surface has been stamped with a carved paddle containing a pattern of parallel lands and grooves. Simple stamping is identified by Coe (1952:311) as the predominant

surface treatment of his Hillsboro series, defined from a ceramic sample recovered at the Wall site between 1938 and 1941 (more fully described by Wilson 1983:342-366). This surface treatment also characterizes the only recognized type within the late prehistoric Gaston series (South 1959:62-84; Coe 1964:105-106), prevalent along the middle Roanoke River valley northeast of the study area. As expected, simple stamping was the most frequently observed (58%) surface treatment in the Wall site sample. Simple stamping was also well represented within the Mitchum site sample (11% of sample total). Whereas the Mitchum vessels were stamped in a manner which produced a linear pattern of lands and grooves parallel or slightly oblique to the rim, the simple stamps observed on vessels and rim sherds from the Wall site were invariably placed diagonal to the rim and perpendicular to one another, producing either a distinctive herringtone pattern or checkered pattern (when overstamped).

Check Stamped. The exterior surface has been stamped with a carved paddle possessing a square to diamond-shaped grid pattern comprised of parallel grooves cut perpendicular or nearly perpendicular to one another. Check stamping represents a major treatment type at both the Wall and Fredricks sites, being represented on 11% and 27%, respectively, of the sherds analyzed. Stamp motifs at the Wall site are usually bold and deeply impressed, whereas those observed at the Fredricks site are consistently shallow and faint. This latter pattern may reflect either the condition of the paddles being used or the dryness of the clay at time of final stamping. Because these check stamps were unclear, it is likely that several sherds from check stamped vessels were misclassified as plain.

Complicated Stamped. The exterior surface has been stamped with a

carved paddle containing a more intricate design than defined for either simple or check stamped treatments. Only a small number of sherds with this type of treatment were recovered from the Fredricks and Mitchum sites. All of them represented curvilinear designs but were too small to ascertain the specific design motif. Complicated stamping is a more common surface treatment at late prehistoric sites of the Pee Dee focus (Coe 1952:309) and at protohistoric/historic sites of the lower Yadkin and Catawba River drainages (Wilson 1983:486-488).

In addition to these eight treatment types, a ninth category--indeterminate--was used to classify those sherds whose surface treatments were either unidentifiable or ambiguous.

The remaining two stylistic attributes considered by the analysis consist of the type of decoration and location of the decorative motif on the vessel. The frequency of decoration, method of decoration, and placement of decorative motifs varied considerably among the three analysed assemblages. Decoration, as distinguished from surface treatment, was usually applied by a technique which is distinctively different from the one used to treat the exterior surface of the same vessel and is confined to a specific portion of the vessel. Eighteen decoration attribute states were observed among the three sites; these can be reduced to five separate decorative modes. These modes are briefly summarized below.

Incised. Decoration consists of one or more lines scratched into the exterior vessel surface (while still wet) with a sharp, pointed instrument. Specific attribute states representing this decorative mode and observed in the analyzed samples include: a) inter-connecting "V"s circumscribing the vessel exterior; b) parallel lip incisions placed oblique to the rim edge; c) short incised lines placed

perpendicular to the rim edge; d) a single, straight line circumscribing the vessel exterior; and e) lines of varying direction representing an indeterminate decorative motif.

Punctated. Decoration consists of one or more small, deep concavities on the exterior surface, formed by impressing the damp clay with the end of a reed, stick, or other pointed instrument. Attribute states representing punctated decorations include: a) circular; b) circular reed; c) oblong; and d) U-shaped.

Notched. Decoration consists of notches placed along one of the rim edges. Most notches observed in the analyzed samples appear to have been produced using the edge of the malleating paddle and are oriented perpendicular to the rim edge; however, a few notches were probably produced by impressing a fingertip into the damp clay. Notching was the most frequently observed mode of vessel decoration.

Finger Impressed. Decoration consists of impressing the fingernail or fingertip into the damp clay either singularly or linearly. Finger impressions are applied to the vessel body and thus are distinguished from fingertip notching. Both notching and finger impressing have been recognized as common decorative modes of the Dan River series (Coe and Lewis 1952; Gardner 1980).

Applique. Decoration consists of attaching modeled clay elements to the vessel exterior. Only three such treatments were observed in the Fredricks and Wall site samples and consist of two podes or vessel feet and one simple node.

In addition to the kinds of decoration discussed above, two other types of vessel/sherd modification were observed. First, nine sherds from the Wall site and two sherds from the Mitchum site had been recycled into disks by edge grinding or chipping. Second, incidents of

vessel repair were found at all three sites in the form of drilled holes on sherds. The interpretation of these holes as mends rather than suspension holes is supported by the facts that the drill holes frequently occur on non-rim portions of vessels and are located near edges that represent vertical vessel cracks.

All decorative motifs were additionally coded as to their location on the vessel. Recognized locations include: lip, lip/rim, rim, rim fold, lower edge of rim fold, neck, neck/shoulder, and body. Exterior surface treatments and decorations are illustrated later for each of the three analyzed samples.

Size

Sherd size was coded for all of the specimens analyzed. Size was measured using a template of concentric circles representing categories defined by specific maximum diameter measurements. Those categories are: <=2 cm dia., >2-4 cm dia., >4-6 cm dia., >6-8 cm dia., >8-10 cm dia., and >10 cm dia.

Size is considered an important attribute for two reasons. First, sherd size can be used to explore behavioral questions related to discard modes. For example, whether a sherd sample is derived from a primary versus secondary context has specific implications for the expected size distribution of those sherds (see Schiffer 1976:30-34). In a somewhat related manner, size can be used as a criterion for evaluating the probable contemporaneity of two or more sherd types recovered from the same archaeological context (e.g., feature fill). Given that breakage rates are essentially similar for all periods, sherds from an earlier occupation and mixed with later material should be identifiable by a distinctively different size distribution profile which is skewed toward smaller sherd size. Such a pattern can be

expected because of the greater cumulative effect of cultural and natural transformations upon the older artifacts (see Schiffer 1976:14-16 for a discussion of transformation processes).

Second, size measurement provides a basis for correcting the relative frequency estimates of sherd types within an assemblage when significant differences in size distribution can be shown to exist. This is important in any attempt to quantify the relationships among sherd types relative to vessel surface area.

FREDRICKS SITE CERAMIC SAMPLE

Archaeological excavations at the Fredricks site (31Or231) recovered 11,203 aboriginal potsherds and three complete vessels. All vessels were recovered in primary context as burial associations; sherds were recovered in secondary context and occurred in all plowzone and sub-plowzone excavation units. All sherds >2 cm in diameter were classified according to the attributes discussed above; sherds <=2 cm in diameter were counted but not classified since their very small size made classification by most attributes either impossible or unreliable. These latter sherds comprise 67% of the total sample (Table 41). The remaining 3698 ceramic artifacts, including vessels, are summarized by temper and exterior surface treatment in Tables 42-43. Frequency distributions of other measured attributes, according to specific temper and surface treatment combinations, are presented in Tables 44-51.

Two primary goals of the Fredricks site ceramic analysis were to define the ceramic assemblage associated with the Middle Contact period occupation at the site and to evaluate the possibility of other cultural components. This was accomplished by evaluating the frequency

Table 41. Frequency of Fredricks site sherds and vessels by size.

Size (diameter)	n	%
<=2 cm	7508	67.00
>2-4 cm	3426	30.57
>4-6 cm	210	1.87
>6-8 cm	42	.38
>8-10 cm	13	.12
>10 cm (sherds)	4	.04
>10 cm (vessels)	3	.02
Totals	11,206	100.00

Table 42. Frequency of Fredricks site sherds by temper and exterior surface treatment (excluding sherds <=2 cm dia.).

Temper Surface	n	%	% (of identifiable sherds)
Coarse Sand			
Plain	13	.35	.44
Brushed	2	.05	.07
Cord Marked	1	.03	.03
Net Impressed	63	1.71	2.14
Simple Stamped	6	.16	.20
Check Stamped	8	.22	.27
Indeterminate	38	1.03	-
Sub-Totals	131	3.55	3.15
Medium Sand			
Plain	883	23.88	29.93
Brushed	61	1.65	2.07
Cob Impressed	9	.24	.31
Cord Marked	54	1.46	1.83
Net Impressed	469	12.68	15.90
Simple Stamped	76	2.06	2.58
Check Stamped	954	25.80	32.34
Complicated Stamped	2	.05	.07
Indeterminate	601	16.25	-
Sub-Totals	3109	84.07	85.03
Fine Sand			
Plain	30	.81	1.02
Cordmarked	1	.03	.03
Sub-Totals	31	.84	1.05
Coarse Crushed Quartz			
Net Impressed	5	.14	.17
Indeterminate	2	.05	-
Sub-Totals	7	.19	.17
Medium Crushed Quartz			
Plain	2	.05	.07
Brushed	2	.05	.07
Cord Marked	1	.03	.03
Net Impressed	37	1.00	1.25
Indeterminate	7	.19	-
Sub-Totals	49	1.32	1.42

Table 42 Continued.

Temper Surface	n	%	% (of identifiable sherds)
Fine Crushed Quartz			
Plain	40	1.08	1.36
Brushed	8	.22	.27
Cob Impressed	1	.03	.03
Cord Marked	5	.14	.17
Net Impressed	65	1.76	2.20
Simple Stamped	7	.19	.24
Check Stamped	4	.11	.14
Indeterminate	54	1.46	-
Sub-Totals	184	4.99	4.41
Coarse Crushed Feldspar			
Plain	9	.24	.31
Brushed	1	.03	.03
Net Impressed	1	.03	.03
Simple Stamped	7	.19	.24
Check Stamped	1	.03	.03
Indeterminate	2	.05	-
Sub-Totals	21	.57	.64
Fine Crushed Feldspar			
Plain	62	1.68	2.10
Cord Marked	4	.11	.14
Net Impressed	4	.11	.14
Simple Stamped	31	.84	1.05
Check Stamped	21	.57	.71
Indeterminate	44	1.19	-
Sub-Totals	166	4.50	4.14
Totals	3698	100.03	100.01

Table 43. Frequency of Fredricks site sherds from Feature and Burial contexts.

Temper / Surface	Bu.1	Bu.2	Bu.3	Fea.1	Fea.2 Bu.4	Fea.3 Bu.5	Fea.4 Bu.6	Fea.5 Bu.7	Fea.6 Bu.8	Fea.7 Bu.9	Fea.8	Fea.9	Fea.10	Fea.11	Fea.12	Fea.13	Total	%	%[1]
Coarse Sand																			
Plain	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2	.11	.28
Brushed	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	.06	.14
Net Impressed	-	-	-	-	2	1	-	1	1	2	-	1	2	1	-	-	11	.61	1.53
Simple Stamped	2	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	4	.22	.56
Check Stamped	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	2	.11	.28
Indeterminate	1	1	1	-	-	-	1	-	-	-	-	-	1	-	-	-	5	.28	-
Sub-Totals	3	1	1	-	2	2	4	1	2	3	-	2	3	1	-	-	25	1.39	-
Medium Sand																			
Plain	31	8	69	11	14	2	4	-	26	4	2	11	4	2	11	10	209	11.60	29.07
Brushed	1	-	1	-	1	4	1	-	4	1	-	6	10	-	-	-	29	1.61	4.03
Cob Impressed	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-	-	4	.22	.56
Cord Marked	-	-	1	-	3	1	1	-	-	-	-	1	-	-	-	-	7	.39	.97
Net Impressed	2	2	21	3	1	4	1	2	3	6	1	17	3	1	1	4	71	3.94	9.87
Simple Stamped	1	-	4	2	2	2	1	-	1	2	-	-	-	-	-	1	16	.89	2.23
Check Stamped	25	9	62	15	29	29	8	2	15	16	2	9	9	-	6	23	259	14.37	36.02
Indeterminate	4	1	3	2	3	3	6	-	3	5	-	5	-	-	-	-	35	1.94	-
Sub-Totals	64	20	161	33	53	45	23	4	52	37	5	49	26	3	18	37	630	34.96	-
Fine Sand																			
Plain	-	-	5	1	2	1	1	-	-	2	-	2	2	-	-	-	16	.89	2.23
Sub-Totals	-	-	5	1	2	1	1	-	-	2	-	2	2	-	-	-	16	.89	-
Coarse Crushed Quartz																			
Net Impressed	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	.11	.28
Indeterminate	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	.06	-
Sub-Totals	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	3	.17	-
Medium Crushed Quartz																			
Plain	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	.06	.14
Brushed	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	.06	.14
Cord Marked	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	.06	.14
Net Impressed	1	1	-	-	-	-	-	-	-	1	-	-	2	-	-	-	5	.28	.69
Sub-Totals	1	1	1	-	-	1	-	-	1	1	-	-	2	-	-	-	8	.44	-
Fine Crushed Quartz																			
Plain	4	-	2	-	-	1	-	-	-	-	1	-	1	2	3	1	15	.83	2.09
Brushed	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	2	.11	.28
Net Impressed	1	-	-	-	-	-	1	-	1	2	1	-	-	-	-	1	7	.39	.97
Simple Stamped	-	-	-	1	-	1	-	-	1	1	-	-	-	-	-	-	4	.22	.56
Check Stamped	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	.06	.14
Indeterminate	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	2	.11	-
Sub-Totals	5	-	2	1	1	2	2	-	3	3	2	-	1	3	3	3	31	1.72	-
Coarse Crushed Feldspar																			
Plain	-	-	-	-	-	-	-	-	-	-	2	1	2	-	-	-	5	.28	.69
Check Stamped	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	.06	.14
Sub-Totals	-	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-	6	.33	-
Fine Crushed Feldspar																			
Plain	1	1	2	-	3	1	3	-	8	2	2	5	-	-	-	6	34	1.89	4.73
Simple Stamped	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	1	4	.22	.56
Check Stamped	-	-	1	-	-	-	1	-	-	3	-	-	-	-	-	-	5	.28	.69
Indeterminate	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	1	4	.22	-
Sub-Totals	1	1	3	-	5	1	4	-	8	8	2	6	-	-	-	8	47	2.61	-
Other (<=2 cm dia.)	116	17	249	38	77	87	80	8	79	94	13	52	21	2	32	71	1036	57.49	-
Totals	190	40	422	73	140	139	115	13	145	151	24	114	55	9	53	119	1802	100.00	100.01

[1] of identifiable sherds.

Table 44. Summary of coarse sand-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	Brushed	Cord Marked	Net Impressed	Simple Stamped	Check Stamped
Portion						
Rim	0	0	0	1	0	0
Neck	2	0	0	4	2	0
Body	11	2	1	58	4	8
Thickness						
<=6 mm	2	0	0	1	3	1
>6-8 mm	7	1	1	27	3	4
>8 mm	4	1	0	34	0	3
Interior Surface						
Plain	11	1	1	16	6	8
Scraped	2	1	0	39	0	0
Rim Form						
Everted	0	0	0	1	0	0
Lip Form						
Flat	0	0	0	1	2	0
Decoration/Location						
V-shaped Notches (on lip)	0	0	0	1	0	0
Fingernail Impress. (on neck)	0	0	0	2	0	0
Size						
>2-4 cm	13	1	1	56	5	8
>4-6 cm	0	1	0	6	1	0

Table 45. Summary of medium sand-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	Brushed	Cob Impressed	Cord Marked	Net Impressed	Simple Stamped	Check Stamped	Comp. Stamped
Portion								
Rim	85	6	2	3	18	7	79	0
Neck	128	8	2	6	24	21	168	1
Body	689	49	5	45	430	49	718	1
Thickness								
<=6 mm	300	6	3	10	22	16	552	0
>6-8 mm	477	48	6	43	262	47	346	2
>8 mm	104	7	0	1	184	13	50	0
Interior Surface								
Plain	869	35	6	44	118	73	937	2
Scraped	11	26	2	7	283	2	6	0
Rim Form								
Everted	32	4	1	0	9	6	27	0
Straight	13	1	0	0	4	0	9	0
Inverted	3	0	0	0	0	0	4	0
Lip Form								
Flat	45	2	0	1	1	4	71	0
Rounded	28	4	2	2	13	3	11	0
Pointed	10	0	0	0	4	0	0	0
Decoration/Location								
Incised (oblique on lip)	3	0	0	1	0	0	18	0
Incised "V"s (on neck/shoulder)	1	0	0	0	0	0	0	0
Oblong Punctations (on lip)	1	0	0	0	0	0	0	0
V-Shaped Notches (on lip)	0	0	1	0	1	1	0	0
V-Shaped Notches (on lip/rim)	0	0	0	0	6	0	0	0
Fingertip Notches (on lip)	0	2	0	0	0	0	0	0
Fingernail Impress. (on neck)	1	0	0	0	0	0	0	0
Size								
>2-4 cm	817	49	9	51	433	67	861	1
>4-6 cm	46	10	0	2	32	9	66	1
>6 cm	20	2	0	1	4	0	27	0

Table 46. Summary of fine sand-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	 Cord Marked
Portion		
Rim	10	0
Neck	2	0
Body	19	1
Thickness		
<=6 mm	18	0
>6-8 mm	9	0
>8 mm	3	1
Interior Surface		
Plain	25	1
Rim Form		
Everted	2	0
Straight	1	0
Inverted	4	0
Lip Form		
Flat	1	0
Rounded	6	0
Pointed	3	0
Decoration/Location	-	-
Size		
>2-4 cm	26	1
>4-6 cm	3	0
>6 cm	1	0

Table 47. Summary of coarse crushed quartz-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Net Impressed
Portion	
Neck	1
Body	4
Thickness	
>6-8 mm	1
>8 mm	4
Interior Surface	
Plain	1
Scraped	3
Rim Form	-
Lip Form	-
Decoration/Location	-
Size	
>2-4 cm	4
>4-6 cm	1

Table 48. Summary of medium crushed quartz-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	Brushed	Cord Marked	Net Impressed
Portion				
Rim	0	0	0	1
Neck	0	0	0	2
Body	2	2	1	34
Thickness				
<=6 mm	0	0	0	1
>6-8 mm	1	1	1	17
>8 mm	1	1	0	19
Interior Surface				
Plain	2	0	0	7
Scraped	0	2	0	22
Rim Form				
Everted	0	0	0	1
Lip Form				
Rounded	0	0	0	1
Decoration/Location	-	-	-	-
Size				
>2-4 cm	2	2	1	36
>4-6 cm	0	0	0	1

Table 49. Summary of fine crushed quartz-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	Brushed	Cob Impressed	Cord Marked	Net Impressed	Simple Stamped	Check Stamped
Portion							
Rim	0	0	1	0	4	0	0
Neck	1	1	0	0	3	1	0
Body	39	7	0	5	60	6	4
Thickness							
<=6 mm	2	0	0	0	2	1	1
>6-8 mm	14	6	1	4	31	6	0
>8-10 mm	24	2	0	1	32	0	3
Interior Surface							
Plain	37	3	1	3	12	7	2
Scraped	2	5	0	2	42	0	2
Rim Form							
Everted	0	0	1	0	0	0	0
Lip Form							
Flat	0	0	0	0	1	0	0
Rounded	0	0	1	0	3	0	0
Decoration/Location							
Short Incisions (on neck)	0	0	0	0	1	0	0
V-Shaped Notches (on lip)	0	0	1	0	0	0	0
Fingernail Impress. (on lip)	0	0	0	0	1	0	0
Size							
>2-4 cm	31	2	1	5	59	5	3
>4-6 cm	6	3	0	0	5	2	1
>6 cm	3	3	0	0	1	0	0

Table 50. Summary of coarse crushed feldspar-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	Brushed	Net Impressed	Simple Stamped	Check Stamped
Portion					
Rim	1	0	0	0	0
Neck	1	1	0	2	1
Body	8	0	1	5	0
Thickness					
>6-8 mm	6	0	1	3	1
>8 mm	3	1	0	4	0
Interior Surface					
Plain	9	1	1	7	1
Rim Form					
Everted	1	0	0	0	0
Lip Form					
Flat	1	0	0	0	0
Decoration/Location					
Size					
>2-4 cm	7	1	1	7	1
>4-6 cm	2	0	0	0	0

Table 51. Summary of fine crushed feldspar-tempered sherds from the Fredricks site.

Attribute Attribute State	Exterior Surface Plain	Cord Marked	Net Impressed	Simple Stamped	Check Stamped
Portion					
Rim	6	0	0	1	0
Neck	4	0	1	9	2
Body	55	4	3	22	19
Thickness					
<=6 mm	12	0	1	0	6
>6-8 mm	41	1	2	18	10
>8 mm	9	3	1	13	5
Interior Surface					
Plain	58	3	3	30	20
Scraped	2	1	1	1	1
Rim Form					
Everted	3	0	0	1	0
Lip Form					
Flat	4	0	0	0	0
Rounded	1	0	0	1	0
Pointed	1	0	0	0	0
Decoration/Location					
V-Shaped Notches (on lip)	3	0	0	1	0
Size					
>2-4 cm	59	4	4	29	20
>4-6 cm	3	0	0	2	1

distributions of sherd categories (temper and surface treatment combinations) for the whole site and for plowzone and sub-plowzone contexts, and by examining patterns of attribute associations. Since all excavated features and burials date to the Middle Contact period (recognized by the presence of historic trade artifacts), it was expected that most sherds from those contexts could also be associated with that occupation. This expectation is based on the premise, supported by field observation, that the feature and burial fill largely represents episodes of intentional filling with general and activity-specific refuse by the occupants of the site. Plowzone sherds, conversely, represent artifacts that have been plowed from the tops of features and burials as well as artifacts which gradually accumulated on the living surface of the site. Given the absence of nonhistoric features within the excavation area, ceramic evidence of earlier cultural components (if present) should occur primarily within the plowzone and secondarily as minor contaminants within features and burials. Earlier ceramic artifacts also should be smaller in size when compared with the later historic assemblage, assuming similar breakage rates (see above).

Eight separate temper types and exterior surface treatments are recognized within the sample, defining 38 distinct sherd categories. Thirteen of these categories are represented by more than 1.00% of the total sample of identifiable sherds (n=2893). Of these, medium sand-tempered plain (29.93%), check-stamped (32.34%), and net-impressed (15.90%) sherds comprise 78.17% of the identifiable sherd sample. Given similarities to the three whole vessels recovered, medium sand-tempered plain and check-stamped ceramics are clearly associated with the historic occupation. The relationship of the net-

impressed sherds, however, is less obvious. Since these three sherd categories comprise the majority of the sample, they are considered in greater detail below.

Evaluation of the relationships between medium sand-tempered plain, check-stamped, and net-impressed ceramics initially involved the use of a Chi-square test of association to identify significant differences among the three sherd categories with respect to various measured attributes. Given that all three categories comprise the same assemblage, general similarity can be anticipated for other attributes reflecting technological, morphological, and stylistic dimensions. Conversely, overall attribute dissimilarity can be expected if these sherd categories represent either temporally or culturally distinct contexts. Although functional variability may be offered as a possible explanation for certain differences, significant difference among a majority of attributes more likely can be considered as an indicator of separate ceramic traditions.

Attributes examined for the three sherd categories include: vessel portion, thickness, interior surface treatment, size, rim form, lip form, and decoration/location. All but the last attribute were represented in samples large enough to be evaluated statistically; these results are presented in Figure 154. Data used for the Chi-square tests were taken from Table 45. Significant differences were observed for all attributes except size and rim form. Additionally, substantial differences in decoration also exist between the net-impressed sherds and sherds of the other two categories.

Medium sand-tempered plain and check-stamped sherds reflect a ceramic technology where vessels interiors were invariably smoothed. Morphologically, they reflect thin-walled jars and, less frequently,

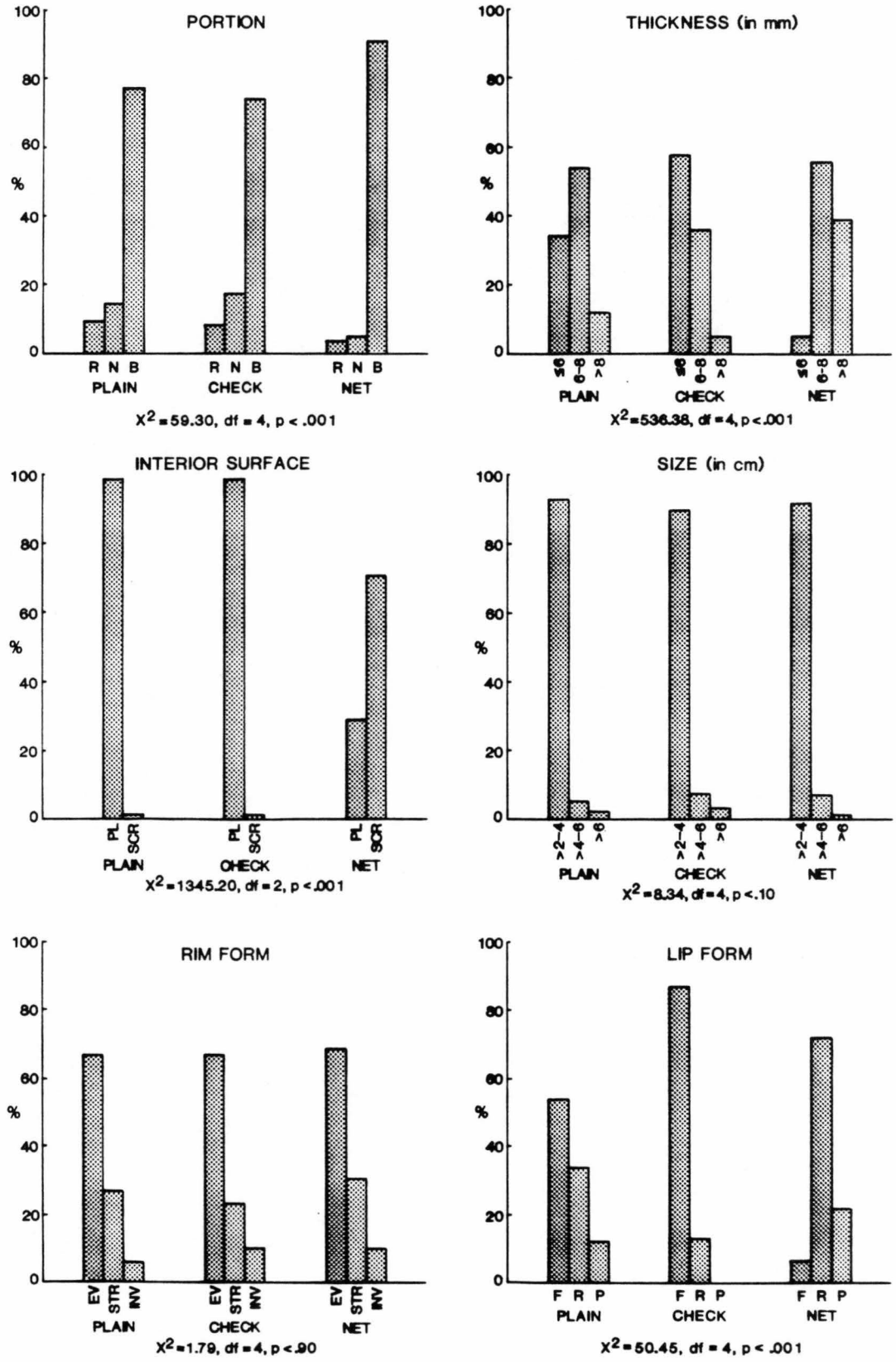


Figure 154. Relative frequency distributions and statistical evaluation of selected attributes for medium sand-tempered plain, check-stamped, and net-impressed sherds from the Fredricks site.

bowls. Relative frequency profiles for vessel portion suggest that restricted vessel forms comprise a majority of the overall assemblage, as indicated by the comparatively high proportion of neck sherds. This is also evidenced by the predominance of everted rims, most of which have flattened lips. The major type of decoration observed for both plain and check-stamped sherds was oblique incising of the flattened lip surface. Although this decoration was common on check-stamped rims (22.8%), it was rare on plain rims (3.5%).

Medium sand-tempered net-impressed sherds, conversely, reflect moderately thick-walled vessels that usually were boldly scraped on the interior surface. The relatively low frequency of rim and neck sherds, when compared with the plain and check-stamped sherds, suggests that net-impressed vessels probably were significantly larger, had little neck constriction, and had a substantially greater ratio of body area to rim circumference. Everted rims on net-impressed sherds appear to represent simple flaring of the vessel lip. In contrast to the other two sherd categories, net-impressed lips were predominantly rounded and notched. Notching was observed on 38.9% of all rim sherds.

It was anticipated that a significant difference between net-impressed and other sherd categories would also be manifested in sherd size. Specifically, interior scraping on net-impressed ceramics was seen as a probable indicator of temporal priority over the plain and check-stamped categories; consequently, it was expected that net-impressed sherds would be generally smaller in size, reflecting a greater cumulative effect of naturally and culturally induced weathering processes on this sherd category. When examined, however, it was found that all categories were similarly distributed by size. Given the observation that net-impressed sherds are significantly

thicker, it is likely that breakage rates among the three sherd categories are not equal. As a consequence, the analysis of size is inconclusive.

At this point, it can be reasonably concluded that net-impressed ceramics and plain and check-stamped ceramics are products of two separate traditions; however, the question of their contemporaneity still remains. In order to address this question, sherd frequencies for the three categories were compared from plowzone and feature/burial contexts. As a method of analysis, 95% confidence intervals were calculated for the relative frequency (percent) of each category for each context. Confidence intervals were also calculated for all other temper/surface treatment categories comprising more than one percent of the total identified sherd sample. It was concluded that the distributions were significantly different if the confidence intervals did not intersect. The interpretation of potential analysis results are as follows:

1. Significantly higher percent within features/burials indicates a likelihood that the sherd category and features/burials are associated (i.e., are a product of the historic occupation);

2. Significantly lower percent within features/burials indicates a likelihood that the sherd category and features/burials are not associated; and

3. No significant difference between contexts indicates that a sherd category may or may not be associated with the historic occupation.

The results of this analysis are presented in Table 52.

Of the 13 sherd categories considered, six displayed significantly different distributions. Medium sand-tempered brushed, fine sand-tempered plain, and fine crushed feldspar-tempered plain were significantly more frequent within features and burials, indicating an historic association for these sherds. Distributions of other sherd

Table 52. Evaluation of differences in spatial distribution of selected sherd categories at the Fredricks site.

Temper Surface Treatment	Plowzone n	 %	 95% C.I. (+/-)	Fea./Bu. n	 %	 95% C.I. (+/-)	Significantly Different
Coarse Sand							
Net Impressed	49	2.25	0.52	11	1.53	0.76	
Medium Sand							
Plain	657	30.22	1.63	209	29.70	2.79	
Brushed	31	1.43	.42	29	4.03	1.21	*
Cord Marked	46	2.12	.51	7	.97	.60	*
Net Impressed	387	17.80	1.35	71	9.87	2.04	*
Simple Stamped	57	2.62	.57	16	2.23	.91	
Check Stamped	687	31.60	1.65	259	36.02	2.95	
Fine Sand							
Plain	14	.64	.28	16	2.23	.91	*
Medium Crushed Quartz							
Net Impressed	31	1.43	.42	5	.69	.51	
Fine Crushed Quartz							
Plain	24	1.10	.37	15	2.09	.88	
Net Impressed	56	2.58	.56	7	.97	.60	*
Fine Crushed Feldspar							
Plain	28	1.29	.40	34	4.73	1.31	*
Simple Stamped	25	1.15	.38	4	.56	.46	
N	2174			719			

Note: Confidence Intervals are calculated (following Hays 1973:379) as:

$$C.I. = P \pm z\sqrt{\frac{(pq)}{N}} \quad ,$$

where P = % / 100
z = 1.65 (for 95% C.I.)
p = P
q = (1-P)
N = Total number of identifiable sherds.

attributes for these three categories are generally consistent with this interpretation. On the other hand, three sherd categories--including medium sand-tempered net-impressed--displayed significantly lower percentages for feature/burial contexts, suggesting their probable association with other site occupations (i.e., either spatially or temporally distinct). The other two sherd categories--medium sand-tempered cord-marked and fine crushed quartz-tempered net-impressed--are similar to medium sand-tempered net-impressed in that they reflect moderately thick-walled, rounded lip vessels that were often scraped on the interior vessel surface. Finally, medium sand-tempered plain and check-stamped, along with five other categories, were similarly distributed (in a statistical sense) between plowzone and feature/burial contexts. The plain and check-stamped categories, however, were the major constituents within both contexts, comprising a total of 61.82% and 65.09% of those samples, respectively.

By considering the contextual relationships among these sherd categories, as well as attribute associations and covariability, three separate ceramic groups that represent potentially distinct cultural components can be identified at the Fredricks site (Table 53). The first group, comprising 69.29% of all identifiable sherds, is associated with the historic occupation of the site. Group I sherds are tempered mostly with medium sand (95.50%), but also with fine sand (1.47%) and fine crushed feldspar (3.03%); they have plain, check-stamped, brushed, and cord-marked exteriors. The first two surface treatments comprise over 94% of the group sample (Figures 155-158). These sherds and the three whole vessels represent thin-walled, restricted jars and bowls that were invariably smoothed on the interior surface. Lips were predominantly flattened and, when decorated, were obliquely incised.

Table 53. Definition of ceramic groups, based on attribute similarities, at the Fredricks site.

Group	Exterior Surface	Temper	n	%	
I	Plain	Medium Sand	883	43.20	
	Plain	Fine Sand	30	1.47	
	Plain	Fine Crushed Feldspar	62	3.03	
	Brushed	Medium Sand	61	2.99	
	Cord Marked	Medium Sand	54	2.64	
	Check Stamped	Medium Sand	954	46.67	
	Sub-Totals		2044	100.00	69.29%
II	Brushed	Medium Crushed Quartz	2	.31	
	Brushed	Fine Crushed Quartz	8	1.23	
	Net Impressed	Coarse Sand	63	9.71	
	Net Impressed	Medium Sand	469	72.27	
	Net Impressed	Coarse Crushed Quartz	5	.77	
	Net Impressed	Medium Crushed Quartz	37	5.70	
	Net Impressed	Fine Crushed Quartz	65	10.01	
	Sub-Totals		649	100.00	22.00%
III	Plain	Coarse Sand	13	5.93	
	Plain	Fine Crushed Quartz	40	18.26	
	Plain	Coarse Crushed Feldspar	9	4.11	
	Simple Stamped	Coarse Sand	6	2.74	
	Simple Stamped	Medium Sand	76	34.70	
	Simple Stamped	Fine Crushed Quartz	7	3.20	
	Simple Stamped	Coarse Crushed Feldspar	7	3.20	
	Simple Stamped	Fine Crushed Feldspar	31	14.16	
	Check Stamped	Coarse Sand	8	3.65	
	Check Stamped	Coarse Crushed Feldspar	1	.46	
	Check Stamped	Fine Crushed Feldspar	21	9.59	
	Sub-Totals		219	100.00	7.42%
UnGrouped	Plain	Medium Crushed Quartz	2	5.26	
	Brushed	Coarse Sand	2	5.26	
	Brushed	Coarse Crushed Feldspar	1	2.63	
	Cob Impressed	Medium Sand	9	23.68	
	Cob Impressed	Fine Crushed Quartz	1	2.63	
	Cord Marked	Coarse Sand	1	2.63	
	Cord Marked	Fine Sand	1	2.63	
	Cord Marked	Medium Crushed Quartz	1	2.63	
	Cord Marked	Fine Crushed Quartz	5	13.16	
	Cord Marked	Fine Crushed Feldspar	4	10.53	
	Net Impressed	Coarse Crushed Feldspar	1	2.63	
	Net Impressed	Fine Crushed Feldspar	4	10.53	
	Check Stamped	Fine Crushed Quartz	4	10.53	
	Comp. Stamped	Medium Sand	2	5.26	
	Sub-Totals		38	99.99	1.29%
Totals			2950		100.00%

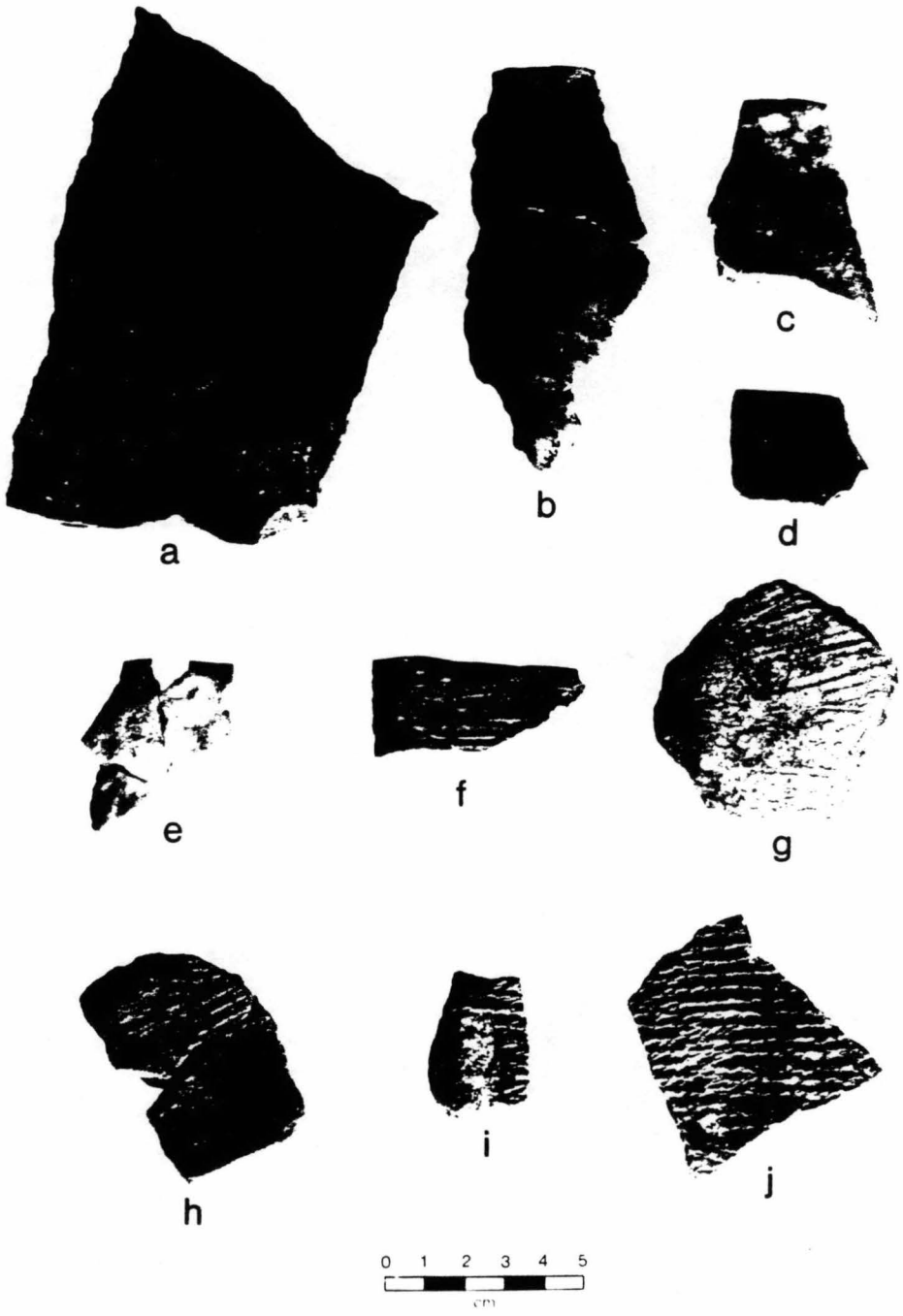


Figure 155. Selected plain (a-e), brushed (f-h), and cord-marked (i-j) sherds from the Fredricks site.



