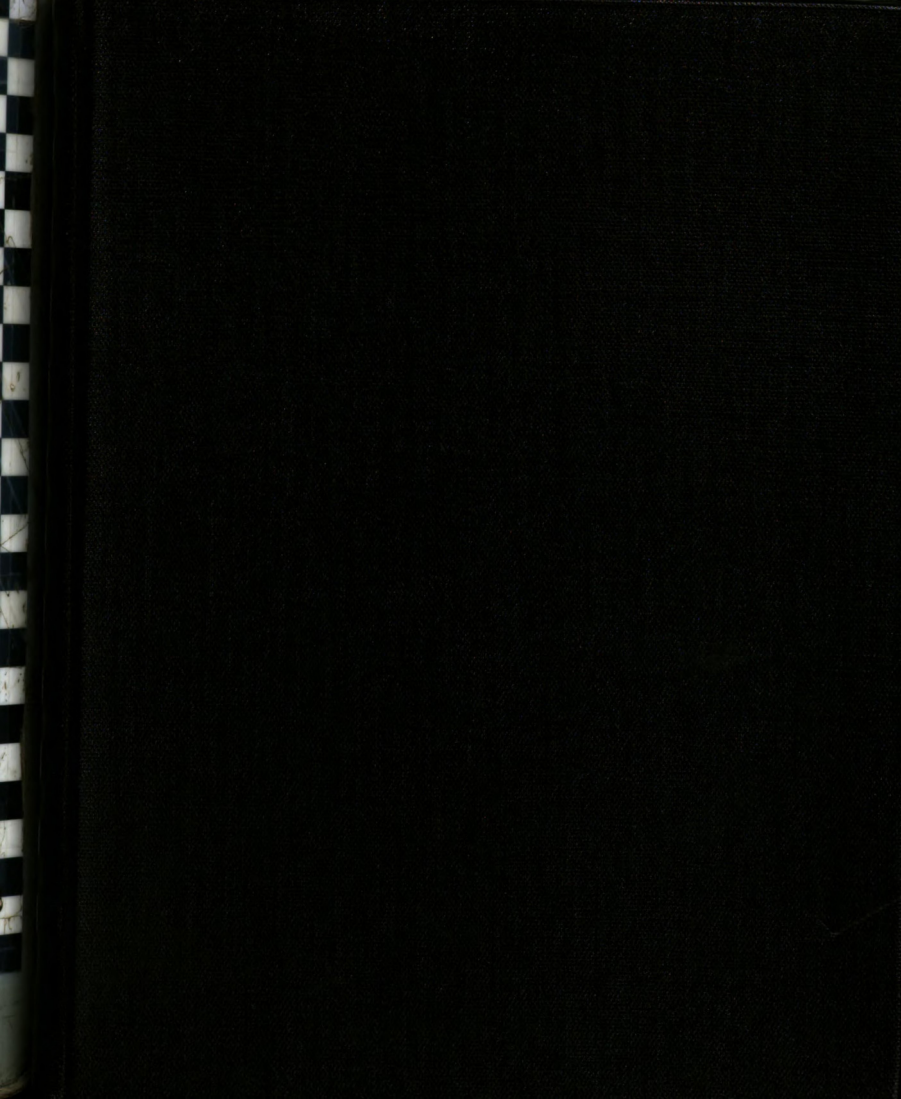






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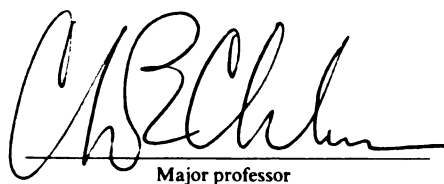
Site Formation Processes
in Historical Archeology

presented by

William B. Lees

has been accepted towards fulfillment
of the requirements for

Doctoral degree in Anthropology



Major professor

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SITE FORMATION PROCESSES IN HISTORICAL ARCHEOLOGY

VOLUME I

By

William Bennett Lees

A DISSERTATION

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

DOCTOR OF PHILOSOPHY

Department of Anthropology

1988

Site formation processes are important with the validity of the research approach. This research approach is based on a theory of site formation processes: in situ processes, refuse disposal, and patterned processes. These hypotheses which are based on a theory of site formation processes describe the predicted question. These artifacts in the context of the diversity of the condition of artifacts within the importance of the collection. These consisting of well-known nineteenth century

ABSTRACT

SITE FORMATION PROCESSES IN HISTORICAL ARCHEOLOGY

By

William Bennett Lees

Site formation processes in archeology have become increasingly important with the realization of the potential affect these processes have on the validity of site interpretations and comparative analyses. This research approaches the problem of site formation processes in historical archeology by examining three of the most common formation processes: in situ-de facto formation, site formation through primary refuse disposal, and site formation through secondary refuse disposal. Based on a theory that states that site formation processes represent patterned processes, models are proposed for each of these three site formation processes. These models are based on a similar set of seven hypotheses which are modified for each formation process to specifically describe the predicted archeological manifestations of the process in question. These hypotheses concern 1) the importance of burned artifacts in the collection, 2) the diversity of artifact classes, 3) the diversity of artifact types within classes, 4) the size and condition of artifacts, 5) the presence of patterns of spatial distribution within the site, 6) the importance of durable goods, and 7) the importance of the architectural assemblage in the total site collection. These models are compared to independent data sets consisting of well-documented excavated sites dating from the early to middle nineteenth century and located in Kansas, Oklahoma, and Arkansas.

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ed both identified and

Despite similarities in location, these sites are variable with respect to factors such as function, ethnicity, and socio-economic status. Evaluation of these models demonstrated that five of the seven hypotheses are supported by the data, and two are rejected. Based on the strength of the performance of the five successful hypotheses, the models, and the general theory on which they are based, are supported as valid. This study demonstrates that processes of site formation result in patterns in the archeological record. These patterns cross-cut cultural variables such as ethnicity and function, and can destroy the value of comparative analyses if not recognized and controlled for. By demonstrating that these processes result in predictable patterns, it has been demonstrated that the affects of these patterns on sites can be both identified and compensated for.

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A dissertation always benefits from the contribution of many individuals. Here, I would like to recognize those persons who, in some cases very indirectly, had a significant role to play in my arriving at this point in my career and in completing this dissertation. At the outset, I must acknowledge Dan McPike of Tulsa's Gilcrease Museum and Charles Cheek, then of the University of Tulsa, who started me in my career in archeology. Charles is one of the finest educators I have ever known, and his influence on my career and my philosophy of archeology is substantial.

Doug Scott has been most helpful and supportive of my research. I worked for Doug when he excavated the Fort Towson Commanding Officer's Quarters in 1975 and thus gained first-hand knowledge of the site and the potential of its research collection. This was certainly critical in the selection of this collection as a focus for this dissertation.

During the course of my graduate study, and especially during the years since leaving residence at Michigan State in 1980, I on numerous occasions came very close to giving up the pursuit of my Ph.D. With very subtle and usually non-intentional prodding, typically expressed as confidence and support, my mother, aunt Frances, brother John and his wife Anita, my neighbors Dave and Susan Ohse, and many friends and colleagues (especially Eileen Johnson) kept me on course. I could not have done it without their support.

The last year that I spent working on this dissertation was also

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the first year of my marriage to Verone. She made it possible to devote literally every waking hour to this dissertation, but in the process gave up much of what she could have otherwise expected of this period in our lives. Her sacrifice was real and her contribution to this dissertation is very substantial.

The Oklahoma Historical Society was key to this dissertation by allowing the collections from the Fort Towson Commanding Officer's Quarters to be loaned to the Kansas State Historical Society so that I could undertake my research. Much of the research and writing of this dissertation was accomplished after hours at the Kansas State Historical Society. The Society was helpful not only in allowing the use of these facilities but also in agreeing to borrow the collections in the first place and in underwriting my trip to Oklahoma to return the collections to the Oklahoma Historical Society.

Chuck Cleland, Bill Lovis, Larry Robbins, and Ken Lewis made up my guidance committee. Their friendship and help over more than a decade is appreciated.

I can't complain about the word processing, drafting, and Photography, because I did all of that myself.

CHAPTER 1: THEORY

Introduction

Site Formation

Site Formation
Historical

The Place of
in Archaeology

Implications
Analytical

Analytical
Historical

Summary . . .

CHAPTER 2: STUDY

The Study Site

Spatial

Temporal

Summary

The Study Context

The Primary
Township

The Community

The

The

The

The

For

TABLE OF CONTENTS

CHAPTER 1: THEORETICAL ORIENTATION	1
Introduction and Problem Statement	1
Site Formation Processes	5
Site Formation Processes and Historical Archeology	17
The Place of Site Formation Processes in Archeological Theory	25
Implications of Site Formation for Analytical Approaches	30
Analytical Approaches in Historical Archeology	30
Summary	38
CHAPTER 2: STUDY APPROACH	40
The Study Setting	40
Spatial Limits	41
Temporal Limits	43
Summary	45
The Study Collections	45
The Primary Study Collection: Fort Towson Commanding Officer's Quarters	47
The Comparative Study Collections	50
The Arkansas Post Branch Bank	50
The Vandever-Haworth Site	55
The Posey Site	59
The Pate-Roden Site	62
Fort Towson East Barracks	65

For

Site

The

Site

Summary

Research Hypo

In Situ

Primary

Seconda

Data Require

Methodologic

CHAPTER 3: ESTABLISHING
OF IN SITU-DATA
FORT TOWSON

Examining th

Examina

At

Ki

No

Pe

Fu

Of

Di

Examina

Fort Washita	67
North Parade Ground Structure	68
Hospital Complex	70
South Barracks	72
Site 34PS212	72
The Jotham Meeker Farmstead	73
Site 14SH315	77
Summary of Study Collections	79
Research Hypotheses	79
In Situ-De Facto Refuse Disposal	81
Primary Refuse Disposal	84
Secondary Refuse Disposal	87
Data Requirements	90
Methodological Approach	92
CHAPTER 3: ESTABLISHING A BASELINE: THE PATTERN	
OF IN SITU-DE FACTO REFUSE DISPOSAL AT THE	
FORT TOWSON COMMANDING OFFICER'S QUARTERS	95
Examining the Model	97
Examination of Hypothesis 1	97
Architectural Artifacts	98
Kitchen Artifacts	100
Non-Kitchen Tools	102
Personal and Clothing Artifacts	103
Furniture Artifacts	103
Other Evidence for Burning	103
Discussion	104
Examination of Hypothesis 2	104

Examina

Ar

Ki

No

Fl

Di

Examina

Examina

Ar

No

Di

Examina

Examina

Discussion

CHAPTER 4: REFINING
COMPARED TO

The Model a:

Hypoth

Hypoth

Hypoth

Hypoth

Hypoth

Hypoth

Hypoth

Discus

Examination of Hypothesis 3	108
Architectural Artifacts	109
Kitchen Related Artifacts	113
Non-Kitchen Tools	114
Furniture Group	114
Discussion	116
Examination of Hypothesis 4	116
Examination of Hypothesis 5	124
Architectural Artifacts	125
Non-Architectural Artifacts	131
Discussion	142
Examination of Hypothesis 6	142
Examination of Hypothesis 7	148
Discussion	149
CHAPTER 4: REFINING THE BASELINE: THE MODEL	
COMPARED TO THE ARKANSAS POST BANK	152
The Model and Arkansas Post	152
Hypothesis 1	153
Hypothesis 2	156
Hypothesis 3	159
Hypothesis 4	163
Hypothesis 5	168
Hypothesis 6	169
Hypothesis 7	172
Discussion	174

CHAPTER 5: EXPLORATION

Examining the

Hypothe

Hypothe

Hypothe

For

For

For

For

Th

Th

Di

Hypothe

Hypothe

For

Jo

Th

Th

For

For

For

Di

Hypothe

Hypothe

Discuss

CHAPTER 6: EXPLORATION

Examining the

Hypothe

CHAPTER 5: EXPLORING PRIMARY REFUSE CONTEXTS	179
Examining the Model	180
Hypothesis 1	180
Hypothesis 2	182
Hypothesis 3	195
Fort Towson East Barracks	196
Fort Washita North Parade Ground Structure	197
Fort Washita Hospital	197
The Posey Site	199
The Jotham Meeker Farmstead	200
Discussion	201
Hypothesis 4	202
Hypothesis 5	207
Fort Towson East Barracks	207
Jotham Meeker Farmstead	208
The Posey Site	209
The Pate-Roden Site	210
Fort Washita North Parade Ground Structure	211
Fort Washita Hospital	211
Discussion	212
Hypothesis 6	212
Hypothesis 7	215
Discussion	217
CHAPTER 6: EXPLORING SECONDARY REFUSE CONTEXTS	221
Examining the Model	222
Hypothesis 1	222

Hypothes

Hypothes

145

3-1

Di

Hypothe

Hypothe

Hypothe

Hypothe

Discuss

CHAPTER 7: SUMMARY

Summary and

Hypoth

Hypoth

Hypoth

Hypoth

Hypoth

Hypoth

Hypoth

Discu

Conclusion

Recom

APPENDIX . . .

Introducti

Catal

Architectu

Hypothesis 2	223
Hypothesis 3	231
14SH315	232
34PS212	233
Discussion	234
Hypothesis 4	235
Hypothesis 5	238
Hypothesis 6	239
Hypothesis 7	241
Discussion	245
CHAPTER 7: SUMMARY AND CONCLUSIONS	249
Summary and Implications	250
Hypothesis 1	250
Hypothesis 2	252
Hypothesis 3	254
Hypothesis 4	255
Hypothesis 5	258
Hypothesis 6	259
Hypothesis 7	261
Discussion	263
Conclusions and Recommendations	264
Recommendations	265
APPENDIX	271
Introduction	271
Catalog System	272
Architectural Artifacts	277

Nails

Window

Rim Lock

Wrought

Bar Sta

Cast B.

Strap H

Shutter

Wrought

Mud Da.

Flashi

Kitchen Art

Cerami

Punch-

Knives

Cast I

Grater

Tin Ca

Cerami

Coffee

Bail .

Tin Ha

Tin Ca

Recog-

Personal an

Person

Cloth

Nails	278
Window Glass	281
Rim Locks	284
Wrough Iron "Suffolk" Type Thumb Latches	300
Bar Staple	315
Cast Butt Hinges	316
Strap Hinges and Pintles	329
Shutter Bolt	338
Wrought Iron Hooks and Staples	339
Mud Dauber Nests	347
Flashing	349
Kitchen Artifacts	351
Ceramic Vessels	351
Punch-Decorated Tin	355
Knives and Forks	359
Cast Iron Cooking Wares	367
Grater	373
Tin Candle Holder	374
Ceramic Candle Holder	374
Coffee Mill	376
Bail	376
Tin Handles	376
Tin Cans	378
Recognizable Melted and Unmelted Glass Artifacts . .	381
Personal and Clothing Artifacts	411
Personal Artifacts	411
Clothing Artifacts	418

Non-Kitchen

Spades

Broad

Brood

Loggin

Fire P

Hammer

Scisso

File .

Balance

Fish H

Sleigh

Spurs

Curry

Harnes

Harnes

Harnes

Harnes

Horse

Adjust

Furniture H

Furnit

Caster

Bed Sc

Clothi

Brass

Non-Kitchen Tools	424
Spades	424
Broad or Planter's Hoe	429
Broom Handle	429
Logging Pike	431
Fire Pokers	433
Hammer	433
Scissors	435
File	435
Balances	436
Fish Hooks	439
Sleigh Bells	439
Spurs	439
Curry Comb	440
Harness Hardware	440
Harness Bosses	442
Harness Buckles	443
Harness Rings	444
Horse Shoes	444
Adjustable Wrench	444
Furniture Hardware	445
Furniture Sized Cast Butt Hinges	445
Casters	455
Bed Screws	459
Clothing Hooks	461
Brass Tacks	463

Iron

Keys

Cabin

Hock

Color

Unrecogniz

Non-R

Non-R

Non-R

Non-R

Non-G

Miscellaneous

Unide

Rolle

Iron

Misce

Misce

Misce

Misce

REFERENCES CITE

Iron Tacks	463
Keys	463
Cabinet Locks	465
Hook	467
Colorless Glass Pendants	468
Unrecognizable Melted Glass Artifacts	470
Non-Recognizable Aqua Glass	471
Non-Recognizable Clear Glass	475
Non-Recognizable Green Glass	476
Non-Recognizable Aggregate Glass	477
Non-Glass Inclusions in Melted Glass	478
Miscellaneous Artifacts	483
Unidentifiable Tin Fragments	483
Rolled Lip Tin Sheets	485
Iron Strap	486
Miscellaneous Melted Metal	490
Miscellaneous Iron Artifacts	491
Miscellaneous Copper Alloy Artifacts	493
Miscellaneous Bone Artifacts	494
REFERENCES CITED	495

Table 1. Summary

Table 2. Summary
Wadever-H

Table 3. Artific
Fort Towson

Table 4. Size of
Towson Comm

Table 5. Summary
Fort Towson

Table 6. Summary
nails, cera
bottle glas
Officer's C

Table 7. Total
category, w
glass, Fort
Quarters

Table 8. Distr
bottle and
Commanding

Table 9. Distr
Towson Comm

Table 10. Summary
Commanding

Table 11. Summary
Towson Comm

Table 12. Artific

Table 13. Distr
Arkansas Po

Table 14. Size
Arkansas Po

Table 15. Summary
nails, cera
glass, and
Arkansas Po

LIST OF TABLES

Table 1. Summary of comparative study collections	51
Table 2. Summary of features excavated at the Vandever-Haworth site in 1966 and 1968	58
Table 3. Artifacts present in the collection, Fort Towson Commanding Officer's Quarters	106
Table 4. Size distribution of artifacts, Fort Towson Commanding Officer's Quarters	117
Table 5. Summary of artifact sizes, all artifacts, Fort Towson Commanding Officer's Quarters	121
Table 6. Summary of artifact sizes, without nails, ceramic sherds, and fragments of bottle glass, Fort Towson Commanding Officer's Quarters	122
Table 7. Total versus whole artifacts by size category, without nails, ceramics, and bottle glass, Fort Towson Commanding Officer's Quarters	123
Table 8. Distribution of recognizable glass bottle and tableware fragments, Fort Towson Commanding Officer's Quarters	133
Table 9. Distribution of melted glass, Fort Towson Commanding Officer's Quarters	134
Table 10. Summary of durable goods, Fort Towson Commanding Officer's Quarters	144
Table 11. Summary of consumable goods, Fort Towson Commanding Officer's Quarters	146
Table 12. Artifacts from the Arkansas Post bank	157
Table 13. Distribution of earthenwares, Arkansas Post bank	161
Table 14. Size distribution of selected artifacts, Arkansas Post bank	164
Table 15. Summary of artifact sizes, without nails, ceramic sherds, fragments of bottle glass, and fragments of cast iron stoves, Arkansas Post bank	166

Table 16. Total
category,
class, and
Arkansas P

Table 17. Dura
Arkansas P

Table 18. Cons
Arkansas P

Table 19. Summ
sites with

Table 20. Arti
Fort Towso

Table 21. Arti
Fort Washi

Table 22. Arti
Fort Washi

Table 23. Arti
Posey site

Table 24. Arti
Pate-Roden

Table 25. Arti
Jotham Mee

Table 26. Summ
refuse con

Table 27. Summ
de facto c

Table 28. Dist
Fort Towso

Table 29. Dist
Washita No

Table 30. Dist
Washita Ho

Table 31. Dist

Table 32. Dist
Meeker Far

Table 16. Total versus whole artifacts by size category, without nails, ceramics, bottle glass, and cast iron stove parts, Arkansas Post bank	167
Table 17. Durable goods (non-architectural), Arkansas Post bank	170
Table 18. Consumable/breakable goods, Arkansas Post bank	170
Table 19. Summary of architectural artifacts from sites with in situ-de facto refuse contexts	173
Table 20. Artifacts from primary refuse contexts, Fort Towson East Barracks	183
Table 21. Artifacts from primary refuse contexts, Fort Washita North Parade Ground Structure	184
Table 22. Artifacts from primary refuse contexts, Fort Washita Hospital	185
Table 23. Artifacts from primary refuse contexts, Posey site	187
Table 24. Artifacts from primary refuse contexts, Pate-Roden site	189
Table 25. Artifacts from primary refuse contexts, Jotham Meeker farmstead	190
Table 26. Summary of artifact classes for primary refuse contexts	192
Table 27. Summary of artifact classes for in situ-de facto contexts	193
Table 28. Distribution of earthenwares at the Fort Towson East Barracks	197
Table 29. Distribution of earthenwares, Fort Washita North Parade Ground Structure	198
Table 30. Distribution of earthenwares, Fort Washita Hospital	198
Table 31. Distribution of earthenwares, Posey site	199
Table 32. Distribution of earthenwares, Jotham Meeker Farmstead	200

Table 33. Summ
ceramic sh
primary re

Table 34. Total
category,
glass, sit

Table 35. Rati
architectu
refuse con

Table 36. Summ
from sites

Table 37. Arti
contexts,

Table 38. Arti
contexts,

Table 39. Arti
contexts,

Table 40. Arti
contexts,

Table 41. Summ
secondary

Table 42. Dist

Table 43. Dist

Table 44. Summ
ceramic sh
sites 14SH

Table 45. Total
category,
glass, sit

Table 46. Rati
to ceramic
14SH315, 3
Pate-Roden

Table 33. Summary of artifact sizes, without nails, ceramic sherds, and fragments of bottle glass, primary refuse contexts	203
Table 34. Total versus whole artifacts by size category, without nails, ceramics, and bottle glass, sites with primary refuse contexts	205
Table 35. Ratio of durable goods (non- architectural) to ceramic sherds, primary refuse contexts	213
Table 36. Summary of architectural artifacts from sites with primary refuse contexts	216
Table 37. Artifacts from secondary refuse contexts, 14SH315	225
Table 38. Artifacts from secondary refuse contexts, 34PS212	226
Table 39. Artifacts from secondary refuse contexts, Vandever-Haworth site	227
Table 40. Artifacts from secondary refuse contexts, Pate-Roden site	229
Table 41. Summary of artifact classes for secondary refuse contexts	229
Table 42. Distribution of earthenwares, 14SH315	232
Table 43. Distribution of earthenwares, 34PS212	234
Table 44. Summary of artifact sizes, without nails, ceramic sherds, and fragments of bottle glass, sites 14SH315 and 34PS212	236
Table 45. Total versus whole artifacts by size category, without nails, ceramics, and bottle glass, sites 14SH315 and 34PS212	237
Table 46. Ratio of durable goods (non-architectural) to ceramic sherds, secondary refuse contexts, 14SH315, 34PS212, Vandever-haworth, and Pate-Roden sites	240

Table 47. Arch
secondary

Table 48. Rela
artifacts

Table 49. Aver
per artifa
and second

Table 50. Summ

Table 51. Cata
Commanding
provenience

Table 52. Desc
Fort Towso

Table 53. Freq

Table 54. Size

Table 55. Size

Table 56. Summ

Table 57. Prov

Table 58. Desc

Table 59. Summ

Table 60. Misc

Table 61. Summ

Table 62. Summ

Table 63. Summ

Table 64. Summ
multiple t

Table 65. Summ
single thi

Table 66. Summ

Table 67. Summ

Table 68. Summ

Table 47. Architectural artifacts from sites with secondary refuse contexts	242
Table 48. Relative importance of architectural artifacts from secondary refuse contexts	244
Table 49. Average percentages, number of classes per artifact group, in situ-de facto, primary and secondary site formation	253
Table 50. Summary of evaluation of hypotheses	263
Table 51. Catalog numbers for the Fort Towson Commanding Officer's Quarters and the proveniences they identify	274
Table 52. Descriptions of location of test trenches, Fort Towson Commanding Officer's Quarters	275
Table 53. Frequency of whole nails, all types	279
Table 54. Sizes of common cut and finish cut nails	279
Table 55. Sizes of "L" head and rose head nails	280
Table 56. Summary of non-melted window glass	283
Table 57. Provenience and sizes, unassociated screws	327
Table 58. Descriptions of unassociated staples	346
Table 59. Summary of mud dauber nests	348
Table 60. Miscellaneous punch-decorated tin	357
Table 61. Summary of sanitary seam can fragments	381
Table 62. Summary of bed screws	459
Table 63. Summary of all non-recognizable melted glass	470
Table 64. Summary of non-recognizable aqua glass: multiple thickness, puddled, and severely burned	473
Table 65. Summary of non-recognizable aqua glass: single thickness	474
Table 66. Summary of non-recognizable clear glass	476
Table 67. Summary of non-recognizable green glass	477
Table 68. Summary of non-recognizable aggregate glass	478

Table 69. Non-El

Table 70. Uniden

Table 71. Uniden
mail perfora

Table 72. Summa

Table 73. Summa

Table 74. Summa

Table 69. Non-glass inclusions found within melted glass . .	481
Table 70. Unidentifiable tin fragments	484
Table 71. Unidentified tin fragments with one or more nail perforations	484
Table 72. Summary of tin squares with rolled edges	485
Table 73. Summary of strap iron artifacts	488
Table 74. Summary of miscellaneous melted metal	490

Figure 1. Location
in this city

Figure 2. Plan of
Officer's
trenches

Figure 3. Plan of
Post Bank

Figure 4. Plan of
Haworth's

Figure 5. Plan of

Figure 6. Plan of
Pate-Rode

Figure 7. Plan of
barrack,

Figure 8. Plan of
Washita

Figure 9. Plan of
Washita

Figure 10. Plan of
of the J

Figure 11. Plan of

Figure 12. Plan of

Figure 13. Plan of

Figure 14. Plan of

Figure 15. Plan of

Figure 16. Plan of

Figure 17. Plan of

Figure 18. Plan of
clothing

Figure 19. Plan of

LIST OF FIGURES

Figure 1. Location of the sites discussed in this chapter	46
Figure 2. Plan of Fort Towson Commanding Officer's Quarters showing rooms and test trenches excavated	49
Figure 3. Plan of the excavations at the Arkansas Post Bank	53
Figure 4. Plan of excavations at the Vandever- Haworth site	57
Figure 5. Plan of excavations at the Posey site	60
Figure 6. Plan of excavations at the Pate-Roden site	63
Figure 7. Plan of excavations at the east barrack, Fort Towson	66
Figure 8. Plan of excavations at the Fort Washita north parade ground structure	69
Figure 9. Plan of excavations at the Fort Washita hospital complex	71
Figure 10. Plan of excavations within Area 851 of the Jotham Meeker farmstead	76
Figure 11. Plan of excavations at site 14SH315	78
Figure 12. Distribution of melted aqua glass	126
Figure 13. Distribution of common cut nails	128
Figure 14. Distribution of architectural hardware	129
Figure 15. Distribution of all types of ceramics	132
Figure 16. Distribution of kitchen artifacts	137
Figure 17. Distrubution of furniture artifacts	138
Figure 18. Distribution of personal and clothing artifacts	139
Figure 19. Distribution of non-kitchen tools	140

Figure 20. Do

Figure 21. Ri

Figure 22. Ri

Figure 23. Su
press ass

Figure 24. Ha
thumb lat

Figure 25. Ex

Figure 26. Ca
condition

Figure 27. St

Figure 28. Ho

Figure 29. Fl

Figure 30. Co

Figure 31. Pu

Figure 32. Ta

Figure 33. Ta

Figure 34. Ca

Figure 35. C.

Figure 36. M

Figure 37. C

Figure 38. M

Figure 39. E
of heat

Figure 40. P
on some

Figure 41. I
affects

Figure 42. I

Figure 43. (

Figure 20. Double bolt rim lock	285
Figure 21. Rim locks	286
Figure 22. Rim locks and staples	287
Figure 23. Suffolk latches: handle and thumb press assemblies	301
Figure 24. Hardware associated with Suffolk-type thumb latches	302
Figure 25. Example of well preserved butt hinges	317
Figure 26. Cast iron butt hinges showing ranges of conditions in the collection	318
Figure 27. Strap hinges and driven pintles	330
Figure 28. Hooks and staples	340
Figure 29. Flashing	350
Figure 30. Complete white ironstone mug	354
Figure 31. Punch-decorated tin panel from a pie safe	356
Figure 32. Table forks	360
Figure 33. Table knives	364
Figure 34. Cast iron dutch oven lid	368
Figure 35. Cast iron dutch oven lid	370
Figure 36. Miscellaneous kitchen artifacts	372
Figure 37. Ceramic candle holder	375
Figure 38. Melted bottle fragments	382
Figure 39. Bottle finishes showing differential affects of heat in the collection	383
Figure 40. Melted aqua bottle showing affects of fire on some specimens	394
Figure 41. Broken aqua bottle showing differential affects of heat on fragments of the same artifact	396
Figure 42. Small bottles	399
Figure 43. Glass bottle stoppers	403

Figure 44. C

Figure 45. E

Figure 46. E

Figure 47. S

Figure 48. S

Figure 49. E

Figure 50. I

Figure 51. M

Figure 52. E

Figure 53. C

Figure 54. E

Figure 55. C

Figure 56. C

Figure 57. M
inclusion

Figure 58. U

Figure 44.	Colorless glass tableware fragments	408
Figure 45.	Pipe bowls	414
Figure 46.	Portion of the frame to a carpet bag	417
Figure 47.	Spade	426
Figure 48.	Spade	428
Figure 49.	Broad or planter's hoe	430
Figure 50.	Logging pike	432
Figure 51.	Miscellaneous tools	434
Figure 52.	Equestrian related artifacts	441
Figure 53.	Casters	456
Figure 54.	Bed screws	460
Figure 55.	Clothing hooks	462
Figure 56.	Cabinet locks and keys	464
Figure 57.	Mass of melted glass clearly showing inclusion of a nail	479
Figure 58.	Unidentified tin artifact	487

Archeo

holds that

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CHAPTER 1

THEORETICAL ORIENTATION

INTRODUCTION AND PROBLEM STATEMENT

Archeologists share the paradigm of general anthropology which holds that culture is patterned (Deetz 1967; Willey and Phillips 1958). The patterns of culture pervade all its aspects including its material manifestations (Kroeber 1917, 1919; Kluckhohn 1962; White 1949). This concept is crucial to archeology, which seeks to reconstruct, interpret and explain the cultural past through a database fundamentally reliant on the material remains of past cultures. The concept of patterning in culture is therefore central to archeology (Clarke 1968).

Although the term pattern recognition has seemingly only recently become entrenched in the archeologist's vocabulary (see, for instance, Martin 1985; South 1977, 1978), the recognition of patterns, and the related notion that culture is patterned, is deeply placed within the archeological literature of this century and before (Fitting 1973; Willey and Sabloff 1980). The establishment of even the most rudimentary artifact classifications, the identification of archeological cultures at any level, and the construction of culture-historical chronologies have all been exercises in pattern recognition and serve to identify pattern recognition as a fundamental methodological tool in archeology (cf. Caldwell 1958; McKern 1939; Willey and Phillips 1958).

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explanations of observed archeological patterns, the degree and ways in which patterns in the archeological record reflect cultural patterns has been given only cursory treatment (Schiffer 1972). In many respects the archeological record has been treated as a direct byproduct of human behavior, the study of which would reveal patterns which precisely mirror those in culture (Binford 1964, 1983; Schiffer 1972). Under this paradigm the identification of patterns in archeological material would equal the identification of patterns in a once viable culture. As long as the focus of archeology was on chronology building and the identification of archeological cultures through the presence-absence study of type or marker artifacts (the trait list approach), such an understanding of the relationship between a living culture and its archeological residue caused no major problems.

As the data base expanded and problems with regional cultural chronologies were resolved, the focus of archeology has increasingly been on the recognition of more subtle patterns in the archeological record; patterns associated with site function, comparative status, ethnicity, and so on. This focus was accompanied by an increasing reliance on quantification as a means to compare sites and parts of sites (Cleland and Fitting 1968). Although emanating from the study of prehistory, such a focus on quantitative pattern recognition has emerged strongly in historical archeology since the early 1970s (South 1972, 1974).

Hand in hand with this concern for quantitative pattern recognition studies, there developed a concern for the meaning of the archeological record; that is, the nature of the relationship between the archeological record and the cultural behavior from whence it derived

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(Binford 1976a, 1983; Schiffer 1972, 1976, 1983; Yellen 1977). Archeologists have increasingly come to realize that the relationship between cultural behavior and archeological remains is not necessarily direct and may instead be skewed or otherwise masked or distorted by a number of cultural and natural processes. Rather than being random effects, however, these forces acting to alter the archeological record have been shown to be systematic and patterned processes (Binford 1983; Schiffer 1972, 1976; Yellen 1977). Concern for an understanding of these systematic patterns has entered the literature as the concern for "site formation processes". Understanding site formation processes has come to be seen as a necessary preliminary step to understanding the meaning of the archeological record. Without an understanding of site formation processes, the relationship between the archeological record and a past cultural behavior or behavioral system remains an unknown, and all interpretations presuming to understand this relationship are suspect (Schiffer 1972, 1976, 1983).

An understanding of site formation processes has therefore emerged as a key to the profitable pursuit of explanation in archeology through a paradigm based on quantitative pattern recognition. Despite the enormous potential importance of site formation processes for archeological analysis, relatively little attention has been paid to them save on the general theoretical level. This is particularly true in historical archeology, where the use of quantitative pattern recognition studies is fundamental and where interpretations are, as a result, extremely susceptible to error at the hands of misunderstood site assemblages (South 1977).

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Just as cultural behavior results in patterned material remains, site formation processes are patterned (Schiffer 1972, 1976, 1983). These processes are either cultural processes, which we know to be patterned, or natural processes, the results of which are also predictable. It should be possible, therefore, to develop a predictive understanding of site formation processes, and to use this predictive ability to control for the affects of site formation processes on archeological analysis.

The research embodied within this dissertation is directed at developing a fuller understanding of site formation processes, particularly as they affect historical archeological sites. The problem is to identify what is predictable about certain site formation processes and to relate this to the meaning of particular assemblages. Put differently, the problem is to determine what type of site formation processes have affected a site, and how this has affected the patterning of the site assemblage (Schiffer 1983). The goal is to be better able to control for variation caused by site formation process, thereby allowing for valid comparisons between and within sites, and for valid and informative interpretations of site assemblages.

This study is proscribed temporally and spatially; it is proscribed temporally to the mid-nineteenth century and spatially to the Central and Southern Great Plains and Trans-Mississippi West. This was done in an attempt to limit variation in the archeological record due to geographic and temporal differences (Lewis 1985). The conclusions drawn from this study will, however, be much broader in their potential applications. Processes of site formation are general processes which, after they have been understood in one setting, can be applied to a

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SITE FORMATION PROCESSES

In the 1960s what has become known as the "new archeology" was ushered in by a series of articles by Lewis Binford (1962, 1964, 1965). This new archeology was built on a framework created by the re-emergence of evolutionary thinking in archeology in the late 1950s (Willey and Sabloff 1980: 181-185). Although many of its components were present prior to the early 1960s, many notably present in Taylor (1948), new archeology was a synthesis of approaches and methods focused on cultural-evolutionary explanation (Willey and Sabloff 1980: 185-191).

At first seen to reject what had come before it, the new archeology was clearly built on the work of the past. Nevertheless, a fundamentally different type of question was being asked about the past, and these questions were being addressed using new theoretical and methodological tools. A significant methodological focus was on the "complete recovery of all the variability in the archeological record" (Willey and Sabloff 1980: 187), both at the intra- and inter-site levels. The result was the collection and comparative study of large amounts of data with the goal of defining and explaining variability at all levels.

The importance of new quantitative approaches to archeological interpretation was an important cause leading to an increased concern for site formation processes:

the relative frequencies of elements, or element fragments, found as ... refuse, are raw data for many statements made about the past. I think it is fair to question any use of this information until we know the ways in which refuse element frequencies reflect the system of which they were once a part [Schiffer 1972: 163].

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Prior to the advent of the new archeology and a concomitant focus on the recognition of patterns at the site specific level, studies of culture chronology and history typically relied on presence-absence data. This focus was reflected in field methodologies which did not recognize the need for consistent and complete recovery of artifacts. Such methods ranged from the lack of screening to collection limited to certain artifact types, such as rim sherds and finished tools (see, for example, Heizer and Graham 1967: 75; cf. Binford 1968). A lack of quantitative comparability was implicit in these approaches, but was not seen as a problem.

The lack of quantitative comparability was not an issue because it did not affect then-current approaches to site comparison. Sites were related on the basis of their interpreted cultural affiliation and were compared using the presence and absence of key attributes--the trait list approach (See Lehmer 1971: 25-28). A classic example of the latter is Wedel's comparison of historic Pawnee and protohistoric Lower Loup and Oneota Aspect sites in Nebraska using the direct historical approach (Wedel 1938). In this study, Wedel's goal was to identify which of the protohistoric cultures was most closely related to the historic Pawnee. Comparison was based on the presence and absence of traits rather than on the relative numerical importance of traits or associated artifacts. This general approach to site comparison continued to characterize archeological research through the 1940s and 1950s, and its results are embodied in many cultural-historical summaries of this period and later (Lehmer 1971; Wedel 1961).

By the 1960s, archeological research using the trait list approach

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had resulted in the construction of cultural chronologies and culture-ecological histories in most areas of the North America (See, for instance, Griffin 1952; Wedel 1961). These chronologies presented an essential framework for more detailed studies, and implicitly posed a wide range of questions concerning the causes of cultural variation both across space and through time. Answers to these questions required new approaches, and a paradigmatic revolution occurred. As mentioned previously, this revolution ushered in what was referred to as the new archeology.

New archeology has as its focus the elucidation and explanation of what had been up until then elusive patterns in the archeological record. The elucidation of these patterns required in effect an expansion of the data base through the consistent collection of a wider range of material evidence. The focus was on comparison and thus on comparability. The focus on comparison increasingly relied on quantification and quantitative and statistical analyses. The relative importance of artifacts rather than their mere presence became paramount. With the new archeology, the paradigm of scientific explanation based on quantitative pattern recognition became the calling card of archeology (Cleland and Fitting 1968).

An excellent and somewhat neglected example of this concern for quantitative pattern recognition is found in historical archeology in the work of South (Martin 1985; South 1977, 1978). South's approach focused on the comparison of entire site assemblages on the basis of the relative importances of groups of artifacts making up that assemblage. Using historic sites with documented functions, South compared groups of contemporary sites known to differ functionally, and showed that there

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were observable and predictable differences between the groups of sites based on the relative importances of artifacts in their assemblages. The differences between functional site groups were presented by South as differing artifact patterns, which he named the "Carolina" and "Frontier" artifact patterns in 1977. While the meaning of these patterns has been much criticized, South's work is methodologically important as an example of the approach and the potential of the paradigm of quantitative pattern recognition for archeological problem solving (Martin 1985).

Clearly, however, when comparing sites on the basis of the relative importance of artifacts, the reasons for variation in the archeological record must be understood. If the functions of two sites are interpreted as being different in the past based on observed difference in the relative numerical importance of artifacts, for example, it must be made certain that the observed archeological differences are related to site function rather than to a multitude of other cultural or noncultural factors. In this context, growing concern for processes of site formation is both easily understood and clearly a development related to the new archeology's focus on quantitative pattern recognition.

In an article published in 1972, Schiffer posed the question, "How is the archeological record formed by behavior in a cultural system?" (Schiffer 1972: 156). This question responded to what he saw as weaknesses in a primary assumption of the new archeology, as expressed by Binford:

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structure performed different tasks, leaves a "fossil" record of the actual operation of an extinct society [Binford 1964: 425, quoted in Schiffer 1972: 156].

The assumption Schiffer derives from this statement is that Binford believed there was a direct relationship between archeological patterning and the patterning of a past cultural system. Schiffer believed that this was not always the case, and he began to question existing archeological methodologies and to propose explicit new approaches to deal with the processes by which cultural activities and behaviors were transformed into the archeological record. Schiffer identified these processes of transformation as "site formation processes", and has remained a major proponent of their study (see Schiffer 1987).