Figure 156. Selected check-stamped sherds from the Fredricks site.

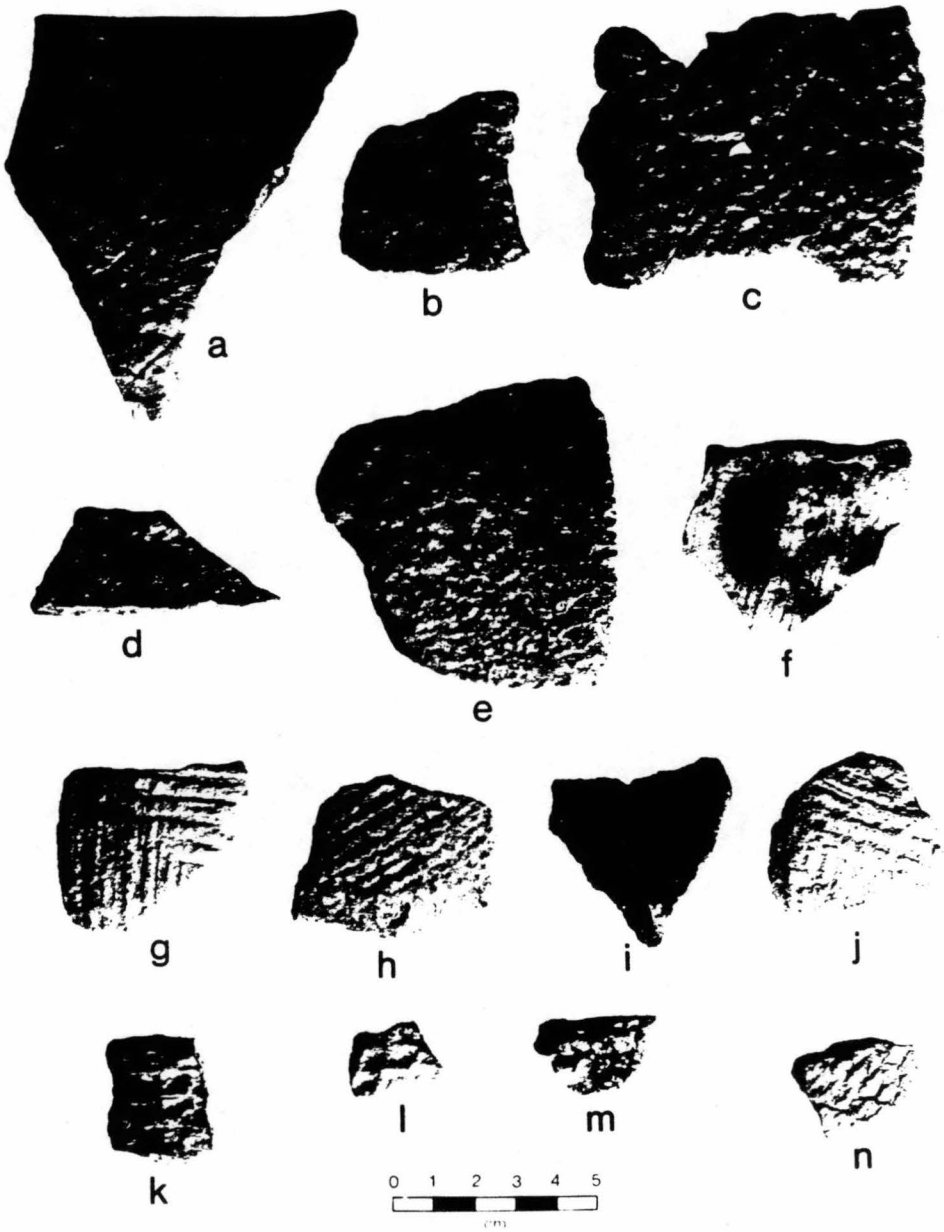


Figure 157. Selected net-impressed (a-e), brushed (f), simple-stamped (g-j), check-stamped (k-l), and cob-impressed (m-n) sherds from the Fredricks site.

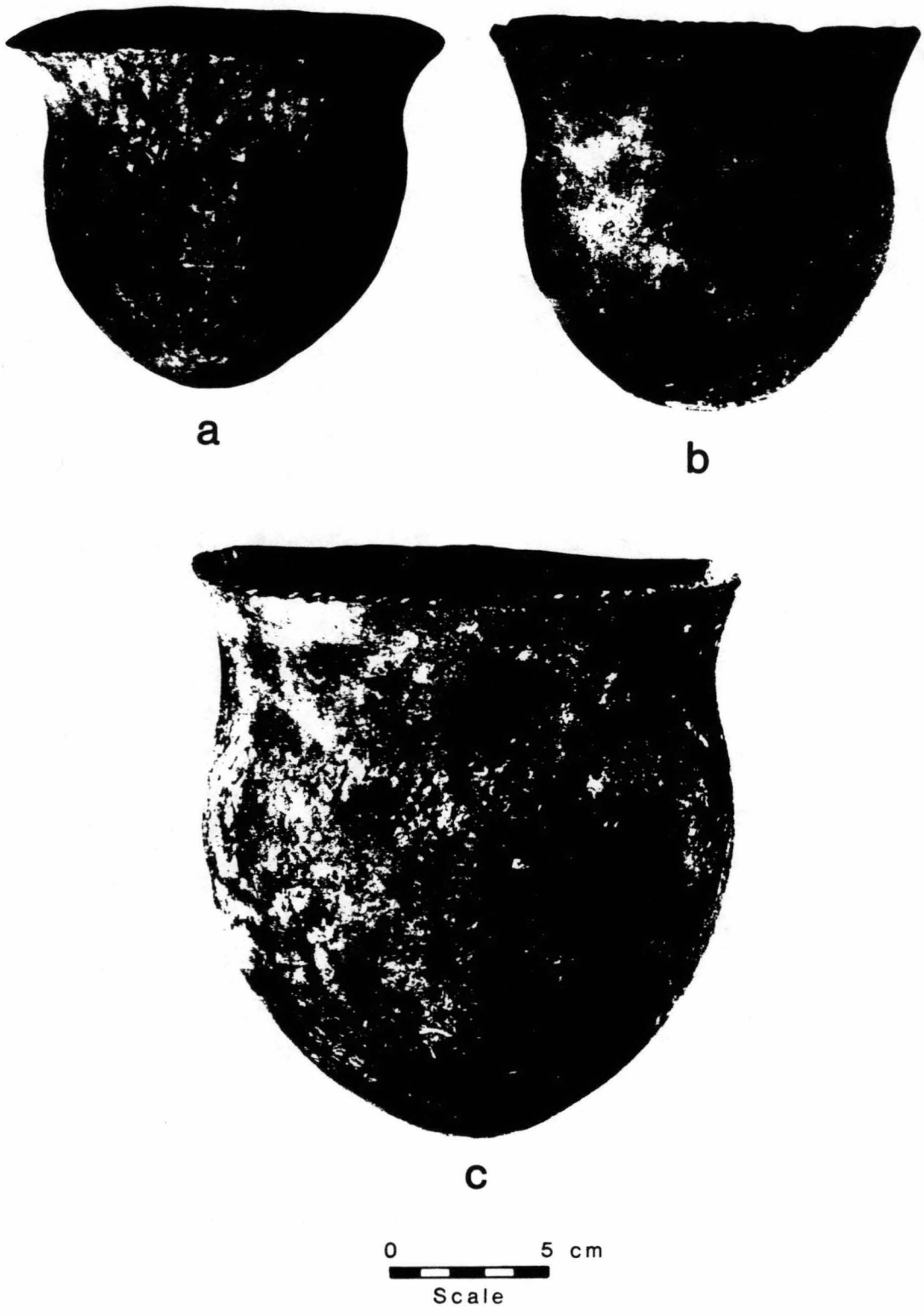


Figure 158. Whole vessels from Burial 2 (a), Burial 8 (b), and Burial 6 (c) at the Fredricks site.

Other vessel areas were only rarely decorated. All three whole vessels were check-stamped, restricted, sub-conical jars with everted rims (two with obliquely incised lips) and range in size from 12-18 cm in height and 14-17 cm in orifice diameter (Figure 159). Four other vessel sections were recovered which were sufficiently large to determine certain vessel attributes. Three of these represent undecorated check-stamped vessels with orifice diameters of 16, 28, and 34 cm. Although this sample is admittedly small, the orifice data suggest two distinct vessel size categories--small (ca. 15 cm dia.) and large (ca. 30 cm dia.). The remaining vessel section represents a small (16 cm dia.), hand-modelled, unrestricted vessel comprised of a fine sand tempered, loosely compacted paste and having a plain exterior surface. Several check-stamped sherds had been drilled (Figure 156), reflecting attempts to extend usage of cracked vessels through mending. The use of both plain and check-stamped vessels in cooking is indicated by the presence of carbonized organic residue on the interior surface of several sherds.

Group II sherds comprise 22.00% of the total sample. These sherds are tempered with coarse sand (9.71%),medium sand (72.27%), coarse quartz (0.77%), medium quartz (6.01%), and fine quartz (11.24%), and have brushed (1.54%) and net-impressed (98.46%) exterior surfaces (Figure 157). These sherds have interior surfaces which are predominantly scraped, and they represent relatively thick-walled vessels. Rim decoration is more common and mostly consists of V-shaped notches along the lip/rim edge. The single vessel section within the sample, recovered from Feature 8, represents an unusual vessel form with the orifice diameter being substantially smaller than the maximum body diameter (Figure 159).

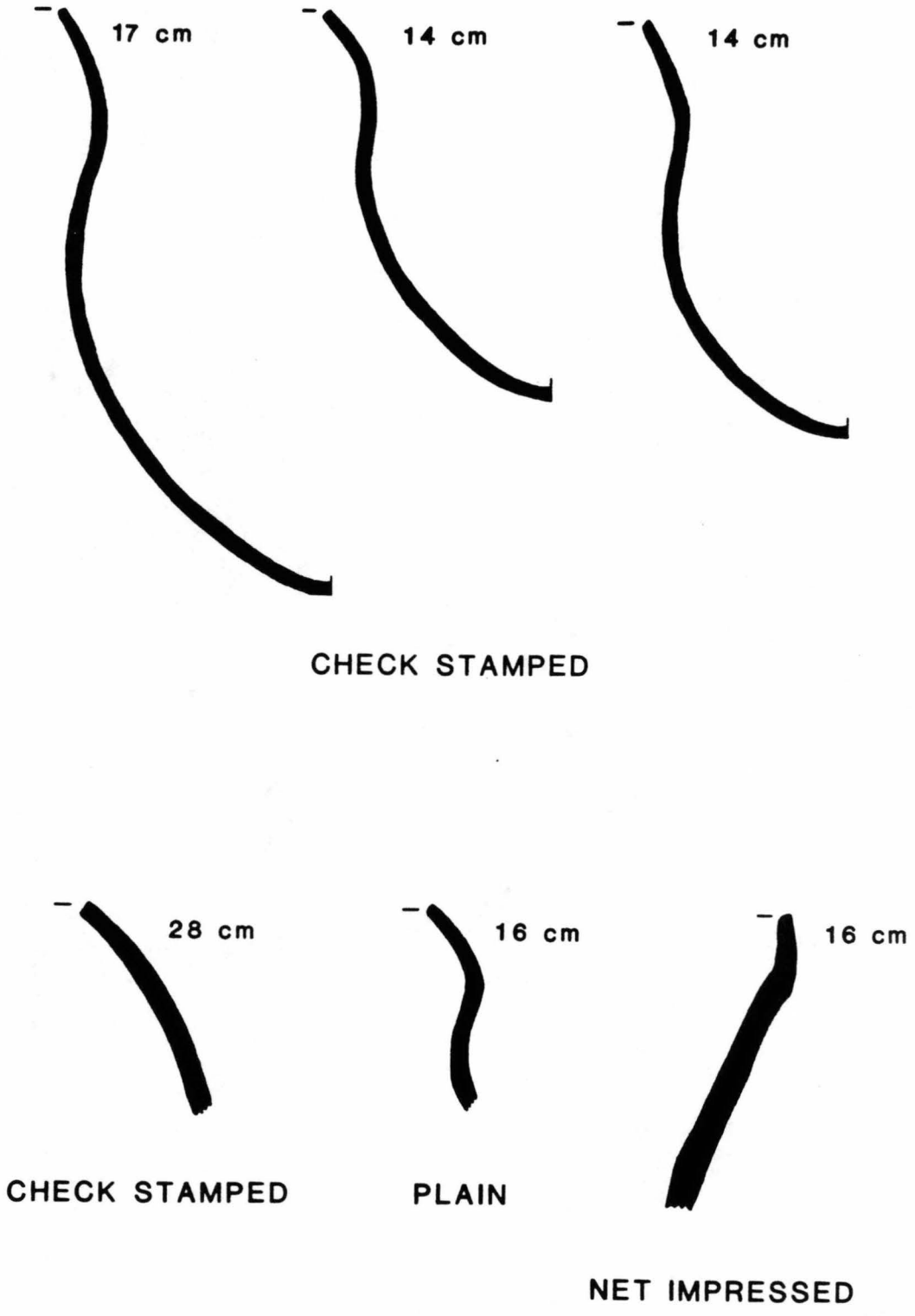


Figure 159. Profiles of vessels and selected vessel fragments from the Fredricks site.

Analyses discussed earlier indicate that this group represents a ceramic tradition that is distinctively different from the one reflected by Group I and that shows strong relationships to Coe and Lewis' (1952) Dan River series. Furthermore, Group II sherds generally do not appear to be directly associated with any of the excavated features or burials at the Fredricks site. Three possible interpretations of these ceramics can be offered, none of which can be fully confirmed or rejected by the available data. First, these sherds may represent the material remains of a contemporary but ethnically distinct social/ethnic group residing at the site. Given abundant ethnohistoric accounts of population movement and amalgamation during this period, such a potential explanation is not unreasonable. Second, Group II sherds may represent a mixture of chronologically separate materials, only part of which are associated with the historic site occupation. This explanation is also reasonable in the absence of good contextual data for these sherds. Third, these sherds may simply relate to an earlier occupation of the Fredricks site. Although a few large net-impressed sherds were recovered from Features 8-9 and in association with check-stamped pottery, this latter explanation is the most plausible since a majority of other net-impressed sherds from features and burials, while similar with respect to all other attributes, typically have highly eroded edges and surfaces. These conditions contrast with the usually crisp edges of plain and check-stamped sherds from the same contexts.

Finally, Group III sherds comprise 7.42% of the ceramic sample and are tempered with coarse sand (12.32%), medium sand (34.70%), fine quartz (21.46%), coarse feldspar (7.77%), and fine feldspar (23.75%). Exterior surfaces consist of plain (28.30%), simple-stamped (58.00%), and check-stamped (13.70%) treatments (Table 53). Sherds are thick,

have predominantly smoothed interiors, and represent vessels with everted rims. Decoration consists of V-shaped notches applied to the lip. As will be seen later, these sherds are most likely associated with the protohistoric occupation at the nearby Wall site and may represent an isolated house or peripheral village debris. Additional potential sites of this type have been identified by survey and testing elsewhere within 400 yards of the site.

Fourteen other sherd categories, comprising a total of 38 sherds (1.29% of the overall sample), cannot be placed into any of these groups because of small sample size or ambiguous attribute associations.

WALL SITE CERAMIC SAMPLE

Excavations at the Wall site (31Or11) during 1983-1984 produced 18,426 potsherds and four complete vessels. A majority of the sherds were recovered from the midden deposit at the northern edge of the site and from plow-disturbed soil. The four complete vessels are artifacts associated with Burials 1-83 and 3-83. As with the Fredricks site sample, detailed analysis was limited to sherds greater than 2 cm in diameter (Table 54) and are summarized in Tables 55-56. Additional information about vessel morphologies represented by the Wall site ceramic assemblage was obtained through a brief examination of vessels and vessel fragments recovered from excavations conducted at the site by the Research Laboratories of Anthropology between 1938 and 1941.

Examination of covariability among sherd attributes suggests that most of the Wall site sherds are probably associated with the major occupation of the site; consequently, they are treated as a single assemblage in the following discussion. Wall site pottery is predominantly tempered with medium sand (50.67%), fine crushed feldspar

Table 54. Frequency of Wall site sherds and vessels by size.

Size (diameter)	n	%
<=2 cm	14,018	76.06
>2-4 cm	3890	21.11
>4-6 cm	420	2.28
>6-8 cm	71	.39
>8-10 cm	22	.12
>10 cm	5	.03
>8 cm (vessels)	4	.02
Totals	18,430	100.01

Table 55. Frequency of Wall site sherds by temper and exterior surface treatment (excluding sherds <=2 cm dia.).

Temper Surface	n	%	% (of identifiable sherds)
Coarse Sand			
Plain	7	.16	.20
Brushed	1	.02	.03
Net Impressed	2	.05	.06
Simple Stamped	9	.20	.26
Check Stamped	7	.16	.20
Indeterminate	7	.16	-
Sub-Totals	33	.75	.75
Medium Sand			
Plain	205	4.65	5.86
Cob Impressed	10	.23	.29
Cord Marked	2	.05	.06
Net Impressed	14	.32	.40
Simple Stamped	1345	30.49	38.44
Check Stamped	207	4.69	5.92
Indeterminate	452	10.24	-
Sub-Totals	2235	50.67	50.97
Fine Sand			
Plain	12	.27	.34
Simple Stamped	1	.02	.03
Sub-Totals	13	.29	.37
Coarse Crushed Quartz			
Plain	1	.02	.03
Cord Marked	2	.05	.06
Indeterminate	5	.11	-
Sub-Totals	8	.18	.09
Medium Crushed Quartz			
Net Impressed	3	.07	.09
Simple Stamped	6	.14	.17
Indeterminate	8	.18	-
Sub-Totals	17	.39	.26
Fine Crushed Quartz			
Plain	11	.25	.31
Cob Impressed	2	.05	.06
Fabric Marked	2	.05	.06
Net Impressed	3	.07	.09
Simple Stamped	48	1.09	1.37
Check Stamped	58	1.31	1.66
Indeterminate	56	1.27	-
Sub-Totals	180	4.09	3.55

Table 55 Continued.

Temper Surface	n	%	% (of identifiable sherds)
Coarse Crushed Feldspar			
Plain	2	.05	.06
Cord Marked	1	.02	.03
Simple Stamped	30	.68	.86
Check Stamped	9	.20	.26
Indeterminate	16	.36	-
Sub-Totals	58	1.31	1.21
Fine Crushed Feldspar			
Plain	147	3.33	4.20
Brushed	1	.02	.03
Cob Impressed	4	.09	.11
Cord Marked	4	.09	.11
Fabric Marked	2	.05	.06
Net Impressed	16	.36	.46
Simple Stamped	1085	24.59	31.01
Check Stamped	198	4.49	5.66
Indeterminate	356	8.07	-
Sub-Totals	1813	41.09	41.64
Quartz & Feldspar			
Plain	5	.11	.14
Net Impressed	1	.02	.03
Simple Stamped	25	.57	.71
Check Stamped	11	.25	.31
Indeterminate	13	.29	-
Sub-Totals	55	1.24	1.19
Totals	4412	100.01	100.03

Table 56. Summary of Wall site sherds by exterior surface treatment.

Attribute Attribute State	Exterior Surface Plain	Brushed	Cob Impressed	Cord Marked	Fabric Marked	Net Impressed	Simple Stamped	Check Stamped
Portion								
Rim	42	1	1	0	0	5	210	34
Neck	33	0	2	1	1	8	343	63
Body	322	1	13	7	3	32	2030	398
Thickness								
<=6 mm	109	0	5	0	0	2	391	78
>6-8 mm	231	2	7	5	0	22	1757	337
>8 mm	50	0	4	4	0	15	401	75
Interior Surface								
Plain	384	2	16	7	0	31	2537	480
Scraped	2	0	0	2	0	5	10	6
Rim Form								
Everted	18	1	0	0	0	4	131	22
Everted/Flaring	3	0	0	0	0	0	1	0
Everted/Folded	0	0	0	0	0	1	29	8
Everted/Rolled	0	0	0	0	0	0	1	0
Straight	1	0	0	0	0	0	4	0
Inverted	10	0	0	0	0	0	5	0
Lip Form								
Flat	14	0	0	0	0	2	112	24
Rounded	27	1	0	0	0	0	91	10
Pointed	4	0	0	0	0	3	10	1
Decoration/Location								
V-Shaped Notches (on lip)	1	1	0	0	0	0	35	2
V-Shaped Notches (on lip/rim)	11	0	0	0	0	4	117	18
Fingertip Notches (on lip/rim)	0	0	0	0	0	0	2	1
Incised "V"s (on neck)	2	0	0	0	0	0	0	0
Incised "V"s (on neck/shoulder)	2	0	0	0	0	0	0	0
Incised "V"s (on body)	1	0	0	0	0	0	0	0
Misc. Incisions (all vessel areas)	7	0	0	0	0	0	0	0
Circular Punctations (on lip)	1	0	0	0	0	0	0	0
Circular Punctations (on shoulder)	10	0	0	0	0	0	0	0
Circular Punctations (on body)	2	0	0	0	0	0	0	0
U-Shaped Punctations (on body)	3	0	0	0	0	0	0	0
Fingernail Impressions (on neck)	0	0	0	0	0	0	0	1
Pinched Rim Fold	0	0	0	0	0	0	0	1
Size								
>2-4 cm	334	2	13	7	3	31	2183	420
>4-6 cm	38	0	3	1	1	7	289	64
>6 cm	17	0	0	1	0	1	77	6

(41.09%), and (to a much lesser extent) fine crushed quartz (4.09%). Other temper categories comprise less than five percent of the overall sample. Exterior surfaces are largely simple stamped (72.85%); however, significant numbers of check-stamped (14.00%) and plain (11.15%) sherds are also present. Other surface treatments represented in the sample are: net impressed (1.11%), cob impressed (0.46%), cord marked (0.26%), fabric marked (0.11%), and brushed (0.06%) (Figures 160-163). Although some of these sherds may in fact represent earlier or later occupations, this cannot be demonstrated because of inadequate sample size. With one exception, temper and exterior surface treatment vary independently of one another. Fine crushed quartz temper is associated largely with check stamping. Possible implications of this pattern are considered below.

As with the Fredricks site sherd analysis, Chi-square tests of association were used to evaluate attribute differences among the three major sherd categories (i.e., surface treatments) represented within the sample (Figure 164). These tests are based on data presented in Table 56. Significant differences (at p=.01) among plain, simple-stamped, and check-stamped sherds were observed for only two attributes--thickness and rim form. Both of these attributes monitor vessel morphology. Whereas simple-stamped and check-stamped sherds usually represent moderately thick-walled, constricted jars with everted or everted/folded rims, plain sherds appear to be associated more with unrestricted bowls which have relatively thin walls. This pattern is also reflected by the frequency distribution of vessel portions represented by plain sherds, with rim sherds outnumbering neck sherds. Plain sherds also display considerably more variability in decoration than the other two sherd categories. Decoration of simple-stamped and check-stamped vessels is



Figure 160. Selected simple-stamped sherds from the Wall site.

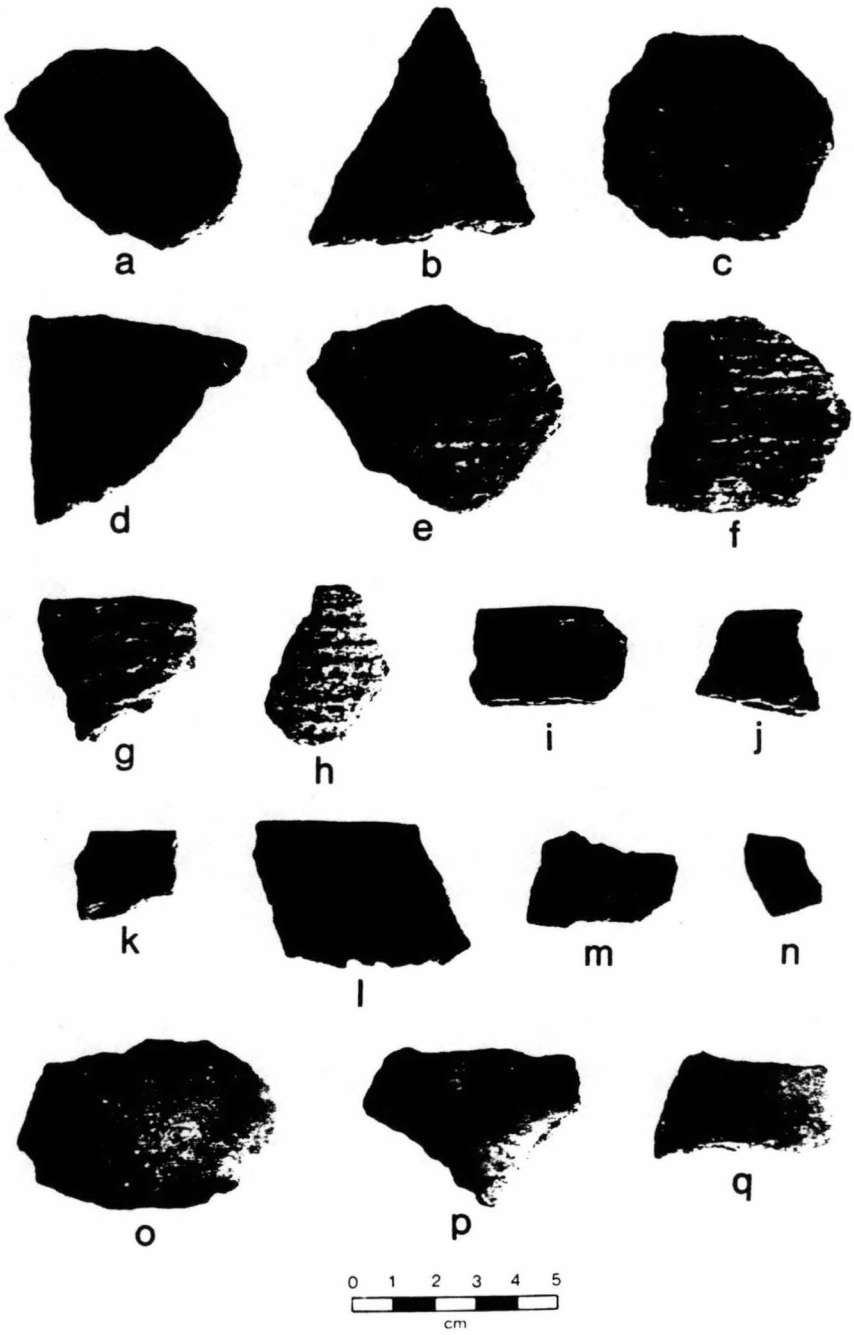


Figure 161. Selected check-stamped (a-h) and plain (i-q) sherds from the Wall site.

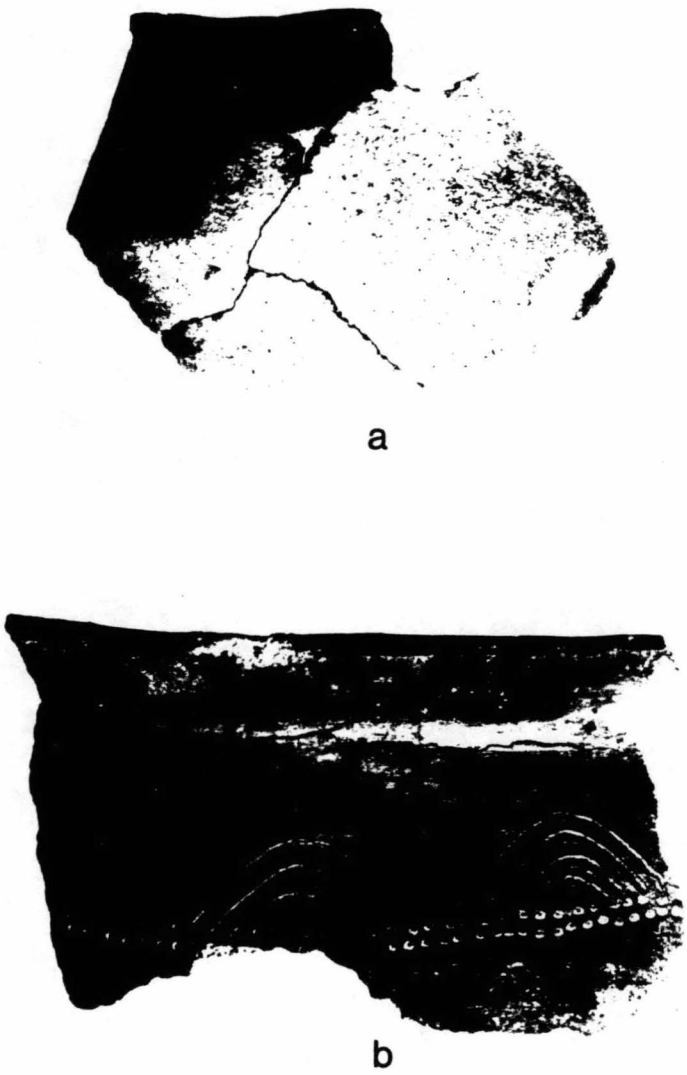


Figure 162. Undecorated (a) and decorated (b) plain vessel sections from the Wall site.

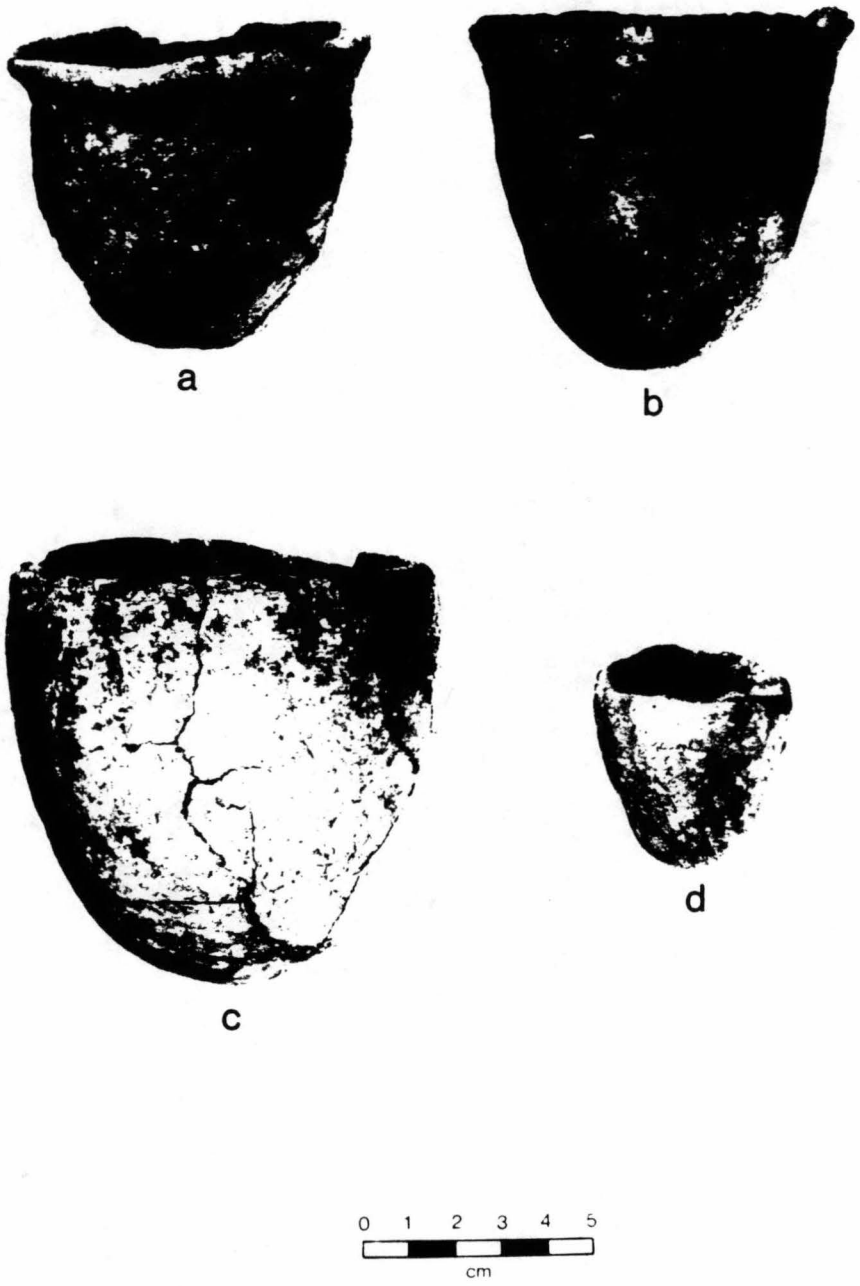


Figure 163. Whole vessels from Burial 3-83 (a-b) and Burial 1-83 (c-d) at the Wall site.

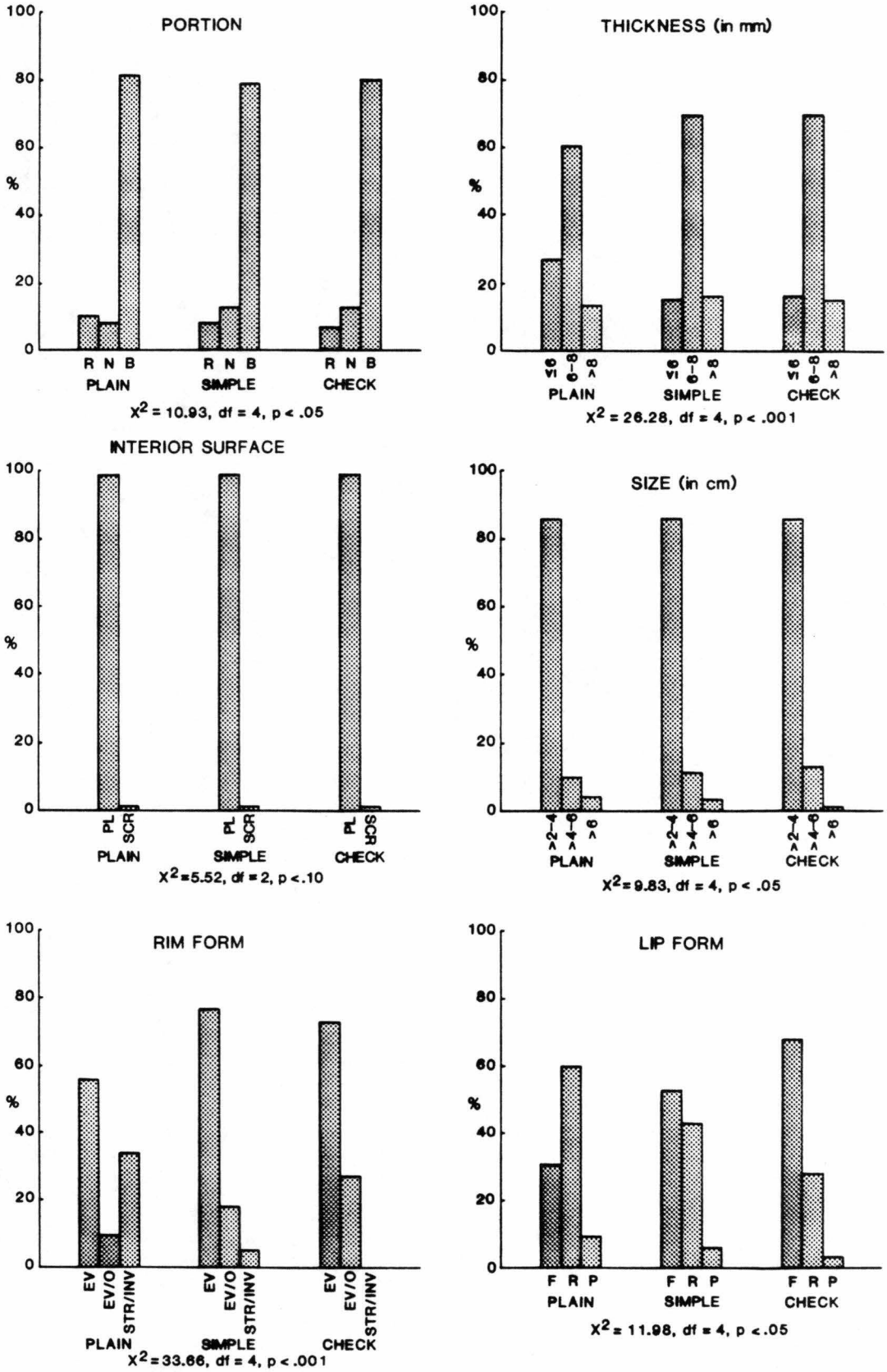


Figure 164. Relative frequency distributions and statistical evaluation of selected attributes for plain, simple-stamped, and check-stamped sherds from the Wall site.

almost solely restricted to the rim area and usually consists of V-shaped notches along either the lip or lip/rim edge. Whereas similar decorations were observed on plain rim sherds, other decorative modes involving incising and punctating seem to have been more common on plain vessels. Additionally, these latter decorations frequently occur on the vessel shoulder and body.