Schiffer's original concern for site formation processes was a concern "with explaining how the archeological record is produced in terms of explicit models, theories, and laws of how cultural systems operate" (Schiffer 1972: 156). While he recognized that archeologists held assumptions on the workings of certain aspects of this process, his focus was on making the processes explicit so that they could be controlled for in archeological analysis. The goal was to be able to increase the confidence with which archeologists made statements based on quantified archeological data.

Schiffer has presented a number of key concepts and terms which are central to a discussion of site formation processes as they have been presented so far in the literature. Most of these concepts have been implicit in archeological research for some time, but have only recently been formalized. These terms generally describe the various states through which archeological materials pass on their way to the

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archeological record, and the different processes by which materials enter the archeological record.

Fundamental in understanding site formation theory are the two basic contexts in which cultural materials may exist: systemic context and archeological context (Schiffer 1972). According to Schiffer, who first formalized the definition of these two forms of context:

systemic context labels the condition of an element which is participating in a behavioral system. Archeological context describes materials which have passed through a cultural system, and which are now the objects of investigation of archeologists [Schiffer 1972: 157].

It is the transformation of materials from their systemic to their archeological contexts that is of concern in studies of site formation process. The relationship between these two contexts is of crucial importance for archeology because of the fundamental need of archeologists to be able to reconstruct the systemic context of an artifact from information provided by its archeological context.

The transformation of materials from the systemic to the archeological context involves a combination of cultural and noncultural processes. Initially important are a range of cultural behaviors, such as discard, which result in the dismissal of materials from their systemic contexts. The processes of context transformation (systemic context to archeological context) involving cultural factors are referred to by Schiffer as "cultural formation processes", or "C-transforms" (Schiffer 1976: 14-15). Noncultural factors, such as organic decay and erosion, are also important in the development of archeological context, and are referred to as "noncultural formation processes", or "N-transforms" (Schiffer 1976: 15-16). Despite the

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overriding importance of C-transforms in defining the archeological assemblage, they have received relatively less attention than have N-transforms.

A critical point between systemic and archeological contexts is the point of loss. Loss is here used as a very general concept which recognizes that point after which an artifact will no longer be used by its host culture but before it is found by the archeologist. An artifact that is found by an archeologist does, of course, reenter the systemic context of culture and is actively used by the recipient culture. In a like manner, artifacts can cycle through systemic and archeological contexts any number of times through actions such as salvage and reuse (Schiffer 1976).

Loss can occur in a number of ways, most commonly through discard but also including loss, used in the isolated and idiosyncratic sense, and abandonment. Artifact loss through discard is the most critical to archeology since this type of loss describes most archeological remains. Recognizing differences in discard behaviors, and therefore in types of refuse, a number of terms have been presented to describe differences in refuse. These are "primary refuse", "secondary refuse", and "de facto refuse" (Schiffer 1972: 160-161).

Both primary and secondary refuse are the result of intentional discard behavior. The distinction between these types of refuse is simple; primary refuse is discarded at the location of use while secondary refuse is removed from this context of use. Small artifacts swept out the back door of a kitchen are primary refuse, while larger artifacts picked up and dumped in a privy or refuse pit are secondary refuse. Clearly, the artifacts at the back of the kitchen were used in

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the kitchen, while those found in the privy may be from the kitchen or a variety of other contexts.

De facto refuse is defined by Schiffer (1972: 160) as "elements which reach archeological context without the performance of discard activities". Generally, like primary refuse, this refers to items which occur at their context of use. South (1977) recognizes several different types of de facto refuse reflecting differences between non-intentional abandonment due to catastrophic events such as fire (in situ-de facto refuse); intentional abandonment (de facto refuse); and non-intentional loss (primary-de facto refuse). Under this scheme, de facto refuse includes, for example, artifacts left at a site when it is abandoned. A perfect example of this are the buildings which are typically left when a farmstead is abandoned. Primary-de facto refuse, on the other hand, occurs when a site is in active use, and describes the classic loss situation but specifically describes loss at the site of use. South describes the difference between primary-de facto and primary refuse as follows:

pins and beads falling onto a sand floor, or through the cracks of a wooden floor would come under this primary de facto context, whereas a midden deposit of bone and broken objects scattered over the floor, or swept into a corner of a room would be considered as primary refuse [South 1977: 297].

In situ-de facto refuse is the result of a catastrophic event which results in the non-intentional deposition of materials at their place of use. A perfect example of this type of refuse, and that used by South in his definition of this type, are the materials contained in the remains of a building which burned during its active use.

These concepts are, once again, central to the concept of site

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formation process as currently presented in the literature. Their focus on the point of transition from behavioral or systemic contexts to archeological contexts reflects this point as the major concern of studies of site formation. While it will later be argued that site formation processes can and perhaps should be a more encompassing concept, this focus on the transformation of the systemic to the archeological context accurately reflects the focus and immediate needs of current studies of site formation and further identifies site formation processes as an issue of primarily methodological importance. As Schiffer puts it:

between the time artifacts were manufactured and used in the past and the time these same objects are unearthed by the archeologist, they have been subjected to a series of cultural and noncultural processes which have transformed them spatially, quantitatively, formally, and relationally. If we desire to reconstruct the past from archeological remains, then these processes must be taken into account, and a more generally applicable methodological principle substituted for the one that asserts that there is an equivalence between a past cultural system and its archeological record [Schiffer 1976: 12].

In a recent article, Schiffer notes that despite a growing experimental and theoretical concern for issues related to site formation process, consideration of site formation processes remains rare at the critical level of data recovery, analysis, and interpretation (Schiffer 1983). While Schiffer perceives a growing acceptance of the need to adequately deal with the effect of site formation process on archeological study, he identifies three general areas where we are still far away from a methodological or theoretical ability to do so. These areas are:

(1) how best to conceptualize the nature and operation of formation processes, (2) how to assess their influence on the evidence of the past, and (3) how to identify empirically

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which formation processes created specific deposits [Schiffer 1983: 676].

The third of these areas is to Schiffer the most critical to understand if we are ever to be able to control for the affect of site formation processes on archeological assemblages.

Schiffer's approach to site formation is not without opposition. An important debate on this topic exists between Schiffer and Binford, the latter of which maintains that his 1964 statement, quoted earlier, is valid and that there is in fact a direct relationship between a cultural system and its archeological remains. Like Schiffer, Binford is concerned with developing an understanding of the sources and causes of the remains making up the archeological record. He is also in agreement with Schiffer that it is important to recognize the differences between systemic context (which Binford terms the dynamic state of culture) and the archeological context (the static state of culture). Binford further agrees with Schiffer that there are numerous noncultural, post-depositional processes which can significantly alter or distort the archeological record. Binford's major disagreement with Schiffer starts, however, with his proposition that there are cultural processes (C-transforms) which distort the archeological record and that can lead to errors of interpretation by archeologists (Binford 1983: 229-236). This disagreement is summarized by Binford as follows:

given Schiffer's view of a cultural system placing trash in a dump is a C-transform; as such, it is a distorting action, marking the transition between systemic context and archeological context for the items discarded. They were in fact "used" at another place, at a prior time, and as such the presence of the item in the dump is a distortion of such a prior state. But is it also true that it is a distortion of the cultural system? Only if the cultural system is equated with specific actions or the "context of use" for the items in question. However, if one considers the maintenance of life-

space part of the cultural system, the act of cleaning up and disposal itself as a part of the cultural system, even the presence of a dump as a component of the cultural system, how are things distorted? **Answer: they are not distorted.** What is distorted is Schiffer's view of a cultural system, and his ideas as to how to understand one [Binford 1983: 236, emphasis original].

Binford's point is very well taken. A trash dump is very clearly an integral part of the cultural system within which it was created, and it is important to understand it as such. It also, however, contains information that can be used to make inferences on other aspects of the cultural system. In this light, it is instructive to examine Binford's proposition against his analogy of the "rock with eyes":

most of the time we have one or a very few sites that must guide our appreciation for the types of systems that once existed. If we are to use site information we must learn how to see a past system from a site perspective. I have likened this perspective to that of a "rock with eyes" down in a deep hole. What such a rock would see are little glimpses or segments of a system that passes over its hole. In addition, our rock's vision would be biased in terms of the matter that happened to fall into its hole as the living system passes overhead [Binford 1983: 224].

Here, Binford cautions that we do not have the remains of the whole cultural system to work with, and that what we have is instead biased glimpses of the system. Binford is in fact very fortunate to have the luxury of complete sites to use in his comparisons; most archeological comparison is based on sometimes very small portions of sites.

Using a site or a comparison of several sites as the basis for understanding a cultural system is certainly no easy task. While the sites themselves are not distorted components of the system, they are not necessarily representative and inferences about the system based on them may as a result be biased; the system according to the "rock with eyes". This is essentially the stance taken by Schiffer, but perhaps

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at a different level concerned with making inferences from a smaller segment of the archeological record. While a trash dump is clearly an undistorted manifestation of a cultural system, it may present a biased or distorted view of the site of which it is a component (The view of the "rock with eyes" in the dump). Drawing inferences on a site on this basis would clearly not be without problems. More serious problems can result from 1) comparing a primary refuse deposit (the view of the "rock with eyes" in the yard) at one site to a secondary refuse deposit (the view of the "rock with eyes" in the dump) at a second site and 2) assuming they are comparable in terms of drawing inference about the place of the sites in the larger cultural system.

Schiffer's focus is thus on assuring that the basis of archeological inference, and particularly inference based on parts of sites, is a valid one; that we are comparing comparable things and that the relationship of what we are comparing to what we are trying to draw inferences about is understood. If we are investigating trash dumps using trash dumps as data, it is, as Binford professes, difficult to speak of cultural distortion. If, however, trash dumps are just one part of a larger and more complex set of contexts that are being used to draw inferences on the operation of a larger cultural system, distortion is perhaps a useful concept.

The debate between Schiffer and Binford is important in identifying context as a critical variable in understanding site formation. For all practical purposes, the site as understood by an archeologist is a construct composed of a variety of interpreted spatial and chronological contexts. Site interpretations are thus inferences drawn from interpretations of the meaning of any number of site contexts and which

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are based on a theory of the operation of a larger cultural system. The formation of site contexts is clearly primarily a cultural process and the final form of the context is unquestionably dictated by the operation of cultural system. A trash dump will therefore be created based on cultural perceptions of what a trash dump is, where it can be located, what things can be deposited in it, and how the dump is curated during and after use. The form and content of a dump can further be effected by a wide variety of cultural variables such as site ethnicity, status, longevity, and function. Factors such as abandonment and reuse can also be important in deciding the form and content of a dump.

Despite the wide range of cultural variables that can effect a site context, specific types of contexts should differ systematically from other types. A concern for understanding site formation must start with the attempt to define which cultural variables are constant within, and which differ between site formation contexts. By defining these cultural variables, it should be possible to identify the type of site formation context (for example, primary or secondary refuse contexts) represented by a deposit. This is an essential starting point for valid comparisons of contexts on an inter and intra-site basis, and for identifying which variables have the greatest inferential potential beyond the context with which they are archeologically associated.

SITE FORMATION PROCESSES AND HISTORICAL ARCHEOLOGY

The concern for site formation processes developed originally out of a concern for their affects on the interpretation of prehistoric sites. The problem is, however, one that is universal to archeology, and its importance for historical archeology was recognized relatively

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early by South (1977). The nature of site formation processes is such that their effects on archeological contexts can be expected to be relatively uniform cross-culturally and throughout the continuum of time. Given this, the potential importance of historical archeology to provide significant contributions to our systematic understanding of site formation processes is great.

The importance of historical archeology for studies of site formation lies in the level of control that is possible over the nature and meaning of the archeological context (Binford 1977; South 1972). It is clear that the archeological record is the culmination of a number of process of which Schiffer's site formation processes are but a few. In order to understand the effects of site formation processes on a site and therefore on our ability to reconstruct other cultural processes, it must be possible to control either for processes other than site formation or for site formation processes themselves. In prehistory, these other cultural processes must be reconstructed on the basis of archeological information alone--the accuracy of their reconstruction is of course at the mercy of the very site formation processes we are attempting to understand. A dilemma is thus presented: in order to reconstruct the systemic meaning of an assemblage we must first understand the processes that affected the formation of the assemblage; in order to understand the site formation processes we must understand the systemic context from which the assemblage originated.

This circular problem has resulted in ample theoretical discussion without resolve, and in a concern for experimental and/or ethnoarcheological approaches to site formation processes. The reasons

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for the attraction of the ethnoarcheological approach have been lucidly presented by Yellen:

the ethnographic present, in a loosely defined way, provides the archeologist with a set of controlled or "laboratory" conditions within which he can evaluate and sharpen his own analytic techniques. Archeological interpretation is anything but an exact science, and the value and correctness of any particular analytic method can be evaluated only in a most subjective fashion. Because the requisite control is lacking, one cannot refine technique through recourse to archeological data alone--and it is here that carefully collected ethnographic data can prove of great value. Direct observation of an ongoing society permits one to correlate activities, and even patterns of thought or social organization, with material byproducts that may be preserved in the archeological record. One then has a starting point, at which the "answers" are known, and this provides a degree of control that is impossible in a strictly archeological situation. In such a controlled context, analytic methods themselves may be put to the test. The pitfall of circular reasoning is avoided... [Yellen 1977: 11].

By providing a laboratory where archeological theory can be compared against ethnographic "fact", ethnoarcheology and the related experimental archeology have become well respected and important avenues of research into archeological method and theory. Binford, introduced earlier as a major constituent of the debate over site formation, relies heavily on ethnoarcheological research in his quest to understand general cultural processes and the variables that effect their archeological manifestations (see, for example, Binford 1978a, 1978b).

The benefit of experimental and ethnoarcheological approaches is that all variables of site formation can be controlled for, allowing a segregation of the affects of site formation and other processes on an archeological assemblage. This situation can also be created through historical archeological research. Historical archeology actually presents the potential of greatly expanding the utility of this approach by adding time depth and by allowing the investigation of cultural

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expressions which can no longer be observed ethnographically. The conjunction of historical archeology and ethnoarcheology presents the ability to add the diachronic to the synchronic in terms of the investigation of the methodological and theoretical constructs of archeology.

As is true of ethnoarcheology, historical archeologists have access to a wider range of data than do prehistorians. This data includes both the archeological record and the record provided by historical documents (both written and oral). A number of studies and theoretical discussions have presented historical archeology as an ideal comparative laboratory due to this wider range of data and the control which it potentially bestows on the archeological record:

historical archeology data particularly lends itself to analysis in a controlled and specific manner not possible on the prehistoric level. For this reason it offers an ideal arena for the examination of cultural concepts long explored on prehistoric sites [South 1972].

This situation led Binford, in 1977, to define what the "historical" in historical archeology means:

well, it means that there is information available from the past in addition to the archeological record. It means that the past may be investigated with resources other than those provided solely by archeological investigation. That should mean historic[al] archeologists should be more sophisticated and better informed. Specialists in this field should provide the most informative tests or evaluations of ideas set forth by archeologists in general. They should be in the forefront of theory building [Binford 1977: 13].

An example of this potential is expressed in Deetz and Dethlefsen's (1967) now classic study of culture change and archeological methodology using seventeenth and eighteenth century headstone motifs in New England. This study demonstrates how historical archeological data,

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because of the greater control which is possible over it, can be used to verify theoretical and methodological principles accepted only by assumption in prehistory.

Historical archeology offers similar promise to the resolution of questions concerning site formation process. By using historical documents to control for a wide range of variables affecting the specific form of the archeological record, such as site formation, site function, occupant status, and length of occupation, historic sites can be used to evaluate the effects of site formation process on the archeological record. Findings on site formation process developed in this manner can then be applied with confidence to sites lacking in documentation, whether they date from the historic period or before, and a more accurate interpretation of the meaning of the archeological record will result.

In spite of both the promise that historical archeology holds for investigations of site formation processes and a number of excellent ethnoarcheological studies, which rightfully could be classified as lying within this field (See, for example, Binford 1978; Hammond and Hammond 1981; Lange and Rydberg 1972; Savelle 1984), the enormous potential of historical archeology in the area of site formation process has yet to be realized. A few studies have nevertheless begun to consider this area in a systematic fashion.

Among the most overt of the historical archeological studies of site formation process are those by Tordoff (1979), White and Kardulias (1985), and Lewis (1985). Tordoff's study concerned the relationship of different site contexts to the overall artifact pattern from a site. Using data from Fort Snelling, Minnesota, Tordoff found a consistent

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pattern in primary de facto refuse deposits and found that this pattern fit well within South's generalized Frontier Artifact Pattern. From this, Tordoff concluded that patterns for different site contexts possessed systematic and predictable characteristics that would allow the identification of general whole-site patterns as well as patterns reflective of different processes of site formation (Tordoff 1979).

White and Kardulias examined the process of site formation that resulted from the razing, around 1930, of the wing of a mid-nineteenth century house. Archeological, historical, oral historical, and historical photographic evidence was used in this study, from which they concluded that:

the 4715 artifacts collected and examined from the Barnhisel wing were distributed in a non-random manner among most of the site units...their distributional pattern reflects only minimally, if at all, their loci of use. Rather their proveniences can be better explained by the cultural transformation processes (or C-transforms) taking place at the site after the abandonment, and during the razing, of the wing [White and Kardulias 1985].

Of interest in this study, a number of characteristics associated with the razing of this structure were identified as separating it from the pattern expected to result from other types of destruction such as from fire or natural decay after abandonment. For example, a principle locus of intensive burning was identified and was interpreted as the spot where refuse from the wing was reduced by burning. White and Kardulias (1985: 74) contrasted this to the "more even distribution of burnt material" that would have been expected had the building burned accidentally. They also interpreted the lack of window glass, hardware, plumbing, and other salvageable, non-combustible building hardware as an indication of salvaging which would not have been expected had the

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building been subjected to catastrophic destruction and, possibly, even through dilapidation through abandonment and neglect.

The fill of a cistern once located under the porch of the wing was also tied to the razing pattern. This cistern was filled with household refuse dating to a very short time period. The filling of the cistern with refuse during the razing was interpreted as an attempt simply to fill the cistern since it would be exposed after the wing had been removed. The nature of this fill, including a wide range of household items deposited rapidly, was seen to differ from that expected in the event of site abandonment or catastrophic destruction (White and Kardulias 1985).

In a consideration of the different archeological results of the cultural processes of discard and abandonment, Lewis (1985) compared seven sites with discard deposits and two sites characterized by abandonment deposits. These sites were contemporary but varied greatly in their location within the United States. Lewis compared these sites on the basis of the occurrence of food/beverage containers and non-food containers in order to examine hypothesized relationships in the relative importance of these two groups on the sites examined. A higher relative importance of food/beverage containers was expected on sites with discard deposits due to the importance of these containers, as compared to non-food containers, for day-to-day subsistence. On the other hand, a higher relative frequency of non-food containers was expected at sites with abandonment deposits since these less commonly used items might be intentionally left behind on the abandonment of the site. Lewis' comparison of the nine sites showed that such a

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an examination of archeological deposits from nine contemporary historic sites has revealed an association of particular container type proportions with the occupational and abandonment aspects of these past domestic settlements. This implies that the disposal modes employed in the activities accompanying ongoing occupation and abandonment produce recognizable and regularly occurring patterning in the material record. Dumping or discard during a settlement's occupation is correlated to a higher proportion of subsistence containers in the deposits generated, while abandonment appears to produce a higher proportion of containers unrelated to food [Lewis 1985: 92].

The importance of this study lies not so much in the determination that the sites do differ, but in the documentation of the existence of patterns in the archeological record that can be associated with specific site formation processes. This is precisely the focus that Schiffer has recently called for (Schiffer 1983), and Lewis' study has underlined the special ability of historical archeology to address this focus.

In his study of the Mill Creek Site at Michigan's Straights of Mackinac, Martin (1985) provides a very important study of site formation. Through the use of a comparative approach based on South's (1977) artifact pattern approach, Martin examines the causes for observed differences in the relative importance of groups of artifacts. With the historical record as well as independent archeological information as a control, he is able to suggest that observed variations in the importance of domestic artifacts may be related to the degree of isolation of a site and the length of time that it was occupied. Isolation would have restricted the access to goods, thereby suppressing the numerical importance of expendable goods. On the other hand, the longer a site was occupied, and the greater the amount of refuse

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produced, the greater would be the numerical importance of domestic refuse. Although unable to confirm it, Martin suggested that while these factors of isolation and length of occupation may be important contributors to site variability, "the range of activities carried out at the site may be more important" (Martin 1985: 169).

These studies present a common message. They first serve to exemplify the importance of historical archeology for the study of site formation. The conclusions that have been reached were only possible because of the availability of a control provided by historical documentation. They further show, in a very demonstrable way, that the processes that result in the formation of archeological sites are patterned, and that these patterns can be identified and related to specific formation processes. Using the multitude of well-documented historical archeological sites available, site formation processes can be understood in such a way that their affects on undocumented as well as documented sites can be identified.

THE PLACE OF SITE FORMATION PROCESSES IN ARCHEOLOGICAL THEORY

It is important to understand the place of site formation processes within anthropological theory. Initially, this has importance in order to conceptualize, on a broad scale, the type and level of contribution that research on site formation processes can make. It is equally important to understand the role that the study of site formation processes has in the larger context of archeological research; that is, its role in transforming raw archeological data into substantiated theories of culture.

Raab and Goodyear (1984) have described a tendency of archeologists

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to equate site formation processes with "middle-range theory":

most current usages of "middle-range theory" in archeology are far more narrowly focused on the methodological issue of site formation processes. This emphasis in fact continues the development of a materialist epistemology for archeology begun by certain practitioners of New Archeology, most notably Binford. The fundamental objective of such an epistemology is to ground inferences about past human behaviors by developing a reliable methodology for differentiating the effects of behavior from the many other causes of the material record [Raab and Goodyear 1984: 265].

To Raab and Goodyear, such an association of site formation processes and middle-range theory is ill-conceived and ignores the intellectual history of the concept of middle-range theory as it originally developed within sociology. Put simply, this intellectual history presents middle-range theory as the "critical **bridge** between theory and data" (Raab and Goodyear 1984: 257, emphasis original):

middle-range theory emphasized careful formulation and testing of theories that could link empirical data with higher-order conceptual schemes. All of this work addressed explanations of variability in social behavior as the immediate and central purpose of theory-building [Raab and Goodyear 1984: 258].

In their review of the archeological uses of the concept of middle-range theory, Raab and Goodyear see an association of middle-range theory and site formation processes, and obviously feel this association is inappropriate and, indeed, dangerous (Raab and Goodyear 1984: 258). Raab and Goodyear view studies of site formation processes as explicitly methodological exercises which allow archeologists to "deal with material records but not necessarily with problems of cultural dynamism" (Raab and Goodyear 1984: 260). This concept would place site formation processes outside the traditional definition of middle-range theory. Such a concept of site formation processes is altogether narrow and does not appear to recognize the true scope and implications of site

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formation processes for archeology.

Site formation processes consist of a broad range of noncultural and cultural processes through which the systemic reality of a cultural setting is transformed into a material document which we refer to as the archeological record. These include natural processes which result in the disintegration of readily bio-degradable portions of the material world, or which might alter the distribution of artifacts due to erosion. Also included, and fundamentally more important in most respects, are a wide range of cultural processes such as those resulting in a variety of disposal modes. Site formation processes can be logically carried to include a much broader range of factors; site formation results not only from differential material disintegration and refuse disposal, but from all aspects of culture affecting a site and including such things as status, ethnicity, site function, economic interrelatedness, etc.

To date it has generally only been what Raab and Goodyear refer to as methodological considerations that have been subsumed under the concept of site formation process. These methodological considerations concern processes that are perceived to most directly affect the content of a site but which are not uniquely related to the larger sociological functions and associations of the site. Raab and Goodyear conclude that methodological considerations such as these do not fit within the sociological concept of middle-range theory. This conclusion presents a limited view of the concept of site formation process, and ignores fundamental differences between the substance of sociology and anthropological archeology.

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It is reasonable to expect that middle-range theory, if it is to remain the "critical bridge between theory and data", will be broader, perhaps substantially, in anthropological archeology than in sociology. The difference here lies in the distance between theory and data in each of these disciplines. Archeology essentially deals with sociological data, once, or twice, or more removed. In other words, archeology must use the material record to reconstruct an associated sociological "reality". Archeology, therefore, must bridge not only sociological data and anthropological theory, it must also bridge archeological data and sociological data. It is reasonable to subsume both of these bridges within the concept of middle-range theory because their functions within the science of archeology are essentially the same--to bridge data and theory. Site formation process might be recognized as lower middle-range theory, but such a bifurcation is hardly necessary except for epistemological argument.

In addition to arguing that middle-range theory is broader in scope in archeology than in sociology, it is here suggested that the concept of site formation process is broader than Raab and Goodyear and most others would have it. The term site formation process can certainly be taken to imply a concern with any and all processes of site formation. Many have recognized that these include both cultural and noncultural processes, but it is here suggested that the scope of the cultural processes that can be subsumed under site formation processes has been entirely too limited.

Anthropological archeologists must accept the relationship of cultural processes and archeological patterns; it is possible to reconstruct and investigate broad social and economic processes in

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culture through the study of patterns in archeological materials. Given this, it follows that these broad social and economic processes have resulted in specific archeological manifestations, known as patterns, which exist at the level of the site. The broad cultural processes which archeologists hope to interpret and explain are clearly as responsible for the formation of sites as are other cultural and noncultural processes perhaps less closely tied to the broad patterns of culture.

Considered in this light, which is a logical extension of the concept of site formation process, the identification of site formation process as middle-range theory is easy. Allowed to blossom to its fullest, site formation process approaches very nicely what Raab and Goodyear had hoped when they introduced the concept of middle-range theory to archeology, "that middle-range theory might help bring order to theory-building under the spirited but eclectic onslaught of the new archeology" (Raab and Goodyear 1984: 255).

Within this study, therefore, site formation process is accepted as middle-range theory. As presented, site formation process becomes a very broad term covering most of what we do in archeology. This approach is not intended to broaden this term so as to make it useless, but is rather intended to stress the interrelatedness of the totality of our theoretical and methodological pursuits which lie in the realm between archeological data and the body of broad covering theory.

IMPLICATIONS OF SITE FORMATION FOR ANALYTICAL APPROACHES

The need for this study can best be understood by a review of the potential implications of site formation processes on the variety of analytical approaches used, in this case, in historical archeological research. The analytical approaches in use today, as well those ancestral to these approaches, rely in some significant way on the quantitative, statistical comparison of assemblages or sub-assemblages. Understanding the growth in importance of quantitative comparisons in historical archeology is, therefore, important for understanding why increasing attention is being paid to site formation processes. It should be noted at the outset that trends in increasing quantification and statistical analysis and in an increased emphasis on site formation processes are trends general to archeology and their origins lie largely in studies of prehistory.

Analytical Approaches in Historical Archeology

The best way to assess the potential importance for an understanding of site formation processes in historical archeology is to review the theoretical implications of site formation on the various analytical approaches currently in use. As presented earlier, it is the current focus on quantitative comparison in archeology in general that has caused a growing concern for site formation. Perhaps even more so than in prehistory, quantitative comparison has come to dominate the analysis of historic sites. It is in this realm that the most impressive contributions and inquiries are found; if site formation processes affect the validity of results in this arena, they must be understood and controlled.

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Quantitative methods are by no means new to historical archeology. In 1954, Harrington (1954) presented a study of 330 pipe stems from dated contexts to develop a seriation for the dating of pipe stems on the basis of the diameter of their stem holes. This seriation shows a decrease in the diameter of the stem hole during five periods between 1620 and 1800. It is based on the simple statistical comparison of the relative frequencies of stem holes during the various periods devised. Perhaps more importantly, its applications were seen to be for the study of large samples of artifacts, rather than the individual pipe stem. Greater statistical rigor was brought to this method by Binford (1961) in a study published on the eve of the revolution to the New Archeology.

In 1972 South published what has become a seminal paper in historical archeology (South 1972). In this paper, he presented the Mean Ceramic Date Formula which was intended to provide a mean date of a site's occupation based on the ceramic evidence. The Mean Ceramic Date Formula is based on a seriation of ceramics developed from historical documentation of the date range of manufacture of different ceramic wares (See Noel Hume 1970). The mean date formula is a weighted mean manufacture date that takes into account the relative importance of different ware groups represented in an archeological collection. This approach explicitly relies on the quantitative comparison of all ceramics from a collection. Of importance, South compared this quantitative approach to presence-absence approaches to site dating, and showed with clarity the superiority of the former method.

South had several goals in presenting the Mean Ceramic Date Formula. At one level he desired to develop an accurate method for dating historic sites. His success was evident in the reception of his

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work and in its subsequent uses. On a more general level, South used this study to examine the applicability of the concepts of evolution and horizon as they are used in archeology. The use of historical archeological data to examine the appropriateness of these concepts, which are central to much archeological theory, provides an excellent example of the importance of historical archeology to general archeology.

The interpretive power of South's Mean Ceramic Date Formula has been shown, however, to be much greater than was originally presented. Of particular interest here, these additional interpretive uses rely on the use of the formula to identify the presence of biasing cultural formation processes. Turnbaugh and Turnbaugh (1977) show how dates derived from the Mean Ceramic Date Formula can be compared against other sources of information, primarily historical documentation, to point up inconsistencies between these various sorts of documentation and between different archeological contexts. This discovery process leads the way for the explanation of the causes of the identified discrepancies between various sets of data rather than in demonstrating that one set of data is right or wrong. In essence, Turnbaugh and Turnbaugh (1977) have used the Mean Ceramic Date Formula to demonstrate the existence of cultural formation processes that have skewed the archeological record. While the site formation processes responsible for this skewing--processes involved in status, ethnicity, and the like--may go beyond those considered by Schiffer, their affect on the archeological record and on particular analytical techniques is clear. In this case, the same analytical technique that might be affected by these formation

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processes can assist in their identification if the right controls are present, generally in the form of historical documents.

Another analysis that has had profound affects on the development of modern historical archeology is Otto's study of differentials of status in an Antebellum plantation setting (Otto 1975, 1977). Using ceramic evidence, Otto compared three contexts on a single Antebellum plantation in Georgia. These three contexts were associated with decidedly different status groupings found on the plantation, including the planter, the overseer, and the slave. Otto's comparison of these three contexts on the basis of ceramic type, shape, and form showed distinct differences, which allowed him to conclude that:

the ceramic samples from Cannon's Point [plantation] came from sites occupied by people who differed in known status during the same period in time. Therefore, status was held as a constant by means of historical controls, and differences in ceramics may be explained by differences in known status. In turn, the ceramic evidence from Cannon's Point may allow us to predict the status of site inhabitants at other early nineteenth century plantations by analyzing the distribution of ceramic types, shapes, and forms at these sites [Otto 1977: 105].

Like others that preceded it, Otto's study relies on and thereby underlines the importance of the comparative approach using quantitative data.

It is of interest in Otto's study that he examines the possible affects of some site formation processes on the three archeological contexts. He particularly examines the possibility that ceramic reuse by overseers and slaves of planter discards have affected the types of wares to be found. While this is a very important consideration of cultural formation processes, it is informative to examine other potential cultural formation processes that may have affected his

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In essence, Otto is assuming that the three collections examined resulted from the same processes of site formation, with variation occurring only in status. On a hypothetical level, differences in disposal modes could have significantly affected the contents of the deposits. It is possible to suggest, for example, that primary discard of kitchen refuse may have been more prevalent at the slave and overseer sites than at the planter site, where secondary discard may have been consciously important. In this setting, the larger sherds of broken ceramics would have been removed for secondary discard while only the smaller sherds would have entered primary refuse deposits through actions such as sweeping. Assuming there is a difference in breakage between the heavier utilitarian wares and the lighter table wares (a relationship which has never been formally examined), with the former breaking into fewer, larger pieces than the latter, the presence of secondary refuse disposal in one setting and not the other might have significantly skewed the collections. In this scenario, a certain class of ware would be consistently removed from primary discard activities at a higher rate than other wares.

While it is not suggested that this was the case, and while Otto's focus on status differences as the causes of ceramic variability are reasonable, the potential influence of a wide range of other processes of site formation cannot be ignored. It would be informative to see a consideration of some of the attributes recently discussed by Schiffer (1983) in reference to this collection. Particularly useful might be a simple consideration of the size of the artifacts--differences in ceramic sherd size may indicate the comparability of the collections or

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may instead cast suspicion on the sameness of their origins.

In 1977, South published a book which has had significant impact on historical archeological research and which further emphasized the importance of quantitative comparison (South 1977). In this book, South argues for what has come to be known as the pattern recognition approach in historical archeology. While pattern recognition as an approach can be seen in the preceding works (Harrington 1954; Otto 1975, 1977; Turnbaugh and Turnbaugh 1977; South 1972), this study focuses on the importance of the comparison of the entire artifact assemblage. Using functionally based artifact groups, South compared sites on the basis of the relative importance of artifacts within groups. By comparing sites he knew, on the basis of historical documentation, to differ functionally, he demonstrated that these differences were reflected in the archeological record as well. He formalized these differences in two "artifact patterns" which he termed the "Frontier Artifact Pattern" (later renamed the architecture pattern) and the "Carolina Artifact Pattern" (also known as the domestic pattern). These patterns differed primarily on the basis of the relative importance of "architecture group" and "kitchen group" artifacts, with the architecture group predominating in Frontier Pattern sites, and the kitchen group in Carolina Pattern sites. South presented these patterns largely as an exercise to demonstrate that patterns do exist in the archeological record that are related to broad patterns in culture (South 1977). While his study has been heavily criticized, its theoretical importance and potential utility cannot be denied (Martin 1985).

The artifact pattern approach relying on the quantitative

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comparison of entire site assemblages is particularly susceptible to site formation processes. It is perhaps significant, therefore, that South is one of the first historical archeologists to formally stress the importance of considering site formation process in comparative study (South 1977). While the artifact pattern approach is useful for the comparison of parts of the same site, it is most often applied for intersite comparisons. Since entire sites are rarely excavated, the biasing effects of cultural formation processes have potentially significant affects on this type of comparison. For example, if the contents of a secondary refuse pit are compared to a primary refuse deposit adjacent to a structure, different artifact patterns will probably result even if the deposits originated from the same activity or set of activities. This is particularly true when the entire artifact profile is considered. The secondary refuse pit may contain few architectural elements such as nails, while the primary refuse, which is located near a structure (which probably disintegrated upon abandonment), most likely will contain a generous complement of nails. Using the artifact pattern approach, and focusing on the important categories of architecture and kitchen artifacts, these two deposits would appear significantly different despite their common origins.

An important analytical approach using the artifact pattern approach but relying on a single artifact type, ceramics, has recently been presented by Miller (1980). Based on historical information on pricing and on differences in the complexity of manufacture of different nineteenth century ceramics, Miller proposes four levels of ceramics which can be used in the economic scaling of archeological assemblages. Essentially, the classification of ceramics following Miller's scheme

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will allow the comparison of sites with respect to the relative importance of the four price or complexity levels. Other variables held constant, a ranking of sites on this basis will reflect differentials in economic status.

Of course, other variables are not always held constant, and one of these is site formation. Contrast, for example, the ceramics recovered from an upper class dwelling that burned and from the primary refuse midden surrounding this house. Suppose the family possessed a set of costly special occasion dishes belonging to Miller's highest ceramic price level and a set of every-day dishes belonging to the lowest level. The every-day dishes would enter the primary refuse around the house at a higher rate than the special occasion dishes and, from an analysis of the primary refuse, the site would rank towards the lower end of Miller's scale. The burning of the dwelling would, however, have caused the set of special occasion dishes to enter the archeological record at the same rate as the every-day dishes. From an analysis of this debris, this same household would rank substantially higher on the economic ladder than from the analysis of the primary refuse.

Another example is equally informative of the possible affects of site formation on comparisons of this type. Consider on one hand a household on the lower end of the socioeconomic spectrum with a ceramic assemblage composed of mis-matched wares from the full spectrum of Miller's price levels, and a moderate level household with a ceramic assemblage composed of a single, matched set of dishes of the lowest price level. A comparison of these ceramic assemblages without controlling for variables such as diversity (see Schiffer 1983) would

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result in an incorrect interpretation of the relative socioeconomic positions of these two households.

These examples of analytical approaches in historical archeology have served to illustrate a trend towards the increasing reliance on quantitative comparison of whole site assemblages or parts thereof. As has been presented earlier in this chapter, this increase in the importance of quantitative studies is seen as a necessary prerequisite for a concern for site formation processes, and particularly cultural formation processes. An interest in site formation processes is evident in the above studies, implicitly in Turnbaugh and Turnbaugh (1977) and Otto (1977) and overtly in South (1977).

Through example, the potential importance of site formation processes for the above analytical approaches, and for all quantitative considerations of historic sites, has been shown. Although concern for site formation processes in historical archeology has been voiced, very little systematic work has been done towards the identification and explication of these processes. The above examples further illustrate the controlled nature of historical archeological studies. As has been presented earlier, this controlled situation makes historical archeology an ideal arena for studies of site formation processes in archeology.

SUMMARY

This chapter has established a broad theoretical background to the problem addressed in this dissertation; namely, the nature of the relationship between systemic and archeological contexts in historical archeology. Theory covering this relationship is subsumed under the term site formation process. Site formation theory can be recognized

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as general theory with broad coverage and application to the area between archeological data and the broad covering laws of culture. Site formation process belongs to what has been termed middle-range archeological theory.

The historical archeological record had been shown to be particularly suited to the profitable study of site formation process due to the control that is possible over the data. While this setting makes historical archeological research into site formation of importance for all of archeology, it is of critical importance for historical archeological research itself; an increasing reliance on quantitative pattern recognition in historical archeology has concurrently increased the potential for misinterpretation due to misunderstood processes of site formation.

By its controlled nature, historical archeology joins ethnoarcheology and experimental archeology as an important field for the evaluation of the basic assumptions, theories, and methods of archeological inquiry. Each of these sub-disciplines offers different yet complementary types of data and means of independent control over that data. Historical archeology specifically offers a time depth and an ability to examine cultural systems that can no longer be observed by the ethnologist. The independent control offered by historical archeology comes from the written and oral historical record. While dealing with historical archeological data, and while developing insights important for the interpretation of the specific collections under study, this research seeks to take advantage of the potential of historical archeology to contribute to general archeological and anthropological theory.

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CHAPTER 2

STUDY APPROACH

In this chapter the specific parameters of this study are defined. These parameters specifically include the study setting, the study collections, specific research hypotheses, the data requirements of the hypotheses, and the methodological approach to be used for the evaluation of these hypotheses.

THE STUDY SETTING

Study settings can be defined in geographical, topical, and temporal terms according to the needs of the research to be undertaken. For this study a primary requirement of the study setting is to provide access to the type, quality, and quantity of data needed while, at the same time, limiting the range of variability caused by processes other than those under study. To satisfy this requirement, a study setting limited by time and space has been defined.

Central to the delineation of a study area was the choice of the Fort Towson Commanding Officer's Quarters as the primary study collection. Prior to the instigation of this study, the collection was unanalyzed, unreported, and available for extended research. This collection was from a site with a well documented history including specific information on site formation. The control available over this collection made it an ideal starting point for this study; its analysis could be directed to fully explore the hypotheses and establish a firm basis for comparison with other previously reported sites.

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A key factor for defining this study in spatial and temporal terms, then, was the selection of the collection from the commanding officer's quarters as the primary study collection. As discussed in greater detail later in this chapter, the collection from this site dates to the late 1850s and is the result of the civilian use of the quarters after their abandonment by the U.S. War Department. The study, therefore, must encompass an area which includes the southeastern Oklahoma site of Fort Towson and a time span including the mid-nineteenth century.

Spatial Limits

Spatial variations in material culture have long been of interest to archeologists, who have used such variations for, among other purposes, the delineation of local archeological cultures. Historical archeologists attempting to explain spatial variation have stressed the importance of the relationship of the sites within a region to networks of economic interaction (Adams 1976; Jones 1979; O'Brien 1984; Paynter 1982). The significance of regional differences in material culture during the historic period have led to cautions concerning the use of regional models in areas other than those they specifically describe (for example, Chance and Chance 1976; Moir 1982; Roenke 1978; Schoen 1985). The existence of potentially significant differences between regions, for whatever reason, argues for the limitation of this study to the regional level in order to reduce variation caused by regional differences.

The areal extent of the study setting has been somewhat arbitrarily limited to the eastern Great Plains south of Nebraska and the Trans-Mississippi South. This area includes the eastern portion of Kansas,

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the eastern portion of Oklahoma, and the entire state of Arkansas. This area includes the site of Fort Towson and a number of other excavated sites that are reported, well documented, and roughly contemporary to the commanding officer's quarters. Selection of the primary study collection and selection of a realistic comparative data base was key in defining the limits of the study area. It was nonetheless desired that the sites under consideration be comparable on a regional level. Although Kansas, Oklahoma, and Arkansas may at first appear to be an unlikely grouping of states which are seemingly more diverse than they are similar, there are two key factors which make this a homogeneous study setting. First, these areas were settled by Euro-Americans during roughly the same periods in history, although the intensities and causes for this settlement varied greatly from state to state. A second factor of importance is that prior to the immediate post-Civil War period, this area was tied into the national economy through the same general networks of trade and economic interaction. These networks relied in some fundamental way on the Mississippi River, either to bring goods north from New Orleans or West along the Ohio River from the northeastern United States. Therefore, the same basic processes resulted in the settlement of these states during the same general period. This allows us to assume a certain gross level of comparability for sites within the identified portions of these states, and allows us to accept this area as a reasonable study region. These criteria could have allowed the expansion of the study area to include portions of other states. This was not done because of the presence within the chosen study area of a sufficiently large body of data with which the author was familiar.

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Temporal Limits

Historic period material culture varies through time in stylistic, functional, qualitative, and quantitative terms (Deetz 1977, 1986; Jones and Sullivan 1985; Noel Hume 1970). Much of this variation appears related to changes in the methods of industrial production but factors associated with the international and local economies and social processes such as acculturation are important as well. Regardless of the causes, it is safe to conclude that variation in material culture decreases as the length of time considered is narrowed. For questions which do not seek to examine the nature of material culture change through time (i.e., non-evolutionary questions), a comparative data base composed of contemporary sites is preferable to one composed of sites which collectively cover a wide span of time. Since this study seeks to examine certain non-evolutionary questions of site formation, such a contemporary data set is desirable.

As has been introduced above, this study focuses on the mid-nineteenth century collection from the Fort Towson commanding officer's quarters. As a result, the temporal limits of this study must encompass this period. Given this, and the general nature of material culture before and after this mid-century mark, the temporal limits of this study are more specifically defined as encompassing the fifty years between 1820 to 1870. This period has been chosen for a number of reasons. Of foremost importance in selecting this range is the comparability of the material assemblage available within it. Although this period is by no means static with respect to material culture change, the material culture from this period is as a whole relatively

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homogeneous and is in many important ways markedly different from that found before and after. The period around 1800 is characterized, for example, by numerous major changes in ceramic wares available as well as the introduction of machine manufactured nails (Noel Hume 1970). Following the Civil War, another major change in ceramic wares types is found, and major technological changes in the glass bottle industry also occur (Jones and Sullivan 1985; Noel Hume 1970). With respect to material culture, therefore, sites dating from this period appear to represent a highly comparable data set. This 1820 to 1870 period also covers the initial, large scale settlement within the states included within this study. During this period, the economic development of the area would have been at a similar incipient state throughout. Significantly, the pre-1870 period dates before the extension of the railroad to the study area. The railroad significantly changed the pattern of economic interaction and would have imposed potentially significant differentials in the network of supply and interaction within the study area.

Another factor, and this a heuristic one, is that this range covers the dates of occupation of a large number of excavated sites in the region selected for study. Obviously, the occupation histories of sites are almost as variable as is the number of sites. It would clearly be difficult to develop a study collection of sites that were precisely comparable in a temporal sense. Within this 1820 to 1870 era, however, a large number of excavated and reported sites exist with overlapping ranges of occupation. Given the generally homogeneous material culture available during this period, such a data set of sites of overlapping occupation periods can be considered to be highly

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Summary

The study setting has therefore been defined spatially and temporally to include sites dating between about 1820 and 1870 and which are located in parts of the states of Arkansas, Kansas, and Oklahoma. These spatial and temporal limits have been placed on the study setting in order to restrict the potential variations in the study collections that are not due to processes of site formation.

No attempt has been made to restrict the study on the basis of variables such as site function or ethnicity. This would result in a study sample that is altogether too small due to the overall variability of the sample of excavated sites. Further, variation in these factors is seen as desirable in a study of site formation processes. If patterns are interpreted as being the result of site formation processes, observation of their common occurrence at sites which vary topically will be necessary for the validation of this interpretation.

THE STUDY COLLECTIONS

The collections to be used in this study have resulted from excavations conducted within the last two decades (Figure 1). Most of these collections have been reported, but as a group they represent the efforts of a wide range of researchers during a transitional period in American archeology. These collections differ, therefore, not only in their site histories but also in the history of their excavation, analysis, and reporting. In as much as these diverse variables may affect this study, it is important to review the history of these sites and their archeological research in some detail.

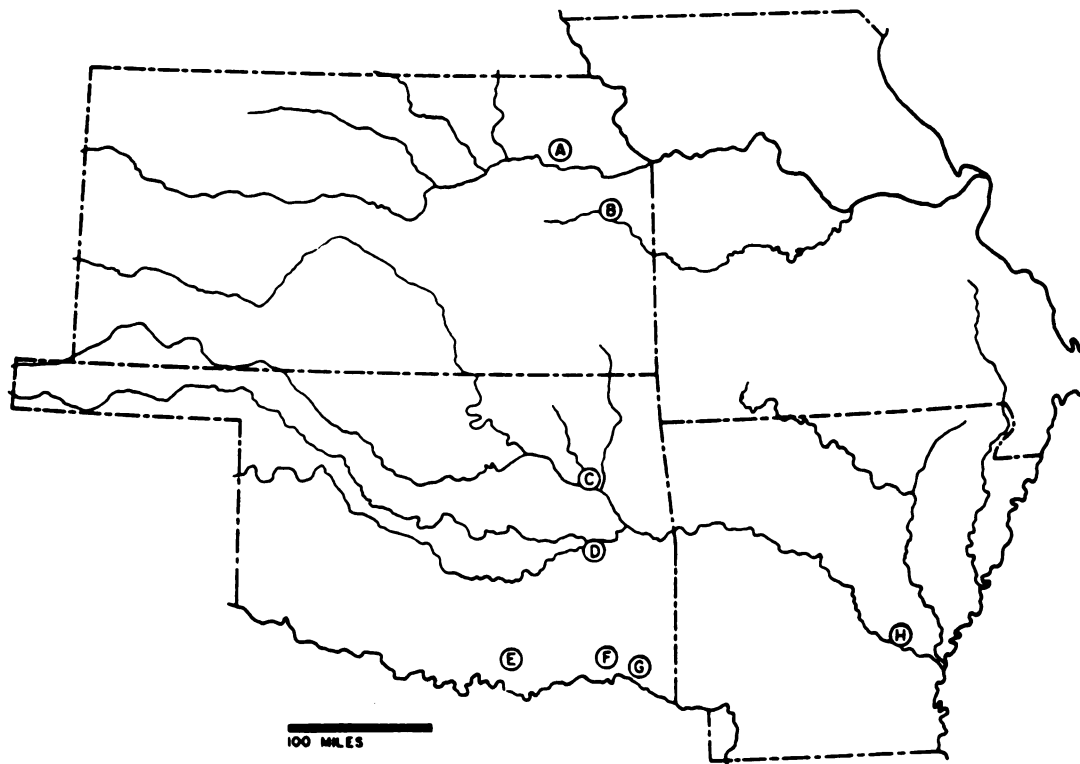


Figure 1. Location of the sites discussed in this chapter. A, 14SH315; B, Jotham Meeker Farmstead; C, Posey and Vandever-Haworth sites; D, 34PS212; E, Fort Washita sites; F, Pate-Roden site; G, Fort Towson sites; H, Arkansas Post bank.

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The Primary Study Collection:
Fort Towson Commanding Officer's Quarters

In 1824, Cantonments Towson and Gibson were established in what is today eastern Oklahoma to protect a new frontier line from the Osage and Plains Indians and from bands of Euro-American outlaws (Gibson 1965: 67; Lewis 1972: 7). Cantonment Towson was abandoned briefly in 1829, but was reestablished as Camp Phoenix in 1830 as the site of a permanent fort in the newly established western lands of the Choctaw Nation. In 1832 Camp Phoenix was officially renamed as Fort Towson (Lewis 1972: 9).

Fort Towson's major military role came during the war with Mexico (1846-1848). By the close of this conflict, Towson's role as a frontier outpost ceased with the establishment of forts further to the west. Following the war with Mexico, Fort Towson's garrison was reduced drastically. In 1854, Fort Towson was abandoned by the U.S. War Department and was turned over to the Department of the Interior, which almost immediately turned the property over to the Choctaw Nation. In 1854, the Choctaw Council made Fort Towson the capital of the Choctaw Nation, and tribal councils were held there in 1855 and 1856. Many of the buildings at the fort, including officer's row, were destroyed by fire in 1857. Fort Towson's last use appears to have been during the Civil War, when it served as the headquarters of Confederate forces operating in the Indian Territory and as a refuge for Indians loyal to the Confederacy (Lewis 1972: 14-15).

The site of Fort Towson has been under the control of the Oklahoma Historical Society since 1968. Archeological research at Fort Towson dates from 1971, when the Oklahoma Archeological Survey, University of Oklahoma, conducted excavations at the site of an 1830s barracks (Lewis

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1972). Shortly after the completion of the Survey's work at this site, the Historical Society created a position for a resident archeologist at the site. Under the direction of a series of such resident archeologists, the post well, powder magazine, commanding officer's quarters, blacksmith and carpenter shops, lime kilns, two post dumps, and the sutler's store and residence were investigated.

The excavations of the commanding officer's quarters are of interest here since the resulting collections serve as the focus of this research. The commanding officer's quarters was excavated in 1975 under the direction of Douglas D. Scott, then resident archeologist at Fort Towson. These excavations involved the complete excavation of the fill of the quarters as well as excavations within the yard (Figure 2). The yard represents the area to the rear of the quarters and was enclosed by stone walls. Within this yard, excavations were focused on identifying walkways and on the excavation of two privies, one stone-lined and one brick-lined. Although a preliminary report on the architectural features of the commanding office's quarters has been completed by Scott (1983), no analysis of the collections has been conducted.

The Fort Towson Commanding Officer's Quarters was situated on the north side of a square parade ground that was surrounded by buildings until the early 1840s. After that date, several buildings were removed and the parade was open on the south side. The north side of this parade was delineated by officer's quarters consisting of a central, separate commanding officer's quarters flanked by two sets of officers quarters composed of three units each. These officer's quarters, originally of log construction, were reconstructed as frame structures that were one and one-half stories high and which were set on three foot

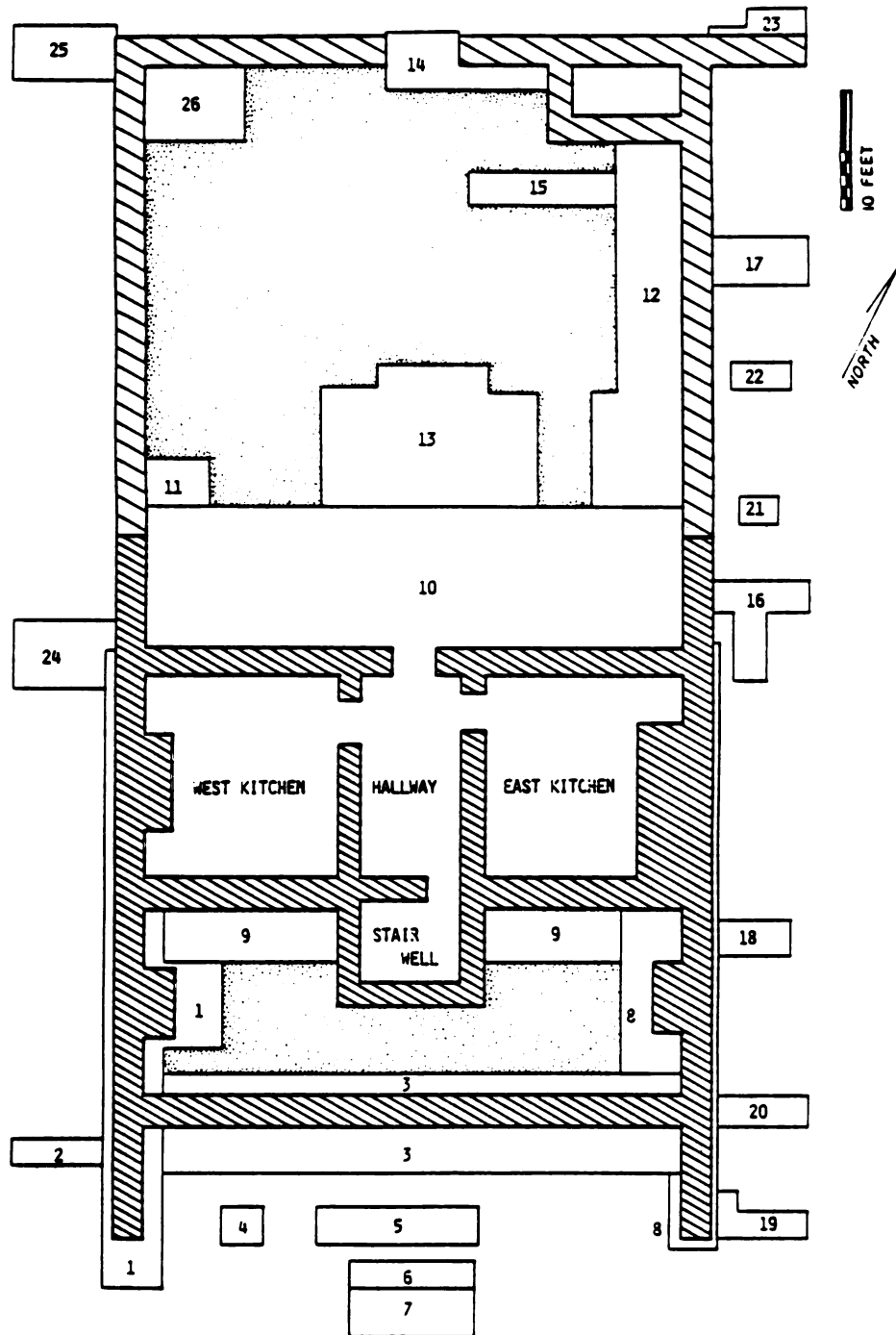


Figure 2. Plan of Fort Towson Commanding Officer's Quarters showing rooms and test trenches excavated.

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stone foundations (Lewis 1972; Scott 1983).

Excavations of the commanding officer's quarters in 1975 suggest that this building was destroyed by fire during its active use. Documents suggest this fire occurred in 1857 and was part of a fire that destroyed many of the remaining buildings at Fort Towson, including the entire officer's row (Scott 1983). Although the occupant of this building at the time of its destruction is not certain, its use at that time was clearly civilian.

The Comparative Study Collections

The comparative study collection focuses on sites for which published reports are available. Since this study focuses on the entire range of artifacts present at a site, the reports on these sites must present a quantitative description of the artifacts recovered. Sites for which these criteria are met include the site of the Arkansas Post bank, Arkansas; site 34PS212, Oklahoma, the Posey site, Oklahoma; the Vandever-Haworth site, Oklahoma; the Pate-Roden site, Oklahoma; the Fort Towson east barracks, Oklahoma; several localities at Fort Washita, Oklahoma; the site of Jotham Meeker's farmstead, Kansas; and site 14SN315, Kansas (Table 1). A description of these sites, which represent the comparative data base for this study, is presented following.

The Arkansas Post Branch Bank, Arkansas

The Arkansas Post Branch of the Bank of the State of Arkansas was established at the southeastern Arkansas settlement of Arkansas Post in 1838. A large brick building to house the bank was constructed in 1840-1841, but by 1843 the Arkansas Legislature had liquidated the bank. This building apparently saw only occasionally use prior to the Civil

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Table 1
Summary of comparative study collections

<u>Site</u>	<u>Location</u>	<u>Years occupied</u>	<u>Site type</u>
Arkansas Post State Bank	SE Arkansas	1841-1863	Hospital
34PS212	SE Oklahoma	1840-1860	Refuse pit
Posey	NE Oklahoma	1830-1840	Trading post, residence
Vandever-Haworth	NE Oklahoma	1830-1850	Trading post, residence
Pate-Roden	SE Oklahoma	1830-1850	Habitation
Fort Towson East Barrack	SE Oklahoma	1830-1860	Barrack
Fort Washita North Parade Ground Structure	SE Oklahoma	1844-1856	Barrack
Fort Washita Hospital Complex	SE Oklahoma	1842-1865	Hospital
Meeker Farmstead	E Kansas	1845-1855	Farmstead, Printing office
14SH315	NE Kansas	ca. 1850	Refuse pit

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War, perhaps due to the unsettled affairs of the Bank of the State of Arkansas, which remained in receivership until after the Civil War.

During the Civil War, Arkansas Post was fortified as "Fort Hindman" by the Confederate Army for the purpose of defending the Arkansas River. Arkansas Post was captured in 1863 after a sustained battle in which the bank building was destroyed by fire. At the time of its destruction, it was apparently in use as a military hospital (Walker 1971).

The bank building was a large, two story brick building with dimensions of about 30 by 60 feet. According to Walker:

based on historic and archeological evidence, the Bank can be described as having been a large two-story rectangular structure which was built of common red brick, trimmed with cut stone, and covered with a galvanized iron shingle roof [Walker 1971: 40].

Walker cites a range of historical and archeological evidence which indicates that this building was in use as a Confederate hospital during the Civil War and the 1863 battle which resulted in the capture of Arkansas Post, and that it was destroyed during the battle probably from a fire started by Union shelling of the building.

The Arkansas Post bank was excavated during two seasons during the 1960s, the first was to test the site and the second resulted in the complete excavation of the building (Figure 3). The testing involved the excavation of three trenches designed to cross-cut the foundations of this building and provide for the identification of its limits and configuration. These trenches did cross the foundations and, as a result, led to the excavation of materials from both the inside and the outside of the building. Approximately fifty percent of this trenching was located outside the building (Walker 1971; Wilson 1966).

The later excavation of the building involved a combination of hand

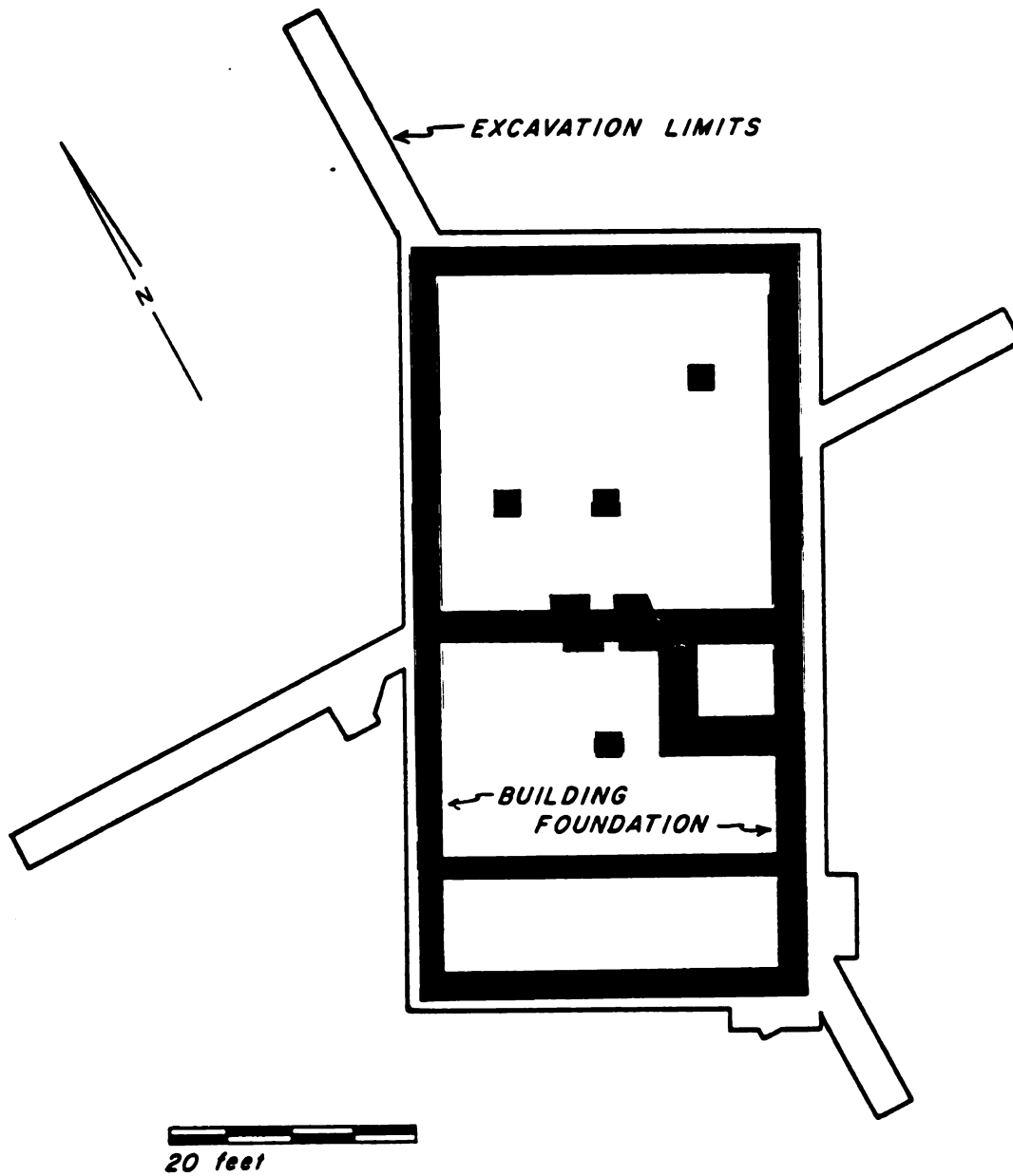


Figure 3. Plan of the excavations at the Arkansas Post Bank (After Walker 1971).

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and mechanized procedures. The testing and initial stages of the full-scale excavation had revealed a distinctive stratigraphy across the site. Underneath a thin humus was a culturally void layer of clay overlying an artifact bearing layer of brick rubble and ash. This brick and ash layer was located on top of a clay subsoil. Since all of the artifacts were found in the rubble layer and appeared to be "mixed throughout the stratum", Walker eventually abandoned any attempt to maintain horizontal and vertical control of artifacts and, in his analysis and report, treated all the artifacts recovered from this site as a unit (Walker 1971: 15).

Excavation of the bank was not done entirely by any one method, and recovery was certainly neither total or consistent. Due to time constraints, Walker employed a small bulldozer to remove much of the overburden and rubble located in the interior of the building:

as the work progressed, a careful watch was kept for any artifacts that might be uncovered; and, insofar as possible, all artifacts, with the exception of small brick fragments, were recovered. When this process was completed, all of the clay mantle and part of the rubble had been removed. Most of the remaining rubble was then excavated by hand; however, it was not possible to remove all rubble from the wall trenches because of the height of the water table during the latter period of the excavation, when over seven inches of rain fell within eight days [Walker 1971: 15].

These recovery techniques probably biased the collection of artifacts from this site in a number of ways. First, it was certainly more likely, especially during the mechanical excavation, that smaller artifacts would be less frequently recovered than larger, more highly visible artifacts. It is also likely that artifacts which contrasted in color to the soil, such as ceramics, may have been more consistently collected than artifacts, such as nails and other small iron artifacts,

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that probably blended in with the soil.

In spite of these biases in collection, the materials from the Arkansas Post Branch bank are of great importance for this study due to their comparability to the Fort Towson commanding officer's quarters. Although the functions of these two sites can be seen to vary considerably, they share a similar process of site formation: destruction by fire.

The Vandever-Haworth Site, Oklahoma

The Vandever-Haworth site is located in the Three Forks locale in northeastern Oklahoma. Due to its strategic location at the confluence of three major rivers, the Arkansas, Verdigris, and Grand or Neosho, the Three Forks area was important in the early settlement of Oklahoma by Euro-Americans. This area was of particular importance in the first half of the nineteenth century as the location of a number of trading posts dealing with American Indian groups such as the Creek, Osage, and a variety of Plains Indian groups (Baugh 1970).

The Vandever-Haworth site is one of two sites excavated in the Three Forks area that have been interpreted as trading posts from the early nineteenth century era. On the basis of historical and archeological information, this site is interpreted as being occupied between 1830 and 1850, during which time it served as a trading post possibly operated by Colonel Hugh Love (Baugh 1970).

The Vandever-Haworth site was discovered in 1964 during a survey associated with the Corps of Engineers' proposed Webber's Falls Lock and Dam No. 16 (Barr 1965). A short testing project was conducted at this site in 1966, during which time two areas of the site were defined and 19 test squares were excavated. These test excavations resulted in the

discovery of a single, circular, trash filled pit measuring six feet in diameter and one foot in depth. Artifacts recovered from these test excavations were assigned to the 1830 to 1850 time period (Baugh 1970; Schneider 1967).

In 1968, an extensive study of this site was conducted in anticipation that it would be destroyed during the rerouting of a state highway in association with the proposed Corps of Engineers project. This intensive study covered a period of 11 days and involved an additional intensive surface collection of the site and the mechanical stripping of the site's plowzone in order to search for features (Figure 4). On discovery, features were carefully excavated and their matrix was sifted through .635 cm hardware cloth (Baugh 1970).

A total of 13 features were discovered during the 1968 mechanical stripping program. These consisted of shallow pit features of varying sizes and depths and with variable artifact and soil matrix contents. A summary of these features, as well as the single feature excavated in 1966, is presented in Table 2.

The data recovery from the Vandever-Haworth site, therefore, focused on two strategies: surface collection and the excavation of features, all of which represented shallow, trash filled pits. The potential is high that the surface collection and the features resulted from different site formation processes related to refuse disposal. Fortunately, the report on this site is carefully quantified and is presented in tables that allow the separation of the collection into the original collection units.

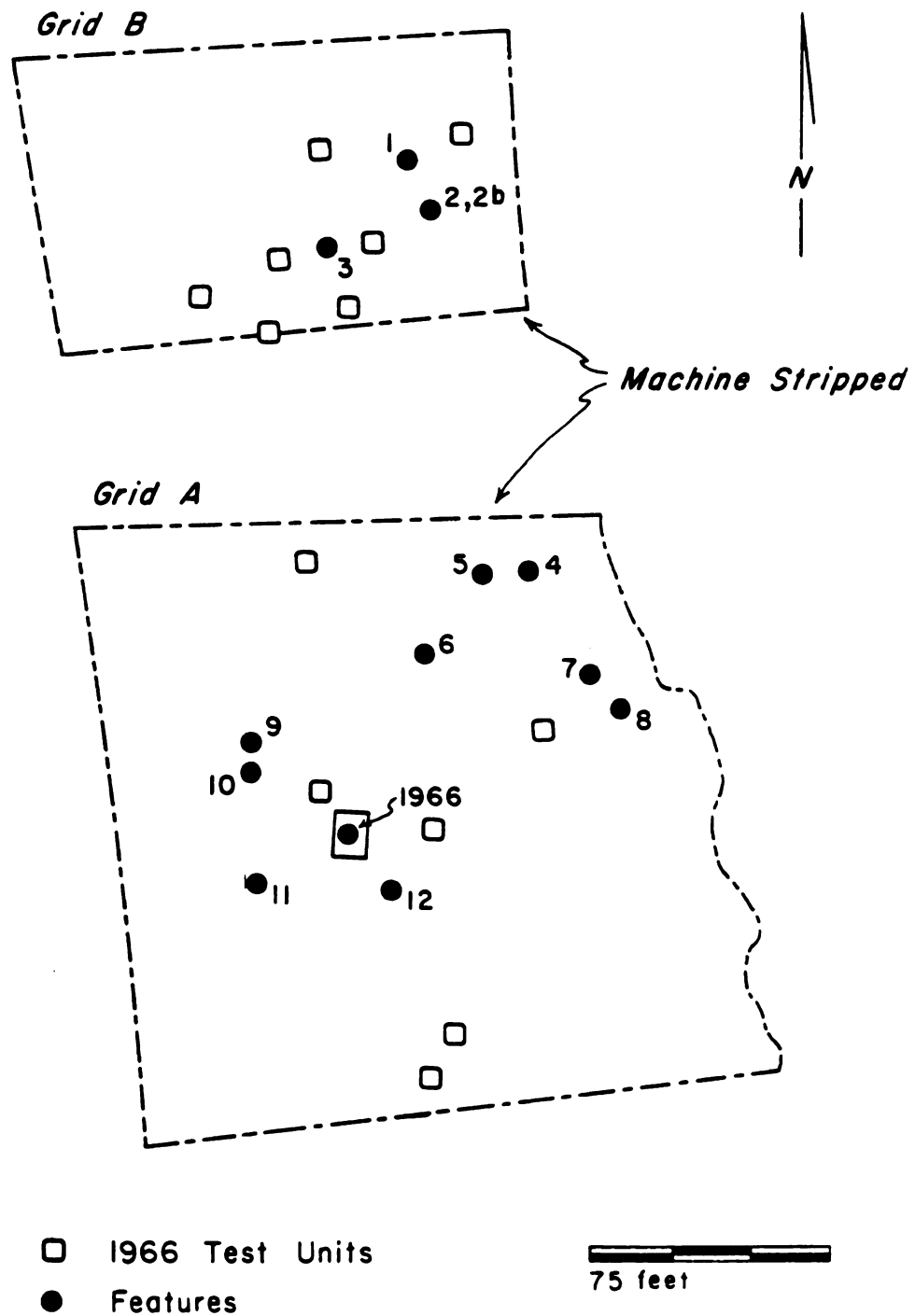


Figure 4. Plan of excavations at the Vandever-Haworth site (After Baugh 1970).

Table 2

Summary of features excavated at the Vandever-
Haworth Site in 1966 and 1968.

<u>Feature Number</u>	<u>Type</u>	<u>Dimensions</u>	<u>Depth</u>
1966	circular pit	6' diameter	1.0'
1	elliptical basin	1.5' x 1.25'	1.5'
2a	circular basin	6.2' diameter	2.0'
2b	rectangular pit	2.0' x 9.0'	.5'
3	elliptical pit	2.7' x 1.4'	2.0'
4	elliptical pit	2.1' x 2.8'	1.8'
5	circular basin	4.4' diameter	2.0'
6	circular basin	5.4' diameter	1.8'
7	oval basin	3.3' x 2.6'	1.3'
8	elliptical basin	2.9' x 3.8'	1.5'
9	circular pit	6.5' diameter	2.1'
10	circular pit	6.5' diameter	1.7'
11	circular basin	6.0' diameter	1.9'
12	irregular rectangular basin and post holes	5.8' x 6.6'	1.9'

The Posey Site, Oklahoma

The Posey site is located directly across the Verdigris River from the previously described Vandever-Haworth site in the Three Forks locale of northeastern Oklahoma. Like the Vandever-Haworth site, the Posey site is interpreted as the location of an early nineteenth century trading post. The Posey site may have been the Three Forks post operated by the Chouteau family in the 1820s and 1830s and later used as an agency for the Creek Indians (Barr 1965). Artifacts from this site suggest an occupation during the 1830 to 1840 period, falling within the range suggested for Vandever-Haworth (Wyckoff and Barr 1968).

Like the Vandever-Haworth site, the Posey site was threatened by the then proposed construction of the Arkansas River Navigational Project. Excavations to recover important information from the Posey site were conducted between November 8 and December 30, 1965. The Posey site covered an area of approximately three acres at the confluence of an intermittent tributary and the Verdigris River. Excavation at this site focused on areas where features were observed on the surface.

Excavations were conducted in five areas of this site (Figure 5). Three block excavations were placed over areas where features were observed on the surface, and were designated as Feature Areas 1 through 3. Another block was laid out along the river in an area where no surface features were observed. This block was composed of individual squares and was termed Grid A. Finally, five non-contiguous test units were used to test another area of the site along the Verdigris River.

A total of 600 square feet were excavated in Feature Area 1. This area was excavated to expose a concentration of sandstone slabs observed

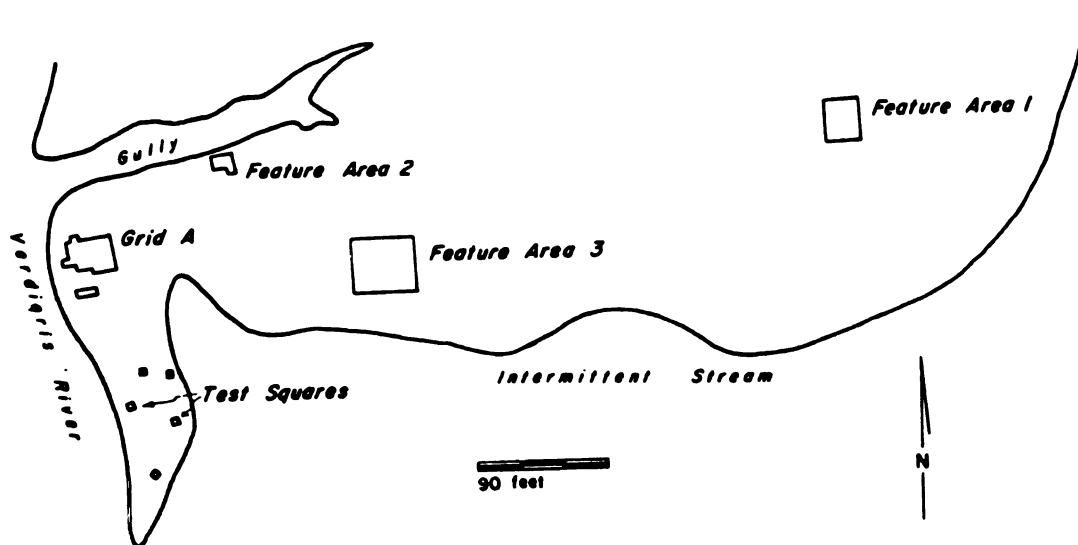


Figure 5. Plan of excavations at the Posey site (After Wyckoff and Barr 1968)

on the surface and believed to represent a building. This concentration was interpreted as representing the foundation for a building, but the scarcity of artifacts found in the vicinity suggested that it was never utilized intensively or served a specialized but unknown function.

Feature Area 2 was situated around an open, sandstone slab-lined well. A total of 225 square feet were excavated around this feature. Excavation was attempted in the interior of the well, but no artifacts were recovered from it. In the surrounding area, artifacts recovered were described as being "very limited in quantity and variety" (Wyckoff and Barr 1968: 14).

In the vicinity of Feature Area 3, several concentrations of rocks were observed on the surface. The central concentration was exposed through the excavation of Feature Area 3, which uncovered an area of 1800 square feet:

as a result of this work, there was uncovered a series of sandstone slabs, several sections of hand-hewn timber, and a few small areas of puddled clay and baked clay. These material traces are believed to be the remains of a house that was roughly 25 ft. square [Wyckoff and Barr 1968: 14].

Like the other Feature Areas, artifacts were restricted in this area to the upper 6 inches. Unlike the other Feature Areas, however, artifacts were reported to be numerous in Feature Area 3.

Grid A covered an area of 775 square feet and was excavated in order to investigate a concentration of coal clinkers revealed in a soil disturbance. Excavations in this area:

uncovered a line of sandstone slabs [that] was 20 ft. in length and varied from 3 to 3 1/2 ft. in width [beneath which] was found (at a depth of 16 in.) an oval basin containing a lense of coal underlain by a lense of ash. Upon removal of these lenses was found a circular, slab-lined hearth and scattered rocks probably relating to this hearth [Wyckoff and Barr 1968].

This coal filled basin was interpreted to be related to metal working activities although it did not appear to be a forge.

The five test pits covering a total of 125 square feet revealed few artifacts and few identifiable features. Excavation in this area was therefore curtailed on the completion of these units.

Although there remain questions concerning the function of some of the features discovered at the Posey site, they all appear to be associated with buildings or activity areas. The artifacts associated with these features should, therefore, represent primary refuse. This contrasts significantly, perhaps, to the contexts associated with the artifacts excavated at the nearby Vandever-Haworth site, most of which derived from refuse pits.

The Pate-Roden Site, Oklahoma

The Pate-Roden site is located in the Kiamichi River valley in extreme southeastern Oklahoma. Excavations were conducted at this site in 1970 by the Oklahoma River Basin Survey as part of a general archeological program associated with the construction of the Hugo Dam and Reservoir by the Corps of Engineers (Rohrbaugh et al. 1971).

The Pate-Roden site is situated on a high point of land alongside a small tributary of the Kiamichi River. Archeological investigations at this site were confined to a single area and included the excavation of a total area of 250 square feet distributed between ten 5 x 5 foot excavation units (Figure 6).

Investigations at this site resulted in the discovery of two historic trash filled pits and a large sample of early nineteenth century artifacts. In general, the artifacts from this site suggest it

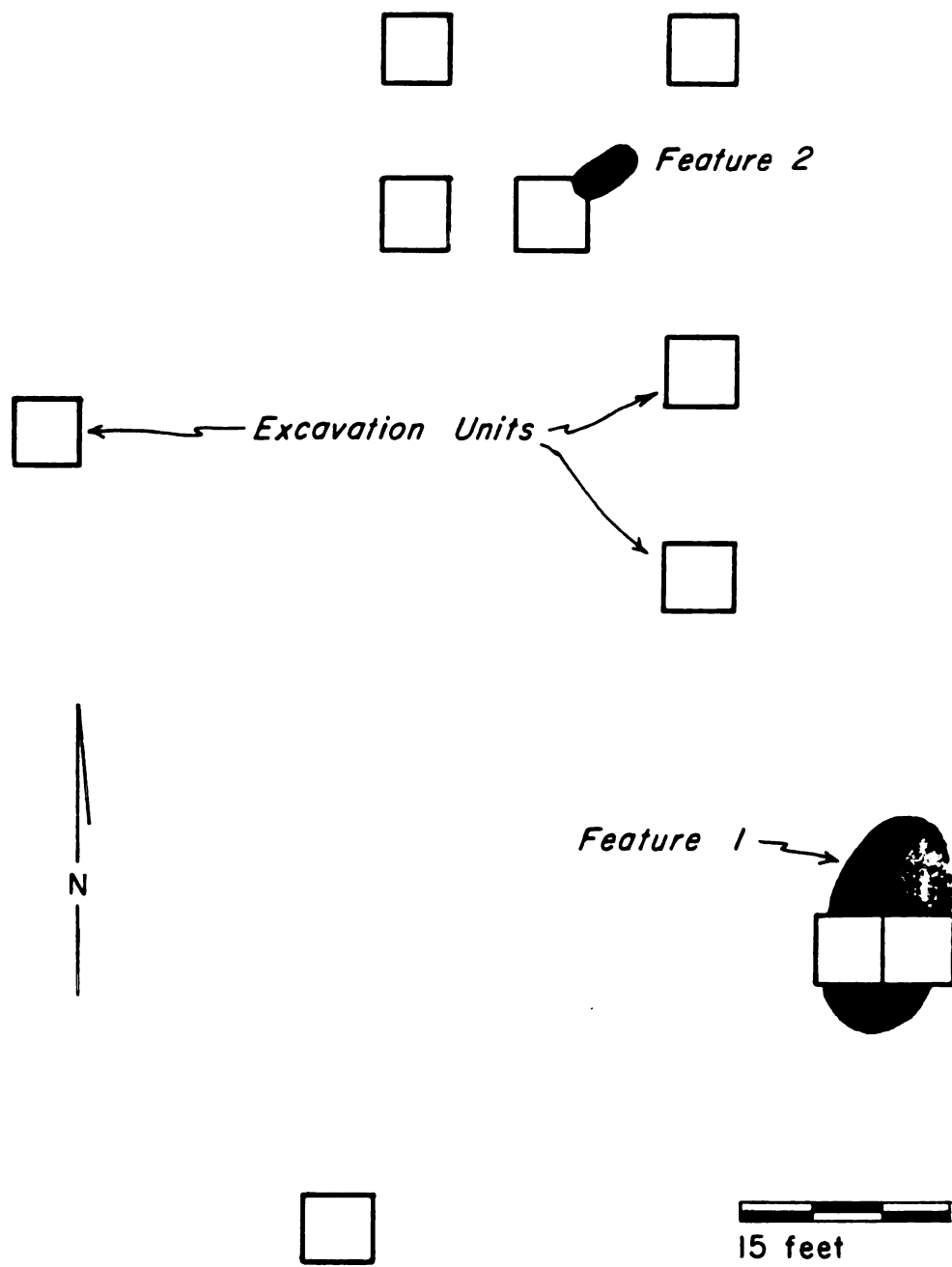


Figure 6. Plan of excavations at the Pate-Roden site (After Rohrbaugh et al. 1971)

was occupied during the 1830 to 1850 period, a range roughly similar to that of the Vandever-Haworth and Posey sites. The reconstructed dates of occupation of this site coincide with the period of initial Choctaw resettlement in southeastern Oklahoma. This, and the presence of Choctaw pottery and possible historic period stone artifacts led to the conclusion that the Pate-Roden site was the site of an early Choctaw habitation.