In order to assess potential diachronic variability in the Wall site sample, the relative frequency distributions of two attributes--exterior surface treatment and temper--were examined from plowzone and midden contexts in four 10x10 ft squares excavated along the northern edge of the site. The squares included in the analysis are 360R530, 370R530, 370R540, and 370R560. The plowzone within these squares is .65-.75 ft thick whereas the midden zone, excavated in two levels, ranges from .40-.90 ft thick. Midden levels were distinguished in the field by soil color and artifact content. Midden Level 1 is interpreted as a sealed refuse deposit; Level 2 appears to represent an earlier, buried humus zone. Plowzone artifact content is derived in part from the uppermost portion of Midden Level 1. Consideration of differences in sherd samples among the plowzone and midden levels is important since it provides a rough assessment of site duration and a means for detecting sources of ceramic variability that may be temporally significant. Distributions of exterior surface treatments and temper types are provided in Table 57.

Potentially significant variability in surface treatment is reflected by a slight decrease in simple stamping and corresponding increase in check stamping from Midden Level 1 to Midden Level 2. The strength of this pattern was evaluated using a Chi-square test comparing major surface treatment (plain, simple stamped, check stamped) with

Table 57. Comparison of selected attributes for plowzone and midden contexts at the Wall site.

Attribute Attribute State	n	%	n	%	n	%
Exterior Surface						
Plain	29	13.68	94	11.72	73	11.39
Brushed	1	.47	0	.00	0	.00
Cob Impressed	0	.00	2	.25	6	.94
Cord Marked	0	.00	4	.50	2	.31
Fabric Marked	0	.00	2	.25	0	.00
Net Impressed	3	1.42	8	1.00	3	.47
Simple Stamped	156	73.58	606	75.56	446	69.58
Check Stamped	23	10.85	86	10.72	111	17.31
Totals	212	100.00	802	100.00	641	100.00
Temper						
Coarse Sand	1	.38	5	.55	8	1.11
Medium Sand	151	57.85	474	52.15	384	53.04
Fine Sand	0	.00	5	.55	3	.41
Coarse Crushed Quartz	0	.00	1	.11	5	.69
Medium Crushed Quartz	0	.00	3	.33	6	.83
Fine Crushed Quartz	6	2.30	28	3.08	24	3.31
Coarse Feldspar	3	1.15	10	1.10	8	1.11
Fine Feldspar	100	38.31	377	41.47	270	37.29
Quartz & Feldspar	0	.00	6	.66	16	2.21
Totals	261	99.99	909	100.00	724	100.00

context. The test results (X^2=15.28, df=4, p<.005) indicate a statistically significant difference, and suggest the possibility that check stamping may have slight temporal priority over simple stamping. This potential trend may also be reflected by the association (noted earlier) of fine crushed quartz temper with check stamping. Beyond this, the three contexts are generally similar in sherd content and support the hypothesis that the Wall site does not represent a lengthy occupation.

Temper distributions among the plowzone and midden levels are also similar. Statistical comparison of the three most frequent temper types (medium sand, fine feldspar, fine quartz) failed to reveal any significant differences (X^2=2.97, df=4, p<.75). Again, the data do not suggest any appreciable time depth for the analyzed stratigraphic contexts.

In summary, the vessel assemblage represented by the Wall site sherd sample can be characterized as follows. Jar forms are predominant. Most are simple stamped but some have check-stamped and plain surfaces. When stamped, the stamp motif is boldly applied and covers the entire vessel exterior. Simple stamps are typically applied at right angles to one another, producing a distinctive herringbone effect. Check-stamped designs are similar to those observed within the Fredricks site sample, consisting of large squares or diamonds; however, they are much more heavily stamped. Vessel interiors were almost always uniformly smoothed.

Most jars have constricted necks and everted rims, some of which also have rim folds. Rim profiles for these jar forms are illustrated in Figure 165:1-aa. Decoration is common and consists of notching the lip or lip/rim edge. Although morphologically similar, check-stamped

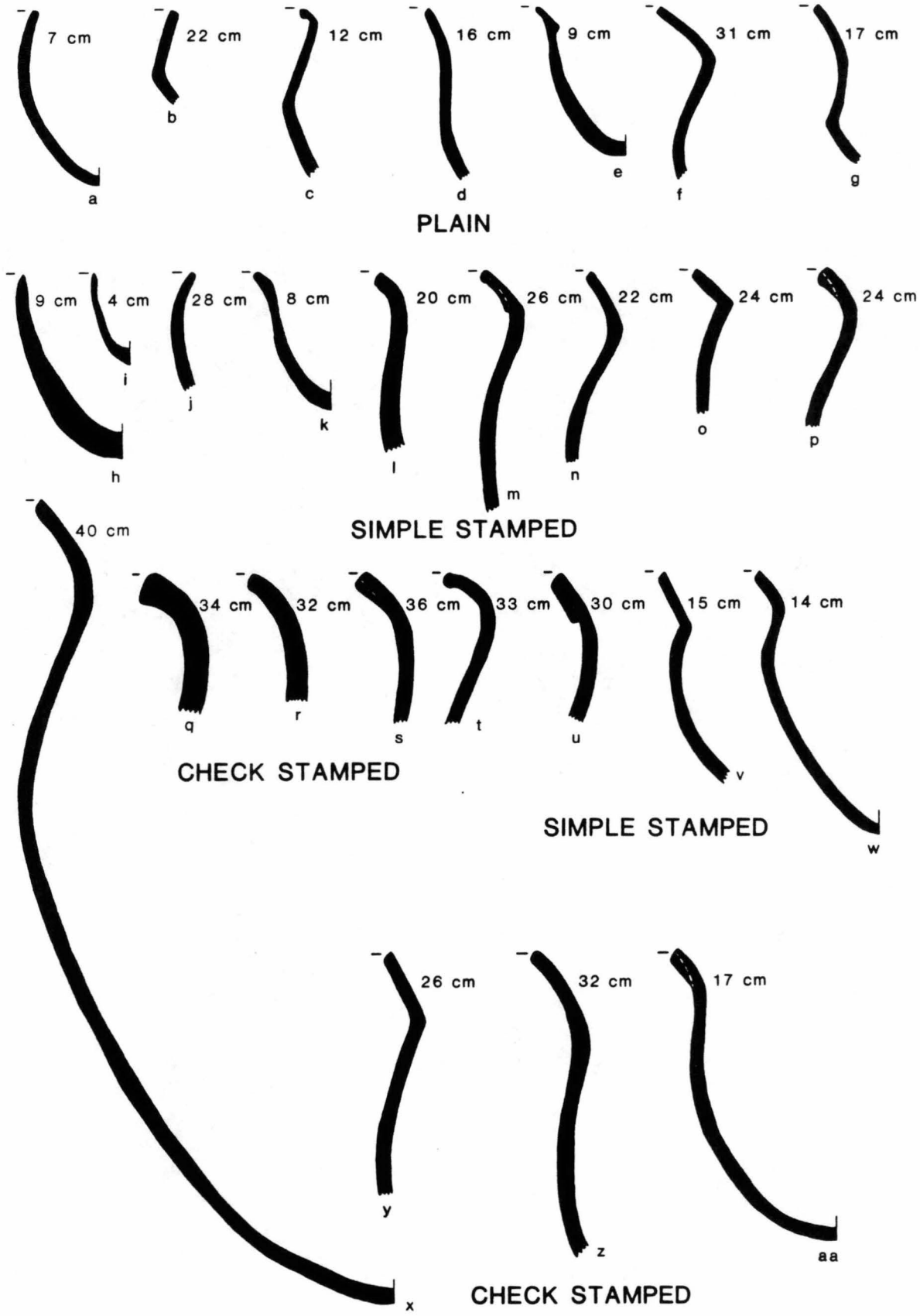


Figure 165. Profiles of vessels and selected vessel fragments from the Wall site (* identifies specimens from 1983-84 excavations; all others from 1938-41).

jars are generally larger than simple-stamped jars, ranging from 17-40 cm in orifice diameter (x=31.0 cm, sd=7.06, n=7). Simple-stamped jars range from 14-33 cm in diameter (x=23.1, sd=6.27, n=9). Both categories of jars have slightly conical to rounded bases.

A small number of jars, including the four vessels recovered from burial contexts, represent an unrestricted jar form, i.e., they lack a constricted neck (Figure 165:a,e,h-i,l). These jars have incurvate, straight, or slightly flaring rim profiles and are either plain or simple stamped. Unrestricted jars are significantly smaller than restricted jars, and range from 4-9 cm in orifice diameter (x=7.4, sd=2.07, n=5). Only two of the vessels analyzed are decorated. One plain vessel section, recovered in 1938, has several randomly placed pairs of short, curved incisions on the exterior body surface. The other vessel, one of two associated with Burial 3-83, is also plain, has a notched lip, and was painted with red ocre on both the exterior and interior surfaces. All four vessels recovered from burial contexts in 1983 are hand-modelled and poorly fired. This contrasts sharply with the remainder of the ceramic sample which represent well-fired vessels constructed by coiling. The paired vessels within both Burial 1-83 and Burial 3-83 are morphologically similar to each other; and each pair appears to have been made by the same individual.

Finally, several sherds and vessel sections have been recovered from the Wall site which represent bowl forms (i.e., having orifice diameters which exceed vessel height). Three distinct bowl types are identified: unrestricted (Figure 165:d,j), unrestricted carinated (Figure 165:b), and restricted (Figure 165:c,f-g). With the exception of one unrestricted simple-stamped vessel, all of the bowls examined have smoothed plain interiors and exteriors. Vessel size, significantly

greater than that observed for unrestricted jars, ranges from 12-18 cm in orifice diameter (x=21.00, sd=7.38, n=6). All of these vessels are well-made and most are decorated. Decoration consists primarily of a single or double line of circular reed punctations along the shoulder, sometimes accompanied by a band of incised "V"s just above the shoulder. Vessel sections were also observed from the 1938-1941 excavations which had punctated "V"s and incised "V"s just below the shoulder.

MITCHUM SITE CERAMIC SAMPLE

During 1983, limited testing was undertaken by the Research Laboratories of Anthropology at the Mitchum site (31Ch452), an historic village site located along the Haw River about 17 miles southwest of the Hillsborough sites. The primary cultural component at the Mitchum site apparently post-dates the Wall site occupation and precedes the final historic Indian occupation at the Fredricks site. This interpretation is based upon the limited occurrence of historic trade material (mostly glass beads) within several archaeological features. A total of 3397 potsherds were recovered from plowzone and sub-plowzone strata, as well as from features (n=14), one human burial, and postholes associated with an oval house pattern (Structure 1). This discussion is limited to the 1351 sherds that were greater than 2 cm in diameter (Table 58). Consideration of the Mitchum site sherds is important to earlier interpretations of attribute variability within the Fredricks site sample since they were also derived from an Historic period context within which plain, stamped, and net-impressed surface treatments are apparently associated. Because of the small number of identifiable sherds that were recovered from features and burials (n=96), the following analysis is limited to a general statement about the ceramic

Table 58. Frequency of Mitchum site sherds by size.

Size (diameter)	n	%
<=2 cm	2046	60.23
>2-4 cm	1202	35.38
>4-6 cm	134	3.94
>6-8 cm	14	.41
>8-10 cm	1	.03
>10 cm	0	.00

assemblage at the site and a more detailed examination of the relationship of net-impressed sherds to other predominant modes of surface treatment.

Aboriginal pottery from the Mitchum site is tempered primarily with medium sand (36.55%), coarse crushed feldspar (19.50%), and fine crushed feldspar (32.29%). Other temper types recognized within the sample, in descending order of frequency, are fine crushed quartz, medium crushed quartz, quartz and feldspar, coarse sand, coarse grit, coarse crushed quartz, fine grit, and fine sand (Table 59). Exterior surface treatments are predominantly plain (40.07%), net impressed (30.26%), simple stamped (14.73%), and brushed (8.06%); other minority treatments such as cob impressed, check stamped, cord marked, and complicated stamped occur on less than seven percent of the Mitchum sherds (Figures 166-167). Both plain and simple-stamped surface treatments are equally associated with all three major temper types. Net-impressed and brushed sherds are predominantly tempered with fine feldspar and medium sand. This differential association of major temper and surface treatment types is statistically significant (X^2=129.41, df=6, $p<.001$); however, it is not known to what extent these differences reflect temporal or functional variability.

Statistical evaluation of other selected attributes for plain, brushed, simple-stamped, and net-impressed sherds also indicates certain significant differences. Their implications are briefly considered below. Attribute summaries for major temper/surface treatment categories are presented in Table 60; attribute distributions by surface treatment are shown in Figure 168.

Plain sherds can be clearly distinguished from other sherd categories by a high proportion of rim sherds. This pattern also

Table 59. Frequency of Mitchum site sherds by temper and exterior surface treatment (excluding sherds <=2 cm dia.).

Temper Surface	n	%	% (of identifiable sherds)
Coarse Sand			
Plain	1	.07	.10
Brushed	1	.07	.10
Cob Impressed	1	.07	.10
Net Impressed	4	.30	.39
Simple Stamped	1	.07	.10
Indeterminate	3	.22	-
Sub-Totals	11	.80	.79
Medium Sand			
Plain	126	9.32	12.22
Brushed	26	1.92	2.52
Cob Impressed	13	.96	1.26
Cord Marked	2	.15	.19
Net Impressed	160	11.83	15.52
Simple Stamped	45	3.33	4.36
Check Stamped	3	.22	.29
Comp. Stamped	2	.15	.19
Indeterminate	93	6.88	-
Sub-Totals	470	34.76	36.55
Fine Sand			
Plain	1	.07	.10
Sub-Totals	1	.07	.10
Coarse Crushed Quartz			
Brushed	3	.22	.29
Net Impressed	3	.22	.29
Simple Stamped	1	.07	.10
Indeterminate	1	.07	-
Sub-Totals	8	.58	.68
Medium Crushed Quartz			
Plain	7	.52	.68
Brushed	3	.22	.29
Cord Marked	1	.07	.10
Net Impressed	13	.96	1.26
Simple Stamped	1	.07	.10
Check Stamped	1	.07	.10
Indeterminate	8	.59	-
Sub-Totals	34	2.50	2.53
Fine Crushed Quartz			
Plain	20	1.48	1.94
Brushed	10	.74	.97
Cob Impressed	3	.22	.29

Table 59 Continued.

Temper Surface	n	%	% (of identifiable sherds)
Net Impressed	15	1.11	1.45
Simple Stamped	5	.37	.48
Check Stamped	3	.22	.29
Indeterminate	13	.96	-
Sub-Totals	69	5.10	5.42
Coarse Crushed Feldspar			
Plain	130	9.62	12.61
Brushed	8	.59	.78
Cob Impressed	15	1.11	1.45
Net Impressed	8	.59	.78
Simple Stamped	39	2.88	3.78
Check Stamped	1	.07	.10
Indeterminate	64	4.73	-
Sub-Totals	265	19.59	19.50
Fine Crushed Feldspar			
Plain	126	9.32	12.22
Brushed	42	3.11	4.07
Cob Impressed	3	.22	.29
Cord Marked	3	.22	.29
Net Impressed	97	7.17	9.41
Simple Stamped	55	4.07	5.33
Check Stamped	7	.52	.68
Indeterminate	130	9.62	-
Sub-Totals	463	34.25	32.29
Quartz & Feldspar			
Plain	1	.07	.10
Net Impressed	7	.52	.68
Indeterminate	8	.59	-
Sub-Totals	16	1.18	.78
Coarse Grit			
Net Impressed	2	.15	.19
Simple Stamped	5	.37	.48
Comp. Stamped	2	.15	.19
Indeterminate	1	.07	-
Sub-Totals	10	.74	.86
Fine Grit			
Plain	1	.07	.10
Net Impressed	3	.22	.29
Comp. Stamped	1	.07	.10
Sub-Totals	5	.36	.49
Totals	1352	99.93	99.99

Table 60. Summary of selected sherd categories from the Mitchum site.

Attribute Attribute State	Medium Sand				Coarse Feldspar		Fine Feldspar			
	Plain	Brushed	Net Impressed	Simple Stamped	Plain	Simple Stamped	Plain	Brushed	Net Impressed	Simple Stamped
Portion										
Rim	23	1	16	7	22	5	19	3	3	2
Neck	15	3	9	11	16	7	12	10	18	14
Body	91	22	136	30	93	27	95	29	76	39
Thickness										
<=6 mm	60	15	33	7	5	8	18	2	8	5
>6-8 mm	61	10	102	35	89	12	92	28	62	31
>8 mm	5	1	24	3	35	19	15	12	27	19
Interior Surface										
Plain	124	24	39	44	127	37	124	41	42	54
Scraped	2	2	119	1	1	2	1	0	51	1
Rim Form										
Everted	13	1	5	6	15	3	7	0	0	0
Everted/Folded	0	0	0	0	0	0	1	0	0	0
Straight	0	0	4	0	0	0	0	0	0	0
Inverted	1	0	0	0	0	2	0	2	0	0
Lip Form										
Flat	11	1	11	2	12	5	8	2	2	2
Rounded	11	0	4	1	10	0	9	0	1	0
Pointed	1	0	0	4	0	0	1	1	0	0
Decoration/Location										
Incised (oblique on lip)	0	0	1	0	0	0	0	0	0	0
Incised "V"s (on neck)	0	0	0	0	0	0	0	0	1	0
Short Vertical Incised Lines (on neck)	0	0	2	0	0	0	0	0	1	0
Misc. Incisions (on body)	0	0	0	0	0	0	1	0	0	0
Circular Reed Punctations (on lip)	0	0	0	0	1	0	0	0	0	0
V-Shaped Notches (on lip)	4	0	6	5	1	4	1	2	0	2
Fingertip Impressions (on neck)	0	0	1	0	0	0	0	0	2	0
Corncob Impressions (on shoulder)	0	0	0	0	1	0	0	0	0	0
Size										
>2-4 cm	114	24	129	35	119	30	117	39	80	51
>4-6 cm	10	2	23	10	11	8	8	3	16	4
>6 cm	2	0	7	0	0	1	1	0	1	0

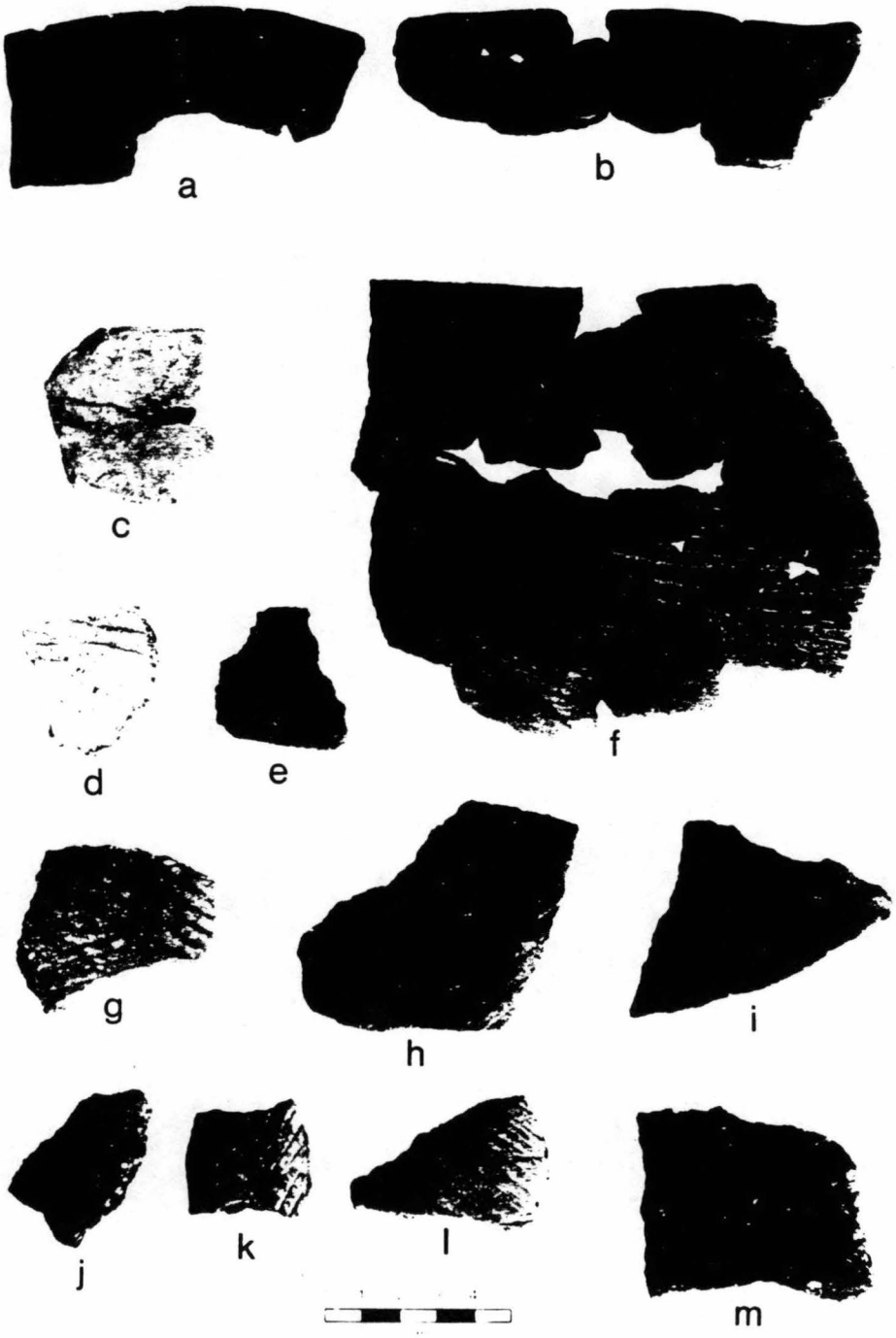


Figure 166. Selected plain (a-c), simple-stamped (d-i), brushed (j-l), and cob-impressed (m) sherds from the Mitchum site.

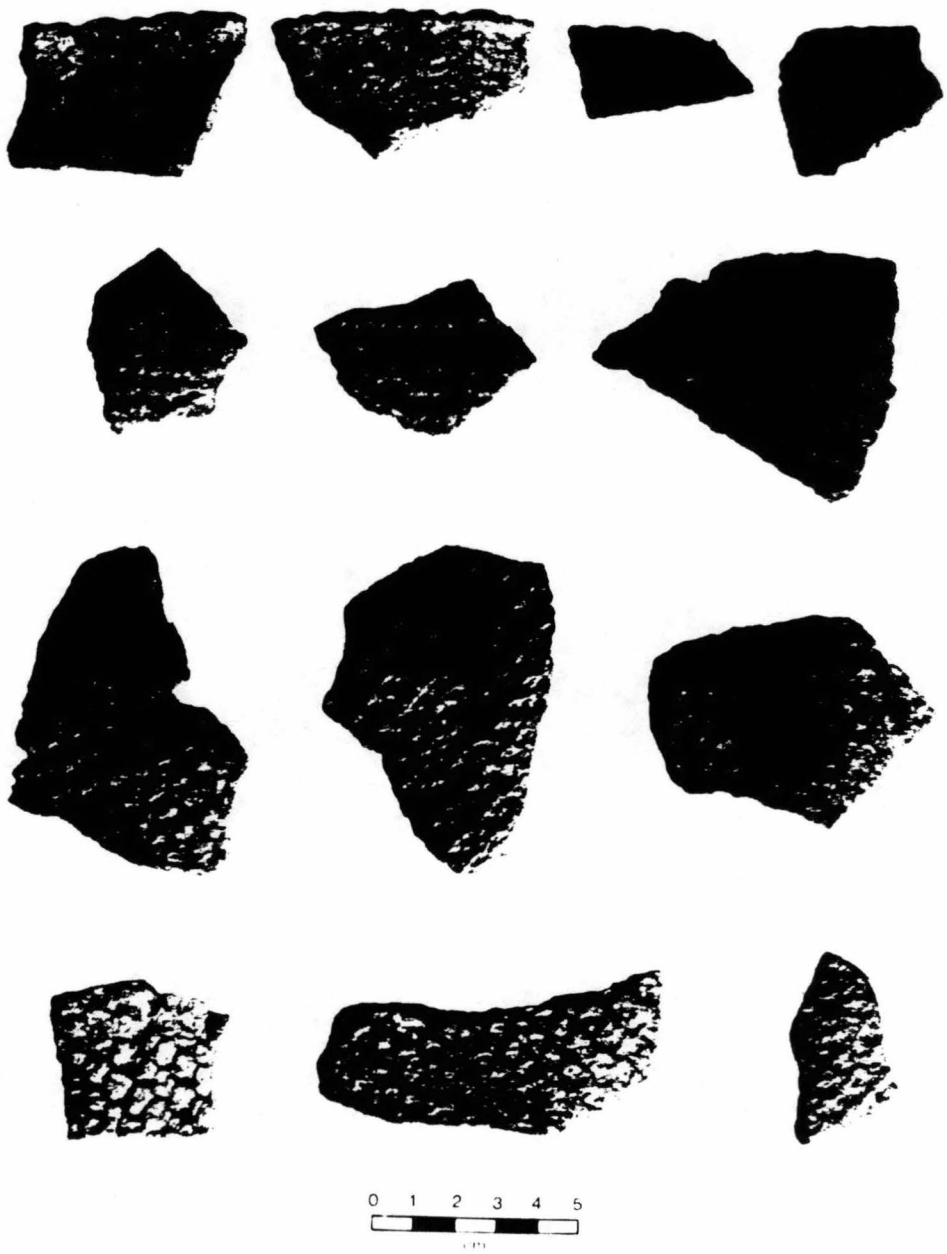


Figure 167. Selected net-impressed sherds from the Mitchum site.

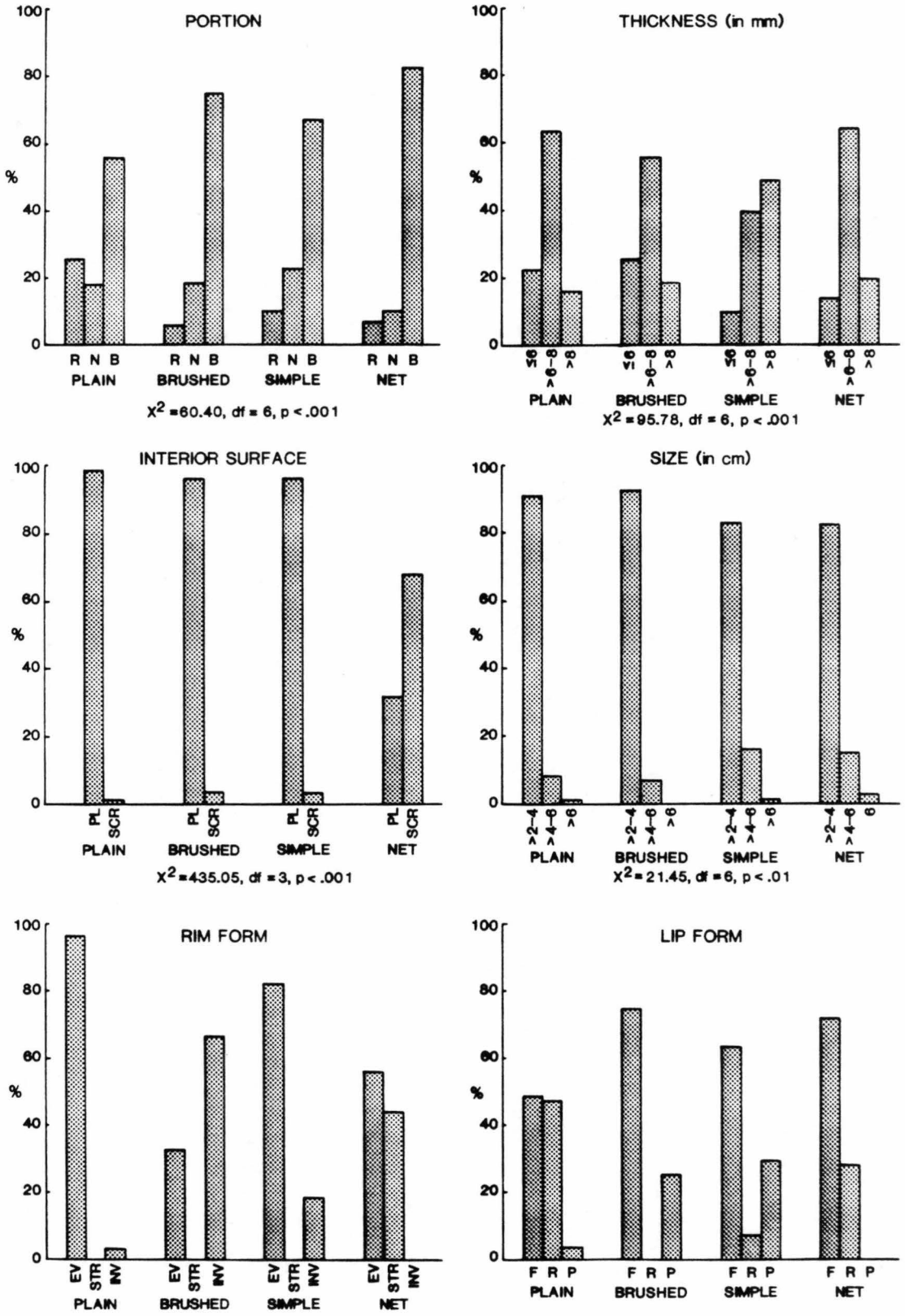


Figure 168. Relative frequency distributions and statistical evaluation of selected attributes for plain, brushed, simple-stamped, and net-impressed sherds from the Mitchum site.

contrasts with vessel portion distributions observed at the Fredricks and Wall sites, and suggests the predominance of a shallow, wide-mouthed vessel form (i.e., with a high rim-to-body ratio). Unfortunately, this possibility cannot be evaluated further because of an insufficient sample of reconstructable vessels. The majority of plain vessels also have everted (or flaring) rims and either flat or rounded lips. Decoration of plain vessels consists primarily of V-shaped notches placed on the lip. Other treatments observed in the sample include incising, punctating, and impressing with a corncob.

Both brushed and simple-stamped sherds appear to represent similar vessel morphologies; however, simple-stamped vessel walls are substantially thicker. Simple-stamped and brushed surfaces were difficult to distinguish and in both cases lands and grooves were usually applied parallel to the vessel rim. This is markedly different from simple-stamped sherds at the Wall and Fredricks sites where stamping was applied either perpendicular or oblique to the rim. Although brushed and simple-stamped rim sherd samples are too small to provide reliable information about rim configuration, it is likely that a majority of these vessels had slightly everted rims with flattened lips. Notching of the lip is the sole mode of decoration that was observed on these sherds.

Finally, the sample of net-impressed sherds collected from the Mitchum site indicates a moderately low ratio of rim circumference to body area. The relatively low proportion of neck sherds, also reflected in the high percentage of straight rims, suggests a distinctly different vessel shape than that inferred for either the plain or simple-stamped/brushed categories. This contrast is further magnified by the predominance of interior scraping on net-impressed sherds. This

type of interior surface treatment was rarely found on sherds other than net impressed. Differences between net-impressed sherds and other major sherd categories are also manifested in decoration. Notching of the vessel lip is still a principal decorative treatment; however, an equal number of sherds also showed evidence of decoration along the vessel neck. Neck treatments recognized on net-impressed sherds include a single band of vertical fingertip notches or short incised lines and incised "V"s. These methods of decoration, as well as other attributes such as prevalent rim form and interior surface treatment, conform well to Dan River ceramic series descriptions (Coe and Lewis 1952).

As with the Fredricks ceramic sample, significant attribute differences can be shown to exist between net-impressed sherds and sherds with other frequently observed surface treatments. Recognition of attribute variability at each site indicates certain distinctive intersite differences in the overall ceramic samples; however, vessels represented by net-impressed sherds appear to be essentially similar. Because a significantly greater proportion of large net-impressed sherds (i.e., greater than 4 cm in dia.) were recovered from the Mitchum site, many of which had uneroded edges, the possibility of their being associated with the remainder of the ceramic assemblage was considered to be greater. This potential association was examined in two ways, and produced mixed results. First, the distribution of plain, brushed, simple-stamped, and net-impressed sherds was examined within plowzone and sub-plowzone strata for a 700 ft^2 excavation area (n=727 sherds). The sub-plowzone stratum, Zone II, was approximately 0.2 ft thick and represents an organically stained zone at the top of subsoil which was skim-shoveled to expose intrusive pits and postholes. It was assumed that if the net-impressed sherds were the product of an earlier

occupation at the site, this situation might be reflected by a significantly greater frequency of those sherds within a sub-plowzone stratigraphic context. A Chi-square test of the sherd distributions within these two zones, however, does not indicate any significant difference (X^2=0.97, df=3, p<.90). A second test comparing the combined strata with excavated features, most of which produced historic artifacts, does indicate statistically significant differences (X^2=34.40, df=3, p<.001). Specifically, simple-stamped sherds occur in greater association with features whereas net-impressed sherds only rarely occurred in such contexts. Both plain and brushed sherds are randomly distributed within both features and excavated strata. These results, although far from conclusive given the limited sample, suggest that the net-impressed pottery may not be associated with the historic features excavated at the Mitchum site. This conclusion is also supported by the fact that the few large net-impressed sherds from undisturbed contexts were all recovered from postholes not associated with Structure 1. As with the Fredricks site, the available ceramic data suggest the presence of at least two separate cultural components; however, additional samples are clearly needed from each site to evaluate this possibility further.

INTERSITE COMPARISONS

The preceding analyses have provided a detailed examination of intrasite ceramic variability at the Fredricks, Wall, and Mitchum sites in order to delineate assemblages of culturally and temporally related sherds, and to provide an empirical basis for evaluating the position of the Fredricks site (via ceramics) relative to two other cultural occupations which are proximate in both time and space. Clarification

of what occurred prior to the Fredricks site occupation is important in identifying this site as early 18th-century Occaneechi Town, since it can be historically documented that this settlement represented an intrusion (after 1676) from the Roanoke River (ca. 50 mi NE of Hillsborough). Unfortunately, no 17th-century Occaneechi sites have been identified along the Roanoke, and probably will not be since much of that valley (particularly the Occaneechi Island area at the confluence of the Dan and Roanoke Rivers) is now inundated by Kerr Reservoir. Archaeological sites identified and sampled prior to inundation document only prehistoric occupations (Miller 1962).

In order to consider more fully the position of the Fredricks site ceramics and their external relationships, a regional database was compiled which includes ceramic information for 25 assemblages from 17 sites (including the Fredricks, Wall, and Mitchum sites) in piedmont North Carolina and Virginia (Figure 169). These data, derived from published and unpublished reports and theses on file at the Research Laboratories of Anthropology, represent a significant portion of the quantified ceramic information presently available for this region (Table 61). With the exception of three assemblages, all represent Late Woodland-Historic period cultural components. Because the database encompasses studies conducted by several researchers over a period of nearly 35 years, much of the available data are too incompatible to be useful for intersite comparison; consequently, only relative frequency distributions of exterior surface treatments are considered (Table 62). In addition, it appears likely that at least some of the assemblages included in this study represent multiple components. Any conclusions drawn from these data must, therefore, be regarded as tentative and will be subject to change as more and better-analyzed assemblages become

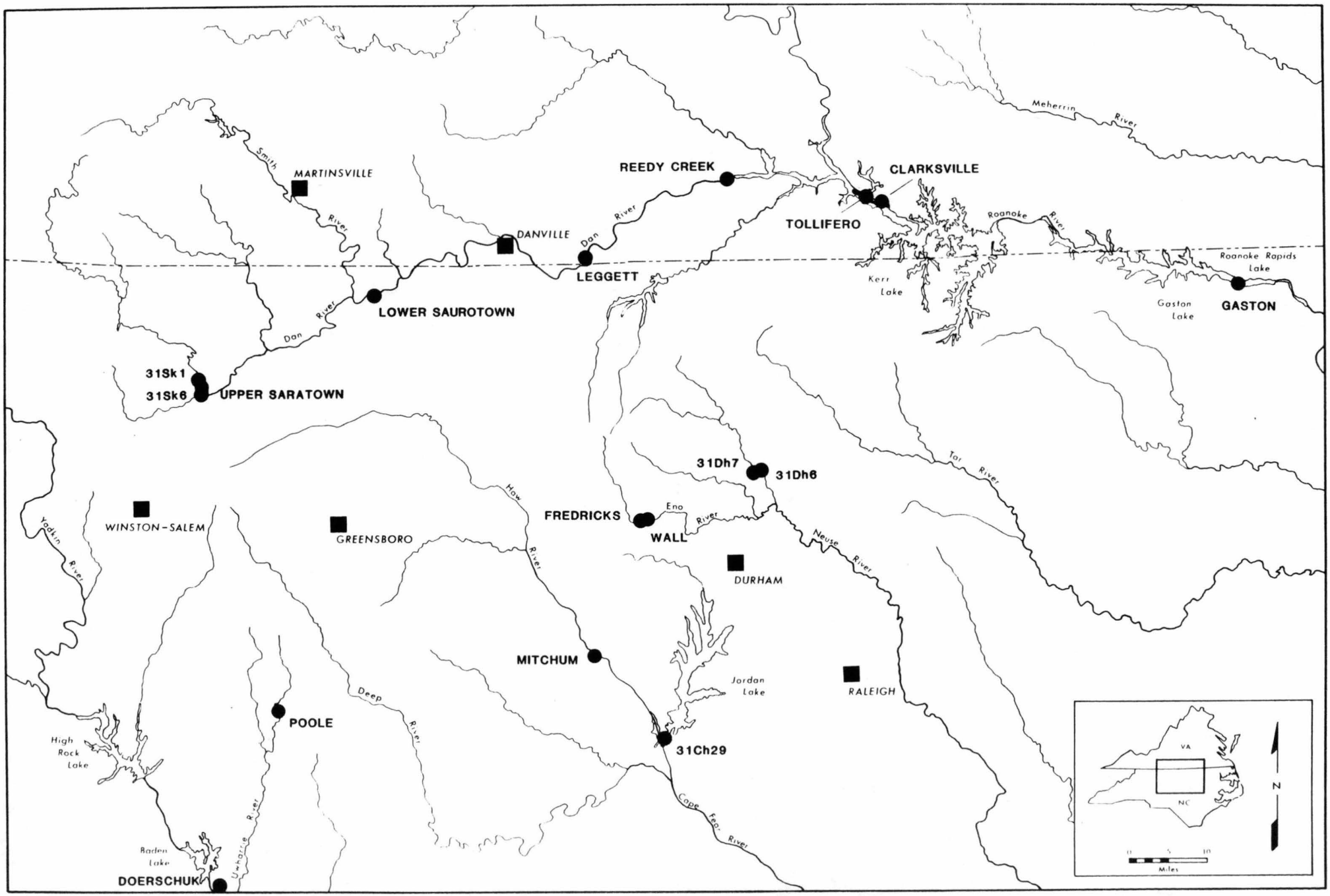


Figure 169. Map locating sites used in the comparative ceramic analysis.