Artifacts from this site come from three contexts including the general site midden and two pit features. The largest of the pit features, Feature 1, was observed on the surface as a "large sunken area" measuring 8 by 14 feet. Excavations of this pit were limited to a trench composed of two 5 by 5 foot units placed across its mid-section. The depth of this feature within the trench was 62.5 inches. This feature was interpreted as a "large refuse pit with sloping sides and rounded bottom" which was filled with a large quantity of historic period materials (Rohrbaugh et al. 1971: 140).

The second pit feature, Feature 2, was identified as a soil discoloration during the excavation of one of the 5 x 5 foot units. This feature extended beyond the limits of the unit, but was completely excavated by following out its outline. It was found to be a trash filled pit measuring 3.5 by 1.75 feet and with a maximum depth of 1.6 feet (Rohrbaugh et al. 1971: 141).

Besides these two pits, no other historic period features were discovered at this site. The presence of a building at this site can be inferred, however, by the presence of a large quantity of nails and other architectural artifacts. In considering the various possible site formation contexts represented by the collection, therefore, it

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would appear that the sample of artifacts from the non-feature midden probably represents primary refuse while that from the two trash filled pits represents secondary refuse.

Fort Towson East Barracks, Oklahoma

Excavations of one of the east barracks at Fort Towson, southeastern Oklahoma, were conducted in 1971 in conjunction with the then proposed stabilization and reconstruction of the post. Through historical and archeological information, this building was identified as a barrack built in 1843 when Fort Towson was rebuilt by the U.S. War Department. Artifacts from this building indicate occupation primarily during the three decades prior to the Civil War. Some more recent material was discovered on the surface, and appears to be the result of very limited turn of the century dumping (Lewis 1972: 87).

Investigation of the Fort Towson barrack was conducted largely through the excavation of five trenches which were mostly confined to the interior of the structure (Figure 7). Three of these trenches did, however, extend a short distance outside the structure. In addition to these trenches, an area was opened up around the north hearth and a unit was excavated to search for the corner of the porch foundation.

Since the excavations of this barrack were largely confined to the interior of the building and resulted in the excavation of overburden down to the original clay floor of the structure, the artifacts encountered could be the result of a number of discard processes. Since all but those few found on the surface appear to date to the period of the occupation of Fort Towson, it is unlikely that they resulted from the use of the abandoned building as a secondary refuse

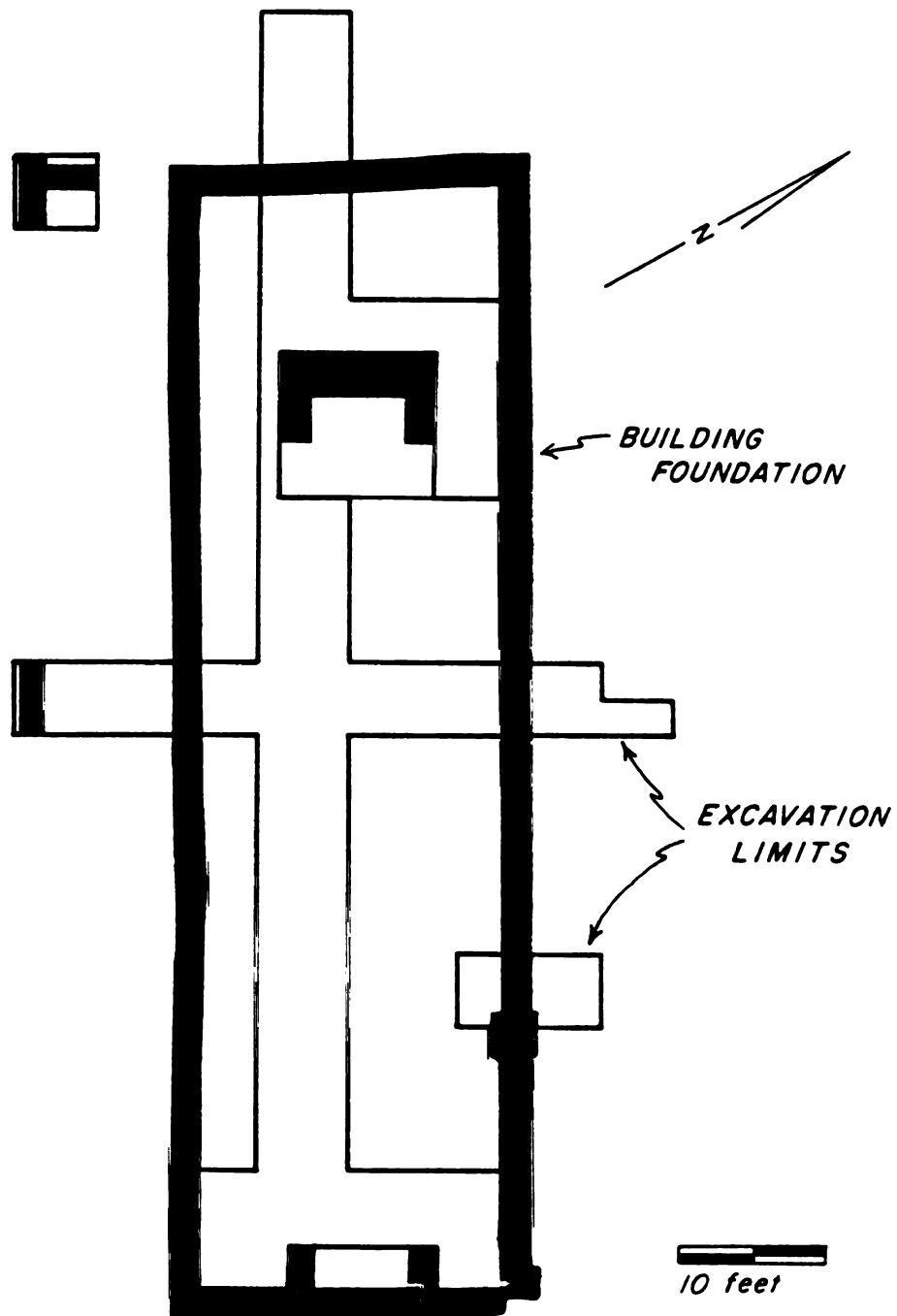


Figure 7. Plan of excavations at the east barrack, Fort Towson (After Lewis 1972).

dump. The artifacts likely are the result of either primary refuse disposal or from the abandonment of the site.

Fort Washita, Oklahoma

Fort Washita was established in 1842 in what is now southeastern Oklahoma. It was located approximately 80 miles west of Fort Towson and served to provide protection for the newly arrived Chickasaws. This post remained in use by the U.S. War Department until 1861, when it was abandoned due to the onset of the Civil War. It was then taken over by the Confederates and served as a Confederate military outpost until the end of the Civil War. Following the Civil War, the post was never reoccupied for military purposes, and in 1870 it was transferred to the Department of the Interior and the Chickasaw Nation. For the remainder of the nineteenth century, the buildings were used for a number of purposes, but the condition of the former fort deteriorated and many of the buildings were destroyed either by fire or through gradual dilapidation. Between 1906 and 1908 the former fort was allotted to the Colbert family who resided at the fort for many years and who eventually sold the site to the Oklahoma Historical Society in 1962 (Blaine 1975).

In 1971 archeological investigations of four separate building areas at Fort Washita were undertaken. These four areas included:

a single story masonry structure believed to be a barracks located on the south side of the parade ground, the foundations of the early post hospital to the southeast of the barracks, the remains of a structure on the north side of the parade ground marked only by the rubble of two fireplaces, and finally two areas of rock concentrations located on either side of an unimproved road just north of the structure [Lewis 1975a: 2].

These four building areas were investigated in order to determine the identity of the buildings or features, to interpret their architecture

and physical appearance, and to interpret the activities associated with these buildings or features. A review of the investigations conducted three of the four areas at Fort Washita is presented below. the rock concentration area is not discussed because it was determined to be characterized by a mixed deposit, making it unacceptable for this study.

North Parade Ground Structure

The North Parade Ground Structure appears to be one of the earliest buildings constructed at Fort Washita. Archeological evidence suggests that it was constructed as a barracks prior to 1844. A reconstruction of this building based solely on archeological information (Figure 8) suggests that it consisted of:

two rooms with a central hallway entering on the north side and passing at least halfway through the building. The two rooms appear to have been connected by a passage behind the central hallway. Each had a limestone fireplace located at the end opposite the hallway. The entire building may have rested upon wooden piers about a foot in diameter which were sunk one foot below the ground surface. Three entrances to the building appear on the north side, one in the center and one on either side for each room, and on the west side just north of the fireplace [Lewis 1975b: 74].

This building was subsequently used as an adjutant's office and schoolhouse. When the new west barracks were completed in 1856, this building was dismantled along with the other original log buildings located on the north and west sides of the parade (Lewis 1975b: 75).

Based on this reconstruction, the materials associated with this structure appear to date roughly between 1844 and 1856. No other substantial uses of this building area appear to have occurred following the 1856 dismantling of this building. In general, therefore, the materials found at this location can be considered to be primary refuse associated with the use of this building.

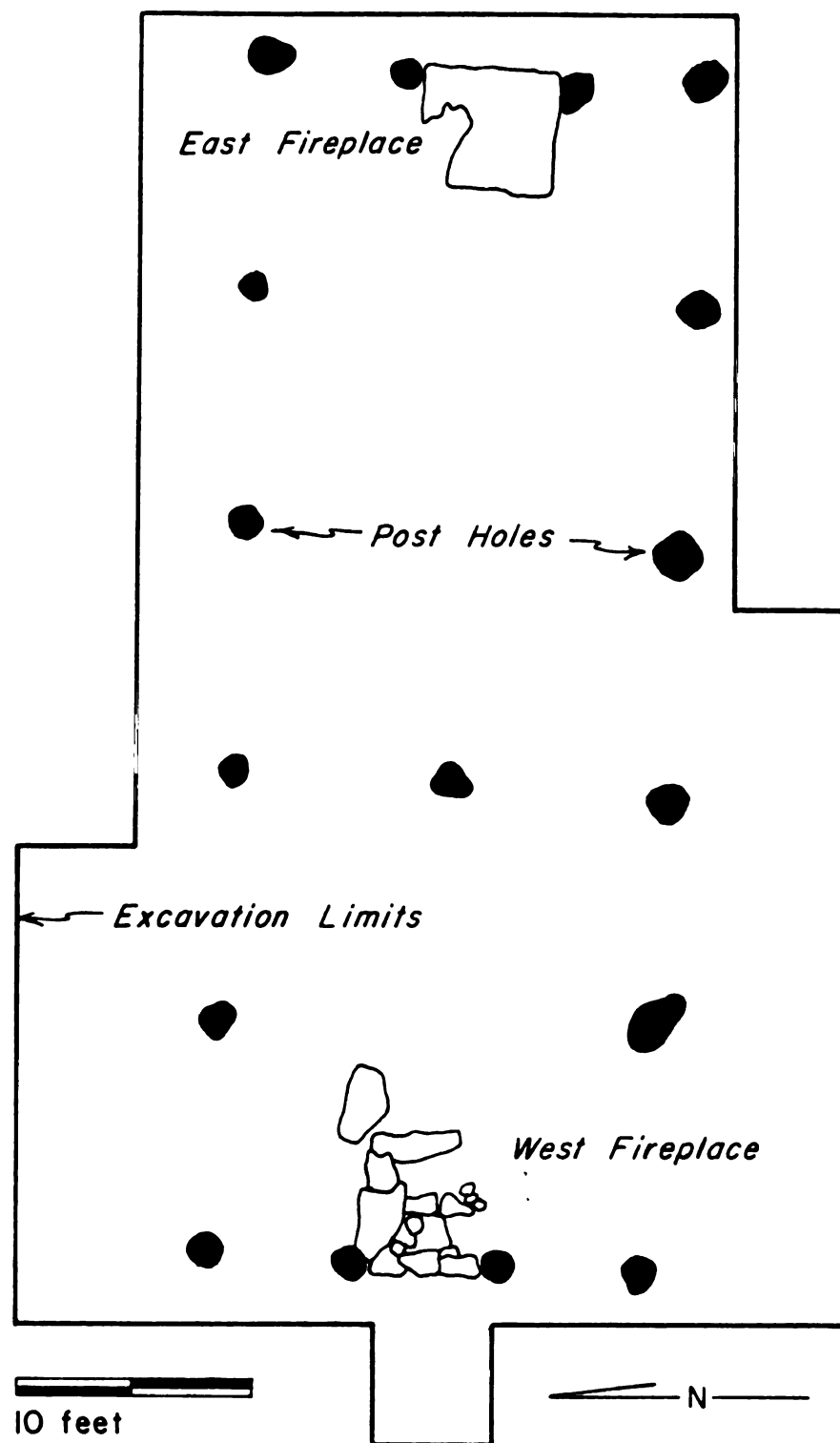


Figure 8. Plan of excavations at the Fort Washita north parade ground structure (After Lewis 1975).

Hospital Complex

Excavations were conducted in an area identified as the location of the first hospital complex at Fort Washita. These excavations revealed the remains of two buildings, interpreted on the basis of archeological and documentary evidence as a hospital building and a detached kitchen building (Figure 9). These buildings were apparently constructed between the establishment of the fort in 1842 and 1845. In 1854, these buildings were apparently totally rebuilt in the same immediate vicinity as the original buildings. In 1856 the second hospital complex, featuring brick buildings, was completed and the first complex was abandoned as a hospital (Penman 1975).

Documents say nothing of the fate of the first hospital complex after that date, but the archeological record suggests these buildings may have served to store munitions and tack until their destruction, possibly at the close of the Civil War. Destruction of these buildings by fire is suggested by the archeological record, although there is no evidence they were in active use at the time of this catastrophic destruction (Penman 1975).

Excavation of the first hospital complex was subdivided into three general areas or units. Two of these (A and C) are associated with the hospital building and the third (B) includes the area of the hospital kitchen. A number of architectural features were encountered during the excavations, including foundation piers, fireplaces, and continuous foundations. Excavations were confined to the area within and immediately surrounding observed architectural features. The material remains, therefore, appear to represent primary refuse dating from the various occupations of these buildings between about 1842 and about

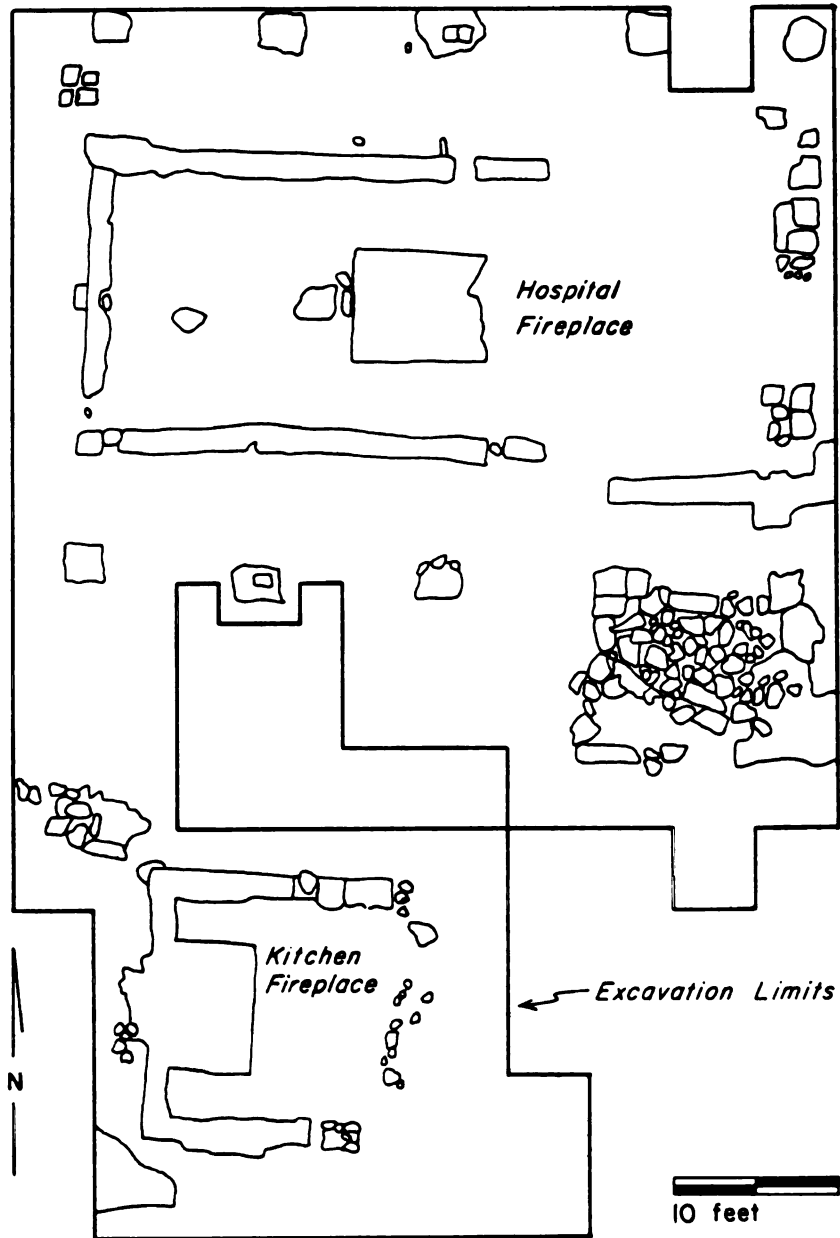


Figure 9. Plan of excavations at the Fort Washita hospital complex (After Penman 1975).

1865. Since the buildings do not appear to have been in use at the time of their destruction, few artifacts can be expected to be related to the catastrophic destruction of these buildings by fire (Penman 1975).

South Barracks

The Fort Washita south barracks was constructed in the late 1840s as part of a program to replace the original log buildings with more substantial and permanent stone and brick buildings. This building remained in use as a barrack until the end of the military occupation during the 1860s, and it was probably destroyed by fire at the close of the Civil War. Following the Civil War, the ruins of this building were modified into a barn and storeroom by the civilian owners of the property. Although most of the recovered artifacts from the south barracks appear to date to the 1849 to ca. 1865 military occupation, these post-Civil War uses of this building indicate the collection may be biased in certain areas. Its utility in this study is therefore greatly restricted (Lopez 1975).

Excavations at the south barracks focused on the recovery of architectural information and were largely confined within the building. Several areas beyond the limits of the foundation and its porches were nevertheless investigated. The materials recovered from these excavations appear to represent primary refuse. There is little archeological evidence for the catastrophic destruction of this building by fire (Lopez 1975).

Site 34PS212, Oklahoma

Site 34PS212 consists of a large historic period trash pit and cemetery that was observed eroding into Eufaula reservoir during an

archeological survey in 1979. Following this discovery, funds were obtained for the immediate emergency excavation of the trash pit.

According to Gettys:

the pit measured 1.6 m by 1.98 m and was 71.12 cm deep. One end of the pit was exposed when the site was first visited during the survey; the excavators postulate that very little material had been lost to erosion at the time of excavation. The pit was described by the excavators as rectangular in shape with slightly rounded corners and straight, obviously dug walls [Gettys 1980: 264].

This trash pit was excavated as a single unit with no control for possible stratigraphic variation. The fill was water screened through window screen. No excavations were conducted beyond the limits of the pit, and therefore its association with other features is uncertain.

Estimates of the age of this trash pit are based solely on the archeological record, which fairly firmly limits the deposition of the materials to the ca. 1840 to 1860 period. Attempts to establish the ethnic identity of this trash pit were largely unsuccessful, but Gettys suggests that it was related to a Native American occupation associated with the relocation of the Creeks to this area. An interpretation of the materials within this trash pit as secondary refuse is also offered (Gettys 1980).

In addition to the trash pit, 34PS212 also contains a small cemetery. Investigations at this cemetery were restricted to a surface collection. The collection from this cemetery will not be considered in this study.

The Jotham Meeker Farmstead, Kansas

The site of the Jotham Meeker Farmstead is a component of a larger site associated with the Ottawa Baptist Mission of east central Kansas.

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In 1838 Jotham Meeker established a mission among the Ottawa who had migrated from Ohio to Kansas in 1837. This mission was located on the Marais des Cygnes River within the Ottawa Reservation. It consisted of a meeting house and other mission buildings, and Meeker's farmstead. This mission and farmstead was, however, destroyed by a flood in 1844, and Meeker relocated it on higher ground the following year (Lees 1985, 1986).

The second site of the Ottawa Baptist Mission (14FR308) was located on a bluff overlooking Ottawa Creek, a tributary of the Marais des Cygnes River. Once again, this site included a variety of mission buildings and the buildings of Meeker's farmstead. Of interest, however, was the presence of a printing office adjacent to Meeker's dwelling house. In addition to serving as a missionary to the Ottawa, Meeker was also responsible for establishing the first printing operation west of the Missouri River at the Shawnee Baptist Mission in 1837. Meeker developed an orthography which allowed him to publish texts and newspapers in a variety of Indian languages such as Potawatomie and Ottawa. In 1849, Meeker moved his printing operation from the Shawnee Baptist Mission to the second site of the Ottawa Baptist Mission. It was housed in a building immediately adjacent to his dwelling (Lees 1985, 1986).

Following the death of Jotham Meeker in 1855 and his wife Eleanor in 1856, the buildings of the farmstead were apparently abandoned and fell into disrepair almost immediately. It is probable that they saw no substantial use other than that by the Meekers. The meeting house appears to have continued in use for a number of years, but it too was abandoned after the Ottawa were removed to Oklahoma in the late 1860s

(Lees 1985, 1986).

In 1985, two weeks of excavations were conducted at the site of the Meeker farmstead at the second Ottawa Baptist Mission. These excavations focused on two areas: the dwelling house and the printing office. The site of the dwelling was determined on the basis of historical descriptions of the house and the presence of a cellar depression and two low mounds marking the locations of hearths. The location of the printing office was inferred from the location of the dwelling; historical references place the office adjacent to and west of the dwelling (Lees 1985, 1986).

Excavations revealed ample architectural evidence of the dwelling house, including the cellar, three hearths, six foundation piers, and a variety of other features (Figure 10). Excavations in the vicinity of the dwelling recovered a sample of artifacts from areas which would have been located within the building and outside the portion interpreted as the kitchen. Except for materials recovered from the cellar fill, which substantially post-date the Meeker occupation, these materials are all interpreted as representing primary refuse associated with the 1845 to 1855 period (Lees 1985, 1986).

Excavations in the hypothesized printing office area failed to reveal any architectural features, but analysis of the artifacts from this area and from the dwelling area indicate that they are significantly different and that they probably resulted from different structures and differing activities. Due to the discovery of printer's type in this area, the materials found in this area are believed to be associated with the printing office as opposed to the dwelling, although

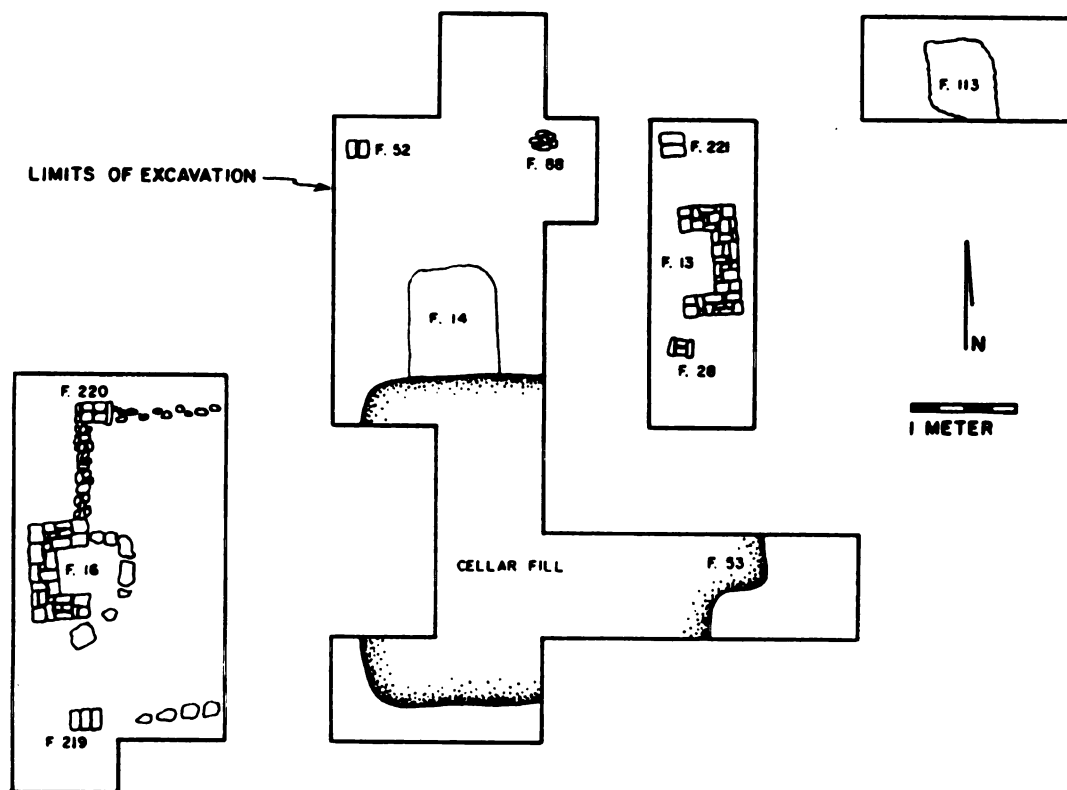


Figure 10. Plan of excavations within Area 851 of the Jotham Meeker farmstead (After Lees 1985).

liberal interaction between these areas is acknowledged. As with the materials excavated from the dwelling area, those from the printing office area are interpreted as primary refuse (Lees 1985, 1986).

The materials from the Meeker farmstead are, with respect to age and its generalized domestic function, quite similar to the collection from the Fort Towson Commanding Officer's Quarters. the collection does, however, differ significantly with respect to site formation. Of special interest, this collection has been analyzed with a concern for variables such as artifact size which may be of crucial importance in studies of site formation and which have not been considered in the analyses of other comparative collections. This collection is housed at the Kansas State Historical Society and was readily available for additional comparative research.

Site 14SH315, Kansas

Site 14SH315 was excavated in 1969 as part of the archeological salvage work associated with the then proposed Grove Reservoir in northeast Kansas. A total of 725 square feet of excavations were conducted at this site. These excavations resulted in the discovery of a single cultural feature from which the majority of artifacts were recovered (Figure 11). This feature consisted of a large trash-filled pit which measured approximately 27 feet by 4 feet by 3.5 feet deep.

According to Reynolds:

the walls and floor of the depression were rounded and uneven. The depression was evidently of cultural origin, although it may have been created by modification of an existing wash or ditch...most of the cultural materials recovered from the depression were discarded domestic trash [Reynolds 1987].

The contents of this trash pit led Reynolds to conclude that it probably dates to the mid-nineteenth century and was probably associated with a

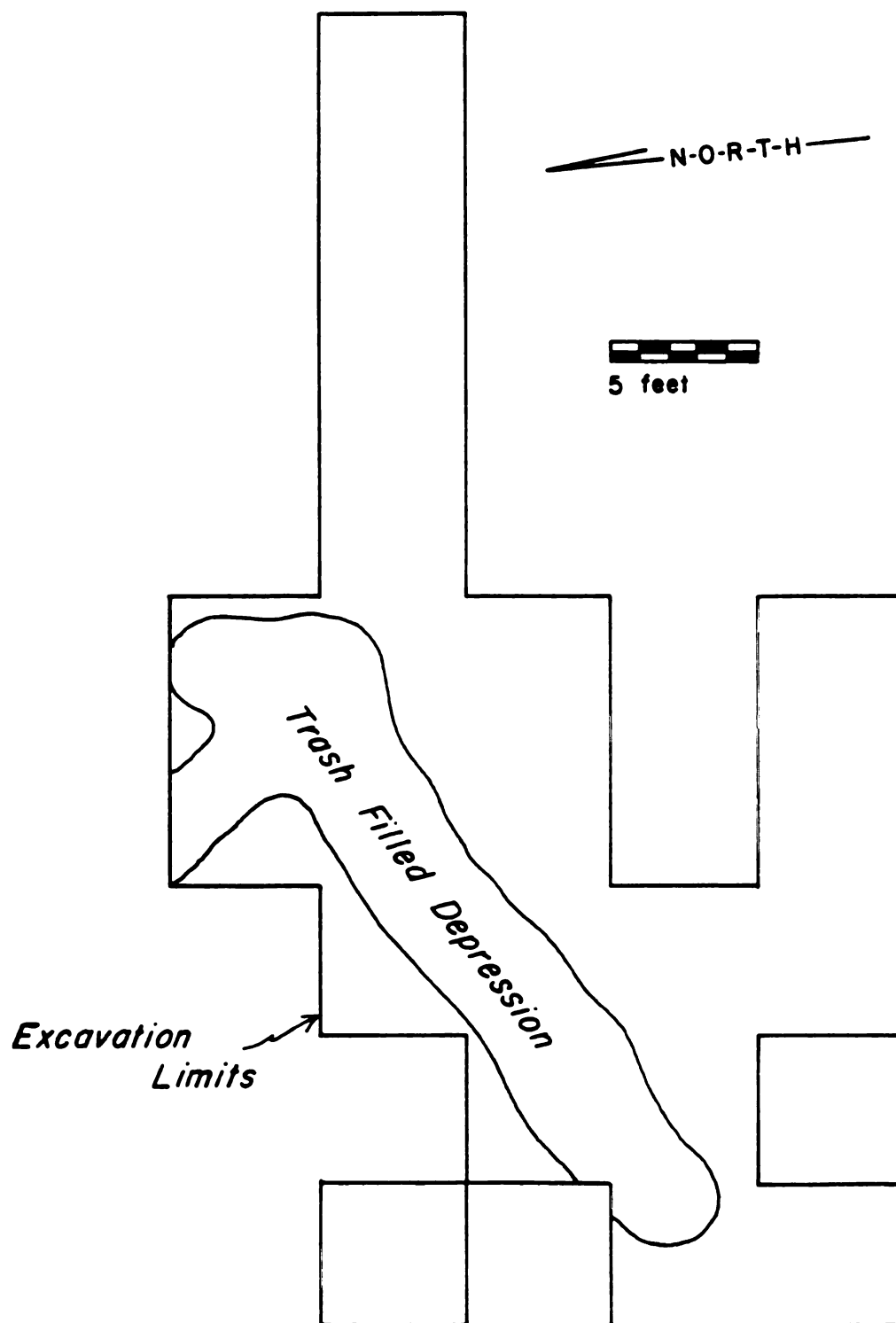


Figure 11. Plan of excavations at site 14SH315 (After Reynolds 1987)

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Potawatomi settlement. This conclusion is based on the ages of manufacture of the artifacts, the presence of artifacts of Native American manufacture and of a type generally traded to Native Americans during the nineteenth century, and the presence of the site within the limits of the Potawatomi reservation as it existed during this mid-century period. Materials within this trash pit were interpreted as secondary refuse (Reynolds 1986). This collection is housed at the Kansas State Historical Society, and was available for re-analysis as necessary.

Summary of Study Collections

This study will, therefore, rely on data from a primary study collection and a number of comparative study collections. Although located within an historically similar region and dating to roughly the same time period, these sites differ significantly with respect to function, ethnicity, and, of utmost importance for this study, in processes of site formation. Since the level of historical and archeological documentation for each of these sites is high, they represent a data base useful for critical evaluation of the operation of differentials of site formation in historical archeology.

RESEARCH HYPOTHESES

In order to structure this data and allow for its profitable analysis, research hypotheses and test implications are needed to specify the expected effects of different site formation processes on these sites. The general theory under which this research was undertaken is straightforward and has far reaching implications for archeological research. This theory is:

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DIFFERENT SITE FORMATION PROCESSES WILL RESULT IN SYSTEMATIC, PATTERNED DIFFERENCES IN THE ARCHEOLOGICAL RECORD. DUE TO DIFFERENCES BETWEEN THE OPERATION OF VARIOUS SITE FORMATION PROCESSES, THEIR PATTERNS IN THE ARCHEOLOGICAL RECORD WILL BE DISTINCT AND WILL ALLOW THE IDENTIFICATION OF AND DIFFERENTIATION BETWEEN PARENT PROCESS(ES).

This research has been directed at defining the patterned differences of three fundamental site formation processes: in situ-de facto formation resulting from the destruction of buildings by fire, primary refuse disposal, and secondary refuse disposal. Each of these processes is known to have operated at the sites considered within this study. Hypotheses specifically describing the expected archeological pattern resulting from these various site formation processes can be presented.

It is useful to briefly discuss here the level at which these site formation processes are expected to be operative. Site formation processes can generally be conceived as processes which affect the formation of parts of sites and as such are manifest at the level of the site context or depositional unit. Any number of contexts within a site may be the result of the same type of site formation process. There may, for example, be several secondary refuse dumps at a site, or several distinct episodes of dumping in a single dump. Likewise, a site context may be the result of more than one process. For example, a surface generally defined by a primary refuse scatter may find a bucket of secondary refuse dumped on it, and may then be covered with the in situ-de facto remains of a burned building which collapses over it. The ability to more effectively define site contexts and sort out these types of factors is one of the goals of a better understanding of the operation of site formation processes.

It is also important to briefly review the nature of the three

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processes of formation considered in the following models. Specifically of interest is the potential relationship of these processes to a variety of cultural variables. In situ-de facto site formation by fire is clearly precipitated by either a natural event such as lightening or an idiosyncratic cultural event such as a dropped lamp. While these events may be blind to culture, the site that is reduced by the resultant fire is the manifestation of a cultural system, and the particular form of the site is effected by a wide range of variables such as function, ethnicity, and status. When two sites are compared, therefore, observed differences and similarities may be related to these or to other cultural factors. The site comparisons undertaken in the following chapters therefore consider not only differences and similarities in site formation but also evaluate other cultural factors. A similar conclusion is necessary in regards to the primary and secondary processes of refuse disposal. Unlike in situ-de facto formation by fire, these are always cultural processes and factors such as site function, status, and ethnicity will have very definite effects on the archeological manifestation of these processes. It is critical, therefore, to consider the fullest range of variables, of which site formation is but one, in assigning meaning to similarities and differences observed in the subsequent analyses.

In Situ-De Facto Site Formation

Site formation through in situ-de facto refuse disposal is of central importance for this study because this describes the primary process responsible for the formation of the collection from the commanding officer's quarters at Fort Towson. It was also of fundamental if not primary importance in the formation of the

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collections excavated from the Arkansas Post Branch Bank, Arkansas. Since the processes of in situ-de facto refuse disposal in the study collection are all associated with the destruction of a building by fire during its active use, this specific process will be the focus here.

Basically, in situ-de facto deposition by the aegis of fire assumes, in this study situation, that when a building is destroyed by fire during its active use the entire contents are destroyed and surviving remains are deposited in the archeological record. While it is possible that some salvage of precious materials may be attempted in such a situation, it is not felt that, even if successful, such salvage would have much affect on the materials deposited since the value of most would have been destroyed by burning. Given such a process of destruction and deposition, we could expect the archeological remains resulting from such a process of site formation to be characterized as follows:

- 1) The entire collection from the affected site context should show evidence of having come in close contact with fire: ceramics should be burned, glass and certain soft metals melted, and so forth (Schiffer 1983: 679-684).

- 2) The collection should be characterized by a diversity of artifacts classes since all artifacts present at the time of destruction will enter the archeological record. This hypothesis contrasts to other types of site formation where certain classes of artifacts (such as ceramics and bottles) enter the archeological record much more commonly than do others due to differential rates of breakage and/or consumption (Schiffer 1983: 684-689).

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3) Despite a diversity of classes of artifacts expected, variation within classes is expected to be limited due to the catastrophic destruction of this site. Variability in ceramics, for example, which might be observed in a deposit resulting from an occupation spanning a number of years is not expected in an assemblage resulting from catastrophic destruction (Schiffer 1983: 684-689).

4) The collection should be characterized by a high relative frequency of large artifacts (including many that are either whole or reconstructable from fragments) since the entire assemblage derived from artifacts in active use. Size is here related to the degree to which the artifacts use-life was expended prior to its loss (Schiffer 1983: 679-684).

5) The distribution of artifacts within the site context should not be random but should be spatially patterned to reflect different use areas of the building at the time of its destruction (Schiffer 1983: 679-684).

6) The ratio between fragile and consumable artifacts, such as ceramics and bottles, and non-expendable, durable artifacts, such as eating utensils and furniture hardware should be relatively low since the collection is not the result of refuse disposal over a long time period where fragile and consumable artifacts accumulate at a higher rate than other, more durable goods through a discard-replacement-discard cycle (Schiffer 1983: 684-689).

7) Closely related to number seven, the architectural assemblage should be characterized by a lower ratio between high-frequency, non-salvageable artifacts such as nails, and artifacts, such as hinges, locks, etc. which are typically salvaged for reuse elsewhere upon the

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abandonment of a building. Due to the great numerical superiority of items such as nails and the relatively small number of other hardware items, however, we might simply expect a more complete and numerically important assemblage of hardware items such as hinges and door locks (Schiffer 684-689).

These seven characteristics act together to define the process of site formation associated with in situ-de facto discard through the catastrophic destruction of a building by fire during its active use. The presence of any one of these characteristics is by itself not expected to provide particularly convincing evidence of the presence of in situ-de facto site formation. Together, however, these seven characteristics, which are hypotheses due to their untested nature, form an archeological model of in situ-de facto site formation.

Primary Refuse Disposal

Site formation through primary refuse disposal is perhaps the most important process in the formation of the archeological record. Most sites have a significant component that can be attributed to primary refuse disposal, and many excavations at historic sites deal almost exclusively with deposits which are believed to have resulted from this process. This process is known to have been the major process resulting in the collections excavated from the Jotham Meeker Farmstead, Kansas; the first hospital and north parade ground structure at Fort Washita, Oklahoma; and the east barrack at Fort Towson, Oklahoma. It was also responsible for major components of the Posey site, Oklahoma.