Table 61. Summary of assemblages used in intersite ceramic analysis.

Time Period Site	Site Name	Assemblage Definition	Location	Reference
Historic				
31Or231	Fredricks	2950 sherds (complete sample)	Eno River	This Report
31Or231	Fredricks	2044 Group I sherds	Eno River	This Report
31Sk1		86 vessel fragments	Dan River	Wilson 1983
31Sk1a	Upper Saratown	100 vessel fragments	Dan River	Wilson 1983
31Sk6		748 sherds (surface collection)	Dan River	Gardner 1980
Protohistoric/Historic(?)				
31Ch452	Mitchum	1031 sherds (complete sample)	Haw River	This Report
31Ch452	Mitchum	719 sherds (excluding net impressed)	Haw River	This Report
31Dh6		575 sand tempered sherds	Flat River	McCollough et al.1980
31Dh7		269 sand tempered sherds	Flat River	McCollough et al.1980
Protohistoric				
31Or11	Wall	3499 sherds	Eno River	This Report
31Or231	Fredricks	219 Group III sherds	Eno River	This Report
31Ch29		1379 New Hope and Hillsboro sherds	Haw River	Wilson 1976
31Rd1	Poole	1252 sherds	Caraway Creek	Wilson 1983
Late Woodland				
31Or231	Fredricks	649 Group II sherds	Eno River	This Report
31Rk1	Lower Saurotown	5298 sherds	Dan River	Lewis 1951
44Ha22	Reedy Creek	5077 sherds	Dan River	Wilson 1983
44Ha23	Leggett	507 sherds	Dan River	Gardner 1980
31Hx7	Gaston	1556 sherds (Clements features)	Roanoke River	South 1959
31Hx7	Gaston	2439 sherds (Gaston features)	Roanoke River	South 1959
44Ha6	Tollifero	748 Clarksville series sherds	Roanoke River	Miller 1962
44Mc14	Clarksville	18,519 Clarksville series sherds	Roanoke River	Miller 1962
31Ch29		587 Uwharrie series sherds	Haw River	Wilson 1976
Middle Woodland				
31Hx7	Gaston	1761 sherds (Vincent features)	Roanoke River	South 1959
31Mg22	Doerschuk	619 Yadkin series sherds	Yadkin River	Coe 1964
Early/Middle Woodland(?)				
44Ha6	Tollifero	7447 Hyco series sherds	Roanoke River	Miller 1962

Table 62. Surface treatment percentages for analyzed ceramic assemblages.

Ceramic Assemblage	Plain	Brushed	Cob Impressed	Cord Marked	Net Impressed	Fabric Marked	Simple Stamped	Check Stamped	Comp. Stamped
Historic									
31Or231(All)	35.22	2.51	.34	2.24	21.83	.00	4.31	33.49	.07
31Or231(I)	47.70	2.99	.00	2.64	.00	.00	.00	46.67	.00
31Sk1	43.02	1.16	5.81	2.33	38.37	.00	8.14	.00	2.33
31Sk1a	54.00	12.00	2.00	1.00	23.00	.00	2.00	3.00	3.00
31Sk6	26.20	4.14	.00	15.51	51.34	.00	.00	1.07	1.74
Protohistoric/Historic(?)									
31Ch452(All)	40.06	9.02	3.39	.58	30.26	.00	14.74	1.45	.48
31Ch452(w/o Net)	57.44	12.93	4.87	.83	.00	.00	21.14	2.09	.70
31Dh6	14.09	9.57	1.22	24.87	46.43	.00	.52	.17	3.13
31Dh7	23.79	1.12	.00	5.95	69.14	.00	.00	.00	.00
Protohistoric									
31Or11(All)	11.15	.06	.46	.26	1.11	.11	72.85	14.00	.00
31Or231(III)	28.30	.00	.00	.00	.00	.00	58.00	13.70	.00
31Ch29(NH/H)	87.60	1.38	.51	4.28	3.19	3.05	.00	.00	.00
31Rd1	62.00	8.00	5.00	2.00	9.00	.00	.50	7.00	7.00
Late Woodland									
31Or231(II)	.00	1.54	.00	.00	98.46	.00	.00	.00	.00
31Rk1	23.97	1.13	3.53	2.93	67.92	.00	.06	.00	.47
44Ha22	21.06	2.19	1.77	7.19	67.54	.00	.26	.00	.00
44Ha23	4.34	1.58	2.56	24.06	67.46	.00	.00	.00	.00
31Hx7(Clem)	2.10	.00	.10	68.10	.20	25.40	3.80	.20	.00
31Hx7(Gast)	2.50	.00	.10	13.40	.20	21.70	61.80	.30	.00
44Ha6(Clark)	20.72	8.42	.00	.00	70.86	.00	.00	.00	.00
44Mc14	10.36	4.00	.72	2.72	81.89	.25	.05	.00	.00
31Ch29(Uwh)	35.95	.00	.00	5.11	53.15	5.79	.00	.00	.00
Middle Woodland									
31Hx7(Vinc)	2.70	.00	.00	42.40	.70	51.90	2.40	.00	.00
31Mg22(Yad)	.00	.00	.00	38.93	.00	50.73	.00	10.34	.00
Early/Middle Woodland(?)									
44Ha6(Hyco)	.16	.00	.00	15.48	.13	84.22	.00	.00	.00

available.

The three goals of the following analysis are to : 1) examine the underlying structure of Woodland ceramic variability (with respect to surface treatment) within the region, focusing upon the Late Woodland-Historic periods (after A.D. 1000); 2) define broad spatio-temporal patterns of ceramic variability (e.g., reflecting separate traditions); and 3) examine the external and internal relationships among the Fredricks, Wall, and Mitchum sites with respect to those patterns. This was accomplished by performing a principal component factor analysis (with VARIMAX rotation) of the surface treatment data, and using Ward's minimum variance hierarchical cluster analysis to group assemblages based on factor scores (SAS Institute, Inc. 1982).

The factor analysis produced a 3-factor solution, which accounts for almost 70% of the total variance (Tables 63-64). Factor 1 is defined by high factor loadings for plain, brushed, cob-impressed, and complicated-stamped surface treatments and reflects the patterned co-occurrence of these treatments within Protohistoric and Historic assemblages. Factor 2 is defined by high positive loadings for cord-marked and fabric-marked treatments and a high negative loading for net-impressed, and monitors a gradual shift toward net impressing during the Late Woodland period. Factor 3 is also defined by a high negative factor loading for net-impressed and high positive loadings for simple-stamped and check-stamped treatments. This factor recognizes a significant inverse relationship between these surface treatments and provides empirical support for the decision to exclude net-impressed sherds from Historic period assemblages at the Fredricks and Mitchum sites.

The cluster analysis of factor scores for the 25 assemblages

Table 63. Correlation matrix for data used in the intersite ceramic analysis (n=25).

	Plain	Brushed	Cob Impressed	Cord Marked	Net Impressed	Fabric Marked	Simple Stamped	Check Stamped	Comp. Stamped
Plain	1.00								
Brushed	.45	1.00							
Cob Impressed	.45	.47	1.00						
Cord Marked	-.51	-.31	-.28	1.00					
Net Impressed	-.22	.06	.02	-.28	1.00				
Fabric Marked	-.47	-.38	-.32	.55	-.44	1.00			
Simple Stamped	-.13	-.18	-.08	-.18	-.42	.08	1.00		
Check Stamped	.20	-.08	-.20	-.18	-.37	-.13	.12	1.00	
Comp. Stamped	.41	.52	.57	-.13	-.08	-.22	-.17	-.08	1.00

Table 64. Factor loading matrix.

Surface Treatment	Factor 1	Factor 2	Factor 3
Plain	.68	-.38	.30
Brushed	.73	-.25	-.13
Cob Impressed	.77	-.16	-.14
Comp. Stamped	.84	.04	-.10
Fabric Marked	-.25	.85	.01
Cord Marked	-.20	.83	-.20
Net Impressed	-.23	-.58	-.77
Simple Stamped	-.20	.08	.65
Check Stamped	-.07	-.16	.72
Eigenvalue	3.05	1.71	1.47
% Total Variance	33.91	18.95	16.32
% Common Variance	49.02	27.39	23.59

defined four distinct groups (Figure 170), all of which correspond well with ceramic traditions previously recognized within the region (see Coe 1952, 1964; Wilson 1983). Cluster 1 is defined by high percentages of cord-marked and fabric-marked sherds. All pre-Late Woodland assemblages are contained within this cluster, as well as the Clements assemblage from the Gaston site. Although this assemblage has been classified within the Late Woodland period based on radiocarbon dates (Coe 1964:118), strong relationships exist with the earlier Vincent assemblage from the same site. The overall similarity between these assemblages and the Yadkin series material from the Doerschuk site suggest a pre-Late Woodland ceramic tradition within piedmont North Carolina and Virginia that was of relatively long duration and spatially extensive.

Cluster 2 assemblages are characterized by a high percentage of net-impressed sherds and a lesser but significant percentage of plain sherds. With the exception of 31Sk6 and possibly 31Dh7, all of these assemblages date to the Late Woodland period. The high number of net-impressed sherds within the 31Sk6 sample suggest that this site probably contains an earlier cultural component (see Gardner 1980:12,84). This may also be the case at 31Dh7. Cluster 2 represents the Uwharrie-Dan River ceramic tradition recognized by Coe and Lewis (1952), as well as materials previously classified as Clarksville series (Miller 1962). In fact, two of the sites within this cluster--31Rk1 and 44Mc14--are type sites for the Dan River and Clarksville ceramic series, respectively. As with Cluster 1, Cluster 2 sites are widely dispersed and appear to represent a relatively long span of time (see Gardner 1980:80-83).

Cluster 3 is comprised of assemblages that date to the

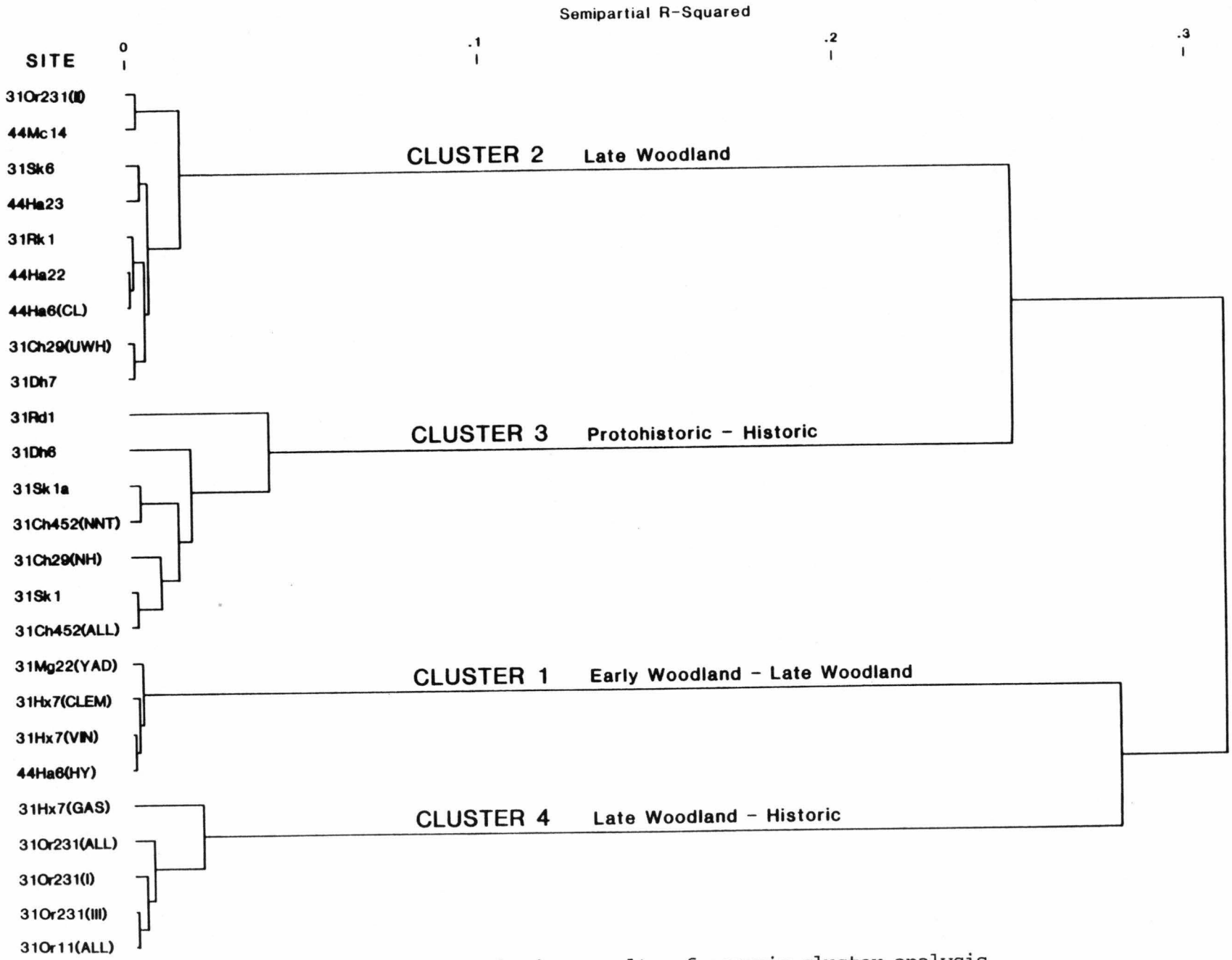


Figure 170. Dendrogram showing results of ceramic cluster analysis.

Protohistoric and Historic periods and that contain high percentages of plain sherds. Other predominant surface treatments include net impressed and brushed. The six sites included within this cluster are widely distributed throughout the Dan, Haw, Yadkin, and upper Neuse river drainages, and appear to represent a development out of the preceding Uwharrie-Dan River tradition. Variability among Cluster 3 assemblages is, to a certain degree, spatially patterned. Assemblages most similar to one another were all obtained from sites along the Haw and upper Dan Rivers. Conversely, both 31Dh6 and 31Rd1--sites whose ceramic assemblages are most divergent from other group constituents--are more distantly located on the periphery of the Haw-Dan River area. Although 31Dh6 may reflect a mixture of sherds from different site occupations, the predominant assemblage composition at 31Rd1 is perhaps better explained by its proximity to a more southerly ceramic tradition characterized by plain, burnished, and complicated-stamped wares (see Wilson 1983:368).

Finally, Cluster 4 contains all of the assemblages from the Hillsborough area (except Group II at the Fredricks site) and the Gaston assemblage from the Roanoke River valley. Predominant surface treatments include simple stamped, check stamped, and plain. Temporally, these assemblages represent the Late Woodland, Protohistoric, and Historic periods, and probably encompass about 200 years. The fact that these assemblages comprise a single cluster is significant. Despite differences noted earlier between the Fredricks and Wall site ceramics, these differences are minor when viewed within the broader context of regional ceramic variability. These results provide compelling evidence for a close cultural relationship between the Fredricks and Wall sites, and the participation by potters at both

sites in a ceramic tradition that was distinctively different from the one embraced by neighboring piedmont groups. Wilson (1983:369) has suggested that differences between the Wall site ceramics and other contemporary assemblages may reflect more basic linguistic differences, with the Wall site occupants possibly being Iroquoian-speakers. In the absence of good ceramic data from Historic period Iroquoian sites (e.g., Tuscarora), however, this possibility cannot be carefully evaluated. Nevertheless, the inclusion of the Gaston assemblage within this cluster strongly suggests that ceramic relationships of the Wall and Fredricks sites are probably to be found to the northeast rather than toward the south or west. Such directionality certainly strengthens any argument for an Iroquoian affiliation.

The overall dissimilarity between Cluster 3 (particularly the Mitchum site) and Cluster 4 assemblages further suggests the existence of two separate and distinct ceramic traditions within the study area during the Late Prehistoric, Protohistoric, and Historic periods. The boundary for these traditions generally lay between the Haw and upper Neuse drainages. However, to what extent this boundary shifted over time remains to be shown. In addition, the origins of the tradition represented by Cluster 4 remain obscure, as well as the degree to which these ceramic differences reflect larger cultural/linguistic differences.

SUMMARY AND CONCLUSIONS

At the beginning of this section, three research questions were posed concerning the composition of the historic aboriginal ceramic assemblage at the Fredricks site, the recognition of additional cultural components at the site, and the relationship of the Fredricks site

ceramics to other ceramic assemblages within the study area. In addition to examining materials from the Fredricks site, samples were also analyzed from the Wall and Mitchum sites. All three questions were considered within the context of an attribute analysis to discover quantifiable patterns of ceramic variability that could be empirically tested. Particular attention was also given to the evaluation of sample context in order to draw informed conclusions about probable cultural and temporal associations among recognizable categories of ceramic artifacts. As a consequence of this analysis, the following observations can be made.

Although future research may show that some of the variability within the Fredricks ceramic sample is a consequence of ethnic diversity during the same historic occupation, most of the variability is more likely due to the presence of temporally separate cultural components. From the available ceramic data, three separate Woodland occupations can be postulated for the Fredricks site. Remains of the first postulated occupation comprise 22% of the sherd sample and were recovered mostly from plowzone contexts. Sherds representing this occupation are tempered with sand and crushed quartz and have net-impressed and brushed surfaces. These materials show strong stylistic and technological relationships to net-impressed pottery from the Mitchum site and generally conform to descriptions of the Dan River ceramic series, which is prevalent along the Dan River drainage during the Late Woodland period.

A second occupation at the Fredricks site is represented by sand-tempered and crushed quartz and feldspar-tempered simple-stamped, plain, and check-stamped sherds, which comprise approximately 7% of the Fredricks sample. These sherds were also recovered primarily from

plowzone contexts and are related to the Late Woodland occupation at the nearby Wall site.

Finally, the majority of ceramic artifacts (ca. 70%) from all contexts at the Fredricks site are associated with the historic occupation and therefore are thought to be the material remains of the Occaneechi Indians. These materials consist of sand-tempered and fine crushed feldspar-tempered check-stamped, plain, brushed, and cord-marked pottery. Although check stamping is represented in other Historic period assemblages within the study area, it is always a minority surface treatment. At the Fredricks site, however, it was the predominant type of treatment. Check stamping is also a major type of surface finish in the Wall site assemblage.

The analysis of the Wall site ceramic sample produced little evidence to indicate more than a single occupation. Moreover, examination of stratigraphic contexts suggests that the Wall site occupation was relatively brief. Sherds from the Wall site are tempered predominantly with medium sand and fine crushed feldspar, and have simple-stamped, check-stamped, and plain exteriors. The simple stamped sherds bear a strong relationship to Late Woodland Gaston series pottery from the middle Roanoke River; however, the exact nature of this relationship is unclear.

Conversely, the Mitchum site sample appears to represent two separate occupations. A small amount of net-impressed pottery, mostly tempered with sand and fine crushed feldspar, conforms to the Dan River ceramic series and appears to represent a Late Woodland occupation. The majority of the sherds, however, are associated with the historic occupation at the site. These materials were recovered from all excavated contexts and are more closely related to historic ceramic

traditions recognized to the west and northwest. Sherds are mostly tempered with sand and crushed feldspar and have plain, simple-stamped, and brushed surfaces.

Finally, comparisons with additional samples from Woodland sites within piedmont North Carolina and southern Virginia indicate a significant discontinuity in the spatial distribution of ceramics at the end of the Late Woodland period. This discontinuity appears to indicate the development of distinct, local ceramic traditions that persisted into the Historic period; however, the cultural processes that underly them remain obscure. It is hoped that as research continues and as additional samples are analyzed, these patterns of regional ceramic variability will become more precisely defined and will permit further insight into the processes of culture change that were well underway by the time John Lawson visited Occaneechi Town in 1701.

CHAPTER X

FAUNAL REMAINS FROM THE WALL AND FREDRICKS SITES

by

Mary Ann Holm

RESEARCH QUESTIONS

Analysis of the faunal remains from the Wall and Fredricks sites provides information important to interpreting cultural changes among the Piedmont Indians during the Protohistoric and Historic periods. Prior to the faunal analysis a series of research questions, based on information from the ethnohistorical record and from previous archaeological work, was formulated. Although several of these questions later proved to be unsuitable for the particular faunal assemblages found at the Wall and Fredricks sites, they did provide some insights that allowed this researcher to move beyond simple identification and toward an interpretation of faunal exploitation in the context of culture change.

The patterns of exploitation of faunal resources reported for several prehistoric North Carolina and Virginia sites (e.g., Waselkov 1977; Barber and Williams 1978; Runquist 1979; Egloff, Barber, and Reed 1980; Coleman 1982) are similar to the pattern reported by Smith (1974) for Middle Mississippi sites in the Mississippi Valley. In addition to showing a concentration on many of the same species as Smith's groups, the North Carolina and Virginia assemblages reflect a similar pattern of selective, seasonally oriented exploitation. Smith (1974:288) hypothesizes that

> this cycle of selective, seasonal exploitation of certain animal species groups by Middle Mississippi populations was a procurement strategy that concentrated on those sections of the biotic community that would provide a maximum meat yield

for a minimum of expended energy.

For the analysis of the faunal remains from the two Eno River sites, Smith's pattern provides two general research questions:

1. How did the overall pattern of faunal exploitation differ between the two sites?

2. Can the subsistence strategies exhibited at the two sites be explained in terms of maximization of meat yield and minimization of energy expenditure?

In order to answer the general research questions, more specific questions were formulated:

1. What was the relative importance of the various species of animals utilized by the occupants of the two sites?

2. Was faunal exploitation a seasonal activity at the two sites? If so, during what seasons was each species hunted?

3. What strategies were employed for procuring the exploited species?

4. How selective were the inhabitants of the sites in their exploitation of animal populations?

Other questions formulated prior to the analysis were:

1. Can patterns of butchering of the major species be identified?

2. Is there evidence of hunting species primarily for their hides?

3. How was faunal exploitation related to plant procurement and exploitation?

4. Was the pattern of faunal exploitation altered by the introduction of European technology?

5. Did introductions by Europeans of new plants and animals affect the existing pattern of faunal exploitation?

These questions formed the initial base from which methods were developed to describe and compare the assemblages recovered from the two sites. As the questions indicate, in addition to identifying the patterns of faunal exploitation of the inhabitants of the sites, a major goal of this research was to examine the possible effects of European contact on the use of faunal resources.

It was acknowledged, however, that differences between the Wall and Fredricks site assemblages could not be attributed automatically to European-induced changes in aboriginal subsistence. For example, differences could have resulted from the fact that the faunal remains from the two sites were retrieved from dissimilar contexts. Over 95% of the bones from the Wall site were found in a large midden associated with the palisade lines on the periphery of the village, and the remainder from the fill of a single burial pit. Nearly 88% of the bones from the Fredricks site, on the other hand, was obtained from burial fill and the rest from feature fill. All except one of the burial pits from the Fredricks site contained sizeable quantities of bone fragments in the zones of fill above the human skeletal remains. These deposits seem not to be the result of overlying midden having slumped into the pits, since the plowzone in the area around the burial pits contained relatively few artifacts. Although the differing contexts of the bones (sheet midden versus pit fill) are significant, the bones from the fill in the tops of the burial pits at the Fredricks site, and the bones from the midden at the Wall site can all be considered to represent the disposal of food refuse.

In addition to reflecting different methods of refuse disposal, the different contexts also may not have provided equal conditions for the preservation of bone. The midden at the Wall site probably represents the activities of many people over a period of several years. The remains from the Fredricks site,however, especially the remains from the burial pits, probably represent much briefer activity of fewer people. Thus, differences in the assemblages from the two sites may reflect differences in seasons of activity or differences in the behavior of large versus small segments of the representative communities.

Also, because the remains from the Fredricks site were primarily from burial fill, they may represent ceremonial activities, which could have been quite different from every-day subsistence practices. Finally, some of the differences between the two assemblages may relate to the fact that the sample from the Wall site (n=30,257) is much larger than that from the Fredricks site (n=16,393).

In spite of these problems, however, it should be recognized that the assemblages from these two sites offer an excellent opportunity to compare pre-contact and post-contact patterns of exploitation of animal resources in a setting in which variables of the natural environmental can, for the most part, be held constant. Further, both sites were exposed to similar factors affecting the preservation of archaeological remains and they were excavated and recorded utilizing the same field techniques. Finally, the remains from the two sites were processed, sampled, and analyzed in an identical manner.

Given the rapidity with which European diseases and social manipulations succeeded in disrupting and ultimately destroying aboriginal culture in Piedmont North Carolina, it seemed likely that the faunal remains from the Fredricks site would show at least some evidence of a change in patterns of faunal exploitation from prehistoric to historic times. It was also expected that differences in the remains would reflect increased participation in the deerskin trade, rather than major changes in subsistence patterns, since ethnohistoric accounts (Lefler 1967:182-184; Swanton 1946:256-257) suggest considerable continuity between prehistoric and historic subsistence practices in North Carolina and Virginia. Prehistoric Dan River subsistence was based primarily on corn and bean agriculture and deer hunting, with other plants and animals utilized to a lesser extent.

> The seasonal round emphasized deer hunting and food storage in winter, small game capture in spring, fishing and wild and domestic plant food harvesting throughout the summer, and nut gathering and turkey hunting in the fall and early winter (Waselkov 1977:230).

Swanton (1946:256-257) provides an outline of the historic Southeastern subsistence cycle.

> Corn, beans, pumpkins, and a few other vegetables were raised, and the fields where these grew usually determined the sites of the towns. This was because they required labor and protection and because most of the crop was stored for later consumption. Dried meat was also stored there, but it was never possible to tell where game animals were to be found, while the location of the field was definite. This, of course meant that the people were generally in or near their villages in summer... Between planting and harvest, they did, however, often get time for a shorter hunt. After harvest they would remain in town until well toward winter to enjoy the produce of their fields and thus place it beyond the reach of human or animal predation. As the harvest was seldom sufficient to last - nor was it expected to last - until another crop came in, the Indians were obliged to seek natural food supplies elsewhere and, since such supplies were not usually concentrated, this meant that the people themselves scattered about in camps where they remained until planting time...

Swanton (1946:257) also mentions that fish were included in the diet during the summer.

In his account of the diet of the Siouan groups of North Carolina, Lawson named as staples many of the species found in the prehistoric sites of the same area (Lefler 1967:182-184; Wilson 1983).

Whereas neither Swanton's nor Lawson's accounts give the kind of information needed to quantify relative dependence upon any particular resource, both indicate that the historic subsistence pattern was similar to the prehistoric pattern.

In both the prehistoric and historic patterns, hunting for food was an important activity. It seems likely that if the inhabitants of the Fredricks site did participate in the deerskin trade, their participation involved (at least initially) only an expansion of the

hunting activities which were already of major importance in their adaptive strategy. With increased participation in the deerskin trade over time it is expected that qualitative (rather than simply quantitative) differences would develop between the hunting activities prior to and after contact. Rather than merely hunting more often or killing a greater number of animals, it is possible that the Indians began to range further from their villages, exploit portions of the environment that previously had been rarely utilized, or hunt species that had not been hunted frequently in the past.

We know that during the period at least from 1650-1676, in which they occupied their island in the Roanoke River, the Occaneechi played an important role in the deerskin trade. It is not known, however, whether this participation increased after they moved to the site on the Eno River around 1680. If the Occaneechi maintained their strong participation in the deerskin trade after their move south (and the abundance of trade goods at the Fredricks site indicates that this is likely), the faunal remains from the Fredricks site might be expected to differ from those of the protohistoric Wall site by exhibiting some or all of the following characteristics:

1. more opportunistic hunting patterns—e.g. hunting should be less seasonally oriented and there should be more evidence of hunting at all times of the year.

2. less balance between maximization of meat yield and minimization of energy expenditure.

3. evidence of exploitation of portions of the environment that previously had not been heavily utilized.

4. changes in procurement strategies--e.g., Waselkov (1977) suggests that, the method of hunting deer may have evolved from stalking to community drives.

5. possibly less specialization and more variability in the faunal assemblage.

6. increased evidence of hunting for fur and hides rather than for meat, such as increased evidence that animals were butchered in the field with only portions of the carcasses being returned to the site.

7. possible increases in the numbers of tools and features associated with hide-working (such as smudge pits).

The first four expectations would reflect qualitative changes in hunting patterns that might have had the effect of increasing, at least temporarily, the quantity of animals (and thereby skins) obtained. The fifth expectation might have arisen if the Fredricks site inhabitants had begun to hunt any available fur-bearing animals, including those species that had not been desirable prior to the onset of European trade. The sixth expectation would reflect a marked increase in the number of animals killed beyond those required to fulfill the needs (subsistence and raw material) of the site inhabitants. The final expectation would manifest an increase in the number of tools and features associated with hide-working that might occur with an increase in hide procurement for trade.

Although this list of preliminary expections is far from exhaustive, it provides a basis on which to compare the two faunal assemblages beyond merely comparing the frequencies of identified species from each site. As work with the assemblages has progressed, the initial list has been reevaluated, further questions added, and others eliminated. Some of these adjustments to the original list of research questions arose when new information was gleened from the ethnohistorical record. More frequently, the original questions had to be modified because of limitations imposed by the faunal assemblages themselves.

ETHNOHISTORIC REFERENCES TO THE USE OF FAUNAL RESOURCES

Among the many ethnohistoric accounts for the Piedmont area of North Carolina and Virginia are those of Lederer, Needham and Arthur, Fallam, Bland, Wood (Alvord and Bidgood 1912), and Lawson (Lefler 1967). With the exception of Lawson's account, however, none of these documents provides detailed information about hunting, fishing, and other subsistence activities of the historic North Carolina Indians. In A New Voyage to Carolina, John Lawson described his 1701 exploration of the region from Charleston, South Carolina, through the North Carolina Piedmont, to New Bern, North Carolina. In addition to presenting the scenes and events of his trip, Lawson also wrote a chapter detailing the "Vegetables", "Beasts", "Insects", "Birds", and "Fish" of North Carolina. Lawson's account thus provides a wealth of information on the use of faunal resources by North Carolina Indians.

During his winter journey, in addition to making direct contact with the Occaneechi in their town on the Eno River (Lefler 1967:61), Lawson encountered a number of other groups including the Eno, Keyauwee, Sapona, and Tutelo. Although he gives considerable attention to the ways in which the Piedmont (and also the coastal) Indians utilized faunal resources, he provides only scanty information, about the ways in which the animals were procured (hunted,trapped, etc.).

Mammals

According to Lawson, deer was the most important mammalian resource to the North Carolina Indians. He mentioned "barbaku'd" and roasted venison; venison broth thickened with acorn meal; and "a Dish, in great Fashion amongst the Indians, which was Two young Fawns, taken out of the Doe's Bellies, and boil'd in the same slimy Bags Nature had plac'd them in" (Lefler 1967:51, 58). Parts of the deer were utilized

in a variety of ways in addition to food. For example, deer hides were used for clothing, shoes, and as covers for drums, and were also an important commodity for trade with the Europeans. "The Bone of a Deer's Foot" was used for scraping the hair off of hides, and deer brains (after being baked and then soaked in water) were used in tanning hides (Lefler 1967:217). Lawson also mentioned the use of the "Head of a Buck" as a decoy with which to hunt other deer (Lefler 1967:29).

Swanton (1946:249) lists a number of ways in which Southeastern Indians used various parts of the deer in addition to those mentioned by Lawson. Horns were boiled for glue and made into projectile points, ornaments, and needles; hooves were made into rattles; and sinews and skins were used to make fishnets and bowstrings. Ribs were made into bracelets, and tibiae into flutes. Tools constructed from deer bones that have been recovered from archaeological sites include metatarsal beamers, ulna awls, and antler flakers (Waselkov 1977; Runquist 1979).

In addition to describing the technique of stalking deer, Lawson mentioned that

> when these Savages go a hunting, they commonly go out in great Numbers, and oftentimes a great many Days Journey from home, beginning at the coming of Winter;...Thus they go and fire the Woods for many Miles, and drive the Deer and other Game into small Necks of Land and Isthmuses, where they kill and destroy what they please (Lefler 1967:215-216).

Other techniques used by North Carolina and Virginia Indians for hunting deer were stalking them without the use of a decoy, and driving them to water without the use of fire (Waselkov 1977:108).

While visiting Occaneechi Town, Lawson was served "good fat Bear," and the next day, in Adshusheer, he feasted upon "hot Bread, and Bears-oil". The Indians considered the paws to be the most edible part of the bear, whereas the head was always thrown away (Lefler 1967:122). In addition to being eaten, bear's oil was used for frying fish, and was

mixed with "a certain red Powder" and daubed on the body and used for greasing the hair (Lefler 1967:121, 174). Lawson also mentioned that the "Oil of the Bear is very Sovereign for Strains, Aches, and old Pains" and that bear's fur was used for making muffs and facing caps (Lefler 1967:122-123). The only method of capturing bear mentioned by Lawson involved killing the animals that were flushed during the fire drives used for hunting deer (Lefler 1967:17).

Opossum was used for food by the Indians, but the fur of this animal was "not esteemed nor used" except when it was spun to make baskets, mats, and girdles (Lefler 1967:125-126, 195). Raccoon meat was served to Lawson on several occasions during his voyage, and raccoon skins and furs were used by the Indians for clothing and blankets (Lefler 1967:23, 126, 200). Although skunks (or polecats) were used for food, Lawson stated that their skins were not used in any way (Lefler 1967:124).

Rabbits (or hares), and squirrels were roasted without being gutted, and their skins were used for clothing and blankets. Although Lawson stated that rabbits were caught during fire drives, he did not provide a description of the ways in which opossums, raccoons, skunks , or squirrels were hunted (Lefler 1967:182, 200).

Beavers were prized for their thick fur, and their skins were used in making shoes, mittens, and other clothes (Lefler 1967:125, 200). Beaver meat was also eaten, and its tail was considered a delicacy (Lefler 1967:66,125). Lawson encountered a Saponi Indian who maintained traps for capturing beaver (Lefler 1967:54).

Lawson listed a variety of rodents and insectivores that were found around the houses and fields of the Indians (Lefler 1967:120, 130-131). These animals may have been used for food, although Lawson did not

mention such a practice.

European-introduced animals present in North Carolina and utilized by the Indians encountered by Lawson during his voyage consisted of horses and pigs. Although cattle were present, Lawson does not indicate that they were used by the Indians for food. According to Lawson, the only use made of the horse by the Indians was for carrying deer back to their villages (Lefler 1967:44). Although Lawson alluded to hog stealing by the Indians, he did not indicate that hogs were raised by them (Lefler 1967:64). He did mention, however, that the "Paspitank" Indians kept cattle at one time, although he was not sure if they were still raising these animals at the time of his travels.

All of the mammals identified from the 1983-1984 faunal assemblages from the Wall and Fredricks sites (with the exception of the shrew and vole) were described by Lawson. Mammals mentioned by Lawson that were not identified in these archaeological assemblages are buffalo, panther, "cat-a-mount" (mountain lion), wild cat, wolf, "tyger", otter, muskrat, minx, elk, fox, and lion.

Birds

Lawson listed over 110 birds that could be found in North Carolina at the time of his journey (Lefler 1967:140-141). Of these, the turkey and the passenger pigeon were the most important to the Indians as sources of food. Turkey bones were also made into many different kinds of tools (e.g., awls and beamers) and ornaments (e.g., beads). Turkey feathers were used by Southeastern Indians in making feather mantles and fans, and in feathering arrows. Arrow points were also manufactured from turkey spurs (Swanton 1946:251). Turkey meat was offered as food to Lawson so often that it eventually "began to be loathsome" (Lefler 1967:34).

Although the passenger pigeon is now extinct, Lawson's description provides a vivid picture of this bird and the way it was hunted and used by the Indians.

> Pigeons...were so numerous in these parts that you might see many Millions in a flock... You may find several Indian Towns, of not above 17 Houses, that have more than 100 Gallons of Pigeons Oil, or Fat; they using it with Pulse, or Bread, as we do Butter...The Indians take a Light, and go amongst them in the Night, and bring away some thousands, killing them with long Poles, as they roost in the Trees. At this time of the Year, the Flocks, as they pass by, obstruct the Light of the Day (Lefler 1967:50-51).

Another bird identified in the faunal assemblages from the Wall and Fredricks sites is the bobwhite quail. This bird was probably an important source of food and it also provided feathers which could have been used for clothing and decoration. Other birds identified from the faunal assemblages include sparrows, killdeer, bluejay, woodpecker, and lesser scaup. Of these only the lesser scaup could be considered, with any certainty, to have been used for food. Lesser scaup is also the only bird identified in the faunal assemblage that was not mentioned by Lawson.

It is important to note that Lawson stated that "all small game, such as Turkeys, Ducks, and small Vermine, they [the Indians] commonly kill with Bow and Arrow, thinking it not worth throwing Powder and Shot after them" (Lefler 1967:216).

Reptiles

The box turtle was probably the most important reptile utilized by the Indians that Lawson encountered. Box turtle meat was eaten, and the shell was made into rattles, cups, and dippers (Lefler 1967:138). Other turtles represented in the faunal assemblages from the Wall and Fredricks sites were snapping turtle, painted turtle, musk turtle, and mud turtle. None of these others was mentioned specifically by Lawson,

but all (with the exception of the musk turtle that was probably not eaten because of its offensive smell) probably were utilized in the same manner as the box turtle.

Vertebrae from a variety of poisonous and nonpoisonous snakes were identified in the two faunal assemblages. Lawson mentioned that "all Indians will not eat them [snakes], tho' some do", that the skin of the king snake was used to make girdles and sashes, and that rattlesnake teeth were used in an instrument for scarifying (Lefler 1967:137, 182, 223). He also noted that the coastal Indians avoided killing snakes "because their Opinion is, that some of the Serpents Kindred would kill some of the Savages Relations, that should destroy him" (Lefler 1967:219).

Amphibians

Amphibians identified in the archaeological assemblages were the spadefoot toad, and indeterminate frogs and toads. Although Lawson noted the presence of frogs in North Carolina and listed them among the "Insects," he did not mention whether they were used by the Indians for food or for any other purpose.

Fish

Lawson listed 20 types of fresh-water fish in North Carolina (Lefler 1967:156). Of these, two (catfish and suckers) were identified in the faunal assemblages from the Wall and Fredricks sites. The other two species identified archaeologically (gar and sunfish) were not mentioned by Lawson.

Fishing with hooks, weirs, and with bow and arrow (on the coast) were all described by Lawson (Lefler 1967:218).

Summary

In addition to descriptions of the ways in which individual species of animals were procured and utilized by the Indians, Lawson provided some additional information useful for interpreting the two faunal assemblages. He mentioned that the Indians "boil and roast their Meat extraordinary much, and eat abundance of Broth" (Lefler 1967:231). He also stated that "All the Indians hereabouts carefully preserve the Bones of the Flesh they eat, and burn them, as being of the Opinion, that if they omitted that custom, the game would leave their Country, and they should not be able to maintain themselves by their Hunting" (Lefler 1967:58). Both of these statements provide information that is helpful in evaluating how accurately the faunal assemblages from the Wall and Fredricks sites reflect the original assemblages of bone produced at these sites and in interpreting any patterns observed in the surviving archaological assemblages.

Nearly every species identified in the faunal assemblages from the Wall and Fredricks sites was mentioned by Lawson. Although Lawson's descriptions of the ways in which the Indians utilized these animals are not consistently detailed, they do provide information that cannot be obtained from the archaeological record alone.

EXCAVATION AND RECOVERY TECHNIQUES AFFECTING FAUNAL REMAINS

At the Wall site, after removal of the plowzone, the midden was excavated (with shovels in the first square excavated and with trowels in each susequent square) in two levels. These levels correspond with a slight change in color between the upper and lower midden soil. The soil from each level in each 10 x 10 ft square was kept separate and waterscreened through a sluice box equipped with a sequence of 1/2-inch,

1/4-inch, and 1/16-inch screens.

Excavation of burials and other features was performed with small handtools such as trowels, dental probes, and brushes. Each natural zone within a feature was removed separately, and all fill from each zone was waterscreened as a unit through the sequence of graduated screens. Special care was taken with the animal bones to ensure that, although dried thoroughly before being placed in plastic storage bags, they did not become cracked and brittle from excessive exposure to sunlight. Ten-liter samples of soil from each zone in each feature was processed by flotation. The bones retrieved through this procedure were subsequently screened in the laboratory through 1/2-inch, 1/4-inch, and 1/16-inch screens to permit comparison of these bones with the faunal remains recovered through field waterscreening.

SAMPLING AND ANALYTIC PROCEDURES

Only those bones and bone fragments recovered from undisturbed contexts were included in the material analyzed from the Wall and Fredricks sites. In other words, bone from the plowzone was excluded. The vast majority of the analyzed faunal remains from the Wall site was from four 10 x 10 ft units of undisturbed sheet midden. Although three burial pits were excavated at this site in 1983, the fill from only one of those pits contained more than a few poorly preserved bone fragments. Therefore, the remains from the fill of only one burial pit and four squares of midden make up the sample analyzed from this site. The faunal assemblage from the Fredricks site was recovered from the fill of fourteen pits. Nine of these were burial pits, one was a fire pit, one a storage pit, and three pits of indeterminate function. As yet, no sheet midden has been found at the Fredricks site.

Identical analytical procedures were used on the assemblages from both sites. All of the bone recovered in the 1/2-inch and 1/4-inch mesh screens was analyzed. There were numerous tiny, unidentifiable fragments of bone retrieved by the 1/16-inch screen. Because it would have been a time-consuming and (probably) pointless task to separate all of these minute fragments from the fine gravel that was also recovered in this size screen, only those bones and bone fragments which appeared to be identifiable were pulled from the 1/16-inch washings. The bones and bone fragments from each excavated unit (10 x 10 ft square of midden, or feature) and from each level or zone within each excavation unit were kept separate during analysis. Also, bones from different sized screens were not combined during analysis.

The basic procedures followed in identifying and analyzing the faunal remains from the two sites closely follow those outlined by Smith (1976): 1) each bone fragment was initially sorted into one of three groups--unidentifiable, identifiable only to class, or identifiable as to skeletal element; and 2) each of these fragments (whether it was identifiable or not) was examined for evidence of modification such as burning or cutting.

For those bones that could be identified beyond the level of class, the side of the body (when applicable) and portion of the bone (proximal, distal, or shaft) was noted. After that, a taxonomic identification was made for each of the identifiable bones and bone fragments. Several of the variables that affected whether a fragment could be identified beyond family or order were: "(1) the specific skeletal element in question (i.e., rib versus mandible), (2) the amount of diagnostic surface present, (3) the ability of the person identifying the specimen, (4) the size of the comparative collection being employed,

and (5) the degree of morphological similarity of species within the taxonomic group" (Smith 1976:281). To help minimize problems introduced by variables (3) and (4), a group of 205 bones and bone fragments was sent for identification to Elizabeth Reitz at the Zooarchaeological Laboratory, University of Georgia. This sample consisted of bones that appeared to be identifiable but for which the type collection at the Research Laboratories lacked comparative specimens. The results of Reitz's analysis are not yet available (the bone fragments sent to her are included in the tables of the present study as unidentified mammal, unidentified bird, etc.).

In addition to determining the total number of fragments in each taxonomic category, all of the fragments in each category were weighed.

When possible, the age and/or sex of the animal represented by a particular fragment was assessed. In most cases, these characteristics could be determined only for the remains of white-tailed deer. For the deer, age was estimated by noting whether or not the epiphyses of the long bones were closed, and by using Severinghaus's (1949) criteria of tooth development and wear. Sex of the deer was determined by using the pelvic girdle criteria set forth by Edwards et al. (1982). Attempts to determine age and/or sex of several other species, such as rabbits, squirrels, and raccoons, were less successful than for deer. This problem resulted, in large part, from characteristics of the faunal assemblages themselves. Many of the bones, or portions of bones, that display the characteristics used to distinguish between animals of different ages or sexes simply were not present in the remains being studied.

Information obtained from the procedures discussed above constitute primary data or "direct quantification of identified material" (Wing

1979:119). Several factors can influence how accurately these primary data reflect the original faunal sample. All bones, for example, do not stand an equal chance of being represented in an archaeological assemblage. The survival of bone after it has been discarded is affected, primarily, by two factors: its physical condition at the time of disposal, and the nature of the environment in which it was placed. Whether a bone was burned, boiled, or roasted affects its chemical and physical properties, which, in turn, influences preservation (Chaplin 1971:15). Also, the basic structure of the bone must be considered. Teeth and phalanges are stronger than ribs and vertebrae, and, thus, are less likely to be destroyed (Payne 1972:68).

The manner in which a particular bone was discarded further affects its survival. If the bone were buried in a trash pit, for example, the rate of disintegration would depend on factors such as the "acidity or alkalinity, degree of aeration, movement of water, bacterial population, as well as the structure and seasonal properties of the soil" (Chaplin 1971:16). If it remained on the surface of the ground, it would be more accessible to scavengers, and more likely to be damaged by weather, and stepped on and crushed.

Excavation techniques also affect the number and kinds of bones eventually available for analysis. The portion of the site excavated, sieving techniques utilized, and steps taken to protect the fragile bone after excavation affect the sample.

For these and other reasons, one can assume that any collection of archaeological bone will represent only a portion of the faunal remains originally associated with the site. Thus, the primary data obtained probably will not provide enough information for reliable interpretations of what the assemblage represents in terms of past

behavior. For this reason, secondary data, "which involve interpretation, extrapolation, or estimations based on primary data" (Wing 1979:118) are neccessary. Examples of secondary data include calculations of minimum numbers of individuals, and estimations of useable meat weight.

Chaplin (1971) lists three of the most commonly named methods for quantifying the species represented by a collection of animal bones: 1) the fragments method, 2) the weight method, and 3) the minimum number method. Whereas there are advantages to each method, Chaplin and many others (e.g., White 1953; Daly 1969; Smith 1976; Styles 1981; and Klein and Cruz-Uribe 1984) prefer the minimum numbers method.

With the fragments method one counts the total number of identifiable bones and fragments of each species and determines the ratio of different bones or different species. The number of identified specimens (bones or bone fragments) per species is sometimes abbreviated as NISP (Payne 1975; Grayson 1979; Klein and Cruz-Uribe 1984). The NISP is little more than a list of bones of different animals present in an assemblage. The number of bones of a particular species represented in an assemblage does not necessarily indicate what percent of the diet of the original inhabitants was made up of the meat from that animal. For example, some species of animals have more bones than others. Also, although hunters may bring back the entire carcass of a smaller animal, they are liable to return with only the more useful parts of a larger one. Thus, only the broadest questions about subsistence can be answered using NISP.

In another approach, used to arrive more directly at conclusions about the relative dietary importance of each species, the analyst weighs the bone from each species and then multiplies that weight by a

factor to determine the amount of meat represented by each type of animal. In using this method, however, every scrap of bone must be utilized in order to arrive at an unbiased approximation of amount of meat (Daly 1969:149). Because much of the bone analyzed usually is fragmented, it is nearly impossible to place each scrap into its appropriate species category. Further, it is impossible to account for all of the bone missing from the site or not retrieved during excavation. Also, the weight of the bone is affected by whether or not it was burned or charred and by the thoroughness with which it was cleaned and dried after excavation. Another objection to the weight method is the fact that it begins with the assumption that there is a fairly constant relationship between the weight of an animal and the weight of its bones. Although there is a correlation between these two factors, the relationship is variable (Smith 1975:100). To counteract this bias it would be necessary to apply a different live weight value for each age and sex category for each species analyzed. Because it is not always possible to identify the species to which a fragment belongs, let alone the age or sex of the animal, the weight method is only appropriate for use with relatively few completely identified fragments.

The minimum numbers of individuals (MNI) method avoids many of the problems that plague the other two methods. Using the simplest form of this procedure, the minimum number of animals of each species is determined by counting the maximum number of any particular bone. When possible, the age, sex, and size of the animal is taken into account to increase the accuracy of this method. This analytical procedure is superior to the other procedures for a number of reasons.

> The minimum number of animals that the bones could have come from is an indisputable fact. It is, moreover, a direct measure of a number of animals involved and is an abstraction of the true number of animals involved only within fixed

> limits. It also involves no assumptions about differential preservation of bone which can not be checked by examination of the specimens or by a site inspection. It is therefore using verifiable facts throughout (Chaplin 1971:70).

Grayson (1973:70) notes that the minimum numbers method "provides us with units which are necessarily independent of one another, and which may therefore be validly used in further statisitical manipulation."

In spite of its advantages, the minimum numbers method also has several shortcomings. First, there is more than one way to derive the minimum number figure from an assemblage. Variation in the way in which faunal material from a site is grouped, for example, affects the results of analysis. If the material is separated into clusters according to the stratum and excavation unit in which it is found, it will yield the largest estimation of MNI. If the excavation unit is ignored, the minimum number decreases, and if neither excavation unit nor stratigraphy is used in grouping the material, the number will be even smaller (Grayson 1973:433). The comparability of the data produced by the minimum numbers method is still suspect unless the analyst explicitly states how he arrived at his figures.

Three methods were used to quantify the faunal remains from the Wall and Fredricks sites. The NISP method was used because it was calculated automatically as the bone fragments were identified. Also, the weight of the bone identified for each taxonomic category was calculated. Comparison of the relative abundance of each species, as revealed by the number of identified fragments and by the weight of these fragments, provided information useful not only in determining the possible importance of these animals to the original inhabitants, but also information about the conditions (such as fragmentation or preservation) that affected how much of the assemblage could be

identified and to what taxonomic level. The weights of the identified bones were not converted to meat weights because of the vast array of biases introduced by the use of the weight method.

The minimum numbers of individuals method was relied on most heavily in interpreting the two faunal assemblages. In comparing the assemblages from the Wall and Fredricks sites, MNI was calculated from each site as a whole, with neither the excavation unit nor site stratigraphy taken into consideration. Although it yielded the smallest number of individuals, this method was necessary because of the different contexts from which the two assemblages were recovered.

RESULTS OF ANALYSIS: WALL SITE

This analysis of the faunal remains from the 1983-1984 excavations at the Wall site concentrated on the bone from four 10 x 10 ft squares of undisturbed midden located just inside the outermost palisade surrounding the village. Although several burials were excavated at this site in 1983, the fill of only one contained more than a few poorly preserved fragments of bone. The remains from the fill of this one burial were also included in the analysis. As previously mentioned, all fill from the midden and the one burial was waterscreened through a sequence of three sized screens. A total of 30,257 fragments was examined from the 1983-1984 excavations. This total consists of 6,040 fragments from the 1/2-inch screen, 19,688 fragments from the 1/4-inch screen, and 4,529 fragments from the 1/16-inch screen. Approximately 42% of the collection (12,714 fragments) could not be identified. The majority of these fragments seem to be pieces of long bones of large mammals (probably deer).

A complete account of the faunal remains recovered in the 1983-1984

excavations is provided in Table 75. Burial 1 had two zones of fill containing a total of 1,340 bone fragments. The only passenger pigeon remains represented in the 1983-1984 assemblage were recovered in the fill of this burial. As there were no other obvious qualitative differences between the bones recovered from the burial and those recovered from the midden, the assemblage will be treated in the following discussions as though it were retrieved from a single context.

The first excavations at the Wall site were carried out in 1938, 1940, and 1941 (Coe 1952,1964). Analysis of the faunal remains from these excavations was performed by Jeanette Runquist (1979). The majority of the remains that Runquist examined were recovered from a zone of undisturbed midden that was sifted through 1/4-inch mesh screen. A sample of the midden from each 10x10-foot square was waterscreened, as was the fill from the few burials and features included in Runquist's sample. Her total assemblage consisted of 6,000 bones and bone fragments. Runquist's findings are occasionally included in this discussion of the results of analysis in order to provide the most complete description possible of the animals originally represented at the Wall site.

A total of 856 fish bones representing 189 individuals (66.8% of the total number of individuals for the assemblage) was identified. The majority of these individuals were catfish. Other fish identified were sucker and gar.

Amphibians accounted for a minimum of 13 individuals (4.6% of the total number of individuals), identified from 105 fragments. Reptiles accounted for 15.0% of the identified bone and 3.2% of the number of individuals identified. Remains of box turtle formed a significant portion of the assemblage, as this species was second only to

Table 75. Animal remains from the Wall Site.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Odocoileus virginianus, White-tailed Deer	4731	15.64	13287.80	61.34	36	12.72
Didelphis marsupialis, Opossum	23	.08	12.55	.06	1	.35
Sciurus carolinensis, Gray Squirrel	35	.12	5.18	.02	1	.35
Sciurus sp.	297	.98	16.47	.08	9	3.18
Procyon lotor, Raccoon	105	.35	51.85	.24	4	1.41
Sigmodon hispidus, Hispid Cotton Rat	24	.08	.90	.00	2	.71
Peromyscus leucopus, White-footed Mouse	22	.07	.63	.00	2	.71
Blarina brevicauda, Short-tailed Shrew	12	.04	5.40	.02	2	.71
Ursus americanus, Black bear	1	.00	21.70	.10	1	.35
Sylvilagus sp., Cottontail	85	.28	7.70	.04	4	1.41
Castor canadensis, Beaver	1	.00	1.30	.01	1	.35
Microtus pennsylvanicus, Meadow Vole	13	.04	.48	.00	2	.71
Glaucomys volans, Flying Squirrel	1	.00	.11	.00	1	.35
Unidentified Mammal	7660	25.32	4560.75	21.05	-	-
Meleagris gallapavo, Wild Turkey	103	.34	194.25	.90	3	1.06
Ectopistes migratorius, Passenger Pigeon	2	.00	.10	.00	1	.35
Colinus virginianus, Bobwhite	4	.01	.30	.00	1	.35

Table 75 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Cyanocitta cristata, Bluejay	4	.01	.27	.00	1	.35
Unidentified Bird	515	1.70	128.07	.59	-	-
Terrapene carolina, Box Turtle	1000	3.30	687.24	3.17	5	1.77
Chelydra serpentina, Snapping Turtle	8	.03	8.50	.04	1	.35
Chrysemys picta, Painted Turtle	6	.02	13.20	.06	1	.35
Kinosternon subrubrum, Mud Turtle	2	.00	0.20	.00	1	.35
Unidentified Turtle	1261	4.17	249.88	1.15	-	-
Crotalid sp., Poisonous Snake	1	.00	.90	.00	1	.35
Unidentified Snake	666	2.20	27.14	.12	-	-
Scaphiopus holbrooki, Spadefoot Toad	1	.00	.10	.00	1	.35
Rana catesbeiana, Bullfrog	19	.06	.20	.00	1	.35
Rana sp., Frog	62	.20	3.19	.01	7	2.47
Bufo sp., Toad	23	.08	.72	.00	4	1.41
Unidentified Amphibian	-	-	-	-	-	-
Ictalurus sp., Catfish	194	.64	2.95	0.01	187	66.08
Catostomus sp., Suckers	8	.03	.54	.00	1	.35

Table 75 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Lepisosteus sp., Gar	8	.03	.34	.00	1	.35
Unidentified Fish	646	2.14	10.56	0.05	-	-
Sub-Total (Identified to Class)	17543	57.96	19301.47	89.06	-	-
Sub-Total (Unidentified)	12714	42.02	2362.17	10.90	-	-
Total	30257	99.98	21663.64	99.96	283	99.95

white-tailed deer in percent of fragments identified to species. Snake bones accounted for 2.2% of the fragments recovered and less than 1% of the individuals.

With the exception of the wild turkey, birds do not seem to have been used frequently by the inhabitants of the Wall site. Three individuals (turkeys), representing 1.1% of the total number of individuals, were identified in the present analysis.

From a count of spurs, Runquist determined that three of the eight individuals in the 1938-1941 assemblage were males, whereas one of the three individuals in the 1983-1984 sample was male. In both cases, the proportions of males to females are somewhat higher than one might expect. In a study of over 6,000 turkeys harvested over a five-year period in Virginia, for example, only 18.9% of the turkeys captured were adult males (Gwynn 1964). The combined totals from the two Wall site samples indicate that four of the eleven individuals identified are male. This is a considerably higher percentage (36.4% versus 18.9%) than Gwynn's (1964) studies indicate would occur in the same general area today.

Other than turkey, birds identified in the 1983-1984 assemblage from the Wall site consist of bobwhite quail, bluejay, and passenger pigeon. Passenger pigeon is represented by a single individual in the 1983-1984 assemblage. The bluejay and bobwhite quail also are represented by only a single individual.

A total of 13,010 bones, representing a minimum of 66 mammals, was identified in the 1983-1984 assemblage. With the exception of the white-tailed deer (MNI=36), squirrel (MNI=10), raccoon (MNI=4), and rabbit (MNI=4); none of the mammals in the assemblage accounted for more than two individuals (0.7% of the total number of individuals).

White-tailed deer comprised 36 individuals (12.7% of the total number of individuals), determined from 4,731 fragments. Because of the small number and fragmentary nature of the deer mandibles in this assemblage, it was not possible to determine the age distribution of all of the deer represented. Of the six mandibles that could be aged, using the method described by Severinghaus (1949), one was approximately 13-17 months old, one was approximately 2-1/2 years old, one was approximately 5-1/2 years old, and three (two lefts and one right) were approximately 7-1/2 years old.

Additional information about the ages of deer hunted by the inhabitants of the Wall site was obtained by examining the epiphyses of the long bones. A minimum of six individuals in the population had open epiphyses (distal femur). This adds another five deer between the ages of 2-1/2 and 4-1/2 years (Lewall and Cowan 1963:635). Using the criteria of pelvic suture closure (Edwards et al. 1982) it was determined that five individuals were less than one year old. Assuming that none of the long bones or pelves represented the same deer as the mandibles, it was possible to determine the ages of a maximum of 17 individuals. A more cautious approach assumes that a long bone, mandible, and/or pelvis falling in the same age category belonged to the same individual. Using this approach, a minimum of 15 individuals could be aged. Of these 15 individuals, 33.3% were less than 1-1/2 years old, 46.7% were between 1-1/2 and 5-1/2 years old, and 20% were approximately 7-1/2 years old. This sample is clearly too small to provide an accurate indication of the age distribution of the exploited population.

The sample studied by Runquist included 145 individuals (46.0% of the total), 144 of which could be aged. Of these indivuals, 17% were fawns, 63% were between 1-1/2 and 7-1/2 years old, and 20% were 7-1/2

years old or older (Runquist 1979:229).

One method of determining the sex ratio of the deer represented by a faunal assemblage is through an examination of frontal bones for the presence of antlers, antler pedicles, or the denser bone that distinguishes males from females. This method was not useful for the 1983-1984 assemblage from the Wall site because very few deer skull fragments were recovered, and because the few antler fragments that were recovered were very small. However, it was possible to utilize a technique developed by Edwards et al. (1982) which uses characteristics of the pelvic girdle to distinguish male from female deer. For deer in which the sutures between the ilium, ischium, and pubis are fully ossified (deer one year old or older), the shape and position of the ilio-pectilineal emeinence are different in males and females. Fourteen right and thirteen left innominate bones complete enough to display the ilio-pectilineal eminence were recovered in the 1983-1984 assemblage. Of these, five right and four left represented individuals below the age of one year and thus could not be used. On one left and one right innominate bone the characteristics of the ilio-pectilineal eminence were neither clearly male nor clearly female. Finally, however, it was possible to determine that five right and five left innominates represented males, and that three left and three right represented females.

An attempt was made to determine the ages of individuals of several species other than deer that were represented in the assemblage. Marks and Erickson (1966) developed criteria for determining ages of black bear based on skull morphology, canine cementum layers, tooth replacement and wear, epiphyseal suture closure, and baculum growth and maturation. As the only element identified as black bear in the Wall

site assemblage was a single fragment of thoracic vertebra, it was not possible to determine the age of this individual. Although the age of raccoons can be determined using tooth wear criteria (Grau et al. 1970), this technique could not be applied successfully to the 1983-1984 faunal remains because no intact raccoon mandibles with enough teeth to permit aging were preserved in the assemblage. Age determination in fox and gray squirrels and in cottontail rabbits is based upon the degree of epiphyseal closure. The distal radius and ulna were utilized by Carson (1961) to develop age classes for squirrels. Of the 332 fragments identified as squirrel, only one was a distal radius and no distal ulnae were preserved. The epiphysis of the single distal radius was closed and thus indicated the presence of an indivdual at least 33 weeks old (Carson 1961:91). Hale's (1949) technique for aging cottontail rabbits is based on the degree of epiphyseal closure in the humerus. Four individuals from the present sample were represented by distal humeri, the epiphyses of which were all closed, indicating that these individuals were at least nine months old (Hale 1949:222).

No butchering marks were observed on any of the bones identified from the 1983-1984 Wall site assemblage. Guilday et al.(1962:64) indicate that it is possible to butcher an animal without leaving any marks on the bones, and that the probability that a bone will be cut in some way is greater if the person butchering the animal is unskilled, careless, or in a hurry. The absence of butchering marks on bones in the Wall site assemblage, thus, may indicate that the animals represented by the assemblage were dismembered by skillful and unhurried butchers. Although the majority of the bone from the Wall site was well preserved, the outer surface of most of the bones was somewhat eroded. It is possible, therefore, that if the original butchering did not leave

deeply cut marks, those marks could have become worn away with the passage of time.

The only bone tools found in the 1983-1984 assemblage were one deer metatarsal beamer, one complete turkey tarsometatarsus awl and fragments of three more awls (Figure 184). Three small pieces of worked antler and one cut bird bone that might have been a bead were also found. In sum, analysis of the faunal remains from the 1983-1984 excavations at the Wall site identified a total of 283 individuals representing 27 species. The five most important species in terms of percent of MNI were catfish (66.08%), deer (12.72%), squirrel (3.53%), frog (2.82%), and box turtle (1.77%).

RESULTS OF ANALYSIS: FREDRICKS SITE

The faunal remains from the Fredricks site were recovered from the fill of nine burials and five features. A total of 16,393 fragments from this site was examined. This total consists of 3,428 fragments from the 1/2-inch screen, 11,494 fragments from the 1/4-inch screen, and 1,469 fragments from the 1/16-inch screen. A total of 138 individuals representing 31 species was identified.

A full listing of the faunal remains from the Fredricks site is provided in Table 76. A brief discussion of the results of analysis of the site as a whole is provided below. Following that, a more detailed treatment of the same remains is provided within a discussion of the features and burials from which the remains were recovered.

A total of 727 fragments from the assemblage were identified as fish. These fragments represented a minimum of 72 individuals (52.2% of the total number of individuals). The vast majority of these were catfish, the most abundant species (in terms of MNI) in the asemblage.

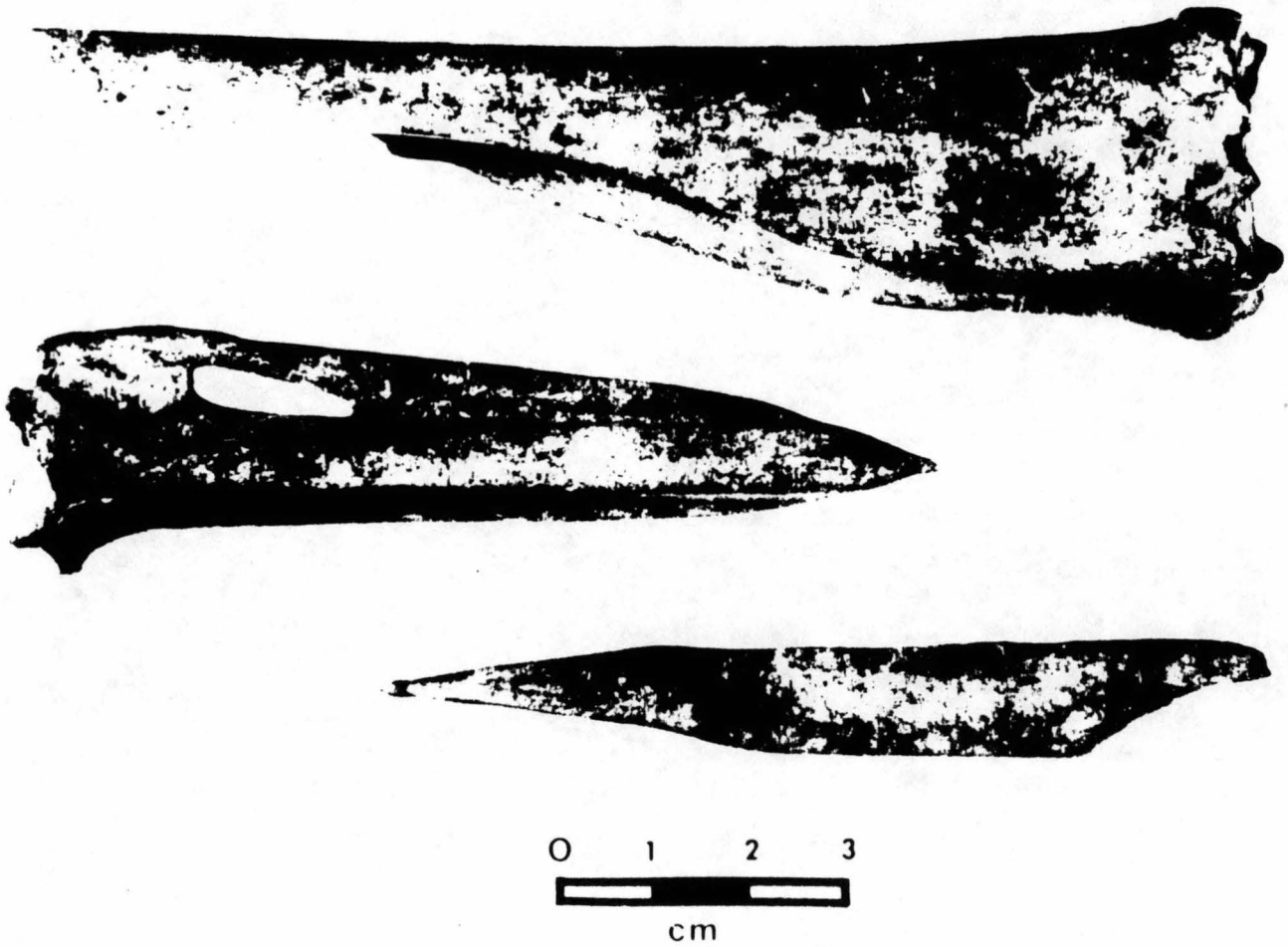


Figure 184. Bone beamer and awls from the Wall site.

Table 76. Animal remains from the Fredricks Site.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Odocoileus virginianus, White-tailed Deer	1128	6.88	4211.94	44.14	9	6.52
Didelphis marsupialis, Opossum	1	.01	.30	.00	1	.72
Sciurus carolinensis, Gray Squirrel	8	.05	3.01	.03	2	1.45
Sciurus niger, Fox Squirrel	3	.02	1.70	.02	1	.72
Sciurus sp.	82	.50	4.58	.05	2	1.45
Procyon lotor, Raccoon	22	.13	11.04	.12	1	.72
Mephitis mephitis, Striped Skunk	1	.01	.70	.01	1	.72
Sigmodon hispidus, Hispid Cotton Rat	11	.07	.22	.00	2	1.45
Peromyscus leucopus, White-footed Mouse	29	.18	.29	.00	2	1.45
Blarina brevicauda, Short-tailed Shrew	1	.01	.01	.00	1	.72
Ursus americanus, Black bear	10	.06	90.60	.95	1	.72
Equus caballus, Horse	1	.01	22.70	.24	1	.72
Sus scrofa, Pig	1	.01	24.50	.26	1	.72
Unidentified Mammal	3539	21.59	2354.20	24.67	-	-
Meleagris gallapavo, Wild Turkey	148	.90	221.81	2.32	4	2.90
Ectopistes migratorius, Passenger Pigeon	47	.29	18.76	.20	6	4.35

Table 76 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Charadriidae, Plovers	1	.01	.10	.00	1	.72
Fringillidae, Sparrows	7	.04	.15	.00	2	1.45
Colinus virginianus, Bobwhite	3	.02	.11	.00	1	.72
Centurus carolinus, Red-bellied Woodpecker	1	.01	.02	.00	1	.72
Aytha affinis, Lesser Scaup	7	.04	2.50	.03	1	.72
Unidentified Bird	376	2.29	74.36	.78	-	-
Terrapene carolina, Box Turtle	1065	6.50	1013.73	10.62	10	7.25
Chelydra serpentina, Snapping Turtle	2	.01	18.90	.20	1	.72
Chrysemys picta, Painted Turtle	3	.02	8.00	.08	1	.72
Sternothaerus oderatus, Musk Turtle	3	.02	.60	.01	1	.72
Kinosternon subrubrum, Mud Turtle	6	.04	.63	.01	3	2.17
Unidentified Turtle	1090	6.65	244.38	2.56	-	-
Crotalid sp., Poisonous Snake	2	.01	1.56	.02	1	.72
Unidentified Snake	226	1.38	10.05	.10	-	-
Scaphiopus holbrooki, Spadefoot Toad	31	.19	.63	.01	3	2.17
Rana sp., Frog	60	.37	2.92	.03	4	2.90
Bufo sp., Toad	1	.01	.80	.01	1	.72

Table 76 Continued.

Species	Frag.	% Frag.	Wt.(g)	% Wt.	MNI	% MNI
Unidentified Amphibian	-	-	-	-	-	-
Ictalurus sp., Catfish	71	.43	1.71	.02	69	50.00
Catostomus sp., Suckers	57	.35	1.36	.01	1	.72
Lepisosteus sp., Gar	48	.29	1.56	.01	1	.72
Lepomis sp., Sunfish	4	.02	.30	.00	1	.72
Unidentified Fish	547	3.43	12.48	.13	-	-
Sub-Total (Identified to Class)	8643	52.76	8363.21	87.64	-	-
Sub-Total (Unidentified)	7750	47.28	1178.30	12.35	-	-
Total	16393	100.04	9541.51	99.99	138	99.91

Other fish identified were sunfish, sucker, and gar.

Amphibians accounted for 8 individuals (5.8% of the total), represented by 92 fragments. The only amphibians identified were spadefoot toad, frog, and unspecified toad.

Reptiles were represented by 17 individuals (12.3% of the total) determined from 2,397 fragments. Most of the fragments identified as reptiles were small fragments of turtle carapace. Box turtle accounted for 10 of the individuals (7.2% of the total) and was the second most abundant species in terms of MNI. A large number (228 fragments) of snake bones was recovered, but many of these were ribs or fragmented vertebrae that could not be identified as to species.

Turkey and passenger pigeon were the most abundant bird species identified. Passenger pigeon accounted for six individuals (4.4% of the total), identified from 47 fragments. Turkey was represented by 148 fragments, accounting for four individuals (2.9% of the total). Based on the presence of spurs, three of the four individuals were males. Other birds identified were bobwhite quail, red-bellied woodpecker, lesser scaup, and members of the Charadriidae (plover) and Fringillidae (sparrow) families.

Approximately 56% of the identified bone fragments from the Fredricks site belonged to mammals. With the exception of the white-tailed deer (MNI=9) and squirrel (MNI=5), none of the mammalian species identified was represented by more than two individuals. The presence of European introduced mammals in the assemblage is indicated by a single femur fragment of a pig and a single horse molar.

The presence of a minimum of nine deer (6.5% of the total) was determined from 1,128 fragments. There were four deer mandibles in the assemblage that were complete enough to be aged using the technique

based on tooth development and wear described by Severinghaus (1949). Of these four, one was approximately 4-1/2 years old, one 5-1/2 years old, one 7-1/2 years old, and one 8-1/2 to 9-1/2 years old. Through an examination of the epiphyses of the long bones of the deer, it was determined that two individuals had unfused distal femora and could thus be aged at between 2-1/2 and 4-1/2 years (Lewall and Cowan 1963:635). A sample of six individuals is too small to permit conclusions about possible exploitation strategies based on age for the Fredricks site. Of the deer that could be aged, however, 50.0% were between 2-1/2 and 4-1/2 years old, 16.7% were approximately 5-1/2 years old, 16.7% were approximately 7-1/2 years old and 16.7% were approximately 8-1/2 to 9-1/2 years old.

There were no innominate bones preserved in the Fredricks site assemblage, upon which Edward's (1982) criteria for sex determination could be applied. Two of the deer frontal fragments recovered at this site were fairly delicate and did not possess antlers, and another frontal piece had an antler attached. These fragments indicate the presence of at least one male and possibly two females.

Of the ten fragments identified as black bear, only one (a proximal metacarpal) could be utilized with the methods described by Marks and Erickson (1966) for determining age. This single bone indicated an individual between the ages of one and two years (Marks and Erickson 1966:404).

The technique proposed by Grau et al. (1970) for determining the age of raccoons could not be applied to the faunal assemblage from the Fredricks site. This technique is based on an analysis of wear on the lower teeth of the raccoon. No mandibles with adequately preserved dentition were recovered.

Although 93 bones and bone fragments were identified as squirrel, none of these was distal radii or distal ulnae. Because of the lack of these elements, it was not possible to use Carson's (1961) technique for determining age of gray and fox squirrels.

Cut marks were observed on a total of twenty of the deer bones in the Fredricks site assemblage. The neck portion of one scapula exhibited several transverse cut marks, as did the distal epiphyses of four humerii. The proximal epiphyses of one tibia and two radii all exhibited several cut marks. One pubis fragment exhibited what appears to be a cut made by an axe and two ilium fragments exhibited cut marks. Three rib fragments, one cervical vertebra, three lumbar vertebrae, and one astrgalus also had cut marks. A cut mark on one of the rib fragments may have been inflicted with an axe. These fragments represent 1.8% of the deer bones recovered at the Fredricks site. Because this is such a small percentage, it is difficult to reconstruct the butchering process utilized by the original inhabitants. However, most of the cut marks are consistent with the skinning and butchering procedures reported for several prehistoric sites in the east (e.g., Guilday et al. 1962).

Fragments of three bone knife handles and a highly polished, tapered splinter of bone that might have been a needle were the only examples of worked bone found at the Fredricks site. All four items had been manufactured from mammal bones but it was not possible to determine the species.

Feature Fill

There were three zones of fill in Burial 1 containing a total of 3,169 bone fragments, 504 of which could be identified to species. The majority of the bones (89.2%) were retrieved from the top zone of fill,

which was a dark brown organically rich soil. The mammals identified were white-tailed deer, opossum, gray squirrel, squirrel sp., and raccoon. Birds consisted of turkey, passenger pigeon, bobwhite quail, red-bellied woodpecker, and a single fragment belonging to the family Charadriidae (plovers). The reptiles and amphibians identified were frog, box turtle, and musk turtle. The four types of fish identified from this pit were catfish, sucker, sunfish, and gar.

There were only two zones of fill in Burial 2, and the top zone, a dark brown humus, contained 84.5% of the bone fragments. The fill of this pit contained only 129 animal bone fragments, 30 of which were identified to species. Deer, squirrel, and raccoon were the only mammals identified, and the only birds identified were turkey and passenger pigeon. Box turtle was the only identifiable reptile, there were no amphibian remains, and there was only one fish bone (catfish).