Site formation through primary refuse disposal involves, as has been outlined earlier in this study, the discard of artifacts in the

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immediate vicinity of the place of use. Collections resulting from this process are expected to possess the following characteristics; all of which are relative to those presented above for in situ-de facto processes:

1) Burned artifacts should be relatively scarce in the collection. In primary refuse contexts, burning of artifacts would have been accidental such as would have resulted, for example, from sweeping artifacts into the hearth (Schiffer 1983: 679-684).

2) The collection should be characterized by a limited range of artifact classes since artifacts would have entered the primary refuse context on a differential basis. Certain consumable or breakable artifacts, such as bottles and ceramics, would be expected in large frequencies, while other durable goods such as eating utensils and furniture hardware would have entered the refuse context much less commonly and perhaps not at all. An important variable to consider here is one of scale; whether the primary refuse being examined derives from one or a number of site contexts. Of course, as the number of site contexts examined increases, the expected diversity of artifacts types represented is expected to increase as well (Schiffer 1983: 684-689).

3) Although a limited range of artifact classes can be expected in primary refuse contexts, diversity within classes can be expected to be high. Sets of artifacts are not expected since a primary refuse deposit will accumulate throughout the length of a site's occupation, changes in the type of artifacts in use will be reflected in the diversity of artifacts represented. Changes in the types of ceramic tablewares in use, for example, will be reflected by a diversity of ceramic types in the archeological record. Similarly, the likelihood

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that all the pieces to a set, whether it be a set of ceramics or building hardware, would find their way to a primary refuse context is very slight (Schiffer 684-689).

4) The overall size of the artifact in a primary refuse deposit should be relatively small. Primary refuse deposits are by definition at the point of artifact use, and it is presumed that the larger artifacts were removed to a secondary context (this may not be true of extremely short term use sites). Primary refuse is therefore best conceived of as the artifacts that are too small to be completely removed from the locus of use, an excellent example being the small artifacts that are swept out the back door (Schiffer 679-684).

5) As was true of in situ-de facto refuse, the distribution of artifacts within a site's primary refuse contexts is expected to be patterned in relation to patterns associated with to the uses of different parts of the site. The clarity of their definition will of course increase with the size of the area under consideration (Schiffer 1983: 679-684).

6) In primary refuse contexts, the ratio between fragile and consumable artifacts, such as ceramics and bottles, and durable goods is expected to be relatively high. This is a function of the fact that primary refuse deposits accumulate over time, and fragile and expendable artifacts will enter the archeological record at a different and higher rate than durable goods (Schiffer 1983: 684-689).

7) The architectural assemblage will reflect this process of differential accumulation but for slightly different reasons. In primary refuse contexts, high frequency durable artifacts, more

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particularly nails, will occur to the almost exclusion of low frequency durable artifacts such as hinges and latches due to the ease and desirability of salvaging artifacts such as hinges and latches for use elsewhere. Of course, architectural artifacts such as window glass will accumulate differentially due to differences in fragility, and are expected to be very common in primary refuse contexts (Schiffer 1983: 684-689).

Again, the co-occurrence of these patterns is what characterizes primary refuse deposits. In considering these hypotheses for in situ-de facto refuse and primary refuse, it should be readily apparent that the measure of these characteristics must initially be conceived in relative terms: only after sufficient study will it be possible to establish absolute values for these characteristics.

Secondary Refuse Disposal

Site formation through secondary refuse disposal is of great importance on most historic sites despite the fact that locations associated with secondary refuse disposal are not always investigated during the course of an excavation. Precisely defined secondary refuse contexts in the form of prepared refuse pits are present in the study collections at site 14SH315, Kansas; the Pate-Roden site, Oklahoma; the Vandever-Haworth site, Oklahoma; and site 34PS212, Oklahoma.

Site formation through secondary refuse disposal involves the removal and deposition of artifacts from their use contexts. Very often this involves the mixing of artifacts from a number of differing use contexts. As was possible with in situ-de facto and primary refuse, the expected characteristics of secondary refuse can be presented as the following sub-hypotheses:

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1) Burned artifacts may be rare or relatively common in a secondary refuse context, depending on whether or not the secondary refuse was subjected to burning as part of its disposal. Statements on the degree to which burned artifacts are important in a secondary refuse situation must await an examination of the data (Schiffer 1983: 679-684).

2) The collection from a secondary refuse context may exhibit a greater diversity of classes of artifacts than either the primary or in situ-de facto refuse contexts due to the possibility that the secondary refuse is derived from a diversity of use contexts. The potential for a great range in the degree of diversity in artifact classes is acknowledged but situations may exist where a secondary refuse deposit is derived entirely from a single context. In this case, there should be a high degree of comparability in the number of artifact classes between the primary and secondary refuse associated with this single context (Schiffer 1983: 684-689).

3) Variation within artifact classes is expected to be less than in primary refuse from the same site since the secondary refuse deposit may reflect a period of time that is substantially less than the length of the site's occupation. Reflecting a smaller slice of time than the primary refuse, variability caused by changes in material usage through time would be less. If, on the other hand, a secondary refuse deposit were used for the entire occupation of the site, there should be great comparability between the variation within artifact classes in the site's primary and secondary deposits. The secondary refuse assemblage should not generally be characterized by sets of artifacts since only

those artifacts that were disposed of were deposited there. If sets are present, this may be indicative of the process of abandonment (Schiffer 1983: 684-689).

4) The collection should be characterized by a high relative frequency of large artifacts, but the number of whole or reconstructable artifacts is not expected to be significant except in the case of consumable artifacts such as bottles which may be deposited in the refuse context as whole artifacts. Clearly, most artifacts making their way to a secondary refuse context did so either because they were consumable or because they were broken. It is probable that artifacts disposed due to their breakage were deposited in both primary and partly in secondary refuse contexts (Schiffer 1983: 679-684).

5) The distribution of artifacts within the secondary refuse context may be patterned with respect to dumping episodes but should not be patterned in relation to patterns of artifact use. This is a factor related to the removal of the artifacts from their use locations after they have ceased to serve a function there (Schiffer 1979: 679-684).

6) The ratio between fragile and expendable artifacts, such as ceramics and bottles, and non-expendable and durable artifacts should be higher than that for primary refuse and lower than that expected for in situ-de facto deposits. This is due to the expectation that broken durables will be discarded directly into a secondary refuse context more often than they will enter the primary refuse context due to their size and due to the fact that they are unlikely to break into small pieces. Also, durable artifacts abandoned at a site may be removed to a secondary refuse site on the re-occupation of a site as part of the clean-up operation (Schiffer 1984: 684-689).

7) The architectural assemblage represented in a secondary refuse context is expected to be insignificant numerically when compared to primary and in situ-de facto contexts. This hypothesis pertains to all types of architectural artifacts, including nails and window glass which typically make up a sizable portion of most other site contexts. This is due to the fact that secondary refuse contexts are generally removed from building locations. Nails and other architectural artifacts would therefore only rarely find their ways into these contexts (Schiffer 1983: 684-689).

DATA REQUIREMENTS

A review of the site formation models presented above provides important insights into the data needed for their critical evaluation. Understanding the data requirements of these models is of course necessary for understanding the limitations of this study and the methodological approaches that can be used in its execution.

In developing the hypotheses for each of the three site formation models under consideration, the same seven aspects of the collections have been explored. This reflects my belief that differences in site formation are relative, and it sets up the necessary conditions for a valid comparison between the various data sets. The seven areas that have been modeled for each site formation process involve the following variables:

- 1) Burning of artifacts
- 2) Diversity of artifact classes
- 3) Variability within artifact classes and the presence of sets

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- 4) Size of artifacts
- 5) Degree of randomness of the distribution
- 6) Ratio between durable and consumable goods
- 7) Ratio between classes of architectural artifacts

In order to fully evaluate the models of the various site formation processes, information on these variables must be available from the sites comprising the data sample. Unfortunately, not all of this information is to be found in published site reports.

It should be briefly noted that the site reports used in this study were prepared over a period of more than twenty years. These reports were prepared to satisfy needs perceived by the individual investigators and which understandably do not always produce the information needed for this current research. Rather than being a problem that peculiarly affects this research, this is a problem that is general to archeology.

In most cases, information on the diversity of artifact classes, variability within artifact classes, the randomness of the artifact distribution, the ratio of various groups of non-architectural artifacts, and the ratio of various groups of architectural artifacts is found in the published site reports for the study sample. While there are some problems in the comparability of the terms and descriptions used, and while certain problems of quantification exist, these are relatively minor and can be overcome.

Rarely, however, is information on the burning of artifacts, the size of artifacts, and the presence of sets of artifacts presented consistently in the site reports. Some information on these variables does exist; for example, limited information on artifact size can be obtained from scaled illustrations.

Although inconsistently presented in published reports, this information can be obtained from several important site contexts representing all three site formation processes under consideration. These site contexts include the primary study collection of the Fort Towson Commanding Officer's Quarters and collections housed at the Kansas State Historical Society. These latter collections include the Jotham Meeker farmstead, and site 14SH315. The collection from the Jotham Meeker farmstead has been analyzed with some of the data needs of this study in mind, and was available for re-analysis as needed. The collection from site 14SH315 is reported, and was also available for re-analysis. The commanding officer's quarters represents in situ-de facto formation contexts; site 14SH315 represents a secondary refuse context; and the Jotham Meeker farmstead represents a primary refuse context.

METHODOLOGICAL APPROACH

The concept of site formation processes as it has been modeled here is based on the comparative relationships between site formation processes. Hypotheses have been expressed in terms relative to what is expected for other processes. The comparison of the hypotheses for one site formation processes to sites known to have formed in this fashion will allow a conclusion of whether or not the observed fits the expected. Based on the fit between the expected and the observed, modifications in the hypotheses and the related model can be proposed.

Critical in this study, however, is not only whether the models adequately describe their respective site formation processes, but whether they adequately describe the differences between site formation

processes; that is, can the presence of a specific site formation process be conclusively identified based on a set of modeled characteristics? To evaluate this question, a comparison must be made between site formation processes.

The result of these inter- and intra-formation process comparisons will be the identification of the characteristics of individual site formation processes and the identification of the critical similarities and differences between various site formation processes. The comparisons of hypothetical models to site data will further allow the refinement of the models by the substitution of absolute values, expressed as ranges of expected values, in place of the relative values currently presented in the hypotheses. This step is essential if these models are ever to be useful for the identification of the presence or absence of a specific site formation process at a particular site.

In order to execute this comparative study, the following methodological steps have been pursued in the following chapters:

- 1) A baseline for this study is established through the comparison of the model of in situ-de facto formation against the primary study collection, that from the Fort Towson Commanding Officer's Quarters. This allows a preliminary assessment of the applicability of the model to the data from this site, and provides a baseline for the process of assigning absolute values to the various hypotheses.

- 2) The comparative sites formed through in situ-de facto processes are compared to the observed data from the commanding officer's quarters in order to A) assess the representativeness of the commanding officer's quarters, B) refine the absolute values applied to

the hypotheses, and C) evaluate the overall appropriateness of the hypotheses for this site formation process and, therefore, for the others modeled in this study.

At this point, after the comparison of the available data on in situ-de facto site formation, a reassessment of the site formation models is appropriate. Certain hypotheses may be tentatively rejected or modified, and additional hypotheses may be presented for the three site formation models.

3) The data from sites associated with primary and secondary site formation processes is compared to their applicable models, as revised and formalized in steps 1 and 2 above. Based on this comparison, the overall appropriateness of the proposed hypotheses is assessed in terms of A) their ability to describe the pertinent site formation process, and B) their abilities to differentiate between the various site formation processes modeled. Based on this, modifications in the site formation models are proposed, and actual values are presented where only relative values once existed.

Following the completion of these three methodological steps, general conclusions are possible on the applicability of the models. These conclusions are stated in terms of the actual differences and similarities between the site formation processes studied. Importantly, patterns that relate to site formation processes are identified. This knowledge can be applied to pattern recognition studies to refine the strength of conclusions resulting from studies of other processes of culture.

CHAPTER 3

ESTABLISHING A BASELINE: THE PATTERN OF IN SITU-DE FACTO REFUSE DISPOSAL AT THE FORT TOWSON COMMANDING OFFICER'S QUARTERS

In this chapter, a comparison of the model presented in Chapter 2 for in situ-de facto refuse disposal by the aegis of fire will be compared to the pattern from the Fort Towson Commanding Officer's Quarters. On November 19, 1857, this building was destroyed in a fire which burned many of the buildings remaining at Fort Towson. The previously unreported collection from this site was analyzed as a part of this research, with the descriptive information presented here as an appendix. Information utilized in this chapter is abstracted from the information in this appendix.

The excavation of the commanding officer's quarters building also included investigation of the surrounding areas, including the toft area behind the quarters. Within the building, which was delineated by stone footings and foundation walls, excavations were focused on several sealed contexts. These sealed contexts were the east and west kitchens, the hall between these kitchens, and a stair well which represented a walled off portion of the hall. These areas were sealed by a thick layer of stone building rubble and soil. These four rooms were in what was essentially a basement under the north half of the building. This basement was, however, on the same level as the rear toft area and a door from the hall opened up into this area. Excavation in these four contexts was by room, although the kitchens were subdivided by quadrants.

In addition to the presence of burned artifacts, evidence of the 1857 fire was overwhelming in the basement rooms. The fire was apparently so intense that the limestone foundations were heavily oxidized (Scott 1983: 26). The fill of the basement rooms revealed both the sealed nature of the deposits and the effects of the fire:

excavation of the rubble [in the west kitchen] indicated a stratified fill consisting of 3 feet to 4 feet of limestone rubble followed by a layer of ash, charred timbers, lathing and framing nails, and then 1 inch to 2 inches of plaster laying directly on the floor. The plaster appeared to be ceiling plaster and the ash and nail layer appears to be fall from the upper floors. Many of the artifacts were found protruding from the floor itself into the ash and nail layer suggesting the items were associated with the basement surface [Scott 1983: 29-30].

The burned fill appeared relatively undisturbed in the hall and east kitchen as well, but had been disturbed in the stair well. This stair well had been partially cleaned out by collectors years before the 1975 excavations (Scott 1983).

The south half of the building was investigated with a series of test trenches excavated to examine foundations and other architectural features (See Figure 2). The interior of the south half of the building was not excavated. The surface in this area was relatively high. In discussing the fireplaces in the south half of the building, Scott (1983: 25) noted that "only the foundations of these fireplaces were present since the area was bladed by a bulldozer in 1965 in an attempt to clean up the site."

Outside the structure proper, investigations were conducted to the front of the building in areas where the porch steps and remains of the company road were located; in the east and west alleys between the commanding officers quarters and other officer's quarters, and where a

stone rubble drain and walk were found; and in the toft area behind the building that was enclosed with a stone wall. Within this toft area, a gravel pavement and walk, two privies, and evidence for a covered walkway to the privy were documented.

Since the site had been occupied for thirty years prior to the 1857 fire, only certain contexts were expected to hold materials exclusively related to this event. These contexts were the four basement rooms. Materials related to the fire were also expected to be extremely common in other contexts within the limits of the structure, although these areas were also expected to contain some materials deposited prior to 1857. In the areas surrounding the building, it was anticipated that materials related directly to the fire would be rare, and that most materials discovered would pre-date the fire.

EXAMINING THE MODEL

The model of in situ-de facto refuse disposal presented in Chapter 2 consists of seven hypotheses. The comparison of this model and the empirical data from the commanding officer's quarters is therefore presented for each individual hypothesis. The overall accuracy and appropriateness of this model is then considered.

Hypothesis 1

Hypothesis 1 holds that the entire collection from the commanding officer's quarters should show evidence of burning. It is at the outset important to note the differential affect of fire on artifacts of different composition. For all practical purposes, iron artifacts do not show the affect of burning when recovered archeologically. Other softer metals, such as copper and copper alloys, lead and lead alloys, and silver, have a much lower melting point and depending on the heat of

a fire, can be affected quite severely by heat. Most ceramic artifacts are easily identified as burned due to discoloration and melting of the glaze, although stonewares are less easily affected than earthenwares. Glass artifacts such as bottles and window pane are clearly the most easily affected by heat, and are quickly melted into non-recognizable forms.

A wide range of artifacts from the commanding officer's quarters show evidence of having been affected by heat. Some soft metal artifacts have melted, most of the ceramics are noticeably burned, and most of the glass has been melted into non-recognizable forms. More detailed consideration of the impact of heat on the artifacts in the collection can be presented by a consideration of broad function-related artifact groups based on those originally proposed by South (1977). These groups include 1) architectural artifacts, 2) kitchen artifacts, 3) non-kitchen tools (combining South's activities and firearms groups), 4) personal and clothing artifacts (including South's tobacco pipes group), and 5) furniture artifacts. These functional categories will be used throughout this and subsequent chapters and are presented simply as as means of organizing the discussions.

Architectural Artifacts

Most of the architectural artifacts remaining in the collection are of iron construction and show no evidence of having been affected by heat. Some of the rim locks have heavy brass parts, but these likewise show no evidence of heat effects. One possible exception is a brass key which is still inserted into one of the rim locks. Only the bit and part of the barrel remain and it appears that the remainder of this key

melted away during the 1857 fire, perhaps at the point where it protruded from the door.

Some iron artifacts can be indirectly identified as having been affected by fire. These artifacts, relatively rare in the collections, have melted glass adhering to them, which indicates their presence when the glass was in a molten state. Included among these artifacts are a hook and staple and twenty-three machine cut nails. While representing only a small number, it is important to note that inclusions of melted glass on non-glass artifacts were rare throughout the collection with less than 100 documented occurrences. Other examples involving architectural artifacts include mortar and window glazing putty.

The only architectural artifacts that can systematically be shown to have been affected by heat are the mud dauber's nests and, indirectly, window glass. The mud dauber nests are, of course, not in themselves architectural. In that they are commonly attached to buildings, and in that the specimens from the collection show evidence for having been attached to flat surfaces such as would be found on a building, they are here interpreted as having had a direct association with a building. The fact that they are present in the collection is evidence that they have been fired to a fairly high temperature; otherwise they would have dissolved in the mesic environment of southeastern Oklahoma.

The window glass from the collection includes only 46 sherds that have not been affected by heat. An unknown quantity of melted aqua glass certainly represents window panes. The inability to satisfactorily separate melted window glass from other types of melted aqua glass presents an important difficulty in the analysis of this and

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other sites resulting from destruction by fire.

Kitchen Artifacts

Kitchen artifacts include not only those artifacts that would be found in the kitchen but artifacts associated with the serving and consumption of food. In this sense, kitchen artifacts may have been found both in the kitchen and dining areas.

Of these kitchen related artifacts, the affects of heat are clearly evident only on those made of glass and ceramic. With the glass artifacts, the same problem exists as was discussed for the architectural artifacts above; the melted condition makes it difficult in many cases to identify the form and thus the function of the glass specimens. Nevertheless, some very clear statements can be made from the specimens in the collection.

Looking first at aqua colored glass, we must rule out a consideration of glass of this color that is melted beyond recognition. Once melted beyond recognition, aqua bottles and aqua window glass cannot be satisfactorily differentiated. A number of aqua glass specimens exist, however, that are still recognizable. These specimens range from those with no signs of alteration by heat to those that are severely melted and just barely recognizable. Included is a complete aqua bottle which melted flat and was molded to debris lying on the floor. Another example consists of two articulating sections of a bottle; the upper body, shoulder and neck are slightly melted while the lower body and base have not been affected by heat. This indicates the bottle broke before being subjected to extreme heat; numerous similar examples are found in the collection.

In addition to the aqua bottle glass, the collection also included olive green and colorless bottle glass. The colorless bottle glass includes a single complete bottle which has been melted flat; other definite period examples are lacking in the collection. The colorless glass that has been melted beyond recognition in the collection also certainly includes colorless tablewares, perhaps almost exclusively. These will be discussed later.

The olive green glass is the only color category which can be conclusively designated as bottle glass whether in an unmelted or a melted, unrecognizable form. This is due to the distinctive color of this glass which is found exclusively in bottles. The olive green glass includes a complement, albeit small in comparisons to other colors, of severely melted, non-recognizable specimens and unmelted and melted but recognizable specimens. The melted but recognizable specimens range from severely to minimally melted, and include several examples of articulating pieces where only one has been affected by heat.

Colorless glass tablewares appear to represent an important component of the colorless glass from the collection. Included among these specimens are a number of unmelted specimens, specimens which are melted but recognizable, most of which represent fragments of tumblers, and a larger component of glass melted beyond recognition. Most of the colorless glass is interpreted as tableware because of its weight and since most occurs in thick, heavy globules that would result from the melting of thick, heavy pieces.

The ceramics from the site have the greatest clarity with respect to their functional identification and their identification as burned or unburned. Burning shows very clearly on most ceramic artifacts, either

as a discoloration of the glaze or an actual burning of the glaze. At the same time, the burning does not generally destroy the form of the ceramics and their functional identification is clear.

The large ceramic collection from the site included 5,649 specimens. Of these, however, only 1,275 were available for analysis; these are here assumed to present a representative (in qualitative terms) view of all the ceramics from the site. Of those available for study, 1,045 are obviously burned and only 221 show no evidence of burning. Of the burned sherds, some are only slightly discolored while the glaze on others is totally burned off. A number of sherds also have melted glass adhering to them.

Non-Kitchen Tools

Non-kitchen tools were numerically rare in the collection, but provide evidence of the fire. An artifact interpreted in the field as a wooden broom handle is represented in the collection by several charred sections of a wooden dowell:

One other major artifact was found on the floor of [the west] kitchen; the charred handle of a broom. The handle was about three feet long and remnants of the wire wrapping for the straw bristles were also found [Scott 1983: 31].

The charred nature of this specimen obviously indicates burning.

One of two balances found in the commanding officer's quarters has a copper alloy face plate; this face plate was partially melted away indicating its contact with intense heat. The other balance is missing its face plate, which was also probably made of brass. It is possible that this face plate was entirely melted away.

These three artifacts--a broom and two balances--are the only among the non-kitchen tools that showed evidence of burning. The brass

sleigh bell and harness bosses show no evidence of exposure to intense heat. Considering the small number of artifacts which could have shown the affects of heat, it is significant that two are clearly burned and that a third may have been burned as well.

Personal and Clothing Artifacts

Personal and clothing artifacts included numerous items clearly affected by heat. Evidence of burning is found on four of five tooth brush fragments; the fifth fragment was located in a surface context outside the building. A complete elbow pipe which was found in the west kitchen has, however, been severely burned. An elbow pipe embossed with a woman's head is listed in the catalog but is now missing. This pipe, which was found in Test 11 in the toft area behind the west kitchen, is listed as burned in the catalog. In addition to these burned pipes, the collection includes a fractured porcelain marble that has also been burned. Only one button, made of bone, showed evidence of burning.

Furniture Artifacts

Most of the furniture artifacts are iron and showed no evidence of burning. A brass butt hinge, brass tacks, a brass key, a brass keyhole escutcheon on a lock plate, and several glass pendants are the only furniture artifacts that could be expected to be affected by heat. Only the glass pendant fragments show the affect of heat. These pendants received only minor heat alteration.

Other Evidence for Burning

Other evidence of the intense burning of the commanding officer's quarters is found in several severely melted and non-recognizable pieces

of metal. These specimens include nine small (6 grams) to large (150 grams) pieces of melted copper, seven pieces of melted brass (6 and 75 grams), and three pieces of melted lead alloy (8 and 28 grams). Although these cannot be identified functionally, they provide excellent evidence for intense burning.

Discussion

This review of Hypothesis 1 provides evidence for burning in all the major functional categories of artifacts present in the collection. In some categories this evidence is overwhelming. The evidence has shown that not all artifacts are visibly altered by heat and that even among those that are easily affected some may escape alteration. Despite this, it can be seen that most of the heat sensitive materials in the collection from the commanding officer's quarters show at least some evidence of burning.

Hypothesis 2

Hypothesis 2 holds that the collection from the commanding officer's quarters should be characterized by a diversity of artifact classes which reflect the classes and proportions of artifacts present when the building was destroyed. To examine this hypothesis, a table of all the identified materials found at the site has been prepared which shows not only the classes of artifacts found but their frequencies (Table 3). In cases where a fragment of an artifact indicates the presence of the whole artifact, it is listed as a whole artifact. Artifacts located outside the limits of the commanding officer's quarters building and which, therefore, were probably not in the building at the time of its destruction are not included in this table. Artifacts which are interpreted to post-date the 1857 occupation

of the commanding officer's quarters are also not listed in the table. Artifacts listed in the catalog but now missing from the collection are included in parentheses.

A review of this table shows a great amount of diversity in the classes of artifacts present in the collection. Not only are the consumable and easily breakable artifacts (such as bottle glass, window glass, and ceramics) that typify all archeological collections present, but there are also a large number of classes of durable, non-consumable artifacts. These durable goods include items such as the rim locks and thumb latches in the Architecture Group; the table knives and forks and punch decorated tin (pie safe) from the Kitchen Group; all of the artifacts in the Non-Kitchen Tool Group, such as the spades and balances; the silver in the Personal and Clothing Group; and most of the artifacts in the Furniture Group, such as the casters, bed screws, and clothing hooks.

In addition to the presence of these durable, non-consumable goods, it is also important to note in the above table that these items occur in quantity. For example, in the Architecture Group there are eight to twelve rim locks (the low number represents items present in the collection, the high number includes possible specimens that are now missing), five thumb latches and associated hardware, nineteen to twenty-eight hooks and staples, and twenty-one to twenty-six cast iron butt hinges. Likewise, in the Kitchen Group there are nine forks and twelve knives; in the Non-Kitchen Tool Group there are two to three spades; and in the Furniture Group there are twenty-nine cast iron butt hinges, nine casters, six bed screws, and five to six clothing hooks.

Table 3

Artifacts present in the collection,
Fort Towson Commanding Officer's Quarters

<u>Artifact</u>	<u>Number found</u>
<u>Architecture Group</u>	
Machine cut nails	20,855
Window glass	6**
Rim locks	8 (4)
Lock staples	7
Keys	1
Thumb latches	5
Latch bars	4
Latch bar staples	4
Keepers	4
Hand forged, clinch type nails	5
Butt hinges	21 (5)
Unassociated flathead wood screws	81
Unassociated lock head screws	1
Strap hinges/pintles	16 (5)
Shutter bolts	1
Large Staple, door bar	1
Hasps	1
Flashing	5
<u>Kitchen Artifact Group</u>	
Punch decorated tin (pie safe)	3
Table forks	6 (3)
Table knives	11 (1)
Dutch oven lids	3*
Cast iron vessel	1
Grater	1
Candle holders	2
Coffee mill	1
Fish hooks	1
Tin handles	3
Tin cans	3*
Bottle fragments	35**
Glass stoppers	4**
Colorless glass tableware	6**
Ceramic sherds	1130 (4076)

Table 3 (Cont'd)

Non-Kitchen Tool Group

Spades	2	(1)
Broad hoes	1	
Broom	1	
Logging pike	1	
Scissors	1	
File	1	
Curry Comb	1	
Balances	2	
(Fire pokers)		(2)
(Spurs)		(4)
Sleigh bell	1	(1)
Harness bosses	2	
Harness buckles	4	
Harness rings	1	

Personal and Clothing Group

Bone tooth brushes	4	
Straight razor	1	
Tobacco pipes	3	
Military hat devices	2	
Silver (coin or jewelry)	1	
Carpet bag	1	
Slate pencils	2	
Suspender buckle	1	
Buttons	19	(5)
Marble	1	

Furniture Group

Butt hinges	30	
Casters	7	(2)
Bed screws	6	
Clothing hooks	5	(1)
Glass pendants from lamps	2	(3)
(Door knockers?)		(2)
Tacks	14	
Keys	2	(2)
Cabinet locks	3	
Brass hook	1	
Iron hooks	19	(9)
Unassociated staples	15	

Table 3 (Cont'd)

* Represents estimated minimum number

** Grossly underrepresented in count due to affect of melting on this type of artifact

The diversity of artifacts documented in Table 4, therefore, is not made up of idiosyncratically occurring items which supplement the high frequencies of breakable and consumable goods. These breakable and consumable goods are rather supplemented by a diversity of frequently occurring durable, non-consumable goods.

At this point, it is impossible to go beyond this subjective conclusion that the commanding officer's quarters collection is characterized by a diversity of artifact classes with a high relative frequency among all classes. A less subjective statement on the degree to which this collection differs from collections resulting from other site formation processes, and the significance of this difference, must await the presentation and analysis of comparative data, which will occur in later chapters.

Hypothesis 3

Hypothesis 3 builds on number 2 in stating that despite a diversity of artifacts expected, variation within artifact classes should be limited. This limited variation is anticipated because of the instance-in-time nature of the collection, where artifacts of a class are expected to be similar due to the presence of sets of like artifacts or to similarities in style found throughout the household. This

hypothesis can most profitably be examined within each of the five artifact groups introduced earlier in this chapter.

The ability to examine the presence of sets in the collection has unfortunately been somewhat diminished by the collection and cataloging of the artifacts. Certain associations of artifacts, in particular architectural artifacts, were noted and even photographed in the field. Unfortunately, these associations were not preserved in the artifact catalog. Some information on sets that may not be reconstructable on form alone has therefore been lost. This consideration of sets will therefore be based largely on conclusions based on artifact type and form, although where possible some information on sets noted in the field is interjected. Furthermore, information on ceramic sets has been lost to this study due to the unavailability of most of the ceramics from this site.

Architectural Artifacts

Among the architectural artifacts, it is useful to examine the rim locks, thumb latches, butt hinges, hooks and staples, and strap hinges and pintles. Most of the architectural artifacts are related to these types; for example latch bars, latch bar staples, keepers, and hand forged clinch nails are all probably related to the thumb latches. Other types are either so few in number, such as the two keys and one shutter bolt, or were characterized by little variation in manufacture and cannot be conceived of as sets, such as cast iron butt hinges and machine cut nails, that detailed consideration here is of little use.

In looking at the rim locks, only six specimens can be closely compared. These include five complete locks and one distinctive back

plate to a door lock. The five complete rim locks include two door locks and three closet locks; the back plate indicates an additional door lock. The two complete door locks differ in a number of ways, the most obvious being that one has a third bolt (a night latch). This difference might be a result of the different placement of these locks in the building, with the three-bolt lock being placed on an exterior door. Despite their differences, these complete locks are similar in that neither utilized a door knob although both were designed for one. The back plate demonstrates the presence, however, of another door lock identical to the complete, two bolt lock in the collection.

The three closet locks include two that are identical and one that differs slightly in size and in the form of the key used. The presence of the two identical locks is here seen as important. The third lock may have been a replacement for a worn out lock or may have served differently in the structure.

Although they cannot be paired precisely, sets are certainly represented by the rim locks and lock staples present in the collection. The seven rim locks are accompanied in the collection by seven lock staples of a type used on rim locks. While individual locks and staples can no longer be associated the presence of like numbers suggests that at least some of these represent original sets.

There are five wrought iron thumb latches in the collection, as well as like numbers of latch bars, latch bar staples, and keepers which are certainly associated with these thumb latches. These latches are all of the Suffolk pattern although they vary somewhat in detail. Most if not all of this variation in these artifacts may have been caused by their hand manufacture. The same is true of the hardware associated

with these latches. Although somewhat variable, there is a great amount of similarity in the latch bars, latch bar staples, and keepers. While none of these can be specifically paired into an original set, these pieces have a great amount of similarity and very certainly represent at least five sets of artifacts making up complete Suffolk latch assemblies.

The ability to discuss sets of cast iron butt hinges from the site has been compromised through the collection and cataloging procedures used at the site. Sets of hinges are noted in the field notes, and are also noted in the catalog but these references can no longer be correlated with actual specimens. The large number of architectural and furniture sized butt hinges and the similarities in these hinges once again suggests the presence of sets of hinges.

The strap hinges and pintles were all hand forged and an amount of variation is expected as a result. Five of the six strap hinges are similar in pattern, being characterized by a circular cusp and a body which tapers towards the joint. One strap hinge differs from this pattern; it has a parallel sided body and its distal end is pointed. The fifteen pintles include fourteen driven and one plate mounted pintles. While the fourteen driven pintles are similar in design, they vary greatly in size. Five of the driven pintles are barbed, which represents a relatively rare treatment.

Overall, then, the strap hinges show a fair amount of variability but the overall patterns are quite similar. The large number of the unusual barbed pintles, although only a minority percentage of all the pintles, indicates a certain amount of consistency in form and

manufacture. Four original sets of straps and pintles are preserved in the collection.

The nineteen wrought iron hooks and staples are hand forged and subject to variation from manufacture. Nevertheless, all but one of these hooks belong to the same basic pattern with a twisted shank. The anomalous hook has a non-twisted shank that is square in cross section.

Sets of iron hooks and staples are definitely present in the collection in small numbers, and are indicated in larger numbers by the artifact inventory and by the field notes. A set of hooks and staples consists of the hook itself and two staples. Three complete sets are present in the collection along with twelve hooks with one staple still in association. Only five hooks had no staples associated with them. There are in addition twelve unassociated staples in the collection, ten of them of a size identical to those found with hooks. These ten staples probably were associated with some of the hooks now having staples missing; it is probable that many were inadvertently separated from their respective hooks after excavation.

Examples of sets of architectural artifacts are indicated in Scott's 1983 summary of the dig. Of interest, these sets are made up of groups of artifacts of different types:

An eight inch long door hinge with the pintle still attached, as well as another pintle, were found on the north side of the doorway. A large four inch by eight inch doorlock and a thumb latch were found on the south side of the doorway suggesting the door opened to the north [Scott 1983: 37].

A second doorway may have been situated along the south wall and upstairs in the room above the kitchen. This doorway was probably centered in the wall separating the front and rear rooms of the upstairs. Two pintles, a small doorlock, and a doorlatch were found along the southern wall of the kitchen as evidence for this upstairs door [Scott 1983: 37].

These sets can, unfortunately, no longer be identified in the collection.

Kitchen Related Artifacts

A great amount of similarity and several sets are present among the kitchen related artifacts. Important here are, bottle glass, ceramics, and table knives and forks.

The table knives and forks present important information on the presence of sets. Of the seven table forks, there are four varieties. Four of the seven nevertheless belong to a single variety, with the other varieties having only one example each. One specimen, accounting for one variety, was located well outside the building and probably pre-dates the civilian household. The eleven table knives belong to three varieties, but nine belong to a single variety. Of importance these nine knives are of identical pattern to the variety accounting for four of the seven forks; these knives and forks clearly represent a set of table "silver."

Evidence for the presence of a set of ceramics exists in the collection, although this could not be fully assessed due to the fact that about 77 percent of the ceramics were missing and not available for analysis. Important support for the presence of a set of dishes at the commanding officer's quarters comes from the distribution of ceramics in the site. Almost all of the ceramics found within the limits of the building were found clustered within the east kitchen. Two major concentrations of ceramics were found in this room, and both were associated with the remains of cabinets which Scott (1983: 35) suggests once held the ceramics. This is a pattern that would occur with a set of dishes.

Other evidence that the ceramics from the site represent one or more sets comes from an examination of those still present in the collection. The vast majority of the sherds in the collection are of undecorated or mold-decorated white ironstone. Among the mold-decorated sherds, designs are repetitive. Overall, the consistency in ceramic type and the presence of repetitive patterns supports the presence of one or more sets of ceramics.

A set of bottles is probably also indicated in the collection. This set consists of a cluster of olive green bottle fragments, characterized by circa three-inch diameter bodies and champagne finishes. This cluster, found in the hallway between the kitchens, is interpreted as a "set" of wine bottles which were once stored, possibly in a free standing cabinet, in the dwelling.

Non-Kitchen Tools

Most artifacts in the Non-Kitchen Tool Group are one-of-a-kind items in the collection. The exception, and an important one, lies in the two spades. The archeological discovery of tools such as these is very unusual, and it is significant that these two spades are identical in both manufacture and form.

Furniture Group

Convincing evidence for sets of artifacts is also found among the furniture artifacts. The furniture sized butt hinges have already been mentioned, but also suggestive of sets are the casters, bed screws, hooks and staple, and clothing hooks.

Six of seven casters found were essentially complete, and could be divided into two varieties with three casters in each. A caster listed

in the catalog but now missing probably belonged to one of these varieties, making the number of specimens four instead of three. Four is, of course, the number that would occur on a piece of furniture. These varieties are interpreted as representing two sets which were originally on two pieces of furniture.

Six identical bed screws were included in the collection; these are interpreted as a set(s) originally present on one or more similar pieces of furniture. Four of the five clothing hooks in the collection were of identical pattern and size. These hooks were found in proximity to one another and are interpreted as an original set. The two keys and the two cabinet locks were, however, of very different patterns.

Additional evidence for sets of furniture artifacts is provided in Scott's excavation summary:

also located on either side of the [west kitchen] fireplace were base remnants of built-in closets or cabinets. Two sets of four cabinet hinges and two cabinet locks were found on the floor to the east of the closets. The hinges and lock placement on the floor suggest the south cabinet opened to the north and the north cabinet opened to the south [Scott 1983: 31].

the wooden [east] kitchen closet or cabinet stood on the north side of the fireplace and was five feet six inches long and three feet three inches deep. Four cabinet hinges, a cabinet lock, and a cabinet key were found in the area west of the cabinet and along the north wall. The door to the cabinet probably opened to the north as the hinges were found near the north wall [Scott 1983: 35].

a third wooden cabinet may have been located in an upper room and fell into the southeast corner of the kitchen area during the fire. Three cabinet hinges and a cabinet lock ... suggests that a cabinet similar to those in the basement was located on the south side of the main floor fireplace [Scott 1983: 36].

These sets of artifacts which were so clear in the field have not been preserved in the catalog of the collection.

Discussion

This review of the collection from the commanding officer's quarters presents excellent information on the presence of numerous sets of artifacts. Numerous instances of similarity between artifacts that cannot be considered as sets has also been demonstrated. Sets include architectural artifacts, furniture artifacts, and artifacts associated with kitchen-related functions. Although these sets account for a numerically small percentage of the total artifact inventory, the number of sets is nevertheless impressive. The full importance of these sets can, of course, only be assessed against comparative data from other sites. Overall, however, the requirements of Hypothesis 3 are upheld by this analysis.

Hypothesis 4

Hypothesis 4 deals with the size of artifacts, and holds that their relative size should be high and that many specimens should either be whole or should be reconstructable from fragments. Important here are not only breakable and consumable artifacts, but also durable goods which in many contexts enter the archeological record only after they have been worn out or broken.

In order to examine this hypothesis, several attributes of the artifacts have been presented in Table 4. These attributes include a measure of size and an indication of whether an artifact is whole or broken. Since this table is directed at the artifacts present in the 1857 household, artifacts post-dating this year and artifacts located in contexts away from where the structure collapsed during the 1857 fire have been excluded. Since their size and condition cannot be assessed, artifacts not present in the study collection have also been omitted.

Table 4

Size distribution of artifacts,
Fort Towson Commanding Officer's Quarters

<u>Artifact</u>	<u>Size in centimeters</u>			
	<u>0-10</u>	<u>10-20</u>	<u>20-30</u>	<u>30+</u>
<u>Architecture Group</u>				
Common cut nails*	18,913	80		
Finish cut nails*	1,892			
Window glass	6			
Rim locks*		4	1	
Rim lock back plate		1		
Rim lock face plate	1			
Rim lock bolt spring	1			
Rim lock side		1		
Lock staples*	2	3		
Lock staple fragments	1			
Key	1			
Bar staple*		1		
Thumb latches*			2	
Thumb latch fragments	2	2		
Latch bars*		2	1	
Latch bar fragments		1		
Latch bar staples*	3			
Latch bar staple fragment	2			
Keepers*	2	2		
Hand forged clinch nails*	5			
Cast iron butt hinges*	3			
Butt hinge fragments	14	5		
Flat head wood screws*	72			
Lock head screw*	1			
Screw fragments	10			
Strap hinge and pintles*			2	2
Strap hinges*			1	
Fragmentary strap hinges		1		
Pintles*	2	8		
Shutter bolts		1		
Hasps	1			
Mud dauber nests	13			

Table 4 (Cont'd)

Kitchen Artifact Group

Punch decorated tin*			1	2
Table forks*	2	4		
Table knives*	3	7	1	
Dutch oven lids*			2	
Oven lid fragments	2	2		
Cast iron vessel		1		
Grater		1		
Ceramic candle holder*		1		
Tin candle holder	1			
Coffee mill		1		
Fish hooks*	1			
Tin handles	1	2		
Tin cans	3			
Ceramic sherds**	1,060	27		
Olive bottle fragments	37	6		
Aqua bottle fragments	24	3	1	
Colorless bottle fragments	2	1		
Colorless tableware frags	6			
Amber bottle fragments	4			
Glass bottle stoppers*	4			

Non-Kitchen Tool Group

Spades*				2
Broad hoe*			1	
Logging pike*				1
Scissors*		1		
File*		1		
Curry comb*		1		
Balance*		1		
Balance (incomplete)		1		
Balance hook		1		
Sleigh bell*	1			
Harness bosses*	2			
Harness buckles*	5			
Harness rings*	2			

Personal and Clothing Group

Bone tooth brush frags	5			
Straight razor		1		
Elbow pipe*	1			
Pipe stems	2			

Table 4 (Cont'd)

Silver (coin or jewelry)	1		
Carpet bag frame part			1
Marble	1		
Slate pencils*	1		
Suspender buckle*	1		
Buttons*	20		
<u>Furniture Group</u>			
Cast iron butt hinges*	21		
Butt hinge fragments	8		
Cast brass butt hinge	1		
Hook and staples*	11	5	
Hook fragments	2		
Staples*	14		
Whole casters*	6		
Fragmentary caster	1		
Bed screws*		6	
Clothing hooks*	5		
Brass tacks*	9		
Iron tacks*	5		
Keys*	2		
Cabinet locks*	1	1	
Lock plate with escutcheon	1		
Glass lamp pendants	2		
Brass hook*	1		

* Denotes artifact that is largely or entirely complete

** This represents only those sherds available for this study.

Artifacts in Table 4 have been tabulated by four size categories: 0 to 10 cm, 10 to 20 cm, 20 to 30 cm, and larger than 30 cm. To measure size, artifacts were placed within a diagram composed of concentric circles with diameters of 10, 20, and 30 cm. the artifact was assigned a size value based on the smallest circle within which it was totally contained.

In considering the information presented in Table 4, is should be remembered that the object is to identify the difference of this collection from collections from other site formation processes. Since comparative site information has yet to be introduced, and since the hypothesis under consideration predicts artifacts from this collection should be larger, it is the larger artifacts which now hold the most interest; small artifacts can be expected in all site formation contexts.

Looking at the sizes of artifacts, there are 22,264 artifacts in the 0 to 10 cm size range, 187 in the 10 to 20 cm range, 14 in the 20 to 30 cm range, and 7 measuring more than 30 cm (Table 5). Most of the artifacts smaller than 10 cm are, however, nails, ceramic sherds, and fragments of glass bottles; their large numbers makes frequencies of other artifacts seem insignificant. Since nails are by nature small artifacts, and since their importance on sites is tied very much to the type of architecture present there, they will be left out of this consideration of artifact size.

Further, the ceramics tabulated in Table 5 are somewhat misleading. Although the vast majority of the sherds are smaller than 10 cm, only one-third of the collection was available for study. Evidence from the

Table 5

Summary of artifact sizes, all artifacts,
Fort Towson Commanding Officer's Quarters

<u>Size range</u>	<u>Number</u>	<u>Percent of total</u>
0 to 10 cm	22,264	99.0%
10 to 20 cm	187	.8%
20 to 30 cm	14	.06%
Greater than 30 cm	7	.03%
TOTAL	22,473	99.89%

collection, from the artifact catalog, from the field notes, and from Scott's summary of the dig (Scott 1983) provide evidence that many if not most of the ceramics from the site are reconstructable into whole or nearly whole vessels. While the ceramics are now represented by relatively small sherds, these in turn probably represent vessels that were whole immediately prior to the 1857 fire and which could probably be reconstructed if all the ceramics from the site were available. Since vessel number cannot be estimated, ceramics will also be deleted from this consideration of artifact size.

The bottle glass from the site is similarly misleading. Now represented by small sherds and melted globs, the bottles from the commanding officer's quarters building were probably whole immediately prior to the 1857 fire. The discovery of several complete but melted bottles, and the number of partially reconstructable bottles from the building supports this. Total reconstruction of the original bottles or

estimation of the numbers involved is, however, impossible due to the melted state of most of the bottle glass. Fragments of bottle glass will therefore also be omitted from this discussion of artifact size.

Removing the nails, ceramics, and bottle glass from the above figures, there are a total of 368 artifacts, with 278 in the 0 to 10 cm range, seventy in the 10 to 20 cm range, thirteen in the 20 to 30 cm range, and seven that are larger than 30 cm (Table 6). Viewed in this fashion, the importance of artifacts larger than 10 cm can be recognized. Although a subjective consideration until comparative information is consulted, the numerical importance of artifacts in the 10 to 20, 20 to 30, and 30+ cm size categories appears to be high.

Table 6

Summary of artifact sizes, without nails ceramic sherds, and fragments of bottle glass, Fort Towson Commanding Officer's Quarters

<u>Size range</u>	<u>Number</u>	<u>Percent of total</u>
0 to 10 cm	278	75.5 %
10 to 20 cm	70	19.0 %
20 to 30 cm	13	3.5 %
Greater than 30 cm	7	1.9 %
TOTAL	368	99.9 %

Looking at the distribution of complete versus fragmentary artifacts is the second important part of the examination of the fourth

hypothesis. Table 7 presents the number of artifacts, minus nails, ceramics, and glass, for each size category, the number of complete artifacts represented in this number, and the percentage of each size category represented by the whole artifacts.

Table 7

Total versus whole artifact by size category, without nails, ceramics, and bottle glass, Fort Towson Commanding Officer's Quarters

<u>Size range</u>	<u>Total</u>	<u>Number whole</u>	<u>Percent of whole</u>
0 to 10 cm	278	206	74.1 %
10 to 20 cm	70	44	62.8 %
20 to 30 cm	13	11	84.6 %
30 cm plus	7	7	100.0 %

Looking at these numbers, it is clear that whole artifacts represent a very important component of the artifacts. This is especially true as the size of the artifact increases. Artifacts larger than 20 cm almost always represent whole items, while an important percentage of those smaller than 20 cm are also whole.

Although nails are generally relatively small artifacts in the terms used here (most are less than 10 cm in overall size), it is perhaps important to discuss the number of whole versus fragmentary nails from the site. There are a total of 20,243 whole nails of all types located in proveniences within the building. The number of nails

that have been broken can be determined by tabulating the nail fragments with heads; 2,681 head fragments are present in the collection. When added to the whole nails, this indicates that a total of 22,924 nails were found within the limits of the commanding officer's quarters. Whole nails thus represent 88.3 percent of all the nails represented in the collection.

This consideration of the size and condition (whether whole or not) of the artifacts from the commanding officer's quarters demonstrates that they are distributed within a wide range of size categories from 0 to greater than 30 cm in size, with large artifacts being present in impressive numbers. It is further shown that whole artifacts are very important in the collection, especially as the artifact size increases. These findings, while awaiting the test of comparative data, appear totally with Hypothesis 4.

Hypothesis 5

This hypothesis considers the distribution of the artifacts within the site. Under the assumption that the collection from the commanding officer's quarters reflects the contents of a household in active use, the archeological distribution of the materials should not be random. Instead, the distribution should be spatially patterned to reflect different uses of different parts of the building at the time of its destruction.

In order to examine this hypothesis, it will be useful to contrast the distributions of architectural artifacts and other artifacts. The architectural artifacts, and in particular high frequency specimens such as nails and window glass, can be expected to have a generalized distribution due to their use throughout the building. The non-

architectural artifacts, on the other hand, should have a much more isolated distribution due to their restricted locations near their point of use within the household. Certain exceptions may exist; furniture hardware may be more evenly distributed throughout the building because furniture was certainly found throughout the household when it was occupied.

Architectural Artifacts

A total of 18,303 grams of melted aqua colored glass was found at the site. As previously considered, most of this aqua glass is interpreted as window glass. Looking at the distribution of this glass, only 28 grams were discovered beyond the limits of the commanding officer's quarters building (Figure 12). Within the building, 11,190 grams were located in the northern halves of the kitchens, immediately south of the north wall of the building (2,136 grams were not collected by quadrant). Another 2,532 grams were located in the hall between the kitchens, much of which may have been located along the northern wall. The second highest concentration of aqua glass consisted of 1,999 grams found along the south wall and beneath the former south porch of the building. Of the glass that could be assigned to a specific provenience within the kitchens, only 201 grams were located in the south half of these rooms. Although most of the interior of the south half of the structure was not excavated, numerous test units did examine this area. Except for Test 3 along the south wall, very small quantities of aqua glass was encountered in these test units.

The distribution of melted aqua glass, most probably representing window glass, was certainly not consistent throughout the building.

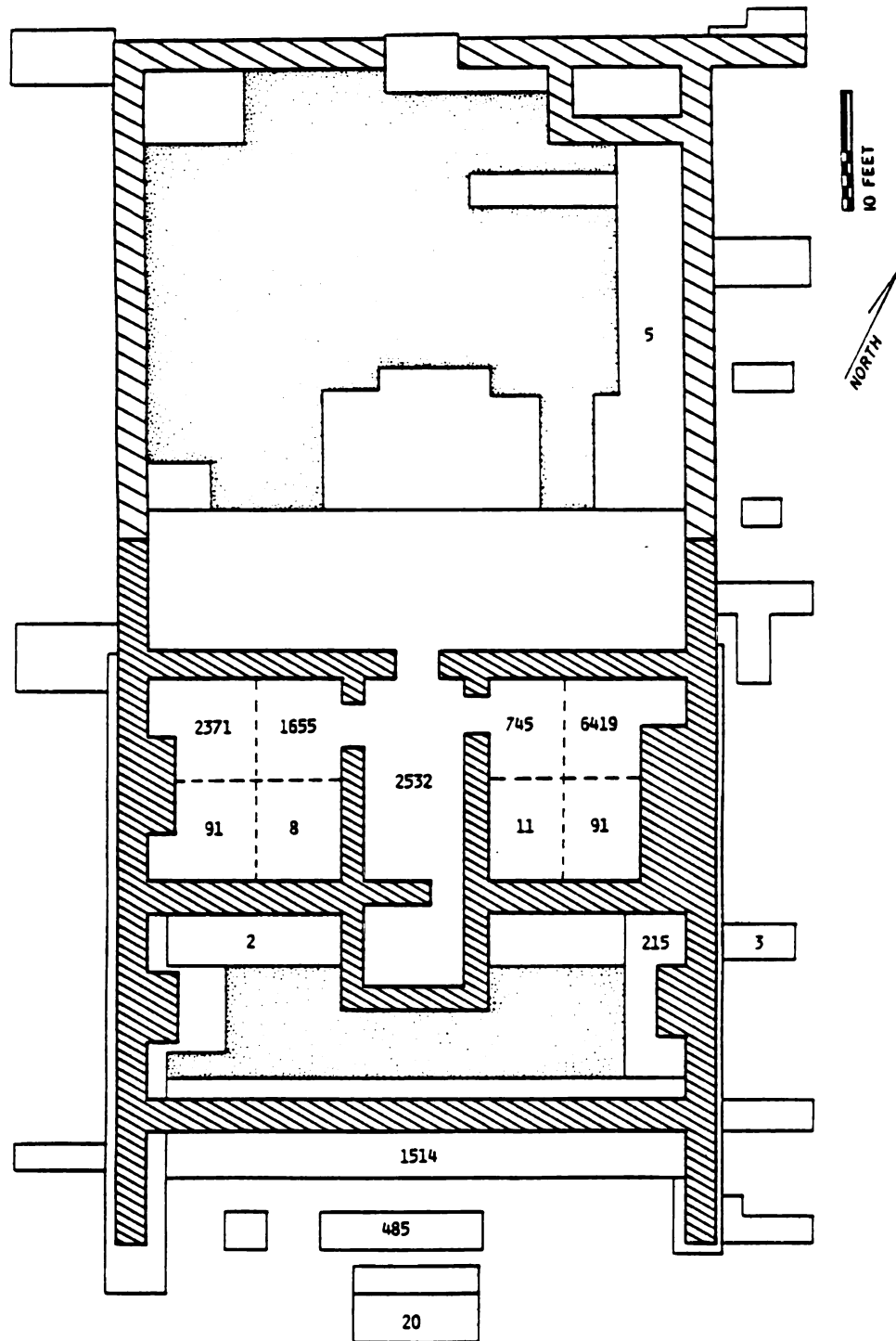


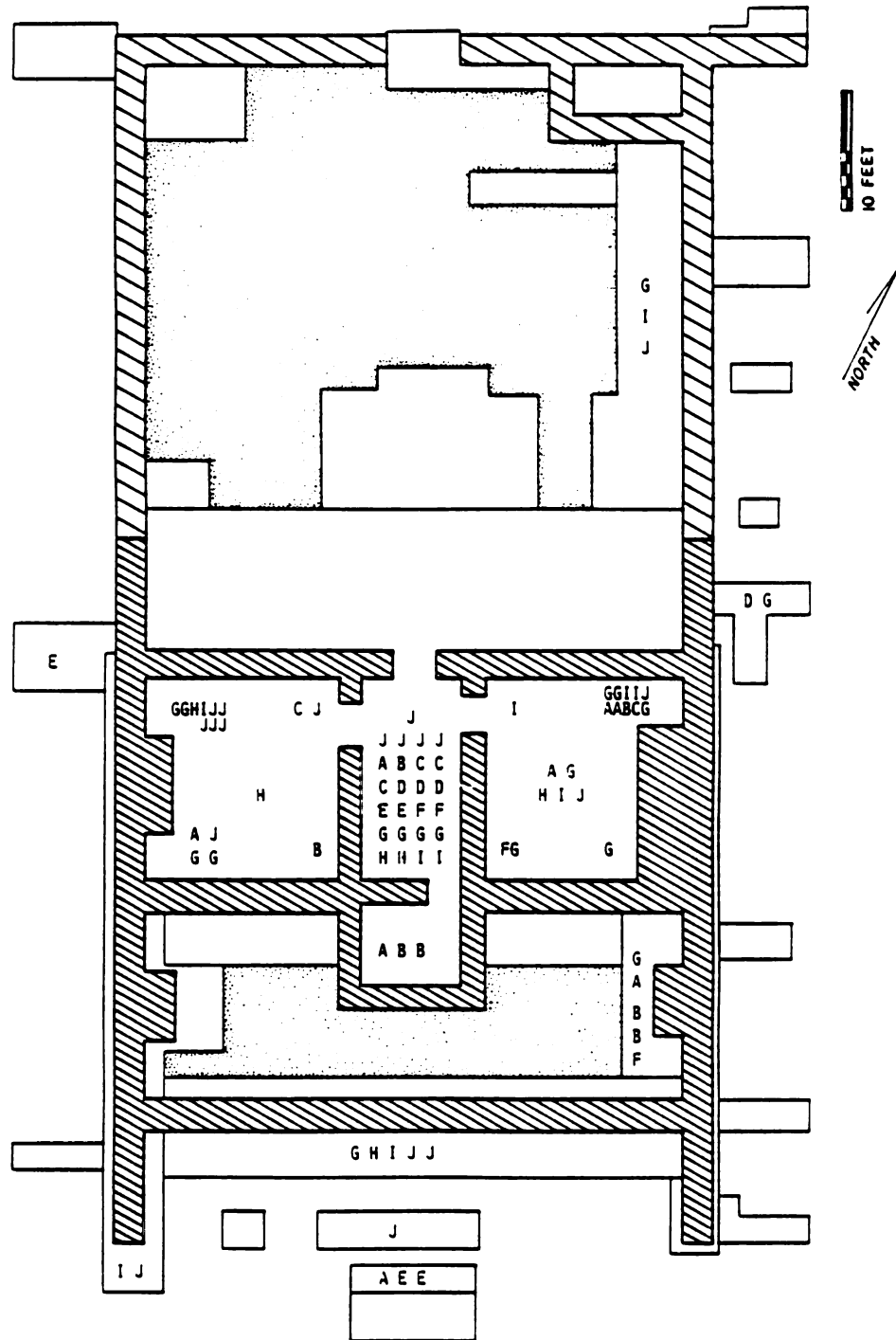
Figure 12. Distribution of melted aqua glass.

Most of it occurred along the north and the south exterior walls of the building. As was presented earlier, this patterning is believed to reflect the use of this glass in windows, and its presence largely along the north and south walls is believed to indicate that most if not all of the windows were in these walls. The fact that more melted aqua glass was found along the the north wall supports this interpretation; the north wall of the building was an additional storey in height due to the presence of the walk-out basement kitchens.

The distribution of common cut nails of all sizes includes 20,243 that could be assigned a specific provenience (Figure 13). Of these, 18,391 were located within the limits of the building. Within the building, common cut nails occurred in frequency in the west kitchen (n = 3,258), the east kitchen (n = 3,686), the hall between the kitchens (n = 3,788), and along the south wall (n = 5,246). Although not quite as frequent, good numbers of nails were also observed along the interior walls and the east and west walls of the structure. No clear patterning of nails was observed within the kitchens.

The final architectural artifacts to consider is the hardware which occurs in relatively low numbers when compared to the nails and melted aqua glass. The distribution of rim locks, rim lock staples, thumb latches, thumb latch bars, thumb latch staples, thumb latch keepers, butt hinges, strap hinges, pintles, and hooks and staples is presented in Figure 14. The highest frequency of these artifacts can be observed in the kitchen and in the hall, with the hall having the largest number. Few artifacts were found in the stair well, probably because it had previously been looted by artifact collectors. The high frequency of these artifacts, much of which is door hardware, in the hall is not

Figure 13. Distribution of common cut nails.



Legend: A = rim lock; B = rim lock staple; C = thumb latch;
 D = latch bar; E = latch bar staple; F = latch bar keeper;
 G = butt hinge; H = strap hinge; I pintle;
 J = hook and staple

Figure 14. Distribution of architectural hardware.

surprising since this is the location of doors to the outside and to the kitchens. It is further probable that this floor plan was carried to upper storeys, making it a very common location for door hardware. Looking just at the kitchen and hall, the distribution of architectural hardware can therefore be seen to be patterned in relation to expectations based on the design of the building.

Looking at the distribution south of the kitchens and hall, much less architectural hardware is observed. This is probably largely a function of the smaller area excavated there, which focused on trenches excavated to expose foundation elements. The discovery of fewer of these artifacts may also be a function of the 1965 disturbance of the area and the suspected removal of artifacts with metal detectors by hobby collectors. The artifacts in the hall and kitchens were deeply buried and would not have been so easily disturbed in this fashion. The architectural artifacts that do occur in this southern half of the building are nevertheless similar to those found in the kitchens and hall. Assuming removal of some architectural artifacts by earth moving and by collectors, these remaining artifacts suggest that the distribution of architectural hardware may have been relatively dense throughout the building.

The review of the architectural artifacts, including common cut nails, melted aqua glass (window glass), and architectural hardware has indicated that while the common cut nails occur relatively evenly within the building, the melted aqua glass and the architectural hardware is definitely patterned. This patterning has been interpreted to reflect the patterned distribution of windows and hardware in the building prior to its destruction.

Non-Architectural Artifacts

The distribution of the non-architectural artifacts is the next to be considered. These include artifacts associated with kitchen functions, non-kitchen tools, furniture hardware, and personal and clothing artifacts. By far the largest in number are the kitchen related artifacts, with the most common of these being the ceramics and glass.

Based on the artifact catalog, an estimated total of 5,436 ceramics of all types could be assigned specific proveniences. Of these, 5,206 are located within the limits of the building (Figure 15). Within the building, it is immediately clear that the distribution is patterned and that virtually all of the ceramics occur in the east kitchen. A total of 4,908 ceramics were discovered in this provenience, accounting for 94 percent of all the ceramics discovered within the building.

The glass includes recognizable green, aqua, colorless, and amber bottle fragments; aqua and clear stoppers; colorless glass tablewares; and melted green and colorless glass (melted aqua glass is not considered here because it is interpreted to represent window glass predominately). Within the building, all of the recognizable colorless glass tableware fragments are located in the east kitchen (Table 8). Furthermore, of 6,924 grams of melted colorless glass, 5,699 grams were also located in the east kitchen (Table 9). This accounts for 82 percent of the melted colorless glass. Based on its form, this melted colorless glass is interpreted to represent melted glass tablewares.

The colorless glass tableware and melted colorless glass is very obviously patterned within the building. The location of the bulk of

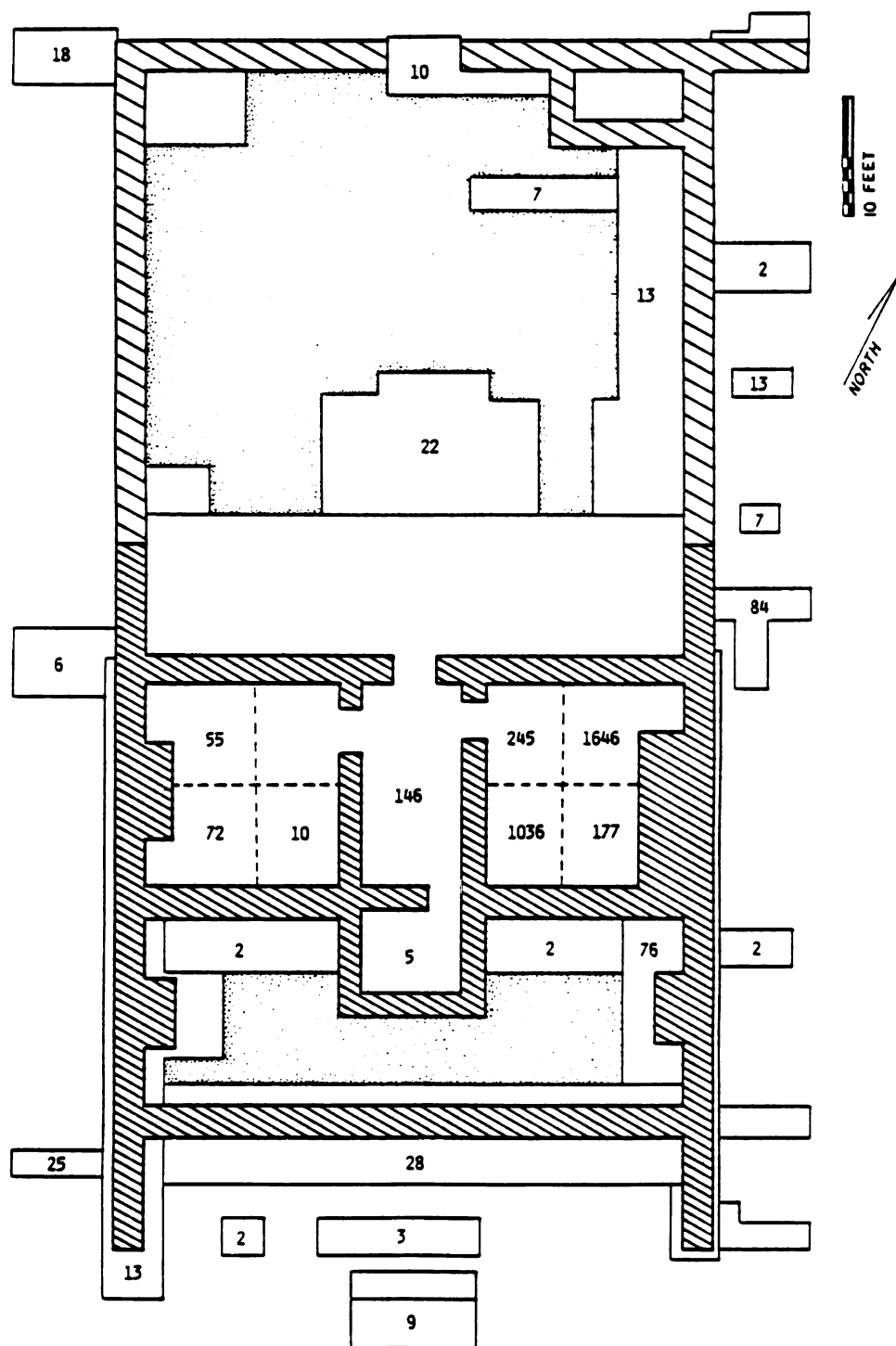


Figure 15. Distribution of all types of ceramics.

Table 8

Distribution of recognizable glass bottle and tableware fragments,
Fort Towson Commanding Officer's Quarters

<u>Provenience</u>	<u>Color/type</u>	<u>Quantity</u>
West kitchen	Colorless bottle	1
East kitchen	Colorless bottle	1
Hallway	Colorless bottle	-
Stair well	Colorless bottle	-
T 9 (interior)	Colorless bottle	-
T 3 (south wall)	Colorless bottle	-
T 8 (east wall)	Colorless bottle	-
T 1 (west wall)	Colorless bottle	-
T 4 & 5 (south porch)	Colorless bottle	-
West kitchen	Colorless tableware	-
East kitchen	Colorless tableware	5
Hallway	Colorless tableware	-
Stair well	Colorless tableware	-
T 9 (interior)	Colorless tableware	-
T 3 (south wall)	Colorless tableware	-
T 8 (east wall)	Colorless tableware	-
T 1 (west wall)	Colorless tableware	-
T 4 & 5 (south porch)	Colorless tableware	-
West kitchen	Olive bottle	8
East kitchen	Olive bottle	2
Hallway	Olive bottle	9
Stair well	Olive bottle	-
T 9 (interior)	Olive bottle	-
T 3 (south wall)	Olive bottle	1
T 8 (east wall)	Olive bottle	-
T 1 (west wall)	Olive bottle	-
T 4 & 5 (south porch)	Olive bottle	-
West kitchen	Aqua bottle	8
East kitchen	Aqua bottle	5
Hallway	Aqua bottle	1
Stair well	Aqua bottle	-
T 9 (interior)	Aqua bottle	-
T 3 (south wall)	Aqua bottle	-
T 8 (east wall)	Aqua bottle	1
T 1 (west wall)	Aqua bottle	-
T 4 & 5 (south porch)	Aqua bottle	1

Table 9

Distribution of melted glass, Fort Towson Commanding Officer's Quarters

<u>Provenience</u>	<u>Color</u>	<u>Quantity</u>
West kitchen	Colorless	606 grams
East kitchen	Colorless	5699 grams
Hallway	Colorless	466 grams
Stair well	Colorless	-
T 9 (interior)	Colorless	23 grams
T 3 (south wall)	Colorless	17 grams
T 8 (east wall)	Colorless	103 grams
T 1 (west wall)	Colorless	30 grams
T 4 & 5 (south porch)	Colorless	10 grams
West kitchen	Olive green	295 grams
East kitchen	Olive green	10 grams
Hallway	Olive green	527 grams
Stair well	Olive green	-
T 9 (interior)	Olive green	-
T 3 (south wall)	Olive green	29 grams
T 8 (east wall)	Olive green	15 grams
T 1 (west wall)	Olive green	-
T 4 & 5 (south porch)	Olive green	-
West kitchen	Aqua	4249 grams
East kitchen	Aqua	9278 grams
Hallway	Aqua	2532 grams
Stair well	Aqua	-
T 9 (interior)	Aqua	2 grams
T 3 (south wall)	Aqua	1514 grams
T 8 (east wall)	Aqua	215 grams
T 1 (west wall)	Aqua	-
T 4 & 5 (south porch)	Aqua	485 grams

the ceramics and the bulk of the glass tablewares (both confirmed and interpreted specimens) in the east kitchen provides very strong evidence of patterning which reflects patterns in the pre-destruction household. The ceramics and glass tablewares would probably have been stored in the same location since they would have been used in the same generalized function. The co-occurrence of the remains of these artifacts in the same provenience supports this for the commanding officer's quarters. Scott (1983) suggests the ceramics were stored in a cabinet on a floor above the east kitchen; this may indicate the location of the dining room.

Turning to other glass artifacts, it can be observed in Table 10 that the recognizable fragments of aqua bottles, olive green bottles, and colorless glass bottles are clustered in the kitchens and hall, with very few found south of these areas. Within the kitchens and halls, certain patterns in the distribution of these artifacts can be observed. The olive green bottle fragments, for example, cluster in the hall and in the southwest corner of the west kitchen. The melted olive green glass, certainly from bottles, is also concentrated in the hall and in the west kitchen. Most of the aqua bottle fragments are located in the northwest corner of the west kitchen.

This information on bottles once again reveals patterns in the distribution of artifacts within the building; these patterns probably reflect patterns in the use of artifacts in the household. The large frequency of olive green bottle glass in the hall may, for example, reflect storage of wine, either in the hall or in a cabinet or rack on an upper floor.

Looking finally at the relatively low frequency kitchen related

artifacts such as knives, forks, coffee mills, and dutch oven lids, it can be seen from Figure 16 that most occurs within the building and within the kitchens. Although the numbers involved are really too small to use to elicit patterns, it is interesting that while the forks are scattered throughout the building, most of the table knives were found in the east kitchen. It is possible to speculate that the dispersion of forks relates to their more common day-to-day use, and that the table knives may have received less common use and were found in the east kitchen since they were stored upstairs with the ceramics and glass tablewares.

Leaving kitchen artifacts behind, we can turn to a brief discussion of furniture hardware, personal artifacts, and non-kitchen tools. Unfortunately, most of these artifacts occur in very low frequencies and are thus of limited use in identifying patterns of use. The distributions of these artifacts are presented in Figures 17, 18, and 19. From these figures, it can be seen that the personal artifacts are relatively evenly distributed throughout the house and that a fair percentage occurs outside the limits of the structure. Despite this relatively even distribution, it is significant that within the building the buttons cluster in four general locations and do not occur individually. For example, five of the six Type 1 porcelain buttons (see Appendix), along with a Type 3 porcelain button, a shell button, and a copper button were found in the southwest quadrant of the west kitchen. These concentrations may reflect areas in upper floors where clothing was stored at the time of the fire. Clearly, even in such small numbers, patterns in the distribution of personal artifacts can be

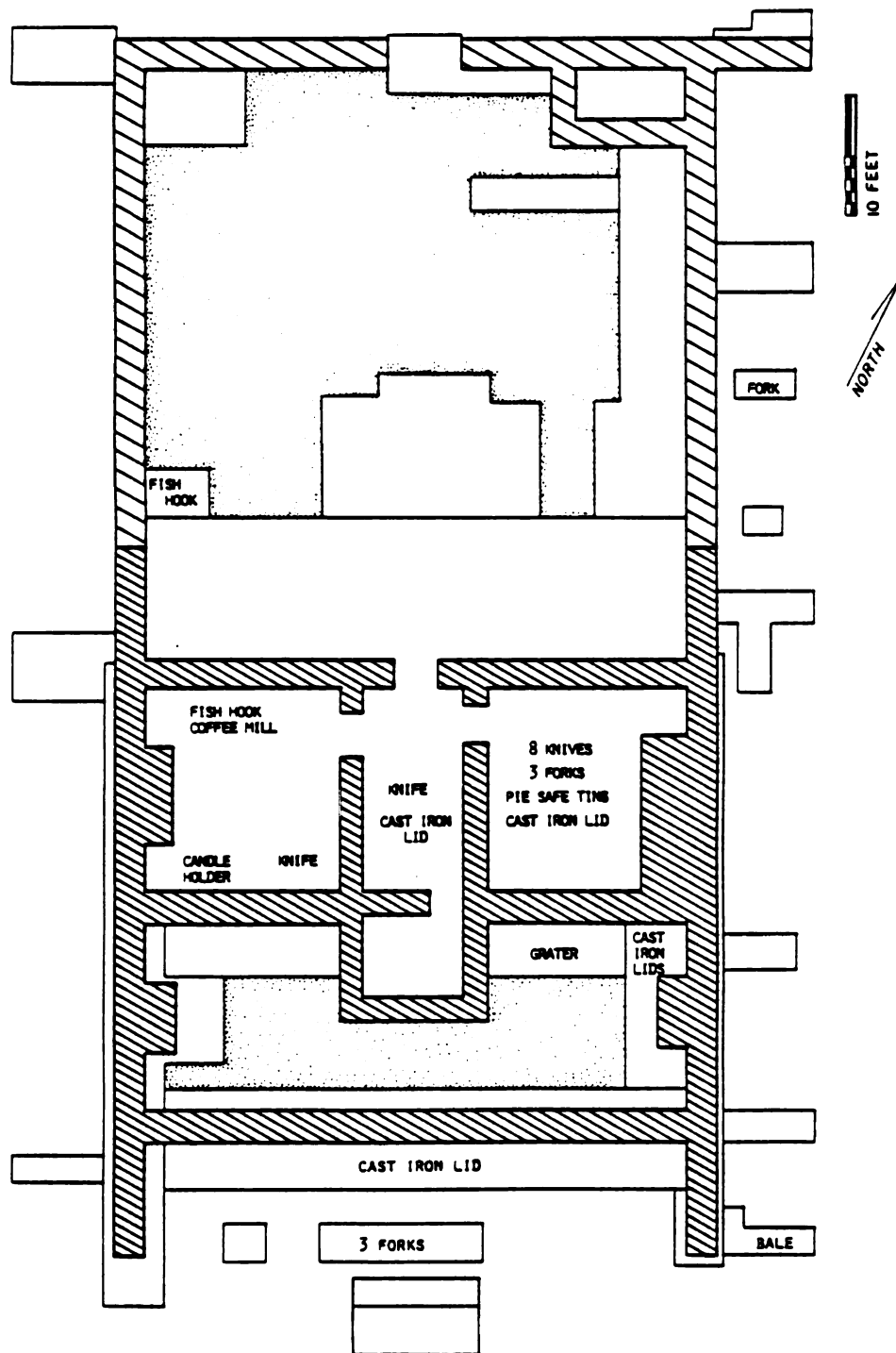


Figure 16. Distribution of kitchen artifacts.

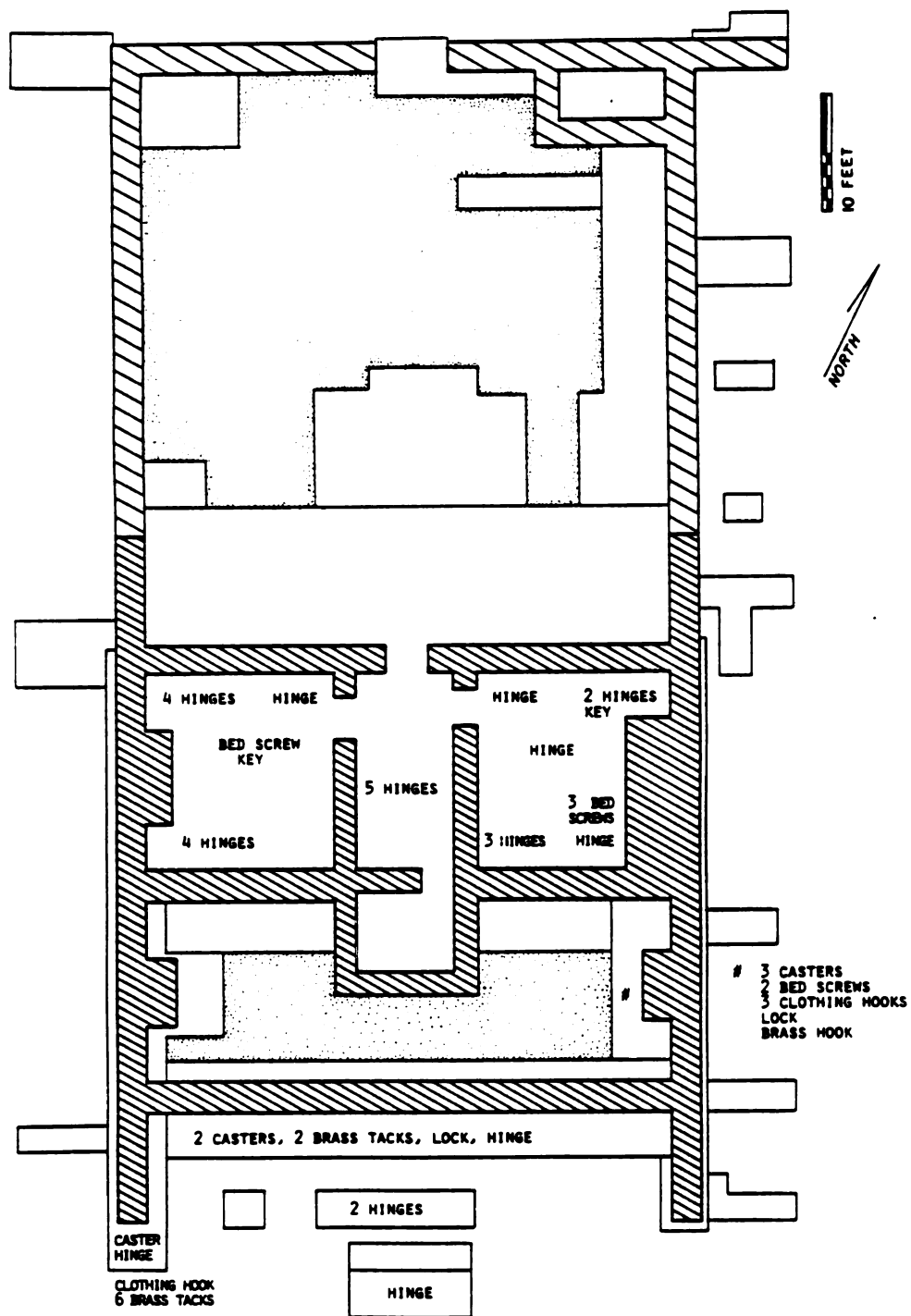


Figure 17. Distribution of furniture artifacts.