The two zones of fill in Burial 3 contained 5,008 fragments of bone, 873 of which could be identified to species. Of the total number of animal bone fragments recovered from the site, 30.5% were recovered from the fill of this pit. Although a few unidentifiable fragments were located in the lower zone of fill, 99.4% were in the top zone of dark brown humus. Identified mammals consisted of black bear, white-tailed deer, gray squirrel, raccoon, skunk, and cotton rat. A single fragment was identified as domestic pig. The birds identified were turkey, passenger pigeon, and lesser scaup. Reptiles and amphibians were comprised of box turtle, snapping turtle, painted turtle, musk turtle, mud turtle, Crotalidae (poisonous snake), and frog. Fish identified were catfish, gar, and sucker.

Feature 1 had two zones of fill, the uppermost of which contained 95.6% of the 1,539 animal bone fragments. Of these, 257 fragments could

be identified to species. The mammals represented were white-tailed deer, squirrel, raccoon, and cotton rat. The only birds represented were turkey and passenger pigeon. Remains of box turtle, mud turtle, poisonous snake, frog, catfish, sucker, and gar were also recovered.

Two major zones of fill were identified in Feature 2/Burial 4 and a total of 982 bone fragments (155 of which could be identified) was recovered. The first zone, a dark brown soil with charcoal fragments, contained 65.6% of the bone in this pit. The second zone, a mottled orange clay, contained 34.4% of the bone. White-tailed deer, raccoon, white-footed deer mouse, turkey, passenger pigeon, and box turtle were identifed.

Of the 2,375 bone fragments in the fill of Feature 3/Burial 5, 457 were identified. There were two major zones of fill. The uppermost zone (a brown loam with ash) contained 82.8% of the bone and a second zone (mottled orange clay) contained 17.2%. The mammals represented in the fill were white-tailed deer, gray squirrel, fox squirrel, squirrel sp., raccoon, cotton rat, meadow vole, white-footed deer mouse, short-tailed shrew, and black bear. Turkey and passenger pigeon were the only birds present; whereas toad, frog, box turtle, and mud turtle made up the reptiles and amphibians. Fish identified were catfish and gar.

The five zones of fill in Feature 4/Burial 6 contained a total of 301 bone fragments. Only 23 of these fragments could be identified. In the other burial pits, the majority of the animal bone was located in an uppermost zone of dark organic soil. In Feature 4/Burial 6, however, 65.4%, of the bone fragments were from two deeper zones of mottled orange clay, and 23.6% were from two zones of brown loam mottled with

orange clay. Only 11.0% of the bone was retrieved from the uppermost zone of dark organic soil. All of the bone fragments which could be identified from this pit were white-tailed deer.

No animal bone fragments were found in the fill of Feature 5/Burial 7.

Six major zones of fill were distinguished in Feature 6/Burial 8. These zones contained a total of 683 bone fragments, 110 of which were identifiable to species. The first zone, a brown loam with numerous small pebbles, contained 39.8% of the bone fragments. The third zone, also a brown loam, contained 37.2%, Zone 5 contained 10.5%, and the rest (12.5%) was contained in the bottom zone. Animals represented were white-tailed deer, squirrel, raccoon, white-footed deer mouse, passenger pigeon, box turtle, snapping turtle, and painted turtle.

In Feature 7/Burial 9, there were two primary zones of fill containing 217 fragments of animal bone. Only 15 of these fragments were identifiable, and all were white-tailed deer. The deepest zone of fill, a mottled orange clay, contained 65.9% of the bone, and the rest (34.19%) was contained in the upper (brown loam soil) zones of fill.

Feature 9 has been interpreted as a fire pit associated with Structure 1, probably the remains of a sweat house. The bottom of this pit was lined with charred bark, and clusters of charred maize kernels were found lying within the charred remains of woven containers, probably baskets. Along with the maize kernels, one of these clusters contained the charred foot bones of an unidentified small mammal. The bones of this animal accounted for 57.5% of the total number of fragments (134) in the pit. The uppermost zone of fill in this pit (a dark yellowish-brown sandy ash) contained 26.1% of the bone fragments,

the center zone (a combination of fill similar to that in Zone 1 mixed with orange clay) contained 6.7%, and the deepest zone (charcoal, reddish clay, and ash), which contained the charred maize, accounted for 67.2% of the bone. All of the bone fragments in this third zone of fill were charred. In addition to a single horse molar, there was white-tailed deer, raccoon, and bear.

Feature 10 was a trash-filled storage pit with two zones of fill. The uppermost zone was a dark brown loam, which contained 96.3% of the 722 animal bone fragments. Of these fragments, 134 could be identified as white-tailed deer, squirrel, turkey, and box turtle.

Feature 11 contained 13 identifiable bones (from a total of 94 fragments), all of which were identified as white-tailed deer. There was only one zone of fill in this feature.

Feature 12 had two zones of fill containing 282 bone fragments. The upper zone, a dark reddish-brown soil, contained 54.2% of the bone, and the lower, a brown sandy loam mottled with orange clay, contained 45.7%. The 75 identifiable bones were comprised of white-tailed deer, squirrel, white-footed deer mouse, black bear, and box turtle.

There were two zones of fill in Feature 13. An uppermost shallow zone of mottled yellow clay, which contained almost no bone, intruded into a thicker zone of dark brown, highly organic soil, which contained 98.1% of the bone. Of the 755 bone fragments, 209 were identifiable. Animals represented were white-tailed deer, fox squirrel, squirrel sp., raccoon, bear, turkey, passenger pigeon, sparrow, box turtle, and frog.

The four burial pits most similar in terms of fill were Burial 1, Burial 2, Burial 3, and Feature 1. In all of these pits, the vast majority of the animal bone was recovered from the uppermost zone of

fill, a dark, organically rich soil. The bone from these pits was well preserved and each pit contained most of the 31 species identified in the overall assemblage. The four pits were also very closely aligned in terms of spatial arrangement.

Feature 2/Burial 4 is somewhat similar to these four pits in that the majority of the bone fragments were recovered from an upper zone of dark organic fill. Only 65.6% of the bone from this pit was recovered from this zone, however, as opposed to the 84.5-99.4% for the same zone in the other aforementioned pits.

Feature 3/Burial 5 likewise could be grouped with the burial pits mentioned above. The majority of the bone was recovered from an upper zone of fill that consisted of a dark organic soil. Also, the species identified in Feature 3/Burial 5 were almost identical to those identified in Feature 1.

Feature 7/Burial 9 and Feature 4/Burial 6 were very similar to one another and quite different from the other pits. In addition to being in adjacent positions, the two pits are similar in that the only identifiable remains recovered in either is white-tailed deer. The remainder of the bone fragments were too poorly preserved to identify. In both pits, approximately 65% of the bone was recovered in a deep zone of mottled orange clay. It is likely that the acidic nature of this clay is responsible for the poor preservation. Zones of brown loam or humus were identified in each of these pits, but unlike Burials 1-3 and Feature 1, these zones contained very few animal bones.

Feature 6/Burial 8 was unique in that the faunal remains were recovered in zones of brown loamy soil separated from one another by zones of orange and brown mottled clay. No single zone contained the

vast majority of bone. The preservation of the bone in this pit was not as good as in the other burial pits.

Finally, Feature 5/Burial 7 was unique in that it was the only burial pit from which no faunal remains were recovered. This pit was also more shallow (by 0.75 ft) than any of the other pits and lacked an upper zone of dark organic soil (which may have been plowed away).

COMPARISON OF THE TWO ASSEMBLAGES

Before a discussion of the use of faunal resources by the inhabitants of the two sites can be attempted, the state of preservation of the two faunal assemblages should be evaluated. As noted earlier, the contexts from which the bones were retrieved at the two sites were dissimilar. The majority of the bones from the Fredricks site were recovered from burial pit fill, whereas the majority of those from the Wall site were recovered from deposits of sheet midden. It has been suggested that "small fragments just would not survive" in a midden deposit (Runquist 1979:342) and that bones deposited in pits are less likely to be stepped on, exposed to scavengers, or damaged by weather than are bones which are not placed in pits (Chaplin 1971:16; Waselkov 1977:84).

At the Wall site, 19.96% of the bone was retrieved from 1/2-inch screen, 65.07% from 1/4-inch screen, and 14.97% from 1/16-inch screen. At the Fredricks site, 20.91% was recovered from 1/2-inch screen, 70.12% from 1/4-inch screen, and 8.96% from 1/16-inch screen. Obviously, more small bone fragments were preserved in the midden deposits from the Wall site than in the pitfill at the Fredricks site. It should be noted that only those bones and bone fragments that appeared to be identifiable were pulled from the material recovered in the 1/16-inch screen. Thus,

the percentage of small, identifiable fragments is actually higher in the Wall site assemblage than in the Fredricks site assemblage. At both sites, much of the bone recovered in the 1/2-inch screen consisted of identifiable fragments of bones of larger animals and complete, or nearly complete, bones from medium-sized animals. Identifiable bone from the 1/16-inch screen belonged, for the most part, to smaller species, such as fish and amphibians. The vast majority of the bone recovered in the 1/4-inch screen, however, consisted of fragments of bone that were too small and/or too fragmented to be identified. The percentage of bone fragments that could not be identified was higher for the Fredricks site assemblage (47.28%) than for the Wall site assemblage (42.02%). It is likely that this is a result of the fact that the percentage of bone recovered in the 1/4-inch screen was also higher at the Fredricks site than at the Wall site.

Another way in which the condition of the bones from the two sites can be evaluated is by comparing the extent of fragmentation of the bones in the two assemblages. Extent of fragmentation can be determined from the number of fragments of deer bones present per individual identified (Runquist 1979:172). At the Wall site, a minimum of 36 individuals and 4,731 fragments were identified as white-tailed deer, which yields a ratio of 131.42 fragments per individual. For the Fredricks site, nine individuals and 1,128 fragments were identified as white-tailed deer, which yields a ratio of 125.33 fragments per individual. Thus it seems that, at least for the white-tailed deer, the bones in the Fredricks site assemblage are only slightly less fragmented than those in the Wall site assemblage. As noted earlier, the faunal remains from the Fredricks site may represent refuse cleaned from house floors, which would make the original contexts of the analyzed bone from

both sites quite similar. Therefore, the slight difference in the ratios suggests to some extent that large bones deposited in pits may not be subjected to factors causing fragmentation as frequently as those deposited in sheet midden.

It should be noted that 30.7% of the bone from the Fredricks site was burned whereas only 8.9% of the bone from the Wall site was burned. This suggests the possibility that the deposits from which the Fredricks site assemblage were derived represent a limited range of activities such as cleaning house floors or hearths. A higher percentage of activities that did not produce burned bone may be represented by the Wall site assemblage. Table 77 shows the percentage of deer skeletal elements represented in the Wall and Fredricks site asemblages. With the exception of five elements (innominate, atlas, axis, cervical 3-7 vertebrae, sacrum, and patella) there is a higher percentage of every element represented at the Fredricks site than at the Wall site. This is one indication that the Fredricks site assemblage is better preserved than that from the Wall site. However, it could also be an indication that deer bones were treated differently by the inhabitants of the two sites. If, for example, the inhabitants of one of the sites frequently utilized deer bones as tools, it is possible that certain skeletal elements would not be discarded in the midden as food refuse. These tools would be curated, and thus would not be recovered in the midden in the same percentages as would be expected if preservation were the only factor being considered.

For example, proximal metacarpals and metatarsals should survive better than less-resistant elements such as proximal humeri or frontals. Proximal metacarpals and metatarsals were made into beamers by some Piedmont groups, and several of these hide-working tools have been

Table 77. Expected and actual representation of deer skeletal elements.

Element	Expected Freq./Ind.	Wall (36 Ind.)	Fredricks (9 Ind.)
Occipital	1	11.1	22.2
Frontal	2	4.2	11.1
Hyoid, half	2	1.4	11.1
Mandible, half	2	56.9	61.1
Maxilla	2	23.6	33.3
Atlas	1	11.1	0.0
Axis	1	38.9	33.3
Cervical 3-7 Vertebrae	5	23.3	8.9
Thoracic Vertebrae	13	8.1	17.1
Lumbar Vertebrae	6	24.5	86.1
Sacrum	1	16.7	11.1
Scapula	2	77.8	88.9
Humerus, proximal	2	20.8	44.4
Humerus, distal	2	87.5	100.0
Radius, proximal	2	47.2	61.1
Radius, distal	2	15.3	55.6
Ulna	2	47.2	66.7
Metacarpal, proximal	2	13.9	94.4
Innominate	2	95.8	83.3
Femur, proximal	2	44.4	66.7
Femur, distal	2	37.5	72.2
Tibia, proximal	2	48.6	72.2
Tibia, distal	2	4.2	66.7
Patella	2	11.1	5.6
Metatarsal, proximal	2	45.8	77.8
Metatarsal, distal	4	33.3	72.2
Astragalus	2	27.8	66.7
Calcaneum	2	30.6	94.4
Proximal Phalanx	8	17.4	54.2
Second Phalanx	8	8.3	27.8
Distal Phalanx	8	16.3	23.6

identified in the Wall site assemblage (one in the 1983-1984 assemblage and nine in the assemblage examined by Runquist). As yet, however, no tools of this kind have been recovered from the Fredricks site, whose original inhabitants had access to metal tools that may have made bone beamers obsolete. The percentages of proximal metacarpals (13.9%) and metatarsals (45.8%) recovered at the Wall site are not much higher than the percentages of other elements which could have been expected to be less well-preserved. At the Fredricks site, the percentages of proximal metacarpals (94.4%) and of metatarsals (77.8%) is considerably higher than the percentages for many of the other elements. Thus, it is likely that the different representation of deer skeletal elements at the two sites is a result of differential patterns of use and/or discard of the bones by the inhabitants of the two sites in addition to the possible effects of differential preservation.

There is no evidence, therefore, that the bone from one site is appreciably better preserved than the bone from the other site. It follows also that there is little indication, in this case, that bones deposited in a pit will be better preserved than those discarded in an open midden. It is possible, however, that large bones deposited in pits will be slightly less fragmented than bones deposited in sheet midden.

Overall, the faunal assemblages from the Wall and Fredricks sites are very similar. Only five species were identified at the Wall site that were not present in the Fredricks site assemblage. These were rabbit, beaver, meadow vole, flying squirrel, and bluejay. With the exception of rabbit (MNI=4) and meadow vole (MNI=2), none of these species was represented by more than a single individual. Whereas meadow vole was represented by two individuals, it is very likely that

these burrowing animals were intrusive in the deposit and were not utilized by the site's inhabitants. Rabbit is the only species from the Wall site assemblage that can be considered notable in its absence from the Fredricks site assemblage.

Nine species were identified from the Fredricks site that were not identified in the 1983-1984 assemblage from the Wall site. These were horse, pig, skunk, red-bellied woodpecker, lesser scaup, musk turtle, sunfish, one individual belonging to the family Charadriidae (plover), and one individual belonging to the family Fringillidae (sparrow). As only one of these species, skunk, was present in the assemblage analyzed by Runquist, it is likely that none of these species was utilized to any great extent, if at all, by the inhabitants of the Wall site. With the exception of the sparrow (MNI=2), these species were only represented by a single individual each in the Fredricks site assemblage. The presence of two European-introduced mammals, pig and horse, in the Fredricks site assemblage is important. However, pig was represented by only one femur fragment and horse by only one molar.

Thus, based on the presence or absence of individual species, the data suggest there were no major differences in the utilization of fauanl resources by the inhabitants of the two sites. The two exceptions noted are the absence of rabbit and the presence of two European domesticates in the Fredricks site assemblage.

Although the gross inventories of species utilized by the inhabitants of the two sites are virtually the same, there seem to be differences in the ways and/or relative amounts in which these species were procured and/or utilized. In an attempt to determine which species were most important in the diet of the inhabitants of the sites, the amount of meat available from each was calculated, using estimations by

Smith (1975a), White (1953), and Cleland (1966). These figures are presented in Table 78. It should be noted that the bones, skins, furs, and carapaces of these animals were often important to the Indians as materials for tools, clothing, utensils, and other material goods. Thus, a particular species would not always have been selected on the basis of its value as a source of food. The presence of only a single molar identified as horse indicates that this animal probably was not used for food by the inhabitants of the Fredricks site. Therefore, the amount of meat provided by this animal was not included in the calculations of available meat at this site.

The most important animals in the Wall site assemblage, listed in rank order of estimated meat yield, were deer, catfish, bear, raccoon, beaver, and turkey. At the Fredricks site the order was deer, bear, catfish, pig, turkey, and raccoon. Again, the asemblages appear to be quite similar.

In an attempt to gain a more detailed indication of the relative importance of the various species utilized, twelve species or species groups were ranked according to a technique proposed by Smith (1975b:125-127). Using this approach, the species were ranked by their relative importance in terms of both the minimum number of individuals and projected meat yield. The results are shown in Figure 185.

At both sites, the species cluster into four groups. Deer and fish ranked very high on both scales and were evidently the most important faunal resources at the two sites. The second cluster consists of animals that ranked fairly high in terms of meat yield but were not frequently utilized. At the Wall site these animals were black bear and beaver; at the Fredricks site, they were black bear and pig. Smith (1975b:126) notes that the low exploitation of bear and beaver at the

Table 78. Estimated meat yield in pounds.

Species	Estimated Meat Yield/Ind. (Lbs.)	Wall lbs.	Wall %	Fredricks lbs.	Fredricks %
White-tailed Deer	85.0	3060.0	82.4	765.0	61.5
Opossum	8.5	8.5	0.2	8.5	0.7
Gray Squirrel	1.0	1.0	0.0	2.0	0.2
Fox Squirrel	1.5	-	-	1.5	0.1
Squirrel sp.	1.2	10.8	0.3	2.4	0.2
Raccoon	15.0	60.0	1.6	15.0	1.2
Hispid Cotton Rat	0.2	0.4	0.0	0.2	0.0
White-footed Deer Mouse	*	-	-	-	-
Short-tailed Shrew	*	-	-	-	-
Meadow Vole	*	-	-	-	-
Flying Squirrel	0.1	0.1	0.0	-	-
Black Bear	210.0	210.0	5.6	210.0	16.9
Rabbit	2.0	8.0	0.2	-	-
Beaver	31.5	31.5	0.8	-	-
Pig	75.0	-	-	75.0	6.0
Total Mammal	-	3390.3	91.1	1079.6	86.8
Turkey	8.5	25.5	0.7	34.0	2.7
Passenger Pigeon	0.7	0.7	0.0	4.2	0.3
Plover	*	-	-	-	-
Sparrow	*	-	-	-	-
Bobwhite	0.3	0.3	0.0	0.3	0.0
Red-bellied Woodpecker	*	-	-	-	-
Bluejay	0.1	0.1	0.0	-	-
Lesser Scaup	1.0	-	-	1.0	0.1
Total Bird	-	26.6	0.7	39.5	3.1
Frog	*	-	-	-	-
Toad	*	-	-	-	-
Spadefoot Toad	*	-	-	-	-
Total Amphibian	-	-	-	-	-
Box Turtle	0.3	1.5	0.0	3.0	0.2
Snapping Turtle	10.0	10.0	0.3	10.0	0.8
Painted Turtle	0.3	0.3	0.0	0.3	0.0
Musk Turtle	0.3	-	-	0.3	0.0
Mud Turtle	0.3	0.3	0.0	0.9	0.1
Snakes	0.2	0.2	0.0	0.2	0.0
Total Reptile	-	12.3	0.3	14.7	1.1
Catfish	1.5	280.5	7.6	103.5	8.3
Sunfish	1.0	-	-	1.0	0.1
Gar	1.0	1.0	0.0	1.0	0.1
Suckers	4.0	4.0	0.1	4.0	0.3
Total Fish	-	285.5	7.7	109.5	8.8
Total	-	3714.7	99.8	1243.3	99.8

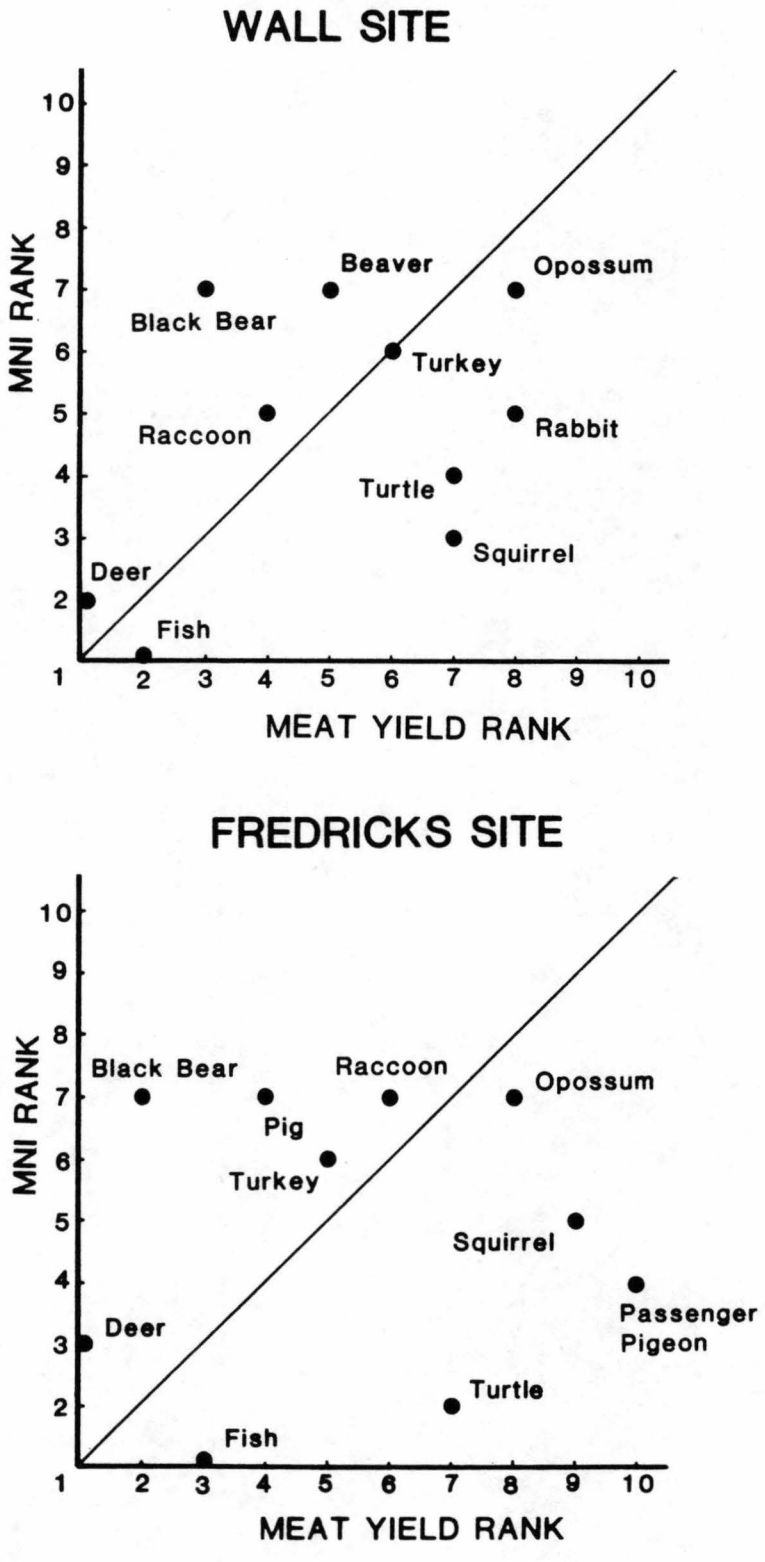


Figure 185. Bivariate plots of rank values for 12 animal species at the Wall site and Fredricks site.

Middle Mississippian sites whose faunal remains he analyzed may have been due to the fact that these species have low rates of reproduction, and thus were rarely encountered. It is interesting to note, however, that in his description of his visit to Occaneechi Town, Lawson (Lefler 1967:61) mentioned that the Indians brought him "good fat Bear" and that "Their Cabins were hung with a good sort of Tapestry, as fat Bear, and barbakued or dried Venison." It is also unlikely that pig would have been readily available to the inhabitants of the Fredricks site since this site was occupied early in the colonization process.

The third cluster consists of species that were utilized in high numbers but which yielded relatively small quantities of meat. At the Wall site, these species were rabbit, squirrel, and turtle. At the Fredricks site, they were turtle, squirrel, and passenger pigeon. At the Fredricks site, turtles were represented in higher numbers than were deer.

The fourth cluster of animals includes those species whose MNI and meat yield ranks were nearly equal. None of these species ranks very highly in terms of either criterion of importance. At both sites these species were raccoon, turkey, and opossum.

At both sites, then, deer and catfish were the most important faunal resources. Turtle and squirrel were major secondary resources, as was rabbit at the Wall site and passenger pigeon at the Fredricks site. Raccoon, turkey, and opossum were utilized on a more limited basis at both sites. Bear, and beaver at the Wall site, and pig at the Fredricks site, provided large quantities of meat but were not as frequently encountered as were other species.

HABITAT PREFERENCES AND SEASONALITY

The species utilized by the inhabitants of the Wall and Fredricks sites can be divided into three groups based on their preferred habitats. Evidence for the seasons during which each species would have been procured is very limited.

Fish and all of the turtle species except box turtle are aquatic. Beaver are also dependent on an aquatic habitat. There is no archaeological evidence indicating at what seasons these species were collected. However, both turtles and fish are less readily available for exploitation during the winter. As only one beaver incisor was identified from the Wall site, it was not possible to determine the age of the individual or the season in which it was killed. The lesser scaup (identified in the Fredricks site assemblage) winters in North Carolina and occurs on lakes, rivers and ponds.

Shelford (1963:59-60) lists white-tailed deer, black bear, gray squirrel, fox squirrel, raccon, opossum, striped skunk, and turkey among the species of the oak-hickory forest. Flying squirrel is also a forest species. Of these animals, deer, gray squirrel, raccoon, and opossum also commonly utilize the forest edge. Other forest edge species identified in the assemblages are cottontail rabbit and bobwhite. With the exception of the passenger pigeon, which was present during the fall (Schorger:268, 280), all of these forest and forest edge species were year-round residents of the North Carolina Piedmont. Thus, their presence in the assemblages provides little indication of the seasons during which they were exploited. The low representation of juvenile rabbits in the assemblages may indicate that this species was exploited primarily during the spring when the ratio of mobile juveniles to adults would have been lower than at other times of the year (Smith 1975b:100,

115-116). Turkey and passenger pigeons would have congregated in large flocks during the fall, in order to take advantage of the mast available at that time, and thus would have been more easily exploitable during those months.

The fact that no rabbits were identified in the faunal assemblage from the Fredricks site, and that passenger pigeon was represented by only one individual at the Wall site, makes it possible that the deposits from which the Fredricks site assemblage were derived are more representative of fall activities, whereas those deposits from which the Wall site assemblage was derived are more representative of spring activities.

Archaeologically, it is possible to determine the season during which deer were killed for those individuals represented by skulls having antlers attached (indicating May-February) or shed (indicating December-May). It is also possible to determine the season during which fawns (less that twenty months old) were killed based on stages of tooth eruption (Severinghaus 1949). At the Wall site it was only possible to determine the season during which two of the 36 individuals were killed. One individual was killed between May and February, as indicated by an antler attached to a frontal fragment, and another individual was killed during the spring or early summer, as indicated by the stage of dental eruption evident in one mandible. From the Fredricks site assemblage, it was possible to determine that one of nine individuals had been killed between May and February. The seasons during which the other individuals had been obtained could not be determined.

There are no clear indications that the inhabitants of one of the sites exploited specific portions of their environment to either a greater or lesser extent than the inhabitants of the other site.

Likewise, there are no indications that there were major differences in the seasons during which the species were exploited. This apparent similarity, however, may simply be the result of a lack of evidence discernible in the archaeological record.

DIVERSITY

One way in which it was posible to distinguish differences in the use of faunal resources by the inhabitants of the Wall and Fredricks sites was through the calculation of diversity. The formulas used and their results are shown in Table 79.

Using the Shannon-Weaver Index, species diversity was calculated as 1.46 for the Wall site assemblage and 2.19 for the Fredricks site asemblage. These numbers indicate that there is a greater diversity of species represented in the Fredricks site assemblage than in the Wall site assemblage. Using the same formula, Wing (1977) calculated diversity for assemblages from 43 other sites in the Southeast. The diversity indicated for the Wall and Fredricks site assemblages is lower than that indicated for all 43 of Wing's asesmblages. The three sites that displayed diversity nearly as low as that of the Wall and Fredricks sites were sites at which the economy was based on specialized fishing (Wing 1977:87). As neither the techniques used in analyzing the faunal remains nor lists of species identified at each site were presented in Wing's discussion, it is difficult to evaluate whether or not a comparison of the Wall and Fredricks site assemblages with those reported by Wing is valid. However, at both the Wall and Fredricks sites, fish represented over 50% of the individuals identfied and were the second most important resource, following deer, in terms of meat yield. At both sites, deer and fish were the most important resources.

Table 79. Summary of species diversity measures.

Diversity Measure	Site			
	Fredricks	Wall	31Sk1	31Sk1a
Shannon-Weaver Index[1]	2.19	1.46	2.54	2.29
Lieberson's Diversity Index[2]	0.73	0.55	0.88	0.88
Simpson's Index of Diversity[3]	0.73	0.54	0.85	0.87

[1] $H' = \sum P_i \text{Log}_e P_i$,

where P is the percentage of individuals of i species identified (Wing 1977:81).

[2] $Dw = 1\text{-}S = [(X_1)^2 + (X_2)^2 + (X_3)^2 \ldots]$,

where D_w stands for diversity within a population and is determined by deriving the sum (S) of the squared percentages of each variable trait and subtracting that sum from one (Dickens 1980:40).

[3] $D = 1 \pm (P_i)^2$,

where D is Simpson's Index of Diversity, P_i, is the proportion of individuals of species i in the assemblage (Styles 1981:45).

At the Fredricks site these species accounted for 56.68% of the MNI, whereas at the Wall site they accounted for 79.5% of the MNI. It is the dominance of these two resources that accounts for the fact that the two sites appear to be similar, in terms of diversity, to the specialized fishing sites described by Wing (1977).

Another method chosen for calculating diversity is Lieberson's variation of Simpson's Index of Diversity. This method is described by Dickens (1980:40) as providing an "index that represents statistical probability of obtaining unlike characteristics in a population." The percentages of individuals of each species identified from the Wall and Fredricks sites were used with this formula. The resulting percentages were 0.55 for the Wall site and 0.73 for the Fredricks site. This indicates that there were only 55 chances out of 100 that any two randomly selected individuals identified from the Wall site assemblage will be different, whereas the chances of two individuals from the Fredricks site being different species are 73 out of 100.

The final method is Simpson's Index of Diversity. Using this index, the lowest possible diversity would be 0 whereas maximum diversity for an assemblage is $1 - 1/s$, s being the total number of species (Styles 1981:45). At the Wall site maximum diversity is 0.969 and actual diversity is 0.539. For the Fredricks site assemblage, maximum diversity is 0.966 and actual diversity is 0.726. Thus, using Simpson's Index of Diversity, the Fredricks site assemblage exhibits more diversity than the Wall site assemblage. Also, the Wall site assemblage is only moderately diverse, whereas the Fredricks site assemblage exhibits fairly high diversity.

From the results of all four calculations, it is clear that the faunal assemblage from the Fredricks site exhibits more diversity than

that from the Wall site. Increased diversity of faunal exploitation may have been a trend already developing in the Piedmont prior to European contact or it may represent a response to increased disruption of the social and natural environments following contact. To further investigate this problem, calculations were made of the diversity exhibited by assemblages from an Early Contact site and a Middle Contact site, both located in the North Carolina Piedmont on the upper Dan River. 31Sk1 dates ca. 1650-1675, and 31Sk1a dates ca. 1680-1690 (Wilson 1983:225). In age, 31Sk1 falls between the Wall and Fredricks site, whereas 31Sk1a may overlap slightly with the early portion of the occupation of the Fredricks site. The later of the two Dan River sites exhibited greater diversity than the earlier site when calculated using the first and third formulas, whereas the second formula yielded equal values for both sites. The results when each formula was used, however, indicate that the assemblages from 31Sk1 and 31Sk1a exhibited greater diversity than either the Wall or the Fredricks site. Thus there is no evidence to indicate that increased diversity in faunal exploitation was a general trend from Protohistoric through Historic times in the Piedmont. Likewise, there is no clear indication that the utilization of a greater diversity of species was necessarily a response to environmental disruption created by the presence of Europeans.

CONCLUSIONS

Although the inhabitants of the Wall and Fredricks sites exploited a wide variety of species, both relied most heavily on deer and catfish. Turtle and squirrel were important secondary resources at the two sites, as were rabbit and raccoon at the Wall site and passenger pigeon at the Fredricks site. Turkey and opossum were supplementary resources at both

sites, as was raccoon at the Fredricks site. Bear, at both sites, beaver at the Wall site and pig at the Fredricks site were only occassionally utilized. European domesticated animals, although present at the Fredricks site, had not become important as subsistence items.

The lack of data on the age and sex of most of the animals utilized made it impossible to determine with any certainty how selective the inhabitants of the two sites were in their exploitation of particular species. Nor was it possible to determine whether or not the patterns of exploitation can be explained in terms of maximization of meat yield and minimization of energy expenditure. Neither of the two most reliable methods for determining seasonality was very useful in interpreting the assemblages from the two sites. The presence of migratory fowl, passenger pigeon and lesser scaup, indicates some exploitation by the inhabitants of the Fredricks site of fall and winter species. The presence of juveniles of particular species (e.g., rabbit and squirrel) also provides evidence of seasonality. The fact that only adult rabbits were identified indicates that the inhabitants of the Wall site may have utilized this species in the spring.

It is possible that the reliance upon deer as a primary resource reflects an effort to minimze energy expenditure while maximizing meat yield. Deer congregate in relatively high densitites during the fall and early winter in order to feed upon mast. They are thus easier to exploit at these times of year than at others (Smith 1975b:138). Ethnohistoric accounts and prehistoric evidence (Lefler 1967:215-216; Swanton 1946:256-257; Waselkov 1977:230) indicate that Southeastern Indians hunted deer primarily in the fall and winter. As it is not possible to determine the season during which the deer in the Wall and Fredricks site assemblages were killed, it is not possible to determine

whether the inhabitants of the two sites utilized the same strategies as other Southeastern groups.

The knowledge of the age and/or sex of a few of the deer identified from the two sites, however, makes it possible to hypothesize about the methods used to hunt this species. At both sites, a nearly equal number of males and females was identified. Because such a low percentage of the total number of individuals could be sexed, though, these figures may not be an accurate reflection of the actual sex distribution of the animals utilized. In both assemblages, the majority of the individuals were neither very young nor very old. This indicates that it is likely that drives or surrounds were the methods used in hunting the deer rather than stalking (Waselkov 1977:120).

Catfish was the second most important resource at both sites in terms of meat yield. The preferred water habitat of this species is small rivers with sluggish current (Smith 1975b:61), conditions which are met by the Eno River. Catfish are available in large numbers during the spring spawning season and also in the summmer when the water level is low (Smith 1975b:60). The seasons during which the inhabitants of the Wall and Fredricks sites exploited this resource cannot be determined. However, Swanton (1946:257) proposes that many Southeastern Indian groups relied on fishing during the summer.

The secondary resources identified from the Wall and Fredricks sites differ from those reported for other sites which seem to represent minimized energy expenditure-maximized meat yield strategies. At the Middle Mississippi sites reported by Smith (1975:137-138) and the prehistoric Dan River sites reported by Waselkov (1977:101) raccoon and turkey were reported as important secondary resources. These species, like deer and catfish, exhibit high population densities during the fall

and winter, when they were most likely to have been hunted. With the exception of passenger pigeon (at the Fredricks site), the species identified at both sites as important secondary resources do not congregate in easily exploitable groups at any time of the year. Squirrel, turtle, and rabbit may have been abundant near the sites and fairly easy to capture. That these species were such important resources to the inhabitants of the Wall and Fredricks sites suggests that the exploitative strategy used by these people was not entirely dominated by a concern for maximization.

Calculations of diversity indicated that the inhabitants of the Fredricks site used a greater diversity of species than the inhabitants of the Wall site. There is no indication, however, that this increased diversity through time was a general trend in the Piedmont. Nor is there any clear indication that it was necessarily a response to the disruption of the social and natural environments produced by Europeans.

From the data available thus far, contact (either direct or indirect) with Europeans seems to have had little effect on the basic pattern of faunal exploitation of the inhabitants of the Fredricks site. The presence of one horse molar and one fragment of pig bone indicates that animals introduced by Europeans probably were not important to the diet of these people. The increase in butchering marks found on deer bones from the Fredricks site, however, may be the result of different butchering practices following contact.

The many European artifacts found at the Fredricks site indicate considerable participation in the deerskin trade by the inhabitants of this site. There is, however, no direct evidence for this in the faunal assemblage. There is no indication that species were being hunted primarily for their hides rather than for meat, at least not in the near

vicinity of the village. Nor is there evidence that portions of the environment were being exploited either more or less heavily than in the past. Even though good evidence for the exact strategies used to hunt deer is lacking, there is an indication that procurement strategies at the Fredricks site were not very different from those at the Wall site. Also, no increase in the number of tools or features associated with hide-working is evident at the Fredricks site. In fact, no hide-working tools have been found at the Fredricks site. There are three possible explanations for the discrepancy between the presence of a large number of European artifacts at the Fredricks site and a lack of evidence for participation in the deerskin trade in the faunal assemblage. The majority of the remains from the Fredricks site were recovered from burial pitfill and may reflect special ceremonial behavior that was not related to hunting activities associated with the deerskin trade. A second possibility is that activities associated with the deerskin trade, in general, were carried out at hunting camps away from the village. A third possibility is that in their role as trade "middlemen", the Occaneechi were not directly involved in the hunting activities associated with the deerskin trade.