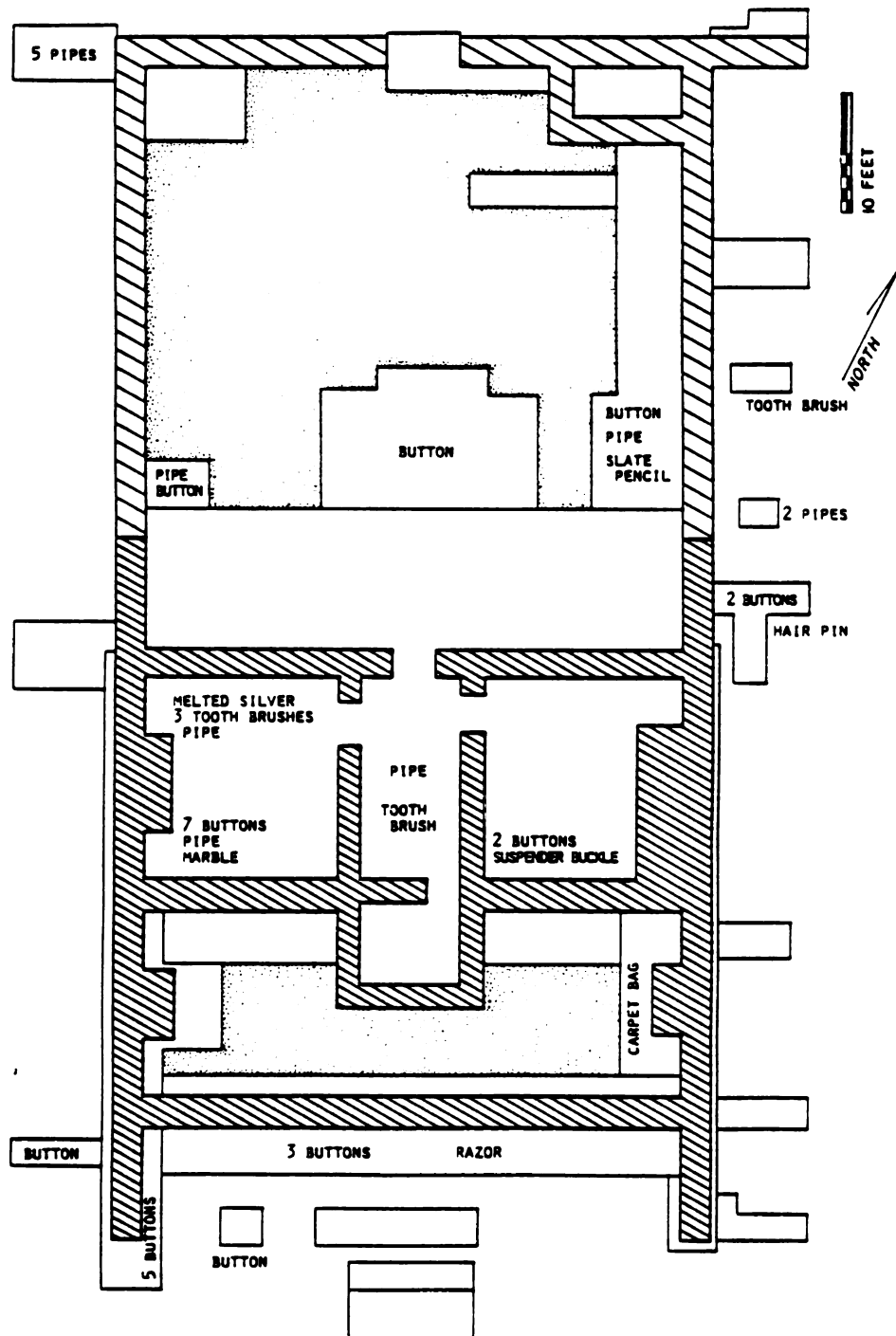


Figure 18. Distribution of personal and clothing artifacts.

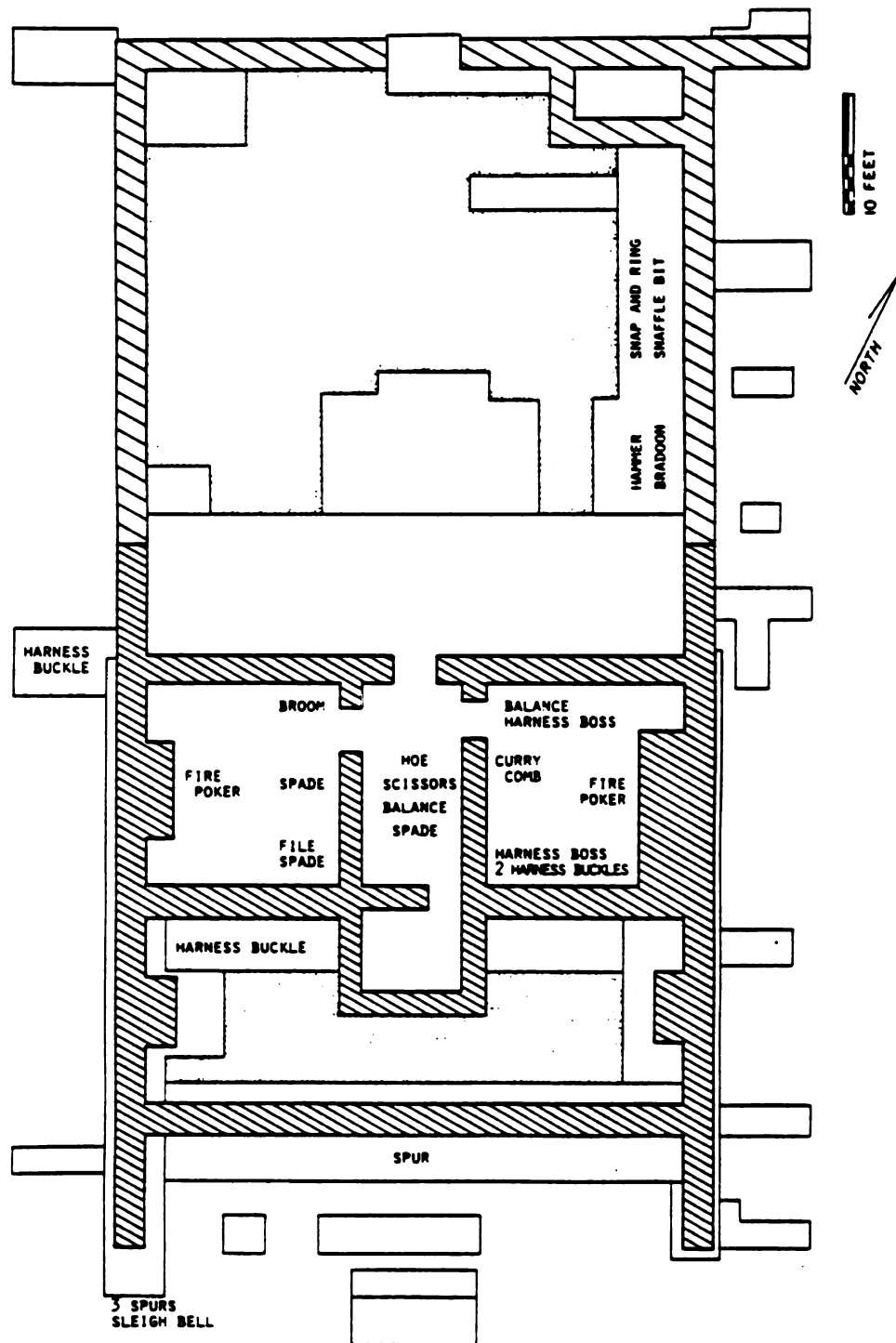


Figure 19. Distribution of non-kitchen tools.

documented.

Furniture hardware is distributed relatively evenly throughout the structure. It is interesting that most of it occurs to the south of the kitchens except for the furniture or cabinet sized hinges and the hooks and staples, which occur with frequency in the kitchens and hall. The distribution of hinges in the kitchens can partially be explained by the presence of built-in cabinets there, documented during the excavations. They are further explained as the remains of furniture, probably located in upper floors, which held the ceramics and glass tablewares. The hinges found in the hall may likewise be related to the olive green bottle glass fragments found there, and possibly represent the remains of a wine cabinet. The hooks and staples, typically interpreted as architectural hardware, may also have served on cabinets or furniture, which the distribution and association with the small butt hinges seems to support.

The non-kitchen tools found at the site occur most commonly in the kitchens and hall. Some of these tools also occur in Tests 1, 3, 9 and 12. The artifacts in Test 12 include a hammer, a bradoon, a snap and ring, and a snaffle. The concentration of the harness trappings in this location may indicate storage of these items there, possibly on hooks under the covered walkway to the privy hypothesized by Scott (1983). Within the kitchen and hall, the tools include three spades, a hoe, a file, a pair of scissors, a curry comb, two fire pokers, a broom, and two balances. The presence of these tools within the kitchens and hall, with easy access to the back yard, is interpreted as patterning which reflects the original use of these artifacts in the kitchen and toft areas of the 1857 household.

This examination of the distribution of non-architectural artifacts shows several distinct patterns within the commanding officer's quarters building. These include patterns in the distribution of ceramics, bottle glass, glass tableware, knives and forks, furniture hardware, and the non-kitchen tools. The patterns observed vary from the relatively even dispersal of furniture hardware to the tight clustering of the ceramics. These patterns are definitely non-random and are interpreted to reflect patterns in the distribution of artifacts present within the household at the point in time immediately prior to its destruction.

Discussion

This consideration of the distributions of both the architectural and non-architectural artifacts within the site, and in particular within the limits of the commanding officer's quarters building, has demonstrated patterning that appears related to the structure of the building and its contents prior to its destruction by fire. Although it has been suggested that the building site south of the kitchens may have been disturbed by earth moving and removal of artifacts by collectors, the overall patterning and in particular the patterning in the protected kitchens and hall is sufficient to support the requirements of Hypothesis 5.

Hypothesis 6

Hypothesis 6 considers the frequency relationship between durable and consumable/breakable goods. At the commanding officer's quarters, this ratio was expected to be relatively small as a reflection of the ratio of durable and consumable goods in the 1857 household. In other contexts, consumable goods are expected to be much more significant due

to the accumulation of the remains of consumable goods over time through use and discard cycles.

To examine this hypothesis, the durable and consumable/breakable goods from the collection were tabulated, and the results are presented in Tables 10 and 11. Excluded from this consideration are high frequency architectural artifacts such as nails and window glass. Although these are certainly durable goods, they are likely to remain at a site after its abandonment. The presence of these artifacts could thus be expected within a wide range of site formation processes. Other architectural artifacts, such as locks, latches, and hinges, would likely be salvaged on a building's abandonment and are therefore of interest here.

After preparing these tabulations, certain problems became apparent which posed difficulties for the examination of this hypothesis for the commanding officer's quarters. These are:

- 1) The fragile and consumable artifacts from the commanding officer's quarters were predominately ceramics, glass tablewares, and bottles. Presumably, these were all whole immediately prior to the 1857 fire. One or more things happened to these items in the fire: A) they were broken into relatively small pieces, B) they were melted beyond recognition, C) they were both broken and melted.

Smashing a whole set of dishes and a whole set of glass tableware very quickly leads to a significant numerical count of breakable and expendable artifacts. This same process of breaking an assemblage of whole bottles has the same effect, but their subsequent melting makes it impossible to deal with this problem quantitatively or even qualitatively.

Table 10

Summary of durable goods (Includes missing items from catalog),
Fort Towson Commanding Officer's Quarters

<u>Artifact*</u>	<u>Frequency</u>
Rim locks	6
Rim lock back plate	1
Rim lock side	1
Rim lock face plate	1
Rim lock bolt spring	1
Rim lock staples	6
Architectural key	1
Bar staple	1
Thumb latches	6
Latch bars	4
Latch bar staples	5
Keepers	5
Clinch nails	5
Architectural butt hinges	32
Flat head wood screws	82
Strap hinges	10
Pintles	13
Shutter bolt	1
Hasp	1
Punch decorated tin	3
Table forks	9
Table knives	12
Dutch oven lids	2
Cast iron vessel fragment	5
Grater	1
Candle holder (Ceramic)	1
Candle holder (Tin)	1
Coffee mill	1
Fish hooks	1
Tin handles	3
Spades	3
Broad hoe	1
Logging pike	1
Fire pokers	2
Scissors	1

Table 10 (Cont'd)

File	1
Curry comb	1
Spurs	4
Eagle hat devices	2
Sleigh bells	2
 Harness bosses	 2
Harness buckles	5
harness rings	2
Balances	2
Bone tooth brush	5
 Straight razor	 1
Silver	1
Carpet bag	1
Elbow pipes	2
Marble	1
 Slate pencils	 1
Suspender buckles	1
Buttons	25
Furniture butt hinges	30
Furniture sized screws	7
 Hooks and staples	 27
Staples	14
Casters	9
Bed screws	6
Clothing hooks	6
 Glass lamp pendants	 5
Brass tacks	9
Iron tacks	5
Keys	4
Cabinet locks	2
 Lock plate with escutcheon	 1
Brass hook	1
Door knockers	2
 TOTAL DURABLE ARTIFACTS	 434

* Includes fragmentary specimens

Table 11

Summary of consumable goods, Fort Towson Commanding Officer's Quarters

<u>Artifact*</u>	<u>Frequency</u>
Ceramic sherds	5,649
Tin cans	3
Colorless tableware fragments	6
Olive green bottle fragments	43
Aqua bottle glass fragments	28
Amber bottle glass fragments	4
Colorless melted glass	(6975 grams)
Olive green melted glass	(876 grams)
Aqua melted glass	(18303 grams)
TOTAL NUMBER	5,733
TOTAL GRAMS	26,154

* Includes fragmentary specimens

2) The majority of the ceramics from the site were not available for analysis. It was therefore impossible to attempt vessel reconstruction or minimum number estimation to determine the original number of ceramic pieces present. It is this original number of breakable and consumable artifacts that is the subject of this hypothesis.

These two factors make analysis of this hypothesis as originally conceived difficult, especially for the commanding officer's quarters collection. It is still presented as a potentially important distinction, and for collections where the entire ceramic assemblage is present its analysis as originally conceived may still be of utility. A problem still remains, however, in terms of the melted glass because there is no way to reconstruct the number and types of vessels originally represented there.

In an attempt to develop some measure of this hypothesis for the commanding officer's quarters and other sites of similar site formation, a ratio of durable goods to ceramic sherds is proposed. Ceramic sherds are always definable so they represent a strong basis for anchoring a comparison. Further, simple sherd counts can be used to compare all sites regardless of whether minimum vessel counts are possible. While a ratio based on sherd counts has certain theoretical shortcomings based on the above described problems, it presents a comparative tool that can--however minimally--begin to address this hypothesis.

For the commanding officer's quarters, then, a ratio between the 434 durable artifacts and the 5,649 sherds of ceramics is proposed. This ratio computes to thirteen sherds for every one durable artifact, or a ratio of 1:13 (durable artifact:ceramic sherd). The utility of

this ratio as a measure of this hypothesis can, of course, only be determined through comparative analysis.

Hypothesis 7

Hypothesis 7 is similar in many respect to number 6 except that it is concerned only with architectural artifacts. It holds that the assemblage of salvagable architectural artifacts will be more complete than in other site formation contexts.

The architectural assemblage from the commanding officer's quarters has been discussed several times in the above examination of Hypotheses 1 through 6. It has been suggested that the size of the collection of architectural artifacts other than nails and window glass may have been decreased due to removal of specimens by collectors. Nevertheless, the collection that remains is impressive in its size, the types of artifacts represented, and in the presence of sets.

Represented in the collection of architectural artifacts is evidence for eight rim locks and seven staples used with rim locks; two large door keys; evidence for five Suffolk type thumb latches and five latch bars, five staples, four keepers, and six wrought clinch nails associated with them; twenty-one cast iron butt hinges; nineteen hooks and staple sets; six strap hinges and 11 loose pintles; one shutter bolt; and one hasp. Related may be 30 furniture or cabinet hinges which, while they may be from free-standing furniture, may also be associated with built in cabinets. The catalog also lists a number of architectural or potentially architectural artifacts which are now missing. These include four rim locks (possibly furniture locks), five butt hinges (possibly cabinet sized), two strap hinges, and three

pintles.

Although the collection certainly does not contain all of the architectural hardware that would be found in a dwelling such as the commanding officer's quarters, it is impressive and does suggest that the building was occupied at the time of its destruction. Like several other hypotheses, however, the conclusion presented here is subjective and will remain so until it can be compared to other collections from similar and different site formation processes.

DISCUSSION

The model for in-situ de-facto refuse disposal by the aegis of fire was presented in Chapter 2, and consisted of seven sub-hypotheses or hypotheses. These seven hypotheses were concerned with the importance of burned artifacts in the collection, the diversity of artifact types present, the degree of variability within artifact types and the presence of sets, the size of the artifacts, the presence of non-random patterns in the distribution of artifacts on the site, the ratio between durable and consumable artifacts, and the ratio between types of architectural artifacts. Each of these hypotheses has been carefully considered for the Fort Towson Commanding Officer's Quarters using the artifacts excavated there in 1975. All the hypotheses except number six have been very supported--in some cases tentatively--at this site. The appropriateness of Hypothesis 6 cannot be properly interpreted without further comparative study.

Through a preliminary consideration during the analysis of the commanding officer's quarters, Hypothesis 6 was found to have certain logical flaws which made its evaluation difficult as originally conceived. These flaws were related to the breakage and melting of

glass artifacts, and the breakage of ceramic artifacts. As originally conceived, this hypothesis required a comparison of artifacts that were complete prior to the site's destruction rather than of a collection that became highly fragmented during the site's destruction. Although this is theoretically possible through the reconstruction of ceramics or the estimation of minimum numbers of ceramic vessels, it was not possible with the melted glass. The commanding officer's quarters collection was also found to be deficient in the data needed to approach this hypothesis. This deficiency related to the fact that only a third of the ceramic collection was available for analysis, precluding reconstruction of vessels or estimation of accurate minimum vessel numbers.

Due to these problems with the evaluation of Hypothesis 6 based on minimum vessel counts, an alternate approach was proposed. This approach involves the development of a ratio between durable artifacts and ceramic sherds. While this new approach is not believed to be as sensitive to the hypothesis as the original approach, it may have more utility in across-the-board site comparison. Given the nature of the data, it is also the only measure that could be developed that would approach this hypothesis.

The conclusions that were reached concerning each of the six successfully examined hypotheses varied. For Hypothesis 1, which questioned the presence of burned artifacts; Hypothesis 3, which considered artifact variability and the presence of sets of artifacts; and Hypothesis 5, which considered whether the spatial distribution of artifacts on the site would reflect patterns related to the pre-destruction use of the site, the conclusions were strongly positive.

In other words, it was possible to say that burned artifacts occurred extensively throughout the collection, that sets of artifacts were common in the collection, and that there was clearly patterning in all groups of artifacts which reflected the construction and use of the 1857 household.

For the balance of the hypotheses, concerning artifact diversity, artifact size, and the ratio between architectural artifacts, conclusions were subjective. While the collections from the commanding officer's quarters appeared to support the specific requirements of the hypotheses, the values dealt with are relative ones. It will not be possible, therefore, to present a firm conclusion on these hypotheses until the patterns from the commanding officer's quarters are compared to data from other similar and different sites.

Although more critical for some of the hypotheses than for others, the comparison of the results of this analysis of the commanding officer's quarters to data from other sites is an important step in developing a final conclusion on the validity of the hypotheses and the hypothesis from which they are ultimately derived. This consideration of comparative data will be undertaken in several subsequent chapters, including the following chapter which considers the pattern for a site similar in formation to the commanding officer's quarters.

One conclusion that can be firmly presented as a result of the consideration of the commanding officer's quarters is that, with the exception of Hypothesis 6, the hypotheses presented are realistic in that they can be examined archeologically. With the proposed modifications, Hypothesis 6 may also prove an important clue to site formation.

CHAPTER 4

REFINING THE BASELINE: THE MODEL COMPARED TO THE ARKANSAS POST BANK

In this chapter, the patterns for in situ-de facto site formation observed for the Fort Towson Commanding Officer's Quarters are compared to the collection from the Arkansas Post Branch Bank of the Bank of the State of Arkansas. The Arkansas Post bank represents an important comparison because it shares a process of site formation identical to that for the commanding officer's quarters.

Essentially, the examination of the commanding officer's quarters discussed in the previous chapter presents an untested model of in situ-de facto site formation by the aegis of fire. This model was presented as observations of archeological patterns related to seven sub-hypotheses or hypotheses. If this is a valid model, it should hold for sites other than the one from which it was extrapolated. The purpose of this chapter is, therefore, to examine these same seven hypotheses against data from the Arkansas Post bank in order to test the appropriateness of this model.

THE MODEL AND ARKANSAS POST

As was reviewed in Chapter 2, the Arkansas Post bank was located within the community of Arkansas Post, Arkansas. It was a brick building constructed in 1841, but which was for all practical purposes abandoned shortly thereafter because of the failure of the bank. This building was used during the Civil War as a hospital for the Confederate States of America, and was destroyed by fire during a United States bombardment of the town in 1863. At the time of its destruction it was

being used as a hospital.

In the following discussion, the seven hypotheses examined for the commanding officer's quarters are examined for the Arkansas Post bank. This examination involves substantially more than comparing the expected with the observed at Arkansas Post. Much more important is a comparison of the observed patterns at Arkansas Post with those reviewed in Chapter 3 for the Fort Towson Commanding Officer's Quarters. If the patterns documented at Fort Towson are representative of in situ-de facto site formation, they should be mirrored at the Arkansas Post bank. If not, a discrepancy will exist which will suggest these patterns were caused by processes of culture other than those being investigated here. Following the consideration of Arkansas Post and its comparison to the commanding officer's quarters, an assessment of the proposed model of in situ-de facto site formation will be possible.

Hypothesis 1

This hypothesis concerns the importance of burned artifacts in the collection. The collection from the commanding officer's quarters showed overwhelming evidence of burning of glass and ceramic artifacts, some evidence for burning of non-ferrous metal artifacts, and indirect evidence for the burning of iron artifacts. The Arkansas Post bank was, like the commanding officer's quarters, destroyed by fire, and the collections from this site should have examples of heat altered artifacts similar in form and number to those observed at the commanding officer's quarters.

Evidence for the destruction of the Arkansas Post bank by fire is found throughout Walker's 1971 report on the site (Walker 1971). In his discussion of the archeological findings at the Arkansas Post bank,

Walker concluded:

the large amount of ash, the few fragments of charred timber, the fragments of warped or melted glass and metal, and the discoloration of many of the china ware fragments due to heat definitely indicate that the structure burned and that the artifacts recovered from the site were in the building at the time that it burned [Walker 1971: 30].

Specific reference to burned artifacts contained in Walker's report include melted metal, melted glass, and burned ceramics.

Melted glass from the site included window glass, with 182 out of a total of 384 specimens showing the affects of heat. The window glass appears, however, to be the only type of glass for which the burned or unburned condition was systematically recorded. Photographs of bottle fragments, for example, clearly show melted specimens for which the accompanying text description makes no mention of their melted states. (Walker 1971: 145-149). Occasional references to heat alteration occur throughout the description of the bottle glass from the site, but usually only where heat distortion prevented accurate measurement or description.

The clearest statement of the extent of heat alteration on the bottle glass from this site is found in a description of the 225 miscellaneous fragments of glass bottles. While providing no number, Walker (1971: 177) states that "almost all have been so badly damaged by heat that no describable features remain."

Although the ceramics provide evidence of heat alteration, they are no more systematically dealt with in this regard than the bottle glass. For example, a photo of a reconstructed water basin and pitcher clearly shows that both have been fire damaged. In the accompanying description of these reconstructed vessels, however, only the pitcher is

mentioned as being fire damaged (Walker 1971: 102-106). Other references to evidence of burning on the sherds from this site are rare.

The fact that Walker describes only three sherds as being burned beyond recognition may suggest that the intensity of burning of this collection was much less than for the commanding officer's quarters (Walker 1971: 137). The affect of heat on ceramics may therefore have been much more subtle at the bank site, and may have been seen as less important to describe.

The ten fragments of melted metal ranged in size up to 7.5 inches and all had inclusions of plaster fragments. Some specimens showed impressions of lumber. From pieces of thin metal which protruded from these specimens, Walker suggested that they represented fused and melted iron shingles which once roofed the bank structure (Walker 1971: 67).

Although the data is not presented with which to quantify a discussion of the affects of fire on the collection from Arkansas Post, it is apparent from Walker's concluding remarks and by evidence in his report that the collection was extensively if not intensively affected by heat. This provides support for Hypothesis 1, and illustrates a need to describe the archeological as well as the original condition of the artifacts.

Another observation on the burned condition of the Arkansas Post artifacts is of interest in comparison to the commanding officer's quarters. Based on a comparison of artifacts that had and had not been heat affected, Walker was able to conclude that:

the discovery that some china ware sherds which were completely discolored by fire were from the same vessels as sherds that had sustained little or no damage, and that some badly warped fragments of glass were from the same bottles as

relatively undamaged fragments strongly suggests that these items had been broken and scattered by considerable force during, or immediately before, the burning of the building [Walker 1971: 30].

This is similar to an observation made at the commanding officer's quarters. The considerable force referred to by Walker was, of course, the explosion of artillery shells at the bank building, which Walker links to the fire which destroyed the building. Such an explanation cannot be invoked at the commanding officer's quarters, which simply caught fire and burned to the ground. At the commanding officer's quarters, the differential burning of artifacts was explained by breakage during the collapse of the building and by the differential intensities of heat within the burning structure.

Hypothesis 2

Hypothesis 2 holds that there should be a diversity of artifacts present in situations of in situ-de facto site formation since the full range of materials present in the site during its active use should remain at the site after its destruction. A diversity of artifact types was observed at the commanding officer's quarters, and is therefore expected at Arkansas Post.

The artifacts from the Arkansas Post bank have been presented in Table 12, where they have been grouped into the five functional categories introduced in Chapter 3. Since the excavations at this site did not extend much beyond the limits of the structure all the artifacts from the site are included in this table.

A review of Table 12 shows that while there is diversity in the classes of artifacts present at Arkansas Post, the diversity is nowhere near as extensive as was observed at the commanding officer's quarters.

Table 12

Artifacts from the Arkansas Post Bank

<u>Artifact</u>	<u>Number found</u>
<u>Architecture Group</u>	
Common cut nails	1217
Window glass fragments	384
Galvanized iron shingles	9
Copper flashing fragments	43
Window sash weights	16
Window sash weight fragments	5
Window sash pulleys	8
Window sash pulley wheel	1
Rim lock staple/strike plate	2
Cast iron butt hinges	3
H-hinge	1
Ornamental iron studs	2
Spike	1
Flat head wood screws	32
<u>Kitchen Artifact Group</u>	
Cast iron pot fragments	2
Cast iron kettle fragments	7
Bail and bail ear	1
Ceramics	385
Colorless glass tablewares	5
Bottle glass	419
Glass stoppers	2
<u>Non-Kitchen Tool Group</u>	
Bayonet scabbard tip	1
Ramrod fragment	1
Rifle trigger guard	1
Artillery shell fragments	3
Harness rings	2
Harness buckle	1
Harness snap	1
Logging chain fragment	1

Table 12 (Cont'd)

Personal and Clothing Group

Carpet bag fragment	1
Marble	1
Suspender buckles	2
Ceramic shaving cream container fragments	7
Gaming die	1

Furniture Group

Butt hinges	2
Lock staple or keeper	1
Cast iron stove fragments	320
Stove bolts	7
Stove bolt nuts	4

Looking just at the total number of classes present at each of these sites, it can be seen that the 69 classes at the commanding officer's quarters greatly outnumbers the 39 classes present at Arkansas post.

Looking at the distribution of classes within the five functional artifact groups, a similar conclusion is reached. At Arkansas Post, there are fourteen classes of architectural artifacts, compared to eighteen at the commanding officer's quarters; seven classes of kitchen artifacts, compared to fifteen at the commanding officer's quarters; eight classes of non-kitchen tools, compared to fourteen at the commanding officer's quarters; five classes of personal and clothing artifacts, compared to ten at the commanding officer's quarters; and five classes of furniture artifacts, compared to twelve at the commanding officer's quarters.

The differences in the diversities of classes between the commanding officer's quarters and Arkansas Post can be seen by the

nature of the classes present within different artifact groups. For example, the Kitchen Artifact Group from Arkansas Post is composed of sherds of bottle glass, ceramics, glass tableware, cast iron vessels, and a bail and attached bail ear. This contrasts markedly to the commanding officer's quarters where in addition to these classes there were also knives, forks, a grater, candle holders, a coffee mill, and punch-decorated tin from a pie safe.

The numbers represented for each class at Arkansas Post were also not as substantial as at the commanding officer's quarters. Although some artifact classes did occur in quantity, such as the sixteen complete window sash weights and the eight window sash pulleys, these were the exception. Other classes which occurred in number at the commanding officer's quarters, such as butt hinges, door latches, knives and forks, and furniture casters, were either represented by only one or two examples or were not present at all at Arkansas Post.

The degree of class diversity characteristic of the commanding officer's quarters and Arkansas Post is clear from the above discussion and is well illustrated by the differences in the total numbers of classes present at each site. While the collection from the commanding officer's quarters can be with little trouble characterized as a very diverse collection, that from the Arkansas Post bank is considerably less diverse.

Hypothesis 3

Hypothesis 3 predicts that variation within classes of artifacts should be limited due to the fact that the deposits reflect an instance-in-time of an in-use site. Variation within such in-use sites is expected to be low due to the presence of sets of like artifacts or

similarities in artifacts which cannot be defined as formal sets.

A review of the materials from Arkansas Post shows very little evidence for the presence of sets or for similarities among artifacts within a class. There are, in fact, very few artifact classes with enough specimens to even examine this hypothesis. None of these occur within the Non-Kitchen Tool Group or the Personal and Clothing Group.

Some classes within the Architecture Group occur in enough quantity to allow an examination of this hypothesis. The nine complete iron shingles, for example, are of identical pattern and size. The sixteen whole and five fragmentary window sash weights, and the eight window sash pulleys, and the two decorative iron studs are likewise identical. The two rim lock staples and three cast iron butt hinges differ, however, in size or form. The identical shingles and window sash weights and pulleys are here seen as significant. These are the only architectural artifacts which occur in great enough numbers to really examine this hypothesis, and it is meaningful that they are identical.

The Kitchen Artifact Group also provides useful information. Looking first at the earthenware ceramics, it is interesting that two reconstructable vessels represent a water pitcher and a basin. These commonly occur as sets, and these two reconstructed vessels may indeed represent a set. If so, however, they represent a mis-matched set since the basin is of undecorated ironstone and the pitcher of undecorated creamware.

It is also useful to examine the distribution of different ceramic wares at Arkansas Post (Table 13). There are eight fundamentally different wares represented in the collection, compared to seven

Table 13

Distribution of earthenwares, Arkansas Post bank

<u>Ware type</u>	<u>Number</u>	<u>Percent</u>
Undecorated ironstone	69	27.2%
Other undecorated whitewares	122	48.2%
Edged wares, all varieties	8	2.9%
Transfer printed	40	15.8%
Decalcomania	4	1.5%
Hand painted	6	2.3%
Annular ware	2	.7%
Spatter ware	2	.7%
TOTAL	253	99.3%

documented from the commanding officer's quarters. Whitewares (Ironstone and other whitewares) are the most common at both sites, representing 75 percent of all earthenwares at Arkansas Post and 89 percent at the commanding officer's quarters. At the latter site, however, other wares except porcelain are very minimally represented. At Arkansas Post, these other wares are of greater importance. Transfer printed wares, for example, account for 15.8 percent of the earthenwares, edged wares account for an additional 3 percent, hand painted wares for 2.3 percent, and decalcomania for 1.5 percent. When it is considered that 90 percent of the whitewares from Arkansas Post represent two vessels, the importance of these other ware types is further enhanced (unfortunately, a similar comparison is impossible for the commanding officer's quarters).

Based on differences in color and designs, Walker was able to further subdivide these eight fundamental wares into 49 distinct

varieties (Walker 1971: 141). In a collection with only 253 sherds, of which 172 belong to two vessels, the only conclusion that can be reached is that the ceramics from the site are extremely variable. The ceramics therefore do not support the presence of sets at this site, and present a picture very different from that obtained from the commanding officer's quarters.

The bottles from Arkansas Post also present a variable lot. It is interesting, however, that a large percentage of the identifiable bottle fragments were interpreted by Walker as medicinal bottles. These included patent medicines, bitters, narcotics, and stoppers from pharmaceutical bottles. Given the use of the Arkansas Post bank as a hospital at the time of its destruction, these medicinal bottles might be interpreted as a functional set made up of unlike specimens.

In the Furniture Group, the only artifacts that occur in frequency are the two brass butt hinges and the hundreds of cast iron stove parts. The latter are of little use here, and the former represent such a small number that any conclusions based on them is of limited value. Nonetheless, it can be noted that the two brass hinges are identical in size and form.

The collection from Arkansas Post thus presents only scant evidence in support of Hypothesis 3. Sets of similar artifacts are suggested from the architectural group, but, except for several matches of two or three artifacts, are missing elsewhere in the collection. The ceramics, one area where formal sets could be expected, provided evidence to the contrary. Sets of dissimilar artifacts may be represented by a mis-matched, reconstructed water pitcher and basin, and

by the large numbers of medicinal bottles in the collection.

Hypothesis 4

Hypothesis 4 is concerned with the size range of artifacts and with the number of whole artifacts in the collection. Large and whole artifacts are expected to be common, which was tentatively verified at the commanding officer's quarters.

Table 14 presents the size distribution and condition (whether whole or not) for the artifacts from Arkansas Post. Although condition could be determined for virtually all the artifacts, the size of the artifacts was only occasionally presented in Walker's report. This is particularly true of artifacts such as ceramics and bottle glass which occurred in large quantities; sizes for many of these artifacts were estimated based on scaled illustrations in the report.

The importance of large artifacts in the collection from Arkansas Post can be observed in Table 15, which presents a summary of the distribution of artifacts between the various size ranges. This table also shows the comparable percentages for the commanding officer's quarters. As was done for the commanding officer's quarters, this table does not consider very high frequency artifacts such as nails, or artifacts such as ceramics and bottle glass that probably became fragments during the actual destruction of the site.

Although the actual numbers are smaller--the Arkansas Post collection is substantially smaller than that from the commanding officer's quarters--Table 15 very clearly shows the importance of artifacts greater than 10 cm at Arkansas Post. This level of importance not only matches that from the commanding officer's quarters, it handily exceeds it. At the commanding officer's quarters, artifacts

Table 14

Size distribution of selected artifacts, Arkansas Post bank

<u>Artifact</u>	<u>0-10</u>	<u>10-20</u>	<u>20-30</u>	<u>30+</u>
<u>Architecture Group</u>				
Common cut nails*	953	21		
Cut nail fragments	243			
Window glass fragments				
Galvanized iron shingles				9
Copper flashing fragments				
Window sash weights*				16
Window sash weight fragments				
Window sash pulleys*		8		
Window sash pulley wheel	1			
Rim lock staple/strike plate*	1	1		
Cast iron butt hinges*		3		
H-hinge*		1		
Ornamental iron studs*	2			
Spike*		1		
Flat head wood screws*	20			
Flat head screw fragments	12			
<u>Kitchen Artifact Group</u>				
Cast iron pot fragments	1			1
Cast iron kettle fragments	7			
Bail and bail ear	1			
Earthenware sherds	30**			
Stoneware sherds				
Colorless glass tablewares	2**			
Aqua bottles*		1		
Olive green bottles*			3	1
Olive green bottle glass	7**	3**		
Aqua bottle glass sherds	8**			
Colorless bottle glass				
Amber bottle glass				
Unidentified bottle glass				
Aqua stopper*	2			
Colorless stopper*	1			

Table 14 (Cont'd)

Non-Kitchen Tool Group

Bayonet scabbard tip	1	
Ramrod fragment		1
Rifle trigger guard		1
Artillery shell fragments	3	
Harness rings*	1	
Harness ring fragments	1	
Harness buckle*	1	
Harness snap*	1	
Logging chain fragment		1

Personal and Clothing Group

Carpet bag fragment		1
Marble*	1	
Suspender buckle*	1	
Suspender buckle fragment	1	
Shaving cream container	2**	
Gaming die*	1	

Furniture Group

Brass butt hinges*	1	
Brass butt hinge fragments	1	
Lock staple or keeper*	1	
Cast iron stove fragments	320	
Stove bolts	7	
Stove bolt nuts	4	

* Denotes whole artifacts

** Partial tabulation; sizes were not listed for all artifacts of this type.

Table 15

Summary of artifact sizes, without nails, ceramic sherds,
fragments of bottle glass, and fragments of cast iron stoves,
Arkansas Post bank

<u>Size range</u>	<u>Number</u>	<u>Percent of total, Arkansas Post</u>	<u>Percent of total, COQ</u>
0 to 10 cm	78	63.9%	75.5%
10 to 20 cm	17	13.9%	19.0%
20 to 30 cm	-	-	3.5%
30 cm plus	27	22.1%	1.9%
TOTAL	122	99.9%	99.9%

larger than 10 cm in size represent 24 percent of those considered (all artifacts except nails, ceramics, and bottle glass) while at Arkansas Post they accounted for 36 percent. It should be noted that this greater importance of larger artifacts at Arkansas Post may be at least partially caused by collection methods. Much of the collection was made during machine removal of brick rubble--larger artifacts would certainly have been more easily seen during this process.

The second measure of interest for Hypothesis 4 concerns the importance of whole artifacts in the collection. Using the same artifacts tabulated in Table 14, Table 16 presents the number of whole artifacts for each size category. Also presented, for both Arkansas Post and the commanding officer's quarters, is the percentage of the

total number of artifacts represented by the whole artifacts within each size category.

Table 16

Total versus whole artifacts by size category, without nails, ceramics, bottle glass, and cast iron stove parts, Arkansas Post Bank

<u>Size range</u>	<u>Total</u>	<u>Number whole</u>	<u>Percent of total, Ark. Post</u>	<u>Percent of total, COQ</u>
0 to 10 cm	78	35	44.8%	74.1%
10 to 20 cm	17	13	76.4%	62.8%
20 to 30 cm	-	-	-	84.6%
30 cm plus	27	16	59.2	100.0%

By comparing the percentages of whole artifacts from Arkansas Post to those from the commanding officer's quarters, it can be seen that whole artifacts are generally less common at Arkansas Post (52%) than at the commanding officer's quarters (73%). In some size categories, however, the percentages are higher at Arkansas Post.

Although falling below the level observed at the commanding officer's quarters, the percentage of whole artifacts observed in this analysis of the Arkansas Post bank is still substantial. The importance of whole artifacts in the collection is further enhanced by examining a number of ceramic vessels which were partially reconstructed by cross-mending sherds.

Among the ceramics, the water pitcher and basin previously

discussed are of importance. The water pitcher was largely reconstructed by cross-mending 103 sherds and the basin by cross-mending 51 sherds. Although not all of the sherds for these vessels were found during the excavations, the fact that these are largely reconstructable suggests they were whole immediately prior to the destruction of the building. Among the 117 stoneware sherds, 49 were cross-mended to form an incomplete jug; once again, a whole vessel prior to site destruction is indicated.

This consideration of Hypothesis 4 presents a view of Arkansas Post that is similar to that from the commanding officer's quarters. Large artifacts were an important part of the collection from the commanding officer's quarters, but were even more common at Arkansas Post. Although the reverse was true concerning the numbers of whole artifacts--they were less common at Arkansas Post than at the commanding officer's quarters--the numbers of whole artifacts at each site can still be interpreted as impressively large.

Hypothesis 5

Hypothesis 5 considers the distribution of artifacts within the site, and predicts that the distribution should be non-random on sites formed by an in situ-de facto process. At the commanding officer's quarters, distinct non-random patterns were documented in a wide range of artifact categories, and these patterns were attributed to activity and structural patterns which were present within the building immediately prior to its destruction. Unfortunately, Walker's report presents no information on the distribution of the artifacts from Arkansas Post. This hypothesis cannot, therefore, be examined for this

site.

Hypothesis 6

This hypothesis considers the relationship between durable goods and consumable/breakable goods in the collection. An examination of this hypothesis as originally presented in Chapter 2 was deemed to be not feasible for the commanding officer's quarters due to the severely melted state of the glass and because the ceramic collection was incomplete. It was determined that in order to properly evaluate this hypothesis, an estimate of the original number of breakable items was required because these were supposedly whole immediately prior to the destruction of the site.

Because the bottle glass is less severely burned, and because Walker (1971) presents estimates of minimum numbers of ceramics and bottles, this hypothesis can be more profitably examined at Arkansas Post than at the commanding officer's quarters. Table 17 presents a listing of durable, non-architectural goods from the Arkansas Post collection, and Table 18 presents a listing of consumable/breakable goods. These tables form the basis of the evaluation of Hypothesis 6.