Analysis of the ethnobotanical remains from the Wall and Fredricks sites (Gremillion 1984, this report) also shows surprisingly little evidence of differences in plant utilization between precontact and postcontact sites. With the exception of peach, no plant species introduced by Europeans were identified at the Fredricks site. Although acorn was not as plentiful at the Fredricks site as at the Wall site and hickory was more abundant at the former, corn, beans, and squash were important resources at both sites. The faunal remains from the Wall and Fredricks sites, when combined with this ethnobotanical evidence,

support the contention that a basic late prehistoric subsistence pattern was maintained well into the Historic period of aboriginal occupation in the Carolina Piedmont.

REFERENCES CITED

Abler, T.S. and Elisabeth Tooker
1978 Seneca. In Handbook of North American Indians Vol. 15, Edited by Bruce G. Trigger. Smithsonian Institution, Washington, D.C.

Adair, James
1930 History of the American Indian. Watauga Press, Johnson City, Tennessee.

Alexander, Edward P. (Editor)
1972 The Journal of John Fontaine. An Irish Huguenot Son in Spain and Virginia, 1710-1719. Colonial Williamsburg Foundation, Williamsburg, VA.

Allen, E. P. and W. F. Wilson
1968 Geology and Mineral Resouces of Orange County, North Carolina. Bulletin No. 81, North Carolina Department of Conservation and Development, Raleigh..

Alvord, Clarence W. and Lee Bidgood (Editors)
1912 The First Explorations of the Trans-Allegheny Region by the Virginians, 1650-1674. Arthur H. Clark Co., Cleveland.

American Geological Institute
1962 Dictionary of Geological Terms. Doubleday, New York.

Anonymous
1715? "Map of Carolina. Showing the route of the Forces sent in the years 1711, 1712, and 1713, from South Carolina to the relief of North Carolina, and in 1715 of the Forces sent from North Carolina to the assistance of South Carolina, also showing the controverted Bounds between Virginia and Carolina. About 15 miles to 1 inch. [1715.] 29 in x 20 in." Public Record Office, Colonial Office Library, Carolina 4, London.

Arber, Edward and A.G. Bradley (Editors)
1910 Travels and Works of Captain John Smith President of Virginia and Admiral of New England 1580-1631. 2 vols. John Grant, Edinburgh.

Asch, David and Nancy Asch
1983 Archaeobotany. In Excavations at the Smiling Dan Site: Delineation of Site Structure and Function During the Middle Woodland Period, edited by Barbara D. Stafford and Mark B. Sant, pp. 635-725. Center for American Archaeology, Contract Archaeology Program, Reports of Investigations No. 137.

Axtell, James
1981 The European and the Indian. Oxford University Press, Oxford.

Bahou, W.F.
1975 The Relationships of Particular Trace elements in the Dickson Mounds Skeletal Population. Paleopathology Newsletter 11:15-17.

Baker, Steven G.
1975 The Working Draft of: The Historic Catawba Peoples: Exploratory Perspectives in Ethnohistory and Archaeology. Ms. on file, Department of History, University of South Carolina, Columbia.

Baker, Vernon
1974 Carillo's Statistical Study of English Wine Bottles: Some Comments and Further Considerations. Conference on Historic Sites Papers 1972, volume 7, part 4, edited by Stanley South.

Barber, Michael B. and Joseph A. William
1978 Faunal Analysis. In 44Cpl, the Onion Field Site, Dan River Focus. Unpublished BA thesis by J.A. Williams, Department of Anthropology, College of William and Mary, Williamsburg.

Barbour, Philip L.
1964 The Three Worlds of Captain John Smith. Houghton Mifflin, Boston.

Barbour, Philip L. (Editor)
1969 The Jamestown Voyages Under the First Charter, 1606-1609. 2 vols. Cambridge University Press for the Hakluyt Society, Cambridge, England.

Barnwell, Joseph W. (Editor)
1908 The Tuscarora Expedition. Letters of Colonel John Barnwell. South Carolina Historical and Genealogical Magazine 9:28-54.

Bartel, Brad
1982 A Historical Review of Ethnological and Archaeological Analyses of Mortuary Practice. Journal of Anthropological Archaeology 1:32-58.

Bass, William M.
1971 Human Osteology: A Laboratory and Field Manual of the Human Skeleton. Missouri Archaeological Society, Columbia.

Beals, Ralph
1962 Acculturation. In Anthropology Today, edited by Sol Tax, pp. 375-395. The University of Chicago Press, Chicago, Ill.

Beaudry, Mary C.
1981 Colonizing the Virginia Frontier: Fort Christanna and Governor Spotswood's Indian Policy. Ms. submitted for publication in The Comparative Archaeology of European Colonialism, edited by Stephen L. Dyson.

Bennyhoff, James A. and Robert Heizer
1958 Cross-Dating Great Basin Sites by California Shell Beads. University of California Archaeological Survey Reports 42:60-92, Berkeley.

Benthall, Joseph L.
1969 Archaeological Investigation of the Shannon Site, Montgomery County, Virginia. Virginia State Library Publications, No. 32. Virginia State Library, Richmond.

Beverly, Robert
1947 The History and Present State of Virginia. Edited with an Introduction by Louis B. Wright. University of North Carolina Press, Chapel Hill.

Billings, Warren (Editor)
1975 The Old Dominion in the Seventeenth Century: A Documentary History of Virginia, 1606-1689. University of North Carolina Press, Chapel Hill.

Binford, Lewis R.
1959 Comments on the "Siouan Problem." Ethnohistory 6:28-41.

1962 A New Method of Calculating Dates from Kaolin Pipe Stem Samples. Southeastern Archaeological Conference Newsletter 9(1):19-21.

1967 Smudge Pits and Hide Smoking: The Use of Analogy in Archaeological Reasoning. American Antiquity 32:1-12.

1971 Mortuary Practice: Their Study and Their Potential. In Approaches to the Social Dimensions of Mortuary Practices, Edited by J.A. Brown. Memoirs of the Society for American Archaeology 25:58-67.

1972 An Archaeological Perspective. Seminar Press. New York.

1979 Nunamuit Ethnoharchaeology. Academic Press, New York.

Black, T.K.
1978 A New Method of Assessing the Sex of Fragmentary Skeletal Remains: Femur Shaft Circumference. American Journal of Physical Anthropology 48:227-231.

Blakely, R.L. and L.A. Beck
1981 Trace Elements, Nutritional Status, and Social Stratification at Etowah, Georgia. In Research Potential of Anthropological Museum Collections, edited by A. Cantwell, J.B. Griffin, and N.A. Rothchild. Annals of the New York Academy of Science, Volume 376.

Blalock, Hubert M.
1960 Social Statistics. McGraw-Hill, New York.

Blatt, H., G. Middleton, and R. Murray
1972 Origin of Sedimentary Rock. Prentice-Hall, Inc., Englewood Cliffs, NJ.

Bohrer, Vorsila L.
1975 The Prehistoric and Historic Role of the Cool-Season Grasses in the Southwest. Economic Botany 29:199-207.

Bourne, Edward G. (Editor)
1904 Narratives of the Career of Hernando De Soto in the Conquest of Florida.... 2 vols. A.S. Barnes, New York.

Brain, Jeffrey P.
1979 Tunica Treasure. Papers of the Peabody Museum of Archaeology and Ethnology No. 71, Harvard University. Cambridge.

Brown, A.B.
1974 Bone Strontium as an Dietary Indicator in Human Skeletal Populations. Contributions to Geology 13(2):47-48.

Brown, Allen
1948 Shell Wampum Beads of North American Indians. Tennessee Archaeologist 4(3).

Brown, James A.
1971 Introduction. In Approaches to the Social Dimensions of Mortuary Practices, edited by J. A. Brown. Memoirs of the Society for American Archaeology 25:1-6.

Brock, R.A. (Editor)
1885 The Official Letters of Alexander Spotswood, Lieutenant-Governor of the Colony of Virginia, 1710-1722. vol. 2. Collections of the Virginia Historical Society, new series, vol. 2. The Society, Richmond.

Buikstra, J.E.
1976 Hopewell in the Lower Illinois Valley. Northwestern University Archaeological Program, Scientific Papers, No. 2. Evanston, IL.

Buikstra, J.E. and D.C. Cook
1980 Paleopathology: An American Account. Annual Review of Anthropology 9:433-470.

Bullen, A.K.
1972 Paleoepidemiology and Distribution of Prehistoric Treponemiasis (Syphilis) in Florida. Florida Anthropologist 25:133-174.

Bunzel, Ruth
1933 Ornament. In Encyclopedia of the Social Sciences, edited by Edwin R.A. Seligman, Vol.11:496-497. The Macmillan Co., New York.

Bushnell, David I., Jr.
1920 Native Cemeteries and Forms of Burial East of the Mississippi River. Bureau of American Ethnology Bulletin 71, Washington, D.C.

1930 The Five Monacan Towns in Virginia, 1607. Smithsonian Miscellaneous Collections, vol. 82, no. 12. Smithsonian Institution, Washington.

Butler, James B.
1963 Rocks of the Carolina Slate Belt in Orange County, North Carolina. Southeastern Geology, Vol. 4, No. 3.

Caddell, Gloria May
1981 Plant Remains from the Yarborough Site. Ms. in author's possession.

Caldwell, Joseph and Catherine McCann
1941 The Irene Mound Site. The University of Georgia Press, Athens.

Carnes, Linda F.
1983 Appendix II: Identification of Euro-American artifacts. In Tomotley: An Eighteenth Century Cherokee Village, by William W. Baden. Report of Investigations No. 36, Department of Anthropology, University of Tennessee, Knoxville.

Carrillo, Richard
1974 English Wine Bottles as Revealed by a Statistical Study: A Further Approach to Evolution and Horizon in Historical Archaeology. Conference on Historic Sites Papers 1972, volume 7, part 4, edited by Stanley South.

Carson, James D.
1961 Epiphyseal Cartilage as an Age Indicator in Fox and Gray Squirrels. Journal of Wildlife Management 25:90-93.

Chaplin, Raymond E.
1971 The Study of Animal Bones from Archaeological Sites. William Claus and Sons, London.

Chapman, Jefferson
1978 The Bacon Farm Site and a Buried Site Reconnaissance. Report of Investigations No. 23, Department of Anthropology, University of Tennessee, Knoxville.

Chapman, Jefferson and Andrea B. Shea
1981 The Archaeobotanical Record: Early Archaic Period to Contact in the Lower Little Tennessee River Valley. Tennessee Anthropologist 6:61-84.

Charles, Tommy
1983 Thoughts and Records from the Survey of Private Collections of Prehistoric Artifacts: A Second Report. Institute of Archaeology and Anthropology, University of South Carolina, Notebook 15:1-37.

Charlton, T.H.
1978 Teotihuacan, Tepeapulco, and Obisdian Exploitation. Science 200:1227-1236.

Clarke, David L.
1968 Analytical Archaeology. Methuen, London.

1977 Spatial Archaeology. Academic Press, New York.

Cleland, Charles E.
1966 The Prehistoric Animal Ecology of the Upper Great Lakes Region. Anthropological Papers, No.29. Museum of Anthropology, University of Michigan, Ann Arbor.

Coe, Joffre L.
1937 Keyauwee a Preliminary Statement. Bulletin of the Archaeological Society of North Carolina 3(1), Chapel Hill.

1952 The Cultural Sequence of the Carolina Piedmont. In Archaeology of the Eastern United States, edited by James B. Griffin, pp. 301-311. University of Chicago Press, Chicago.

1964 The Formative Cultures of the Carolina Piedmont. Transactions of the American Philosophical Society n.s. 54(5), American Philosophical Society, Philadelphia.

Coe, Joffre L. and Ernest Lewis
1952 Dan River Series Statement. Prehistoric Pottery of the Eastern United States, edited by James B. Griffin, Museum of Anthropology, University of Michigan, Ann Arbor.

Coleman, G.N., D.H. Ubelaker, M. Trinkley, and W.E. Clark
1982 The Reedy Creek Site, 44Ha22 South Boston Virginia. Archaeological Society of Virginia, Quarterly Bulletin 37(4):150-188.

Cotter, John and J. Paul Hudson
1957 New Discoveries at Jamestown. National Park Service, Washington.

Cowan, C. Wesley
1978 The Prehistoric Use and Distribution of Maygrass in Eastern North America: Cultural and Phytogeographical Implications. In The Nature and Status of Ethnobotany, edited by Richard I. Ford, pp. 263-288. Museum of Anthropology, University of Michigan, Anthropological Papers No. 67, Ann Arbor.

Cumming, William P.
1958 The Discoveries of John Lederer. University of Virginia Press, Charlottesville.

Daly, Patricia
1969 Approaches to Faunal Analysis in Archaeology. American Antiquity 34(2):146-158.

Davis, R.P. Stephen, Jr.
1983 Aboriginal Ceramics From the Eno and Haw River Valleys and Their Bearing Upon the Identification of John Lawson's Occaneechi Town. Paper presented at the Annual Meeting of the Society for Historical Archaeology, Williamsburg, VA.

DeBoer, Warren
1984 Subterranean Storage and the Organization of Surplus: The View from Eastern North America. Ms. on file at the Department of Anthropology, Queens College, New York.

de Bry, Theodore
1590 Thomas Hariots Virginia. University Microfilms, Inc. Ann Arbor.

Dennell, R.W.
1976 The Economic Importance of Plant Resources Represented on Archaeological Sites. Journal of Archaeological Science 3:229-247.

Depratter, Chester, Charles Hudson, and Marvin T. Smith
1983 The Route of Juan Pardo°s Explorations in the Interior Southeast, 1566-1568. The Florida Historical Quarterly 62:125-158.

Dickens, Roy S., Jr.
1980 Ceramic Diversity as an Indicator of Cultural Dynamics in the Woodland Period. Tennessee Anthropologist 5:34-46.

1984 In Search of Occaneechi: Archaeology and History of the North Carolina Piedmont, Symposium Introduction. Paper presented at Annual Meeting of the Society for Historical Archaeology, Williamsburg.

1985 The Form, Function, and Formation of Garbage-filled Pits on Southeastern Aboriginal Sites: A Archaeobotanical Analysis. In Structure and Process in Southeastern Archaeology, Edited by Roy S. Dickens, Jr. and H. Trawick Ward. University of Alabama Press, University (In Press).

Dickens, Roy S., H. Trawick Ward, and R.P. Stephen Davis, Jr.
1984 The Historic Occaneechi: An Archaeological Investigation of Culture Change: Preliminary Report of 1984 Investigations. Research Laboratories of Anthropology, University of North Carolina, Chapel Hill.

Dimbleby, Geoffrey
1978 Plants and Archaeology. Humanities Press, Atlantic Highlands, New Jersey.

Dobyns, Henry F.
1983 Their Numbers Become Thinned: Native American Population Dynamics in Eastern North America. University of Tennessee Press, Knoxville.

Dougenik, James A. and David E. Sheehan
1975 SYMAP User's Reference Manual. Laboratory for Computer Graphics and Spatial Analysis, Graduate School of Design, Harvard University, Cambridge.

Driver, Harold E.
1969 Indians of North America. The University of Chicago Press, Chicago.

Droessler, J.
1981 Craniometry and Biological Distance--Biocultural Continuity and Change at the Late Woodland--Mississippian Interface.. Center for American Archaeology, Evanston, IL.

Dumbrell, Roger
1983 Understanding Antique Wine Bottles. Antique Collectors' Club Ltd., Woodbridge, Suffolk, England.

Earle, Timothy K.
1980 A Model of Subsistence Change. In Modeling Changes in Prehistoric Subsistence Economies, edited by Timothy K. Earle and Andrew L. Christenson, pp. 1-30. Academic Press, New York.

Edwards J.K., R.L. Marchinton, and G.F. Smith
1982 Pelvic Girdle Criteria of White-tailed Deer. Journal of Wildlife Management 46:544-547.

Egloff, Keith
1980 Crab Orchard Site: A Late Woodland Palisaded Village. Archaeological Society of Virginia, Quarterly Bulletin 34:130-148.

Egloff, Keith, Michael B. Barber, and Celia Reed
1980 Leggett Site: a Dan River Agricultural/Riverine Hamlet. Ms. on file, Virginia Research Center for Archaeology, Williamsburg.

Ewan, Joseph and Nesta Ewan (Editors)
1970 John Banister and His Natural History of Virginia, 1678-1692. University of Illinois Press, Urbana.

Ewers, John C.
1957 Hair Pipes in Plains Indian Adornment: A Study in Indian and White Ingenuity. Anthropological Paper No. 50, Bureau of American Ethnology Bulletin No. 164, Smithsonian Insitution, Washington.

Faulkner, Charles H.
1977 The Winter House: An Early Southeast Tradition. Midcontinental Journal of Archaeology 2:141-159.

Flannery, Kent V.
1976 The Early Mesoamerican Village. Academic Press, New York.

Ford, Thomas
1979 A Descriptive Analysis of the Euro-American Artifacts from the Citico Site (40Mr7) 1978 Excavations. Unpublished report submitted to the Tennessee Valley Authority, Knoxville.

Fritz, Gayle J.
1984 Identification of Cultigen Amaranth and Chenopod from Rockshelter Sites in Northwest Arkansas. American Antiquity 49:558-572.

Fundaburk, Emma Lila and Mary Douglass Fundaburk Foreman
1957 Sun Circles and Human Hands: The Southeastern Indians' Art and Industries. Paragon Press, Montgomery, Alabama.

Futer, A. A.
1969 The Strickler Site. In Susquehannock Miscellany, edited by John Witthoft and W. Fred Kensey, III, pp. 136-147. The Pennsylvania Historical and Museum Commission, Harrisburg.

Gardner, Paul S.
1980 An Analysis of Dan River Ceramics from Virginia and North Carolina. M.A. thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

Gilbert, R.I.
1977 Applications of Trace Element Research to Problems in Archaeology. In Biocultural Adaptations in Prehistoric America, edited by R.L. Blakely, pp 85-100. University of Georgia Press, Athens.

Good, Mary Elizabeth
1972 Guebert Site: An Eighteenth Century Historic Kaskaskia Indian Village in Randolph County, Illinois. Memoir II of The Central States Archaeological Society, Inc.

Goody, J. R.
1962 Death Property and the Ancestors. Stanford University Press, Stanford, California.

Gould, Richard A.
1979 Exotic Stones and Battered Bones: Ethnoarchaeology in the Australian Desert. Archaeology 32(2):28-37.

Grau, G.A., G.C. Sanderson, and J.P. Rogers
1970 Age Determination of Raccoons. Journal of Wildlife Management 34:364-372.

Gravely, Richard P., Jr.
1969 The Madison Cemetery. Eastern States Archaeological Federation Bulletin 27:11.

Grayson, Donald K.
1973 On the Methodology of Faunal Analysis. American Antiquity 38(4):432-438.

1979 On the Quantification of Vertebrate Archaeofaunas. In Advances in Archaeological Method and Theory, vol. 2, edited by M. B. Schiffer, pp. 200-238. Academic Press, New York.

Great Britain, Public Record Office, Colonial Office
1682 Series 1, vol. 48. Microfilm copy in Virginia Colonial Records Project, Colonial Williamsburg Archives, Williamsburg.

1714 Series 5, vol. 1316. Transcript in Library of Congress Manuscript Room, Washington.

Gremillion, Kristen
1984 Aboriginal Use of Plant Foods and European Contact in the North Carolina Piedmont. M.A. thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

Griffin, James B.
1945 An Interpretation of Siouan Archaeology in the Piedmont of North Carolina and Virginia. American Antiquity 10:321-330.

Grinnan, A.G.
1895-1896 The Last Indians in Orange County, Virginia. Virginia Magazine of History and Biography 3:189-191.

Gruber, J. W.
1971 Death in a Late Prehistoric Village in Pennsylvania. American Antiquity 36:64-76.

Guilday, John E., Paul W. Parmalee, and Donald P. Tanner
1962 Aboriginal Butchering Techniques at the Eschelman Site (36La12), Lancaster, Pennsylvania. Pennsylvania Archaeologist 32(2):59-83.

Gwynn, John V.
1964 Virginia Upland Game Investigations: Restoration of the Wild Turkey. Annual Report, Virginia Pittman-Robertson Project.

Hale, Horatio
1883 The Tutelo Tribe and Language. Proceedings of the American Philosophical Society 21:114:1-47.

Hale, J.B.
1949 Aging Cottontail Rabbits by Bone Growth. Journal of Wildlife Management 13:216-225.

Hall, Edward T.
1966 The Hidden Dimension. Doubleday and Company, Inc., Garden City.

Hamilton, T. M. (Editor)
1960 Indian Trade Guns. Missouri Archaeologist 22. Columbia.

Hammett, Julia E.
1983 Preliminary Classification of North Carolina Shell Bead Artifacts: Some Indications and Implications. Ms. on file, Research Laboratories of Anthropology, University of North Carolina, Chapel Hill.

Harrington, Jean C.
1954 Dating Stem Fragments of 17th and 18th Century Clay Tobacco Pipes. Quarterly Bulletin of the Archaeological Society of Virginia 9(1):10-14.

Harrington, Mark R.
1908a Catawba Potters and Their Work. American Anthropologist (n.s.) 10:399-407.

1908b Some Seneca Corn-Foods and Their Preparation. American Anthropologist (n.s.) 10:575-590.

Harriot, Thomas
1972 A Briefe and True Report of the New Found Land of Virginia. The Complete 1590 Theodor De Bry Edition. Introduction by Paul Hulton. Dover Publications, New York.

Harris, Frances L. (Editor)
1937 Lawson's History of North Carolina. Garrett and Massie, Richmond, Virginia.

Hatch, J.W. and R.A. Geidel
1983 Tracing Status and Diet in Prehistoric Tennessee. Archaeology 36:56-60.

Hazard, Samuel (Editor)
1851 Minutes of the Provincial Council of Pennsylvania, From the Organization to the Termination of the Proprietary Government. vol. 2. Jo. Severns, Philadelphia.

Hedrick, U.P. (Editor)
1972 Sturdevant's Edible Plants of the World. Dover Publications, New York.

Heye, George C. and George H. Pepper
1915 Exploration of a Munsee Cemetery near Montague, New Jersey. Contributions from The Museum of the American Indian, Volume 2, Heye Foundation, New York.

Hodder, Ian
1978 The Spatial Organization of Culture. Duckworth and Co. Ltd., London.

1982 The Present Past: An Introduction to Anthropology for Archaeologists. B.T. Batsford, Ltd., London.

Holland, C.G.
1970 An Archaeological Survey of Southwest Virginia. Smithsonian Contributions to Anthropology, Number 12. Smithsonian Institution Press, Washington.

1982 A Saponi Note. Archaeological Society of Virginia, Quarterly Bulletin 37:42.

Holmes, William H.
1903 Aboriginal Pottery of the Eastern United States. Twentieth Annual Report of the Bureau of American Ethnology, 1898-99, pp. 1-237. Smithsonian Institution, Washington.

Horn, H.S.
1978 Optimal Tactics of Reproduction and Life-History. In Behavioral Ecology: An Evolutionary Approach, edited by J.R. Krebs and N.B. Davies, pp 411-429. Blackwell Scientific Publications, Oxford.

Hrdlicka, A.
1916 Physical Anthropology of the Lenape or Delawares, and the Eastern Indians in General. Bureau of American Ethnology, Bulletin 32.

Hudson, Charles M.
1970 The Catawba Nation. University of Georgia Monographs, Number 18. University of Georgia Press, Athens.

1976 The Southeastern Indians. The University of Tennessee Press, Knoxville.

Hudson, Charles M., Marvin T. Smith, and Chester B. DePratter
1984 The Hernando De Soto Expedition: From Apalachee to Chiaha. Southeastern Archaeology 3:65-77.

Hunter, W. A.
1959 The Historic Role of the Susquehannocks. In Susquehannock Miscellany, edited by John Whitthoft and W. Fred Kensey, III, pp. 8-18. The Pennsylvania Historical and Museum Commission, Harrisburg.

Huss-Ashmore, R., A.H. Goodman, and G.J. Armelagos
1982 Nutritional Inference from Paleopathology. Advances in Archaeological Method and Theory, Vol. 5, pp. 395-474.

Jackes, M.K.
1983 Osteological Evidence for Smallpox: A Possible Case from Seventeenth Century Ontario. American Journal of Physical Anthropology 60:75-81.

Johnson, Kristen J.
1983 Formation of Archaeological Refuse Deposits at the Wall Site. Ms. in author's possession.

1984 A Preliminary Statement on Plant Remains from the Wall and Fredricks Sites. Paper presented at the Annual Meeting of the Society for Historical Archaeology, Williamsburg, VA.

Karklins, Karlis
1982 Glass Beads. History and Archaeology 59. National Historic Parks and Sites Branch, Parks Canada, Environment Canada.

Keene, Arthur S.
1981 Optimal Foraging in a Nonmarginal Environment: A Model of Prehistoric Subsistence Strategies in Michigan. In Hunter-Gatherer Foraging Strategies, edited by Bruce Winterhalder and Eric Alden Smith, pp. 171-193. University of Chicago Press, Chicago.

Kent, Barry C.
1984 Susquehanna's Indians. The Pennsylvania Historical and Museum Commission, Anthropological Series, No. 6. Harrisburg.

Kenyon, W. A.
1982 The Grimsby Site: An historic neutral cemetery. Royal Ontario Museum, Toronto, Canada.

Kidd, K. E. and M. A. Kidd
1970 A Classification System for Glass Trade Beads for the Use of the Field Archaeologists. Canadian Historic Sites: Occasional Papers in Archaeology and History 1:45-89.

1982 A Guide to the Artifacts of Colonial America. Alfred Knopf, New York.

King, Chester D.
1982 The Evolution of Chumash Society: A Comparative Study of Artifacts Used in Social System Maintenance in the Santa Barbara Channel Region Before A.D. 1804. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

King, Frances B.
1982 Preliminary Analysis of Botanical Remains from Phillips Spring. In Holocene Adaptations Within the Lower Pomme de Terre River Valley, Missouri, Volume III, edited by Marvin Kay, pp. 701-727. U.S. Army Corps of Engineers, Kansas City District.

Klein, Richard G., and Kathryn Cruz-Uribe
1984 The Analysis of Animal Bones from Archaeological Sites. University of Chicago Press, Chicago.

Klippel, Walter
1971 Prehistory and Environmental Change along the Southern Border of the Prairie Peninsula during the Archaic Period. University Microfilms, Ann Arbor, MI.

Kramer, Carol
1979 An Archaeological View of a Contemporary Kurdish Village: Domestic Architecture, Household Size and Wealth. In Ethnoarchaeology: Implications of Ethnography for Archaeology, Edited by Carol Kramer. Columbia University Press, New York.

Krogman, W.M.
1978 The Human Skeleton in Forensic Medicine. Charles C. Thomas, Springfield, IL.

Kupperman, Karen Ordahl
1980 Settling With the Indians. Rowman and Littlefield. Totowa, NJ.

Lambert, J. B., C. B. Szpunar and J. E. Buikstra
1979 Chemical Analysis of Excavated Human Bone from Middle and Late Woodland Sites. Archaeometry 21:115-129.

Larson, Lewis H., Jr.
1971 Archaeological Implications of Social Stratification at the Etowah Site, Georgia. In Approaches to the Social Dimensions of Mortuary Practices, edited by J. A. Brown. Memoirs of the Society for American Archaeology 25:58-67.

Lawson, John
1967 A New Voyage to Carolina. Edited with an Introduction and Notes by Hugh Talmage Lefler. University of North Carolina Press, Chapel Hill.

LeBlanc, Steven
1971 An Addition to Naroll's Suggested Floor Area and Settlement Population Relationship. American Antiquity 36:210-211.

Lederer, John
1958 The Discoveries of John Lederer. Edited with Notes by William P. Cumming. University of Virginia Press, Charlottesville.

Lee, R. B. and I. DeVore
1976 Kalahari Hunter-Gatherers. Harvard University Press, Cambridge.

Lefler, Hugh T. (Editor)
1967 A New Voyage of Carolina. University of North Carolina Press, Chapel Hill.

Lewall, E.F., and I.McT. Cowan
1963 Age Determination in Black-tail Deer by Degree of Ossification of the Long Bones. Canadian Journal of Zoology 41:629-636.

Lewis, Clifford M. and Albert J. Loomie
1953 The Spanish Jesuit Mission in Virginia, 1570-1572. Published for the Virginia Historical Society by the University of North Carolina Press, Chapel Hill.

Lewis, Ernest
1951 The Sara Indians, 1540-1768: An Ethno-Archaeological Study. M.A. thesis, Department of Sociology and Anthropology, University of North Carolina, Chapel Hill.

Lieberson, Stanley
1969 Measuring Population Diversity. American Sociological Review 34(6):850-862.

Lopinot, Neal H.
1983 Analysis of Flotation Sample Materials from the Late Archaic Horizon. Chapter VII in The 1982 Excavations at the Cahokia Interpretive Center Tract, St. Clair County, Illinois, by Richard W. Jefferies, pp. 77-108. Center for Archaeological Investigations, Southern Illinois University at Carbondale, Research Paper No. 37.

McCary, Ben C.
1957 John Smith's Map of Virginia. With a Brief Account of Its History. University of Virginia Press, Charlottesville.

McCollough, Major C.R. et al.
1980 Phase II Archaeological Investigations of Ten Specified Locales in the Falls Lake Reservoir Area, Falls Lake, North Carolina. Submitted to Wilmington District, U.S. Army Corps of Engineers by GAI Consultants, Inc., Monroeville, PA.

MacCord, Howard A., Sr.
1983 Indians of Piedmont Virginia: An Abbreviated Culture History. Paper presented at A Conference on Piedmont Archeology, Yorktown, VA.

McIlwaine, H.R. (Editor)
1928 Executive Journals of the Council of Colonial Virginia. vol. 3. Virginia State Library, Richmond.

1930 Executive Journals of the Council of Colonial Virginia. vol. 4. Virginia State Library, Richmond.

McKern, T.W. and T.D. Stewart
1957 Skeletal Age Changes in Young American Males. Headquarters Quartermaster Research and Development, Technical Report EP-45, Natick, Massachusetts.

Marks, S.A., and A.W. Erickson
1966 Age Determination in the Black Bear. Journal of Wildlife Management 30(2):389-410.

Martin, Alexander C. and William D. Barkley
1961 Seed Identification Manual. University of California Press, Berkeley.

Merrell, James H.
1982a Natives in a New World: The Catawba Indians of Carolina, 1650-1800. Ph.D. dissertation, The John Hopkins University, Baltimore.

1982b "Our Bond of Peace": Patterns of Intercultural Trade in the Interior, 1650-1700. Paper presented at the Annual Meeting of the American Historical Association, Washington.

1984a "Their Very Bones Shall Fight": Catawba-Iroquois Relations. Paper presented at the Forty-Fourth Conference on Early American History, "The 'Imperial' Iroquois," Williamsburg, VA.

1984b The Indians' New World: The Catawba Experience. William and Mary Quarterly 3rd ser., 41:537-565.

Meyers, J.T.
1970 Chert Resources of the Lower Illinois Valley. Reports of Investigations No. 18, Illinois State Museum, Springfield.

Michel, Francis Louis
1916 Report of the Journey of Francis Louis Michel from Berne, Switzerland, to Virginia, October 2, 1701 - December 1, 1702. Translated and edited by William J. Hinke. Virginia Magazine of History and Biography 24:1-43,113-141,275-288.

Miller, Carl F.
1957 Reevaluation of the Eastern Siouan Problem with Particular Emphasis on the Virginia Branches - The Occaneechi, the Saponi, and the Tutelo. Smithsonian Institution, Bureau of American Ethnology, Bulletin 164, Apthropological Papers, Number 52. Government Printing Office, Washington.

1962 Archaeology of the John H. Kerr Reservoir Basin, Roanoke River Virginia-North Carolina. Bureau of American Ethnology Bulletin 182. Washington, D.C.

Molnar, S.
1971 Human Tooth Wear, Tooth Function and Cultural Variability. American Journal of Physical Anthropology 17:179-186.

Montgomery, F.H.
1977 Seeds and Fruits of Plants of Eastern Canada and Northeastern United States. University of Toronto Press, Toronto.

Mooney, James
1894 The Siouan Tribes of the East. Bureau of American Ethnology Bulletin 22. Washington, D.C.

Morris, Percy C.
1975 A Field Guide to Shells of the Atlantic and Gulf Coasts and The West Indies. Houghton Mifflin Co., Boston.

Morrison, A.J.
1921 The Virginia Indian Trade to 1673. William and Mary Quarterly 2nd ser., 1:217-236.

Morton, Richard L. (Editor)
1956 The Present State of Virginia from Whence is Inferred a Short View of Maryland and North Carolina, by Hugh Jones. The University of North Carolina Press, Chapel Hill.

Mouer, L. Daniel
1983 A Review of the Archaeology and Ethnohistory of the Monacans. In Piedmont Archaeology: Recent Research and Results, edited by J. Mark Wittofski and Lyle E. Browning, pp.21-39. Archaeological Society of Virginia, Special Publication No. 10, Richmond.

Myers, Albert Cook (Editor)
1970 William Penn's Own Account of the Lenni Lenape or Delaware Indians. The Middle Atlantic Press, Somerset.

Naroll, Raoul
1962 Floor Area and Settlement Population. American Antiquity 27:587-589.

Navey, Liane
1982 An Introduction to the Mortuary Practices of the Historic Sara. M.A. thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

Neumann, G.K.
1952 Archaeology and Race in the American Indian. In Archaeology of Eastern United States, edited by J.B. Griffin, pp. 13-34. The University of Chicago Press, Chicago.

Neumann, George
1967 The History of Weapons of the American Revolution. Harper and Row Publishers, New York.

Newman, Robert
1977 An Analysis of the European Artifacts from Chota-Tanasee: An Eighteenth Century Overhill Cherokee Town. Unpublished Master's thesis, Department of Anthropology, University of Tennessee, Knoxville.

Noel Hume, Ivor
1974 All the Best Rubbish. Harper and Row Publishers, New York.

Novick, L.A.
1978 Prehistoric Lithic Material Sources and Types in South Carolina: A Preliminary Statement. South Carolina Antiquities 10(1), Archeological Society of South Carolina, Columbia, SC.

Orchard, William C.
1929 Beads and Beadwork of the American Indians. Museum of the American Indian, Heye Foundation, New York.

Ortner, D.J. and W.G.J. Putschar
1981 Identification of Pathological Conditions in Human Skeletal Remains. Smithsonian Institution Press, Washington.

O'Shea, John M.
1984 Mortuary Variability, An Archaeological Investigation. Academic Press, Inc., Orlando, FL.

Payne, Sebastian
1972 On the Interpretation of Bone Samples from Archaeological Sites. In Papers in Economic Prehistory, edited by E.S. Higgs, pp. 65-81. Cambridge University Press, Cambridge.

1975 Partial Recovery and Sample Bias. In Archaeozoological Studies, edited by A.T. Clason, pp.7-17. North Holland, Amsterdam.

Pearson, Philip Edward
1842? Memoir of the Catawbas, sent to Governor James Henry Hammond. Ms., typescript copy in the York County Public Library, Rock Hill, SC.

Peebles, Christopher S.
1971 Moundville and Surrounding Sites: Some Structural Considerations of Mortuary Practice II. In Approaches to the Social Dimensions of Mortuary Practices, edited by J. A. Brown. Memoirs of the Society for American Archaeology 25:68-91.

Peet, Robert K.
1974 The Measurement of Species Diversity. Annual Review of Ecology and Systematics 5:285-307.

Peterson, Harold
1956 Arms and Armor in Colonial America, 1526-1783. The Stackpole Company, Harrisburg.

Petruso, Karl M. and Jere M. Wickens
1984 The Acorn in Aboriginal Subsistence in Eastern North America: A Report on Miscellaneous Experiments. In Experiments and Observations on Aboriginal Wild Plant Food Utilization in Eastern North America, edited by Patrick J. Munson, pp. 360-378. Indiana Historical Society, Prehistory Research Series, Volume VI, No. 2, Indianapolis.

Pianka, E.
1978 Evolutionary Ecology. Harper and Row, New York.

Polhemus, Richard
1981 Aboriginal Burial Associations from the Plum Grove Site, 40Wg17. In Archaeological Investigations at the Plum Grove Site, Washington County, Tennessee, edited by Roy S. Dickens, Jr. Ms. on file, Laboratory of Archaeology, Department of Anthropology, Georgia State University, Atlanta.

1984 Toqua Report. Unpublished draft report submitted to the Tennessee Valley Authority by the Department of Anthropology, University of Tennessee, Knoxville.

Price, F. G. Hilton
1908 Old Base Metal Spoons. B. T. Batsford, High Holborn, London, England.

Quinn, David B.
1977 North America From Earliest Discovery to First Settlements: The Norse Voyages to 1612. Harper and Row, New York.

Radford, Albert E., Harry F. Ahles, and C. Ritchie Bell
1968 A Manual of the Vascular Flora of the Carolinas. University of North Carolina Press, Chapel Hill.

Rapoport Amos
1969 House Form and Culture. Prentice-Hall, Inc., Englewood Cliffs.

Raymond, Percy E.
1952 Latten Spoons of the Pilgrims. In Antique Metalware, edited by James Mitchell. University Books, New York.

Rights, Douglas L.
1957 The American Indian in North Carolina. John F. Blair, Winston-Salem.

Rights, Douglas L. and William P. Cumming
1958 Essay on the Indians of Lederer's Discoveries. In The Discoveries of John Lederer, edited by W. P. Cumming, pp. 111-126. University of Virginia Press, Charlottesville.

Rothschild, Nan A.
1979 Mortuary Behavior and Social Organization at Indian Knoll and Dickson Mounds. American Antiquity 44:658-675.

Runquist, Jeannette
1979 Analysis of the Flora and Faunal Remains from Protohistoric North Carolina Cherokee Indian Sites. Ph.D. dissertation, Department of Zoology, North Carolina State University, Raleigh.

Sahlins, Marshall D.
1968 Tribesmen. Prentice-Hall, Inc., Englewood Cliffs, NJ.

Sainesbury, W.N. (Editor)
1893 Calendar of State Papers, Colonial Series, America and the West Indies, 1669-1674. Printed for Her Majesty's Stationary Office by Eyre and Spottiswoods, London.

Salley, Alexander S. (Editor)
1911 Narratives of Early Carolina, 1650-1708. Charles Scribner's Sons, New York.

SAS Institute, Inc.
1982 SAS User's Guide: Statistics, 1982 Edition. SAS Institute, Inc., Cary, NC.

Saunders, William L. (Editor)
1968 The Colonial Records of North Carolina. AMS Press, New York. Originally published 1886-1890, P.M. Hale, Raleigh, NC.

Saxe, A. A.
1971 Social Dimensions of Mortuary Practices in Mesolithic Populations from Wade Halfa, Sudan. In Approaches to the Social Dimensions of Mortuary Practices, edited by J. A. Brown. Memoirs of the Society for American Archaeology 25:39-56.

Schiffer Michael B.
1972 Archaeological Context and Systemic Context. American Antiquity 37:156-165.

1976 Behavioral Archeology. Academic Press, New York.

Schiffer, Michael B.
1976 Behavioral Archeology. Academic Press, New York.

Schmorl, G.
1971 The Human Spine in Health and Disease (2nd American Edition). Grune and Stratton, New York.

Schoeninger, M.J.
1979 Diet and Status at Chalcatzingo: Some Empirical and Technical Aspects of Strontium Analysis. American Journal of Physical Anthropology 51:295-310.

Schoeninger, M.J. and C.S. Peebles
1981 Effect of Mollusc Eating on Human Bone Strontium Levels. Journal of Archaeological Science 8:391-397.

Schorger, Arlie W.
1955 The Passenger Pigeon: Its Natural History and extinction. University of Wisconsin Press, Madison.

Schroedl, Gerald F.
1980 Structure and Village Pattern at the Historic Overhill Cherokee Towns of Chota and Tanasee. Paper presented at the 37th Annual Southeastern Archaeological Conference, New Orleans.

1983 Eighteenth Century Overhill Cherokee Domestic Structures. Paper presented at the 48th Annual Meeting of the Southeastern Archaeological Conference, Columbia.

Seehan, B. W.
1980 Savagism and Civility: Indian and Englishmen in Colonial Virginia. Cambridge University Press, Cambridge.

Service, Elman R.
1964 Primitive Social Organization. Random House, New York.

Sever, L.E.
1974 Zinc and Human Development: A Review. Human Ecology 3:43-57.

Severinghaus, C.W.
1949 Tooth Development and Wear as Criteria of Age in White-tailed Deer. Journal of Wildlife Management 13(2):195-216.

Sheldon, Elisabeth Shepard
1978 Childersburg: Evidence of European Contact Demonstrated by Archaeological Plant Remains. Southeastern Archaeological Conference Special Publication No. 5, pp. 28-29.

Shelford, Victor E.
1963 The Ecology of North America. University of Illinois Press, Urbana, Illinois.

Siebert, Frank T., Jr.
1945 Linguistic Classification of Catawba. International Journal of American Linguistics 11:100-104,211-218.

Simpkins, Daniel L.
1984 Some Spatial Configurations of late Archaeological Components in the Carolina-Virginia Piedmont. Paper presented at the Annual Meeting of the Society for Historic Archaeology, Williamsburg.

Sizemore, Beverly A.
1984 "Gorges" and "Wampum": Shell Artifacts from the Wall and Fredricks Sites. Paper presented at the Annual Meeting of the Society for Historic Archaeology, Williamsburg.

Smith, Bruce D.
1974 Middle Mississippi Exploitation of Animal Populations: a Predictive Model. American Antiquity 39(2):274-291.

1975a Toward a More Accurate Estimation of Meat Yield of Animal Species at Archaeological Sites. In Archaeozoological Studies, edited by A.T. Clason, pp.99-106. North Holland, Amsterdam.

1975b Middle Mississippi Exploitation of Animal Populations. Anthropological Papers, No. 57. Museum of Anthropology, University of Michigan, Ann Arbor.

1976 "Twitching": a Minor Ailment Affecting Human Paleoecological Research. In Cultural Change and Continuity, edited by C.E. Cleland, pp. 275-292. Academic Press, New York.

1985 The Role of Chenopodium as a Domesticate in Pre-Maize Garden Systems of the Eastern United States. Southeastern Archaeology, in press.

Smith, Eric Alden
1979 Human Adaptation and Energetic Efficiency. Human Ecology 7:53-74.

Smith, Gerald P.
1965 An Archaeological Survey of the New Hope River Valley. M.A. thesis, Department of Sociology and Anthropology, University of North Carolina, Chapel Hill.

Sorohan, Bryan P.
1985 An Analysis of the Dental Pathology of Human Skeletal Remains from the Wall and Fredricks Sites, Hillsborough, N.C. Honor's thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

South, Stanley
1959 A Study of the Prehistory of the Roanoke Rapids Basin. M.A. thesis, Department of Sociology and Anthropology, University of North Carolina, Chapel Hill.

1964 Analysis of the Buttons from Brunswick Town and Fort Fisher. The Florida Anthropologist 17:113-133.

1977 Method and Theory in Historical Archaeology. Academic Press, New York.

Speck, Frank G.
1919 The Functions of Wampum Among the Eastern Algonkian. Memoirs of the American Anthropological Association 6(1):3-71.

1935 Siouan Tribes of the Carolinas as Known from Catawba, Tutelo, and Documentary Sources. American Anthropologist 37:201-225.

Spencer, Herbert
1886 Part IV: Ceremonial Institutions. In The Principles of Sociology, Vol. II. D. Appleton and Co., New York.

Spicer, Edward H. (Editor)
1961 Perspectives in American Indian Culture Change. The University of Chicago Press, Chicago.

Steinbock, R.T.
1976 Paleopathological Diagnosis and Interpretation: Bone Diseases in Ancient Human Populations. Charles C. Thomas, Springfield, IL.

Stone, Lyle
1974 Fort Michilimackinac 1715-1781. Publications of the Museum, Michigan State University, East Lansing.

Sturtevant, William C.
1958 Siouan Languages in the East. American Anthropologist 60:738-743.

1975 Two 1761 Wigwams at Niantic, Connecticut. American Antiquity 40:437-444.

Styles, Bonnie Whatley
1981 Faunal Exploitation and Resource Selection: Early Late Woodland Subsistence in the Lower Illinois Valley. Northwestern University Archaeological Program, Evanston, Illinois.

Sumner, W. M.
1979 Estimating Population by Analogy: An Example. In Ethnoarchaeology, edited by Carol Kramer. Columbia University Press, New York.

Swanton, John R.
1946 The Indians of the Southeastern United States. Bureau of American Ethnology, Bulletin 137.

Szpunar, C.B., J.B. Lambert, and J.E. Buikstra
1978 Analysis of Excavated Bone by Atomic Absorption. American Journal of Physical Anthropology 48:199-202.

Tainter, J.
1978 Mortuary Practices and the Study of Prehistoric Social Systems. In Advances in Archaeological Method and Theory, Vol. 1, Edited by Michael B. Schiffer, pp. 105-141. Academic Press, New York.

Talalay, Laurie, Donald R. Keller, and Patrick J. Munson
1984 Hickory Nuts, Walnuts, Butternuts, and Hazelnuts: Observations and Experiments Relevant to Their Aboriginal Exploitation in Eastern North America. In Experiments and Observations on Aboriginal Wild Plant Food Utilization in Eastern North America, edited by Patrick J. Munson, pp. 338-359. Indiana Historical Society, Prehistory Research Series, Volume VI, No. 2, Indianapolis.

Tinling, Marion (Editor)
1977 The Correspondence of The Three William Byrds of Westover, Virginia, 1684-1776. 2 vols. University Press of Virginia, Charlottesville.

Trinkley, Michael, and S. Homes Hogue
1979 The Wachesaw Landing Site: The Last Gasp of the Coastal Waccamaw Indians. Southern Indian Studies 31:3-20.

Turner, E. Randolph
1978 An Intertribal Deer Exploitation Buffer Zone for the Virginia Coastal Plain--Piedmont Regions. Archeological Society of Virginia, Quarterly Bulletin 32:42-48.

Turner, F.J. and J. Verhoogen
1960 Igneous and Metamorphic Petrology. McGraw-Hill, New York.

Tyler, Lyon Gardiner (Editor)
1907 Descriptions of Virginia and Proceedings of the Colonie, by John Smith. In Narratives of Early Virginia. Charles Scribners' Sons, New York.

Ubelaker, Douglas L.
1974 Reconstruction of Demographic Profiles from Ossuary Skeletal Samples: A Case Study from the Tidewater Potomac. Smithsonian Institution, Washington.

1978 Human Skeletal Remains. Aldine Publishing Company, Chicago.

Ucko, P.
1969 Ethnography and Archaeological Interpretation of Funerary Remains. World Archaeology 1:262-280.

U.S. Department of Agriculture
1974 Seeds of Woody Plants in the United States. Agriculture Handbook No. 450, Forest Service, Washington.

Varner, John G., and Jeanette J. Varner (Translators and Editors)
1951 The Florida of the Inca. University of Texas Press, Austin.

Vaughan, Alden T.
1977 New England's Prospect by William Wood. University of Massachusetts Press, Amherst.

Voegelin, E. W.
1944 Mortuary Customs of the Shawnee and Other Eastern Tribes. Indiana Historical Society, Prehistoric Research Series 2:4.

Ward, H. Trawick
1980 The Spatial Analysis of the Plow Zone Artifact Distributions from Two Village Sites in North Carolina. Ph.D. dissertation, University of North Carolina, Chapel Hill.

1984a Intra-Site Patterns at the Warren Wilson Site. Paper presented at the Conference on Cherokee Prehistory, Warren Wilson College, Swannanoa, NC.

1984b The Spatial Dimension of Siouan Mortuary Ritual: Implications for Studies of Change. Paper presented at the Annual Meeting of the Society for Historic Archaeology, Williamsburg, Virginia.

1985 Social Implications of Storage and Disposal Patterns. In Structure and Process in Southeastern Archaeology, Edited by Roy S. Dickens, Jr. and H. Trawick Ward. University of Alabama Press, University (In Press).

Waselkov, Gregory A.
1977 Prehistoric Dan River Hunting Strategies. M.A. thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

Waselkov, Gregory, Brian M. Wood, and Joseph M. Herbert
1982 Colonization and Conquest: the 1980 Archaeological Excavations at Fort Toulouse and Fort Jackson, Alabama. Auburn University, Montgomery.

Washburn, Wilcomb E.
1957 The Governor and the Rebel: A History of Bacon's Rebellion in Virginia. University of North Carolina Press, Chapel Hill Press, Chapel Hill.

Watts, Steve
1985 Native vs. Trade Items in the Eighteenth Century Material Culture of the Catawbas and Other Southeastern Native Peoples. Ms. on file, Schiele Museum, Gastonia.

Weisner, Polly
1974 A Functional Estimator of Population from Floor Area. American Antiquity 39:343-350.

White, T.E.
1953 A Method for Calculating the Dietary Percentage of Various Food Animals Utilized by Aboriginal Peoples. American Antiquity 18:396-398.

White, Wesley
1981 Historical Overview of the [Saponi] Tribe: Second Essay. Ms. in possession of author.

Whitthoft, John, W. Fred Kinsey, III, and. C. H. Holzinger
1959 A Susquehannock Cemetery: The Ibaugh Site. In Susquehannock Miscellany, edited by John Whitthoft and W. Fred Kinsey, III, pp 99-119. The Pennsylvania Historical and Museum Commission, Harrisburg.

Williams, Roger
1643 A Key into the Language of America. George Dexter. London. (Reprinted for The Rhode Island and Providence Plantations Tercentary Committee, Inc., 1936, 5th edition, Roger Williams Press, Providence).

Williams, S.C. (Editor)
1930 Adair's History of the American Indians (Reprint of the 1775 London edition). The Watauga Press, Johnson City, Tennessee.

Wilson, Homes Hogue
1983 The Use of Paleo-Nutrition in the Analysis of North Carolina Piedmont Aboriginal Populations. Manuscript on file at the Research Laboratories of Anthropology, University of North Carolina, Chapel Hill.

1984 European Trade Goods from the Fredricks Site (31Or231). Paper presented at the Annual Meeting of the Society for Historic Archaeology, Williamsburg, Virginia.

Wilson, Jack H., Jr.
1976 Final Report: 1974 Excavations within the New Hope Reservoir. Ms. on file, Research Laboratories of Anthropology, University of North Carolina, Chapel Hill.

1977 Feature Fill, Plant Utilization and Disposal Among the Historic Sara Indians. M.A. thesis, University of North Carolina, Chapel Hill.

1983 A Study of Late Prehistoric, and Historic Indians of the Carolina and Virginia Piedmont: Structure, Process, and Ecology. Ph.D. dissertation, Department of Anthropology, University of North Carolina, Chapel Hill.

1985 Feature Zones and Feature Fill: More than Trash. In Structure and Process in Southeastern Archaeology, Edited by Roy S. Dickens, Jr. and H. Trawick Ward. University of Alabama Press, University (In Press).

Wing, Elizabeth
1977 Subsistence Systems in the Southeast. The Florida Anthropologist 30(2):81-87.

1979 Paleonutrition: Method and Theory in Prehistoric Lifeways. Academic Press, New York.

Winkler, Helmut G.F.
1976 Petrogenesis of Metamorphic Rock. Springer-Verlag, New York.

Winterhalder, Bruce
1981 Optimal Foraging Strategies and Hunter-Gatherer Research in Anthropology: Theory and Models. In Hunter-Gatherer Foraging Strategies, edited by Bruce Winterhalder and Eric Alden Smith, pp. 13-35. University of Chicago Press, Chicago.

1983 The Analysis of Hunter-Gatherer Diet: Stalking an Optimal Foraging Model. Paper prepared in advance for Wenner-Grenn Symposium No. 94, Cedar Cove, Fl.

Wright, J. Leitch, Jr.
1981 The Only Land They Knew: The Tragic Story of the American Indians in the Old South. The Free Press, New York.

Wright, Louis B.
1947 The History and Present State of Virginia, by Robert Beverley. The University of North Carolina Press, Chapel Hill.

Wright, Louis B. (Editor)
1966 The Prose Works of William Byrd of Westover: Narratives of a Colonial Virginian. Harvard University Press, Cambridge.

Yarnell, Richard A.
1974 Plant Food and Cultivation of the Salt Cavers. In Archaeology of the Mammoth Cave Area, edited by Patty Jo Watson, pp. 113-122. Academic Press, New York.

1978 Domestication of Sunflower and Sumpweed in Eastern North America. In The Nature and Status of Ethnobotany, edited by Richard I. Ford, pp. 289-299. Museum of Anthropology, University of Michigan, Anthropological Papers No. 67, Ann Arbor.

1982 Problems of Interpretation of Archaeological Plant Remains of the Eastern Woodlands. Southeastern Archaeology 1:1-7.

1983 Prehistoric Plant Foods and Husbandry in Eastern North America. Paper presented at the 48th Annual Meeting of the Society for American Archaeology, Pittsburgh.

Yarnell, Richard A. and M. Jean Black
1983 Temporal Trends Indicated by a Survey of Prehistoric Plant Food Remains from Southeastern North America. Revised version of a paper presented at the 40th Annual Meeting of the Southeastern Archaeological Conference, Columbia, SC.

APPENDICES

APPENDIX A

INVENTORY OF THE SKELETAL REMAINS

Wall Site: Burial 1

Cranial Remains: Complete cranium and mandible

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		5	5
Radius		5	5
Ulna		5	5
Carpals:			
Scaphoid		5	5
Lunate		5	5
Triquetral		5	5
Pisiform		5	5
Trapezium		5	5
Trapezoid		5	5
Capitate		5	5
Hamate		5	5
Metacarpals		4	5
Phalanges		4	4
Femur		5	5
Patella		5	5
Tibia		4/5	5
Fibula		4	4
Tarsals:			
Talus		5	5
Calcaneus		5	5
Navicular		5	4
Cuneiform (med)		5	4
Cuneiform (inter)		4	4
Cuneiform (lat)		5	5
Metatarsals		5	5
Phalanges		4	4
Clavicle		5	4
Scapula		4	4
Sternum		5	5
Ribs		4	4
Vertebrae:			
Cervical	5		
Thoracic	5		
Lumbar	5		
Innominates		5	5
Sacrum	5		

Scale:
5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace

*Bone is absent if not listed.

Wall Site: Burial 2

Cranial Remains: Extremely fragmented. Not reconstructed.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		1	1
Radius		1	1
Ulna		1	1
Carpals:			
Scaphoid		1	1
Metacarpals		1	1
Phalanges		1	1
Femur		1	1
Clavicle		3	-
Ribs		1	1
Vertebrae:			
Cervical	4		
Thoracic	2		
Innominates		1	1

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Wall Site: Burial 3

Cranial Remains: Cranium without face and almost complete mandible.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		5	5
Radius		5	5
Ulna		5	5
Carpals:			
Scaphoid		4	5
Lunate		5	5
Triquetral		5	4
Pisiform		2	2
Trapezium		2	-
Trapezoid		4/5	2
Capitate		5	5
Hamate		5	5
Metacarpals		4	4
Phalanges		4	4
Femur		5	5
Patella		5	5
Tibia		5	5

Fibula		3/4	5
Tarsals:			
Talus		5	5
Calcaneus		5	5
Navicular		5	5
Cuneiform (med)		5	5
Cuneiform (inter)		5	5
Cuneiform (lat)		5	5
Metatarsals		4	4
Phalanges		4	4
Clavicle		4	5
Scapula		4	4
Ribs		3	3
Vertebrae:			
Cervical	5		
Thoracic	4/5		
Lumbar	5		
Innominates		5	5
Sacrum	4/5		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace

*Bone is absent if not listed.

Wall Site: Burial 4

Cranial Remains: Complete cranium and mandible.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		5	4
Radius		3	3
Ulna		4	4
Carpals:			
Scaphoid		4	4
Lunate		4	4
Triquetral		4	4
Pisiform		4	4
Trapezium		4	4
Trapezoid		4	4
Capitate		4	4
Hamate		4	4
Metacarpals		4	4
Phalanges		3	3
Femur		5	5
Patella		5	5
Tibia		5	5
Fibula		4	4

Post-cranial Bones Recovered*	Single	Right	Left
Tarsals:			
Talus		4	4
Calcaneus		4	4
Navicular		4	4
Cuneiform (med)		4	4
Cuneiform (inter)		4	4
Cuneiform (lat)		4	4
Metatarsals		4	4
Phalanges		3	3
Clavicle		4	4
Scapula		3	3
Sternum	4		
Ribs		4	4
Vertebrae:			
Cervical	4		
Thoracic	4		
Lumbar	4		
Innominates		5	5
Sacrum	3		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Wall Site: Burial 5

Cranial Remains: Fragments of temporal bone.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		3	3
Radius		3	2
Ulna		3	-
Femur		3	3
Tibia		3	3
Fibula		2	2
Scapula		-	1
Ribs		1	1

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Wall Site: Burial 1-83

Cranial Remains: Almost complete cranium and mandible

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		4	4
Radius		4	4
Ulna		4	3
Phalanges		-	2
Femur		4	3
Tibia		4	3
Fibula		4	3
Scapula		1	1
Ribs		3	3
Vertebrae:			
Cervical	2		
Thoracic	1		
Innominates		2	2

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Wall Site: Burial 2-83

Cranial Remains: Fragments of parietals, temporals, and mandible.

Post-cranial Bones Recovered*	Single	Right	Left
Ribs		1	1

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Wall Site: Burial 3-83

Cranial Remains: Right and left petrous processes.

No post-cranial remains present.

Fredricks Site: Burial 1

Cranial Remains: Complete cranium and mandible

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		4	2
Radius		2	3
Ulna		4	3
Carpals:			
Scaphoid		4	4
Lunate		4	4
Triquetral		4	-
Pisiform		-	5
Metacarpals		-	3
Phalanges		3	3
Femur		4	5
Tibia		4	4
Fibula		3	3
Clavicle		-	2
Scapula		2	-
Ribs		2	2
Vertebrae:			
Cervical	3		
Thoracic	3		
Lumbar	2		
Innominates		3	3
Sacrum	3		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace

*Bone is absent if not listed.

Fredricks Site: Burial 2

Cranial Remains: Complete cranium and mandible.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		3	3
Radius		3	4
Ulna		3	3
Carpals:			
Lunate		-	4
Metacarpals		3	3
Phalanges		2	2
Femur		3	4
Patella		5	-

Tibia		5	5
Fibula		4	4
Tarsals:			
Talus		5	4
Calcaneus		4	3
Clavicle		4	4
Scapula		3	2
Sternum	3		
Ribs		3	3
Vertebrae:			
Cervical	3		
Thoracic	3		
Lumbar	3		
Innominates		4	4
Sacrum	3		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace

*Bone is absent if not listed.

Fredricks Site: Burial 3

Cranial Remains: Fragmented and partially reconstructed cranium and mandible.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		4	3
Radius		2	4
Ulna		3	4
Metacarpals		2	2
Phalanges		2	2
Femur		4	3
Tibia		3	4
Fibula		4	4
Tarsals:			
Talus		5	5
Calcaneus		4	3
Navicular		4	4
Cuneiform (med)		3	-
Cuneiform (inter)		5	-
Cuneiform (lat)		5	-
Metatarsals		3	2
Phalanges		2	2
Clavicle		3	3
Scapula		2/3	2/3
Ribs		2	2
Vertebrae:			
Cervical	2		
Thoracic	3		
Lumbar	3		

Innominates		4	3
Sacrum	4		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 4

Cranial Remains: Cranium incomplete and not reconstructed. Mandible is complete.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		5	5
Radius		4	5
Ulna		4	4
Carpals:			
Scaphoid		-	5
Metacarpals		1	1
Phalanges		3	3
Femur		4	4
Patella		-	4
Tibia		5	4
Fibula		4	5
Tarsals:			
Talus		5	5
Calcaneus		5	5
Navicular		5	5
Cuneiform (inter)		-	5
Cuneiform (lat)		5	-
Cuboid		5	-
Metatarsals		3	3
Phalanges		3	3
Clavicle		4	4
Scapula		2	4
Sternum	3		
Ribs		3	3
Vertebrae:			
Cervical	3		
Thoracic	3		
Lumbar	3		
Innominates		4	4
Sacrum	4		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 4a

Cranial Remains: Fragments of frontal, parietal, and temporal bones.

Post-cranial Bones Recovered*	Single	Right	Left
Femur		3	3
Tibia		3/4	3
Fibula		2	-
Ribs		2	2

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 5

Cranial Remains: Complete cranium and mandible.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		4/5	4
Radius		4	4
Ulna		5	4
Carpals:			
Scaphoid		5	-
Lunate		5	-
Metacarpals		2	2
Phalanges		2	2
Femur		4/5	5
Patella		4	4
Tibia		4/5	4/5
Fibula		4	4
Tarsals:			
Talus		5	5
Calcaneus		4	4
Navicular		4	4
Cuneiform (inter)		4	-
Cuneiform (lat)		4	3
Cuboid		3	3
Metatarsals		3	3
Phalanges		3	3
Clavicle		5	4
Scapula		3/4	3
Ribs		3	3
Vertebrae:			
Cervical	4		
Thoracic	4		
Lumbar	4		

Innominates	4/5	4/5
Sacrum	3	

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 6

Cranial Remains: Partial cranium and mandible with some reconstruction.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		3	2
Radius		2	3
Ulna		2	3
Femur		3	4
Tibia		2	2
Tarsals:			
Talus		-	2
Calcaneus		-	2
Scapula		1	1
Ribs		2	2
Vertebrae:			
Cervical	2		
Thoracic	2		
Lumbar	2		
Innominates		3	3
Sacrum	1		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 7

No cranial remains.

Post-cranial Bones Recovered*	Single	Right	Left
Tibia		3	3
Fibula		3	3

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 8

Cranial Remains: Fragments of frontal, parietal, occipital, and temporal bones. One half of mandible present.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		1	1
Radius		1	1
Ulna		1	1
Femur		3	-
Tibia		2	2
Fibula		1	1
Ribs		1	1
Vertebrae:			
Cervical	1		
Thoracic	1		
Lumbar	1		

Scale: 5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace
*Bone is absent if not listed.

Fredricks Site: Burial 9

Cranial Remains: Partial cranium and mandible with some restoration.

Post-cranial Bones Recovered*	Single	Right	Left
Humerus		3/4	4
Radius		2/3	2/3
Ulna		2/3	2/3
Femur		3	4/5
Tibia		4	4
Fibula		4	3
Clavicle		4	4
Scapula		3	3
Ribs		2	2

Vertebrae:			
Cervical	3		
Thoracic	4		
Lumbar	2/3		
Innominates		3	3
Sacrum	3		

Scale:
5 Complete
4 3/4 or diaphysis & 1 epiphysis
3 1/2 or diaphysis only
2 1/4 or part of diaphysis
1 Trace

*Bone is absent if not listed.

APPENDIX B

NON-DENTAL PATHOLOGIES

Wall Site

Burial 1

Traumatic/Violent Pathologies
Fractures: Left humerus shaft. The robusticity of the bone indicates that it was used after healing. The deltoid tuberosity and the head is deformed.
Cuts: None
Pierce: None
Degenerative Pathologies
Osteoarthritis:

Vertebrae	Stage of Lipping
C 1-3	0
C 4	2
C 5-7	1
T 1-7	0
T 8-9	1
T 10-11	0
T 12	1
L 1	3
L 2-3	2
L 4	3
L 5	4

Tendonitis: None
Tumors: None
Mechanical Stress
Schmorl's node: Thoracic vertebrae 11 and 12: Lumbar vertebrae 1 and 3.
Dietary Pathologies
Cribra orbitalia: None
Spongy hyperostosis: None
General osteitis:
Cranium: pitting in supra-orbital and frontal region.
Distal and proximal ends of femora and clavicles.
Distal end of tibiae and fibulae.
Proximal end of ulnae.
Left foot first middle phalange.
Innominates in acetabulum and aricular area.

Burial 2

Traumatic/Violent Pathologies
Fractures: None
Cuts: None
Pierce: None
Degenerative Pathologies
Osteoarthritis: None
Tendonitis: None
Tumors: None
Mechanical Stress
Schmorl's node: None

Dietary Pathologies
Cribra orbitalia: None
Spongy hyperostosis: None
General osteitis: None

Burial 3

Traumatic/Violent Pathologies
Fractures: None
Cuts: None
Pierce: None
Degenerative Pathologies
Osteoarthritis: The following bones exhibited slight lipping: Proximal and distal ends of both humerii, medeal articular facet of both patella, both scapula at glenoid cavity, metatarsals and foot phalanges

Vertebrae	Stage of Lipping
C 1-5	0
C 6	1
C 7	-
T 1	-
T 2	1
T 3	-
T 4-7	1
T 8	-
T 9-12	1
L 1	1
L 2	2
L 3	3
L 4-5	2

Tendonitis:
Calcanii
Patella
Humerii
Tumors: None
Mechanical Stress
Schmorl's node: Lumbar vertebrae 1, 2 and 4
Dietary Pathologies
Cribra orbitalia: None
Spongy hyperostosis: None
General osteitis: Proximal and distal ends of the long bones except the left radius.

Burial 4

Traumatic/Violent Pathologies
Fractures: None
Cuts: None
Pierce: None
Degenerative Pathologies
Osteoarthritis: None
Tendonitis: None

Tumors: None
Mechanical Stress
 Schmorl's node: None
Dietary Pathologies
 Cribra orbitalia: cribrotic type
 Spongy hyperostosis: frontal, parietal, and occipital bones
General osteitis: Pitting on ends of all long bones, on both innominates and vertebral bodies.

Burial 5 (No pathologies).

Burial 1-83

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: None
Dietary Pathologies
 Cribra orbitalia: porotic type
 Spongy hyperostosis: None
General osteitis: None

Burial 2-83 (No pathologies).

Burial 3-83 (No pathologies).

Fredricks Site

Burial 1

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: None

Dietary Pathologies
 Cribra orbitalia: porotic type
 Spongy hyperostosis: None
General osteitis: Both fibulae and tibiae shaft and left femur neck.

Burial 2

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None
Tumors: Possible osteoma on right side of mandible.
Mechanical Stress
 Schmorl's node: None
Dietary Pathologies
 Cribra orbitalia: porotic type
 Spongy hyperostosis: None
General osteitis: Pitting on occipital and temporal bones and on the neck of the right femur.

Burial 3

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: Thoracic 11.
Dietary Pathologies
 Cribra orbitalia: None
 Spongy hyperostosis: None
General osteitis: Tibiae shafts, right femur shaft, femora necks, lumbar vertebrae, and acetabulum of both innominates.

Burial 4

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: One cut along frontal, two cuts along right parietal, and two on occipital bone.
 Pierce: Possible wound above left orbit associated with cut on the frontal bone.
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None

Tumors: Possible osteoma on inside of mandible.
Mechanical Stress
 Schmorl's node: Thoracic 11.
Dietary Pathologies
 Cribra orbitalia: None
 Spongy hyperostosis: None
General osteitis: Left fibula on proximal and distal shaft. Clavicles and right radius also exhibit osteitis.

Burial 4a (No pathologies).

Burial 5

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: lipping on patella, right clavicle, tibae, head of right radius, proximal ends of both ulnii and the glenoid cavity of both scapula.

Vertebrae	Stage of Lipping
C 1	-
C 2	2
C 3	-
C 4	3
C 5-7	2
T 1-2	0
T 3	1
T 4	0
T 5	-
T 6	1
T 7-9	2
T 10	3
T 11-12	-
L 1-2	-
L 3-4	4
L 5	5

Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: Thoracic 7, 8, 9, 10, and 11.
Dietary Pathologies
 Cribra orbitalia: None
 Spongy hyperostosis: None
General osteitis: Pitting on occipital bone, auricular area of the right pelvis, left innominate on illium, both hummerii, both patella, distal fibula shafts, right clavicle, both femora and tibae.

Burial 6

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: None
Dietary Pathologies
 Cribra orbitalia: porotic type
 Spongy hyperostosis: None
General osteitis: Proximal end of right humerus and the auricular areas of both innominates.

Burial 7 (No pathologies).

Burial 8

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: None
Degenerative Pathologies
 Osteoarthritis: None
 Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: None
Dietary Pathologies
 Cribra orbitalia: Porotic type
 Spongy hyperostosis: None
General osteitis: None

Burial 9

Traumatic/Violent Pathologies
 Fractures: None
 Cuts: None
 Pierce: Possible gun shot wound of left fibla.
Degenerative Pathologies
 Osteoarthritis: Very slight lipping of lumbar vertebrae.
 Tendonitis: None
Tumors: None
Mechanical Stress
 Schmorl's node: Thoracic 8, 9, 10, and 11.
Dietary Pathologies
 Cribra orbitalia: None
 Spongy hyperostosis: None
General osteitis: None

APPENDIX C

DENTAL INVENTORY AND PATHOLOGIES
(adapted from Sorohan 1985*)

Scale: Deciduous	Permanent	
a	A	Tooth present
b	B	Tooth present with caries*
x	X	Pre-mortem loss
z	Z	Post-mortem loss*
o	O	Tooth not developed*
-		Tooth absent due to eruption of permanent dentition*

* Most of the infomation provided in this appendix is summarized from Sorohan 1985. An "*" indicates that the information is from the author's analysis of the dentition.

Max= Maxillary
Man= Mandibular

Wall Site

Burial 1

	Right					Permanent Dentition										Left
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Man	B	B	B	A	A	A	B	X	A	A	A	B	B	B	X	X

Periodontal disease: Slight to complete alveolar resorption
Calculus: Slight
Hypoplasia: 3-6 years
Percentage of teeth with caries: 58%
Mean attrition value: 6.8

Burial 2

Deciduous Dentition

	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	a	a	a	x	x	x	x	a	a	a
Man	b	b	x	x	x	x	x	a	a	a

Unerupted Permanent Dentition

	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	O	O	A	O	O	A	Z	A	Z	Z	A	O	O	A	O	O
Man	O	O	A	O	O	Z	Z	A	A	A	A	O	O	Z	O	O

Periodontal disease: None
Calculus: None
Hypoplasia: 0-6 months (deciduous); 18-24 months (permanent)
Percentage of teeth with caries: 27%

Burial 3

	Permanent Dentition															
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I1	C	PM1	PM2	M1	M2	M3
Max	X	X	X	B	B	X	A	A	B	A	X	B	B	A	A	X
Man	X	X	X	B	B	X	A	A	A	A	A	B	B	X	B	X

Periodontal disease: Slight to complete alveolar resorption
Calculus: Slight
Hypoplasia: 5-6 years
Percentage of teeth with caries: 62%
Mean attrition value: Max. 5.7; Man. 1.38

Burial 4

	Permanent Dentition															
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	B	A	B	B	A	A	A	A	A	A	A	A	B	A	A	A
Man	B	B	A	A	A	A	A	A	A	A	A	A	A	B	B	A

Periodontal disease: Slight
Calculus: Slight
Hypoplasia: 2-6 years; 11-12 years
Percentage of teeth with caries: 22%
Mean attrition value: Max. 1.69; Man. 1.38

Burial 5*

No dentition present.

Burial 1-83

	Deciduous Dentition									
	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	a	b	b	a	b	a	a	b	b	a
Man	a	b	a	a	z	a	a	a	b	a

Permanent dentition are insitu and could not be quantified.

Periodontal disease: Slight
Calculus: None
Hypoplasia: 7 months in utero to birth*; birth to 6 months
Percentage of teeth with caries: 37%

Burial 2-83

Deciduous Dentition

	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	a	a	a	a	a	a	a	z	a	z
Man	a	a	a	a	a	a	a	z	a	a

Unerupted Permanent Dentition*

	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	O	O	A	O	O	O	Z	Z	Z	Z	O	O	O	A	O	O
Man	O	O	Z	0	0	0	A	A	A	A	O	O	O	Z	O	O

Periodontal disease: None
Calculus: None
Hypoplasia: 7 months in utero to 9 months; 18 months*
Percentage of teeth with caries: 0%

Burial 3-83*

Deciduous Dentition

	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	o	o	o	x	x	a	x	o	o	o
Man	o	o	o	x	x	x	x	o	o	o

Periodontal disease: None
Calculus: None
Hypoplasia: None
Percentage of teeth with caries: 0%

Fredricks Site

Burial 1

Deciduous Dentition

	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	b	b	a	b	a	b	a	a	b	b
Man	b	b	a	a	a	a	a	a	a	b

Unerupted Permanent Dentition

	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	O	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O
Man	O	A	A	A	A	A	A	A	A	A	A	A	A	A	A	0

Periodontal disease: Slight
Calculus: Slight
Hypoplasia: 0-9 months(deciduous); 3-4 years (permanent)
Percentage of teeth with caries: 45%

Burial 2

Deciduous Dentition

	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	a	b	a	-	-	-	-	b	b	a
Man	a	a	a	-	-	-	-	a	b	a

Permanent Unerupted Dentition (unless in parentheses)

	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	O	A	(B)	A	A	A	(A)	(A)	(B)	(A)	A	A	A	(B)	A	O
Man	O	A	(A)	A	A	A	(A)	(A)	(A)	(A)	A	A	A	(A)	A	0

Periodontal disease: Slight
Calculus: Slight
Hypoplasia: Birth to 9 months (deciduous); 9 months to 6 years (permanent)
Percentage of teeth with caries: 29%

Burial 3

Permanent Dentition

	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	A	A	A	A	A	A	B	B	B	B	B	B	Z	A	A	A
Man	B	A	A	A	A	A	A	Z	B	B	A	A	A	A	A	A

Periodontal disease: Slight to moderate
Calculus: Moderate
Hypoplasia: 2-7 years; 11-15 years
Percentage of teeth with caries: 27%
Mean attrition value: Max. 3.7; Man. 3.6
* Interproximal wear was noted between max. RI1 and LI1, RI1 and RI2, LI1 and LI2, RI2 and RC, LI2 and LC, RC and RPM1, LC and LPM1. Possible tool use of teeth, grooves possibly created by repeated insertion of a hard object.

Burial 4

Permanent Dentition

	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	B	A	B	A	A	A	B	B	B	B	A	A	A	A	A	B
Man	B	B	B	A	B	A	B	Z	A	A	A	A	B	B	B	B

Periodontal disease: Moderate
Calculus: Moderate
Hypoplasia: 9 months to 18 years; 11-15 years
Percentage of teeth with caries: 52%
Mean attrition value: Max. 1.69; Man. 1.6

Burial 4a

No dentition present.

Burial 5

	Permanent Dentition															
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Man	X	X	X	B	B	B	X	A	X	A	B	X	X	X	X	X

Periodontal disease: Slight to complete alveolar resorption
Calculus: Moderate
Hypoplasia: 3-5 years
Percentage of teeth with caries: 67%
Mean attrition value: Man. 6.5

Burial 6

	Permanent Dentition															
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B
Man	Z	B	B	B	B	B	A	Z	A	A	Z	B	B	B	B	B

Periodontal disease: Moderate
Calculus: Moderate
Hypoplasia: 1-12 years
Percentage of teeth with caries: 86%
Mean attrition value: Max. 5.0; Man. 4.6

Burial 7

No dentition present.

Burial 8

	Deciduous Dentition									
	M2	M1	C	I2	I1	I1	I2	C	M1	M2
Max	b	b	a	z	z	b	b	a	z	b
Man	b	b	a	a	a	a	a	a	b	b

	Permanent Dentition															
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	O	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O
Man	O	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O

Periodontal disease: None
Calculus: None
Hypoplasia: Birth to 9 months (deciduous); 1-4 years (permanent)
Percentage of teeth with caries: 53%

Burial 9

	Permanent Dentition															
	M3	M2	M1	PM2	PM1	C	I2	I1	I1	I2	C	PM1	PM2	M1	M2	M3
Max	X	X	X	A	A	B	A	B	Z	B	A	B	B	B	X	X
Man	B	X	X	A	A	A	A	Z	Z	A	A	A	A	X	X	B

Periodontal disease: Moderate to complete alveolar resorption
Calculus: Slight
Hypoplasia: 1-6 years; 12 years
Percentage of teeth with caries: 40%
Mean attrition value: Max. 5.25; Man. 3.45