Comparing these tables, it can be seen that durable goods account for a minimum of about 27 artifacts from the site, while consumable/breakable artifacts account for 120 items. There are therefore approximately 4.4 consumable or breakable items represented in the collection for every one durable item. This ration of 1:4.4, durable:consumable goods is here seen to be very low. This has little comparative value; it cannot be compared to the commanding officer's quarters due to several factors concerning the collection, and it cannot be compared to other sites where minimum numbers are not reported or

Table 17

Durable goods (non-architectural), Arkansas Post bank

<u>Description</u>	<u>Number</u>
Cast iron vessel fragments	9
Bail and bail ear	1
Bayonet scabbard tip	1
Rifle trigger guard	1
Harness rings	2
Harness buckles	1
Harness snap	1
Logging chain fragment	1
Carpet bag fragment	1
Marble	1
Suspender buckle	1
Suspender buckle fragment	1
Shaving cream container fragments (minimum no)	1
Gaming die	1
Furniture butt hinges	2
Furniture lock staple	1
Cast iron stove, minimum number	1
TOTAL	27

Table 18

Consumable/breakable goods, Arkansas Post bank

<u>Description</u>	<u>Number</u>
Earthenware vessels, minimum number	48
Stoneware vessels, minimum number	10
Pressed glass vessels, minimum number	3
Liquor bottles, minimum number	20
Food bottles, minimum number	1
medicinal bottles, minimum number	33
Bottle stoppers, minimum number	2
Artillery shell fragments	3
TOTAL	120

which cannot be estimated.

Since a comparison based in part on ceramic vessel minimum numbers is not a measure that can be used to compare all sites, a second method of comparison based on ceramic sherd counts is presented. Regardless of the type of site formation, and regardless of the ability to develop minimum vessel estimates, sherd counts can be developed and can be used as the basis for site comparisons.

At the Arkansas Post bank, there are a total of 385 ceramic sherds present in the collection. Contrasting this to the 27 durable goods presented in Table 17, it is determined that there are 14.3 sherds for every one durable item. This equates to a ratio of 1:14.3 (durable:ceramic sherds) for Arkansas Post. This approach can be used to develop a similar ratio for the commanding officer's quarters. At this site, there are a total of 5,649 ceramic sherds and 434 durable artifacts. This works out to 13 ceramic sherds for every durable artifact, or a ratio of 1:13 (durable goods: ceramic sherds) for this site. This figure compares very favorably to the ratio computed for the Arkansas Post bank, and shows a great similarity between the commanding officer's quarters and this site.

While this approach may not be as theoretically sensitive as that originally proposed for the evaluation of this hypothesis, a comparison based on the ratio of durable goods to ceramic sherds is a very workable approach. It further demonstrates a great amount of similarity between the ratios for the commanding officer's quarters and the Arkansas Post bank. Based on this approach, therefore, information from the Arkansas Post bank and the commanding officer's quarters provides support for Hypothesis 6.

Hypothesis 7

Hypothesis 7 considers the importance and completeness of the architectural assemblage from a site. On sites formed by in situ-de facto processes, a large and relatively complete architectural assemblage is expected since salvage of these items would have been precluded by the building's destruction, in the case of this study by fire. Although far from a complete architectural assemblage, a very full and numerically impressive assemblage was documented at the commanding officer's quarters.

The architectural assemblage from Arkansas Post is not impressive. Even the nails, which numbered well over 20,000 specimens at the commanding officer's quarters, accounted for just over 1,000 artifacts at Arkansas Post. More important for a consideration of Hypothesis 7, however, is the lower frequency of architectural hardware such as hinges and door locks. These items are noticeably lacking from Arkansas Post, and include only nine iron shingles, sixteen fragments of copper flashing, sixteen complete and five fragmentary window sash weights, eight complete and one fragmentary window sash pulleys, one rim lock staple, three cast iron butt hinges, a single "H" hinge, two ornamental studs (which might easily be from furniture), a spike, and 32 screws and screw fragments. Notably absent from this assemblage are items such as door locks, door handles, and shutter latches or bolts. Except for the window sash weights and pulleys, which occur in impressive numbers, the architectural items that are present are either single items or are represented by low numbers.

A more direct means of examining this hypothesis comes from a

comparison of the number of classes of architectural artifacts present at each, and by a consideration of the numerical importance of the nails and window glass in the total site assemblages. Comparing the number of classes of architectural artifacts present provides a measure of their diversity within the collections. At the Arkansas Post bank, there are a total of 14 classes of architectural artifacts present, as compared to a total of 18 for the commanding officer's quarters (Table 19). Although these sites differ significantly in the number of artifacts per class and the types of artifacts represented, this measure of simple class diversity within the Architecture Group indicates at least some similarity between these sites.

Table 19

Summary of architectural artifacts from sites
with in situ-de facto refuse contexts

<u>Site</u>	<u>Number of Classes</u>	<u>Window Glass</u>	<u>Nails</u>	<u>% of all Artifacts</u>
Arkansas Post	14	384	1,217	55.1%
C.O.Q.	18	-	20,885	78.6%

Window glass and nails typically represent some of the highest frequency artifacts on a site and always represent the vast majority of the architectural assemblage. The percentage of the total site collection represented by a combined count of window glass and nails therefore provides another measure of the overall importance of the architectural assemblage at a particular site. At the commanding

officer's quarters, the nails alone comprise over 78 percent of the total site collection. At the Arkansas Post bank, the window glass and nails make up a substantially smaller 55 percent. Although the percentage is much lower for the Arkansas Post bank than for the commanding officer's quarters, it is nevertheless a very high percentage.

On a very subjective level, then, the pattern from Arkansas Post differs markedly from the pattern from the commanding officer's quarters, and does not appear to support Hypothesis 7. Quantitative comparisons, however, present certain areas where these sites are essentially similar. Since these quantitative approaches have more utility in across-the-board comparisons of sites, their results will here be at least tentatively accepted as support for this hypothesis.

Discussion

A comparison of the collections from the Arkansas Post bank with the predictions of the seven hypotheses and with the patterns from the commanding officer's quarters has provided significant information on the applicability of the proposed model for in situ-de facto site formation. This model was originally presented in Chapter 2 and was refined by the application of data from the commanding officer's quarters in Chapter 3. The observed patterns from the Arkansas Post bank provide support for four of the seven hypotheses making up this model. Two of the hypotheses were not supported at Arkansas Post, while another hypothesis could not be addressed due to the lack of data.

Hypothesis 1, concerned with the importance of burning on the collections, was supported at Arkansas Post. The commanding officer's

quarters and Arkansas Post bank therefore appear essentially similar in regards to this hypothesis, with a significant portion of their collections having been affected by heat. This hypothesis was nevertheless difficult to examine for Arkansas Post because of the inconsistent reporting of the condition of the artifacts. This signals a need for greater rigor in reporting the archeological condition of artifacts in site reports.

Hypothesis 2 and 3, which concern the diversity of the collections, do not appear to be supported at Arkansas Post. This site provides a pattern that is entirely different from the commanding officer's quarters, and indicates that these hypotheses may not be valid indicators of site formation. Essentially, the commanding officer's quarters presented a very diverse collection of artifacts (Hypothesis 2) that was, at the same time, characterized by a great amount of similarity within types (Hypothesis 3). The opposite was found to be the case at Arkansas Post.

It is possible to speculate on the reasons for these differences in observed patterns. The commanding officer's quarters represented a domestic household of a probably fairly upper class family. Diversity of classes of artifacts could be expected in such a household due to the diversity of functions common to the household. Similarity in artifacts could equally be expected due to the presence of sets of artifacts and due to similarities in the furnishing of the household. The Arkansas Post bank, on the other hand, had been abandoned prior to its Civil War use and was then brought into service as a Confederate hospital. The building may have been in a dilapidated state at the time, and the furnishing of the hospital would have probably reflected its very

special function and the generally impoverished nature of the Arkansas Confederacy at this time. This condition could explain the lack of diversity of classes of artifacts (Hypothesis 2) and the great diversity within artifact classes (Hypothesis 3). Thus, rather than being controlled by site formation, this analysis and comparison of the commanding officer's quarters and the Arkansas Post bank suggest that Hypothesis 2 and 3 are probably better indicators of site function and social economy than they are of site formation.

Information from Arkansas Post provided strong support for Hypothesis 4, which concerned the size and completeness of the artifacts in the collection. Large and whole artifacts were found to be very important in both the collection from the commanding officer's quarters and the Arkansas Post bank, which was expected since all of the artifacts present at these sites were supposedly whole immediately prior to their destruction. The consideration of Arkansas Post pointed out the lack of attention to recording variables of artifact size and condition in archeological reports.

Hypothesis 5 could not be examined with the data from Arkansas Post. It was expected that the site would present evidence of patterning related to the structure of activities prior to site destruction. This hypothesis could not be examined because information on provenience was not presented in the report.

Both hypotheses 6 and 7 were supported by the data from Arkansas Post. Hypothesis 6 concerned the importance of durable goods in the collection, and predicted that durable goods would represent a significant part of the assemblage. Due to problems in addressing this

hypothesis with the data from the commanding officer's quarters, a new approach was developed and applied. This approach compared the number of durable goods to the number of ceramic sherds. This approach is applicable to any site situation, and a comparison of the ratios from the commanding officer's quarters and the Arkansas Post bank showed a great amount of similarity.

Hypothesis 7 is the final hypothesis making up the model of in situ-de facto site formation. It concerns the importance of the architectural assemblage in the overall site collection. A subjective comparison of the commanding officer's quarters and Arkansas Post indicated that there were differences between the collections. These differences were related to the types and numbers of architectural artifacts present at each site, with the collection from Arkansas Post being relatively lacking in diversity and numbers when compared to the commanding officer's quarters.

As was suggested for Hypotheses 2 and 3, the lack of many classes of architectural artifacts, and the low numbers of classes that were present, may be related to different uses of the sites. Specifically important here may be the fact that the bank had been abandoned for years prior to its Civil War use. Salvage of architectural artifacts such as door locks and hinges may have taken place during these years, leaving this site architecturally poor.

Despite this finding, a slightly different approach to examining Hypothesis 7 was developed. This approach was based on quantitative comparison, which was desired because of its utility in the numerous inter-site comparisons that will be desired in subsequent chapters. These quantitative measures compared the number of classes of

architectural artifacts present, and the numerical importance of window glass and nails in the overall site collections. These measures showed a great amount of similarity between the commanding officer's quarters and the Arkansas Post bank; both had a high number of classes of architectural artifacts and the combined count of window glass and nails represented a sizable percentage of the site collections at each.

CHAPTER 5

EXPLORING PRIMARY REFUSE CONTEXTS

The same seven hypotheses that were examined in chapters 3 and 4 have been used to create a model for site formation through primary refuse disposal. These hypotheses have been specifically modified to reflect the hypothesized differences between primary refuse contexts and other site formation contexts. If these seven hypotheses are sensitive indicators of site formation, then they should match the observed patterns from primary refuse contexts, and they should be capable of separating primary refuse contexts from in situ-de facto contexts and other formation contexts.

Six sites with primary refuse contexts are considered in the following discussions. These are the Fort Towson East Barracks, the Fort Washita North Parade Ground Structure, the Fort Washita Hospital, the Posey site, the Pate-Roden site, and the Jotham Meeker farmstead. The functions of the Fort Towson and Fort Washita sites and the Meeker farmstead are self-explanatory. The Posey site was interpreted as a Choctaw homestead and the Pate-Roden site as a trading post and dwelling. Excavations at the Fort Towson and Fort Washita sites were restricted to the interior of buildings and the area immediately surrounding the buildings. At the Posey site, the Pate-Roden site, and the Meeker farmstead, excavations included a large area of the surrounding toft areas.

EXAMINING THE MODEL

The model of primary refuse disposal considers the same variables used to model in situ-de facto site formation. The pattern for primary refuse disposal is, however, expected to vary and this is reflected in the model of this process. In the following discussion, then, the pattern from the six sites with primary refuse contexts will be compared not only to the hypotheses for primary refuse disposal but also to the patterns described in chapters 3 and 4 for sites within in situ-de facto contexts.

Hypothesis 1

Hypothesis 1 concerns the presence and importance of burned artifacts in the site collections. This hypothesis differs significantly from the same hypothesis for in situ-de facto formation. While burned artifacts were expected to be extremely common for the in situ-de facto contexts examined in this research (which were related to site destruction by fire), they are expected to be exceedingly rare or absent altogether from primary refuse contexts. The following discussion presents a review of evidence for burning among the six sites with primary refuse contexts.

A total of 3,744 artifacts were found in primary refuse contexts at the Jotham Meeker Farmstead. Only two of these artifacts showed evidence of burning or other heat alteration. One of these was a piece of puddled lead, which probably resulted from bullet manufacture. The only definitely burned artifact was a sherd of transfer printed ceramics included in a total ceramic collection of 761 sherds (Lees 1986).

Evidence of burned artifacts was also found at the Fort Washita North Parade Ground Structure. This evidence consisted of three

intensely burned ironstone sherds and two globs of melted colorless glass (Lewis 1975). Substantially more evidence for burning of artifacts is found in the collections from the Fort Washita Hospital. Included in this collection are two sherds of burned ironstone ceramics, four burned sherds of ceramic shaving cream containers, 336 fragments of melted glass ranging in color from dark green to colorless, and 46 pieces of melted lead. The melted lead was attributed to the manufacture of bullets, but the other burned artifacts, in particular the glass, is attributed to the burning of the building after it had been abandoned (Penman 1975).

None of the reports on the primary refuse contexts at the Pate-Roden site, the Posey site, or the Fort Towson East Barracks indicate that any burned artifacts were recovered from these contexts (Rohrbaugh et al. 1971, Wyckoff and Barr 1968, Lewis 1972). It is possible that occasional burned ceramic sherds of melted glass were not noted in these reports, but if so these artifacts certainly would represent only a minor percentage of the overall total for the collections.

In general, except for the Fort Washita Hospital, the collections from primary refuse contexts contained extremely little evidence for the burning of artifacts. Although the number of burned artifacts from the Fort Washita Hospital is more than noted for other primary refuse contexts, it nevertheless represents a very low percentage of the total number of artifacts found there. To put these burned artifacts from the Fort Washita Hospital in perspective, the six burned ceramic sherds must be contrasted against the 397 sherds in the collection, and the 336 pieces of melted glass should be compared to the 3,959 sherds of window glass and the 3,664 sherds of bottle glass found at the site.

A review of the information from the six sites with primary refuse contexts therefore provides a very great amount of support for Hypothesis 1. Although burned artifacts can be expected within these contexts, these artifacts should represent a very insignificant percentage of the total site collections especially as contrasted to in situ-de facto site contexts such as are represented by the Fort Towson Commanding Officer's Quarters and the Arkansas Post bank.

Hypothesis 2

This hypothesis concerns the diversity of artifacts present within the primary refuse collection. It is expected that primary refuse contexts will be characterized by a limited range of artifact classes, especially when compared to in situ-de facto contexts. The limited range of classes is expected because different classes of artifacts would have entered the primary refuse context more commonly than others. Certain types of artifacts, especially larger, durable goods, are therefore expected to be underrepresented or entirely absent in these contexts.

It should be noted here that this hypothesis was found to be of questionable utility after a consideration of in situ-de facto contexts (See Chapter 4). Based on the analysis of this context, distinct differences between the commanding officer's quarters and the Arkansas Post bank were noted, calling into question the general validity of this hypothesis as reflective of site formation processes.

In order to examine Hypothesis 2, the artifacts from the six sites with primary refuse contexts have been summarized in tables 20, 21, 22, 23, 24, and 25. These tables list the artifacts by classes within the five functional artifact groups originally presented in Chapter 3.

Table 20

Artifacts from primary refuse contexts, Fort Towson East Barracks

<u>Artifact class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Window glass (D)*	998
Machine cut nails (D)	1626 (977 fragments)
Iron spike (D)	1
Hinges (D)	3
Bolts/nuts/washers (D)	5
Flashing D)	2
<u>Kitchen Group</u>	
Ceramics	275
Bottle glass	1043
Tin cans	24
Iron kettle fragments (D)	57
Iron stove fragments (D)	2
Table fork (D)	1
Kettle bail ear (D)	1
Candle holder finger loop (D)	1
<u>Non-Kitchen Tool Group</u>	
Pistol barrel (D)	1
Musket ball	1
Gun flint	1
Iron auger (D)	1
Iron chisel (D)	1
Iron file (D)	1
Harness buckles (D)	2
Harness rings (D)	3
Bit ring (D)	1
Singletree reinforcing band (D)	1
<u>Personal and Clothing Group</u>	
Tobacco pipes (D)	7
Buttons (D)	16
Bursting bomb plume socket (D)	2
U.S. Quarter-dollar (D)	1
Suspender hook (D)	1
Vest strap buckle (D)	1

Table 20 (Cont'd)

Furniture Group

Iron clothing hook (D)	1
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* (D) denotes durable goods

Table 21

Artifacts from primary refuse contexts,
Fort Washita North Parade Ground Structure

<u>Artifact class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Common cut nails (D)	337
Wood screw (D)	1
Window glass (D)	482
Staples (D)	3
<u>Kitchen Group</u>	
Ceramics	49
Bottle glass	151
Tin cans	53
Glass tablewares (D)	4
<u>Non-Kitchen Tool Group</u>	
Iron arrow point	1
Trigger (D)	1
Gun flint	1
Lead bullets	4
Lead shot	4
Percussion caps	2
Awl (D)	1
Harness buckle (D)	1
Spur (D)	1
Mule shoe (D)	1
Whiffletree plate (D)	1
Carriage bolt (D)	1
Stove parts (D)	2

Table 21 (Cont'd)

Personal and Clothing Group

Tobacco pipes (D)	5
Porcelain doll parts (D)	1
Buttons (D)	58
Suspender buckle (D)	1
Lace eyelets (D)	2
U.S. Ten-cent piece (D)	1
Slate pencil (D)	1

Furniture Group

Brass tacks (D)	1
Lock parts (D)	6

* (D) denotes durable good

Table 22

Artifacts from primary refuse contexts, Fort Washita Hospital

<u>Artifact class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Common cut nails (D)	8378
Window glass (D)	3959
Bolts/nuts/washers (D)	14
Wood screws (D)	28
Staples (D)	4
Rim lock staple (D)	1
Rim lock part (D)	1
Butt hinges (D)	4
Gate latch (D)	1
<u>Kitchen Group</u>	
Ceramics	397
Bottle glass	3664
Butcher knives (D)	3
Table spoon (D)	1
Stove parts (D)	15

Table 22 (Cont'd)

Kettle parts (D)	36
Tin cans	853
Pot hook (D)	1

Non-Kitchen Tool Group

Trigger guards (D)	2
Lead bullets	18
Lead shot	31
Percussion caps	20
Artillery shell fragments	7
Cannister shot	57
Iron arrow points	2
Gimlet (D)	1
Chain links (D)	3
Padlock (D)	1
File (D)	1
Balance hook (D)	1
Harness buckles (D)	7
Harness bell (D)	1
Halter square (D)	1
Neck yolk attachment (D)	1
Horse shoes (D)	4
Wagon hub parts (D)	3
Singletree parts (D)	3
Slate pencil (D)	1

Personal and Clothing Group

Tobacco pipes (D)	6
Flask top (D)	1
Buttons (D)	33
Garment hooks (D)	2
Suspender parts (D)	2
Military Insignia (D)	1
Finger rings (D)	2
Marbles (D)	2

Furniture Group

Key (D)	1
Clock key (D)	1
Brass tacks (D)	26

* (D) denotes durable good

Table 23

Artifacts from primary refuse contexts, Posey site

<u>Artifact class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Common cut nails (D)	702
Window glass (D)	Included with bottle glass
Staples (D)	3
Wood screws (D)	8
Butt hinge (D)	3
Strap hinge/pintle (D)	2
<u>Kitchen Group</u>	
Ceramics	4412
Glass tablewares (D)	25
Glass bottles	2442 (incl. window glass)
Coffee mill handle (D)	1
Table forks (D)	3
Table knives (D)	2
Table spoons (D)	3
Kettle bails (D)	1
Kettle bail ears (D)	1
<u>Non-Kitchen Tool Group</u>	
Firearms parts (D)	38
Bullet molding debris	10
Percussion caps	5
Gunflints	66
Lead bullets	54
Strike-a-lights (D)	1
Stove parts (D)	8
Scissors (D)	2
Padlock keyhole cover (D)	1
Awl (D)	1
Chain fragments (D)	6
Chisels (D)	2
Files (D)	6
Drills (D)	1
Hammers (D)	1
Hoes (D)	2
Wedge (D)	2

Table 23 (Cont'd).

Horseshoes (D)	5
Horseshoe nails (D)	5
Harness buckles (D)	7
Harness rings (D)	2
Bridle bits (D)	3
Spurs (D)	2
Linch pins (D)	1
Singletree part (D)	2
Tongue washer (D)	1

Personal and Clothing Group

Tobacco pipes (D)	253
Coins (D)	5
Ear ring (D)	1
Finger ring (D)	1
Marbles (D)	6
Trade beads (D)	38
Buttons (D)	79
Suspender strap (D)	1
Clasp knives (D)	5
Combs (D)	1
Jew's harp (D)	2
Hunting knife (D)	2
Thimbles (D)	2
Ceramic shaving cream jar fragments (D)	6

Furniture Group

Key (D)	1
Brass tacks (D)	14

* (D) denotes durable good

Table 24

Artifacts from primary refuse contexts, Pate-Roden site

<u>Artifact class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Common cut nails (D)	260
Spikes (D)	2
Wood screws (D)	2
Window glass (D)	526
Lock staples (D)	2
Cabin hook (D)	1
Key (D)	1
<u>Kitchen Group</u>	
Ceramics	1316
Bottle glass	106
Tin can fragments	129
Kettle fragments (D)	1
Kettle bail ears (D)	3
Kettle bail (D)	1
Table service handles (D)	2
Serving spoon (D)	1
Table spoons (D)	2
<u>Non-Kitchen Tool Group</u>	
Scissors (D)	1
Hammer (D)	1
File (D)	2
Chain link (D)	1
Gun parts (D)	4
Stove parts (D)	1
Harness buckles (D)	3
Bridle bit (D)	1
<u>Personal and Clothing Group</u>	
Tobacco pipes (D)	13
Trade beads (D)	3
Marble (D)	1
Jew's harp (D)	1
<u>Furniture Group</u>	
Brass tacks (D)	2

Table 25

Artifacts from primary refuse contexts, Jotham Meeker farmstead

<u>Artifact class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Machine cut nails (D)	1113 (346 fragments)
Window glass (D)	1466
Wood screws (D)	2
Bolt (D)	1
Shutter bolt (D)	1
Key (D)	1
Staple (D)	1
Lock staple (D)	1
<u>Kitchen Group</u>	
Ceramics	761
Bottle glass	328
Table service handle (D)	1
Pot hook (D)	2
Tinware handle (D)	1
Coffee mill part (D)	1
Cast iron cookware fragments (D)	4
<u>Non-Kitchen Tool Group</u>	
Gun flint	1
Metal cartridge	1
Lead bullets	2
Bullet casting debris	4
Lamp chimney glass (D)	7
Stove parts (D)	1
Straight pin (D)	1
Printer's type (D)	16
Slate/graphite pencils (D)	3
<u>Personal and Clothing Group</u>	
Carpet bag (D)	1
Tobacco pipes (D)	4
Buttons (D)	7
Glass beads (D)	3
Grommets (D)	2
Eye and hook fasteners (D)	2
Suspender buckle (D)	1
Tinkling cones (D)	2

Table 25 (Cont'd)

Perforated token (D)	1
Mirror (D)	1

Furniture Group

No specimens

* (D) denotes durable good

Based on these six tables, the number of artifact classes per artifact group and the total number of artifact classes per site can be calculated, and is summarized in Table 26. From Table 26, it can be seen that the total number of artifact classes per site ranges from a low of 26 at the Pate-Roden site to a high of 53 at the Posey site. At the two in situ-de facto contexts examined earlier in Chapters 3 and 4, the Fort Towson Commanding Officer's Quarters and the Arkansas Post bank, the total number of artifact classes present was 69 and 39, respectively. While the range for in situ-de facto refuse is higher than that for primary refuse, as predicted, these ranges overlap significantly. Simply on the basis of the number of classes present, then, it is impossible to differentiate between these two formation contexts.

Taking a closer look at the classes of artifacts present at the in situ-de facto and primary refuse contexts, it is apparent that while there is no discrete difference in the total number of classes present, there is a difference in the distribution of classes within the five functional artifact groups. At both the Fort Towson Commanding Officer's Quarters and the Arkansas Post bank, the Architecture Group

Table 26

Summary of artifact classes for primary refuse contexts
(percentages are indicated in parentheses)

<u>Artifact Group</u>	<u>Ft. Towson E. Barrack</u>	<u>Ft. Washita N.P.G.S.</u>	<u>Ft. Washita Hospital</u>
Architecture	6 (20.0%)	4 (13.7%)	8 (18.1%)
Kitchen	7 (23.3%)	4 (13.7%)	8 (18.1%)
Tools	10 (33.3%)	13 (44.8%)	18 (40.9%)
Personal	6 (20.0%)	6 (20.6%)	8 (18.1%)
Furniture	1 (3.3%)	2 (6.8%)	2 (4.5%)
TOTAL	30	29	44

<u>Artifact Group</u>	<u>Posey</u>	<u>Pate-Roden</u>	<u>Meeker Farm</u>
Architecture	5 (9.4%)	7 (26.9%)	8 (24.2%)
Kitchen	8 (15.0%)	6 (23.0%)	7 (21.2%)
Tools	24 (45.2%)	8 (30.7%)	8 (24.2%)
Personal	14 (26.4%)	4 (15.3%)	10 (30.3%)
Furniture	2 (3.7%)	1 (3.8%)	0 (0.0%)
TOTAL	53	26	33

has the largest number of artifact classes and the number of classes within the Furniture Group equals or exceeds the number of classes in the Personal and Clothing Group (Table 27).

Table 27

Summary of artifact classes for in situ-de facto contexts
(percentages are indicated in parentheses)

<u>Artifact Group</u>	<u>Fort Towson C.O. Quarters</u>	<u>Arkansas Post Bank</u>
Architecture	18 (26.0%)	14 (35.8%)
Kitchen	15 (21.7%)	7 (17.9%)
Tools	14 (20.2%)	8 (20.5%)
Personal	10 (14.4%)	5 (12.8%)
Furniture	12 (17.3%)	5 (12.8%)
TOTAL	69 (99.6%)	39 (99.8%)

At the primary refuse contexts, however, a distinctly different pattern is observed. Here, while the Architecture Group is important, it is second to the Non-Kitchen Tool Group, and the Furniture Group is relatively insignificant. This pattern reflects the differential deposition of artifacts in primary refuse contexts as expected, but, at least in terms of the diversity of classes entering the primary refuse contexts, it is the architectural and furniture artifacts that are being excluded.

Based on this examination of primary refuse contexts at Fort Towson, Fort Washita, the Pate-Roden site, the Posey site, and the

Jotham Meeker farmstead, there does appear to be a trend towards lesser artifact diversity at primary refuse contexts when compared to in situ-de facto contexts. This trend is not sufficiently pronounced, however, to separate these two site formation processes from one another.

Relatively discrete differences in diversity do appear to exist between these two site formation processes, however, in the distribution of classes within the five artifact groups. At in situ-de facto contexts, the greatest class diversity is noted in the Architecture Group, and the diversity in the Furniture Group is noted to be equal or greater than that in the Personal and Clothing Group. In the primary refuse contexts, however, the greatest diversity is noted in the Non-Kitchen Tool Group. In primary contexts, the Architecture Group, Kitchen Group, and the Personal and Clothing Group are observed to be roughly equal in terms of diversity of artifact classes, but the number of classes present in the Furniture Group is substantially and consistently below all other groups.

Consideration of this hypothesis therefore rejects a simplistic consideration of artifact diversity as a means of separating site formation processes. A much more complex approach based on diversity within artifact groups is proposed in its place. Although Hypothesis 2 was preliminarily rejected after a comparison of the Fort Towson Commanding Officer's Quarters and the Arkansas Post bank, this analysis suggests that a slightly different measure of diversity may allow the retention of this hypothesis as a useful predictor for modeling site formation.

Hypothesis 3

Hypothesis 3 is concerned with type diversity within artifact classes. Specifically, this hypothesis predicts that in primary refuse contexts there should be a great amount of diversity of artifact types within classes that are present in the collections. Evidence for the presence of sets of artifacts should be notably absent. The amount of type diversity expected is related to the type of formation which characterizes primary refuse deposits; namely, deposition of part of an assemblage over the entire period of a site's occupation. Diversity should therefore increase as the length of occupation increases, but should be relatively similar for the sites examined due to probably similar lengths of occupation.

In the previous chapter, after a comparison of the commanding officer's quarters and the Arkansas Post bank, this hypothesis was tentatively rejected. While type diversity was rare at the commanding officer's quarters, it was common at the Arkansas Post bank. The difference between these sites indicated that type diversity was related to cultural factors other than site formation, and that type diversity was probably not a valid measure of site formation.

In order to examine this hypothesis for primary refuse contexts, each of the collections is reviewed for evidence for the presence or absence of type diversity. Except for classes such as nails, window glass, bottle glass, and ceramics, however, the number of specimens within the individual artifact classes from these sites is generally not high. Most of these high frequency classes, such as nails and bottle glass, are of little utility in evaluating this hypothesis. Occurring with less frequency, but still in consistently large enough numbers with

which to examine questions of diversity, are artifact classes such as tobacco pipes, buttons, and beads. These classes are as a rule diverse; many types of buttons, for example, will be found in a wardrobe or even in a single suit of clothing or uniform.

Due to the generally low frequency of artifacts within most of the various classes present in primary refuse contexts, and due to the nature of the artifacts which do occur in frequency, there is little data with which to examine this hypothesis. Ceramics present the only class of artifacts which both occur with sufficient frequency and which are sensitive indicators of class diversity. The following discussion of class diversity will therefore focus exclusively on the ceramic evidence from five of the six sites with primary refuse contexts. One site, the Pate-Roden site, cannot be used in this analysis because the descriptions of the collections from the primary and secondary refuse contexts at this site cannot be segregated based on the report.

Fort Towson East Barracks

The ceramics from the site are summarized in Table 28. There are seven major types represented in the collection. While six types does not represent great type diversity, there is evidence for much diversity in the varieties present within the various types. Among the transfer printed wares, there are at least six varieties among the 40 sherds in the collection, and the 11 sherds of hand-painted ceramics include at least three distinct varieties. This diversity within ceramic types indicates that the collection from the Fort Towson East Barracks is characterized by considerable type diversity.

Table 28

Distribution of earthenwares at the Fort Towson East Barracks

<u>Type</u>	<u>Number</u>	<u>Percent</u>
Transfer printed wares	40	16.0%
Hand-painted wares	11	4.4%
Edged wares	5	2.0%
Sponge decorated wares	14	5.6%
Tortoise shell ware	1	.4%
Annular ware	33	13.2%
Undecorated white ware	146	58.4%
TOTAL	250	100.0%

Fort Washita North Parade Ground Structure

At the Fort Washita North Parade Ground Structure only 45 earthenware sherds were found (Table 29). Within this number, six different types are represented, with many varieties within these types. The six sherds of transfer printed wares, for example, are characterized by four varieties. Overall, this small collection of ceramics demonstrates a great amount of diversity within classes.

Fort Washita Hospital

The 363 earthenware ceramics from this site present good information with which to examine type diversity (Table 30). These sherds are divided among eight different types, with 277 being undecorated white wares.

Within these eight types, further diversity can be noted. Among the 29 sherds of transfer printed ceramics, five different varieties were documented. Among the five sherds of hand painted wares, two varieties were present. Overall, then, the ceramic evidence does

Table 29

Distribution of earthenwares, Fort Washita North Parade Ground Structure

<u>Type</u>	<u>Number</u>	<u>Percent</u>
Transfer printed wares	6	13.3%
Hand painted wares	6	13.3%
Sponge decorated wares	1	2.2%
Annular ware	5	11.1%
Undecorated white ware	26	57.7%
Porcelain	1	2.2%
TOTAL	45	99.8%

Table 30

Distribution of earthenwares, Fort Washita Hospital

<u>Type</u>	<u>Number</u>	<u>Percent</u>
Transfer printed wares	29	7.9%
Edge decorated wares	3	.8%
Hand painted wares	5	1.3%
Sponge decorated wares	4	1.1%
Annular wares	19	5.2%
Blue glazed ware	18	4.9%
Undecorated white wares	277	76.3%
Porcelain	8	2.2%
TOTAL	363	99.7%

indicate that there was a diversity of types within this class of artifacts.

The Posey Site

The ceramics from this site were unfortunately reported using non-standard terminology. Using descriptions and photographs in the report, it was possible to identify five different ceramic types, which accounted for 4,299 sherds (Table 31). It is possible that other types are represented in the collection which could not be identified from the descriptions.

Table 31

Distribution of earthenwares, Posey site

<u>Type</u>	<u>Number</u>	<u>Percent</u>
Transfer printed	1200	27.9%
Edged wares	156	3.6%
Hand-painted wares	375	8.7%
Annular wares	201	4.6%
Undecorated whitewares	2367	55.0%
TOTAL	4299	99.8%

Five types of ceramics from one site is the lowest number for any of the sites so far examined. Within these five types, however, there appears to be an amount of diversity, but once again this was difficult to assess because of the poor descriptions present in the report. It was possible to determine that there were at least seven distinct varieties of transfer printed wares, three varieties of edge decorated wares, six varieties of hand-painted wares, and four varieties of

annular wares. This indicates that despite the low number of types present, the collections are characterized by diversity.

The Jotham Meeker Farmstead

A total of 761 sherds are present in the collection from the Meeker farmstead, including 708 earthenwares. An examination of these earthenwares, summarized in Table 32, shows that a total of seven types are present at the site. The ceramic collection is, however, much more diverse than this would suggest. For example, among the transfer printed wares, which accounts for over 33 percent of all the sherds, there are as many as seven different varieties based on color alone. Among the edge decorated sherds, which number only 40, at least eight varieties are present. The hand-painted/sponge decorated category, with 50 sherds, is actually made up of four types with one of these types having four varieties.

Table 32

Distribution of earthenwares, Jotham Meeker Farmstead

<u>Type</u>	<u>Number</u>	<u>Percentage</u>
Transfer printed wares	238	33.6%
Edged wares	40	5.6%
Hand-painted/sponge decorated	50	7.0%
Annular wares	16	2.2%
Cream-bodied wares	25	3.5%
Mold-decorated whitewares	13	1.8%
Undecorated whitewares	326	46.0%
TOTAL	708	99.7%

Discussion

This review of the ceramic evidence from five of the sites with primary refuse contexts shows a great amount of diversity within classes and within types. The number of types present at these sites ranges from five at the Posey site to eight at the Fort Washita Hospital. These figures compared closely, however, to the seven types present within the Fort Towson Commanding Officer's Quarters collection and the eight types found at Arkansas Post.

Looking at the importance of different ceramic types at these sites, it can be seen that undecorated whitewares were consistently the most common types at all five primary refuse contexts and at the two in situ-de facto contexts. The Fort Towson East Barracks, the Fort Washita North Parade Ground Structure, the Posey site, the Jotham Meeker Farmstead and the in situ-de facto Arkansas Post bank also had large numbers of other ware types such as transfer-printed wares, hand-painted wares, and annular wares. The Fort Washita Hospital and the in situ-de facto Fort Towson Commanding Officer's Quarters collection focused almost exclusively on undecorated whitewares, however, with the whitewares from each accounting for more than 75 percent of the ceramic collections.

Although this consideration of Hypothesis 3 has shown the ceramic collection from primary refuse contexts to be diverse, it has also shown that they cannot be separated on this basis from sites of in situ-de facto formation. As was found in Chapter 4, this evaluation of Hypothesis 3 has shown that it has little validity for the prediction of site formation.

Hypothesis 4

The fourth hypothesis is concerned with the size and condition (whether whole or not) of artifacts in the collection. It is expected that the artifacts from primary refuse contexts will generally be much smaller than those from in situ-de facto and secondary refuse contexts. This is because in this refuse context, it is the smaller artifacts that are deposited with the larger artifacts being more commonly removed to a secondary refuse deposit. It is also expected that whole artifacts will be rare in primary refuse contexts.

Following procedures established in Chapters 3 and 4, the sizes of artifacts from the primary refuse contexts have been tabulated according to four size categories, and have been presented in Table 33. Except for the Meeker farmstead collection, for which comprehensive site information was available, information on artifact size was inconsistently and incompletely reported. One of the six primary refuse contexts, the Pate-Roden site, could not be included in this table because the report on this site does not present separate descriptions of artifacts from the primary and secondary refuse contexts at this site.

A review of the site data presented in Table 33 shows that artifacts larger than 10 cm are not common at any of the sites. Artifacts larger than 10 cm range in importance from 1.3 percent of the tabulated artifacts at the Posey site to 8.0 percent of the artifacts at the Jotham Meeker Farmstead. These figures are consistently and substantially below comparable figures of 24 and 36 percent for the commanding officer's quarters and the Arkansas Post bank, respectively. It is clear from this comparison that not only is the percentage of

Table 33

Summary of artifact sizes, excluding nails, ceramic sherds,
and fragments of bottle glass, primary refuse contexts

<u>Size range</u>	Meeker Farmstead		Fort Washita N.P.G.S.	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
0 to 10 cm	80	91.5%	92	95.8%
10 to 20 cm	7	8.0%	4	4.1%
20 to 30 cm	-	-	-	-
30 cm plus	-	-	-	-
TOTAL	87	99.5%	96	99.9%

<u>Size range</u>	Fort Washita Hospital		Posey site	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
0 to 10 cm	260	96.6%	649	98.6%
10 to 20 cm	9	3.4%	8	1.2%
20 to 30 cm	-	-	1	.1%
30 cm plus	-	-	-	-
TOTAL	269	100.0%	658	99.9%

<u>Size range</u>	Fort Towson East Barracks			
	<u>Number</u>	<u>Percent</u>		
0 to 10 cm	72	92.3%		
10 to 20 cm	5	6.4%		
20 to 30 cm	1	1.2%		
30 cm plus	-	-		
TOTAL	78	99.9%		

large artifacts low at the primary refuse contexts, it is significantly different from those from in situ-de facto contexts.

The next measure of importance for Hypothesis 4 concerns the importance of whole artifacts in the collection. In general, the condition of artifacts was more difficult to determine from reports than was their size, and fewer artifacts are available for an analysis of condition than for size. The number of artifacts for which condition could be determined, the number of these that are whole, and the percentage represented by the number of whole artifacts is summarized for each of five sites in Table 34. As was the case earlier, this table does not consider nails, ceramics, or bottle glass.

This table shows a surprisingly high level of importance of whole artifacts in the collections from these five sites. It can further be noted that at three of the five the smaller the artifact the more likely it is to be complete. In contrast to this, at the commanding officer's quarters and the Arkansas Post bank, the importance of whole artifacts increased as the size of the artifact increased.

It is next useful to look at the overall importance of whole artifacts in the collections from primary refuse contexts. In the five sites examined here, whole artifacts accounted for 41.7 percent of collections at the Posey site, 44.8 percent at the Meeker Farmstead, 50.0 percent at the Fort Towson East Barracks, 61.9 percent at the Fort Washita Hospital, and 74.6 percent at the Fort Washita North Parade Ground Structure. This range of 41.7 to 74.6 percent brackets comparable figures for in site-de facto contexts. At the Arkansas Post bank, whole artifacts accounted for 52 percent of the collection, and at the Fort Towson commanding officer's quarters whole artifacts accounted

Table 34

Total versus whole artifacts by size category, excluding nails,
ceramics, and bottle glass, sites with primary refuse contexts

<u>Size range</u>	<u>Total</u>	<u>No. whole</u>	<u>Percent of total</u>
<u>Jotham Meeker Farmstead</u>			
0 to 10 cm	80	37	46.2%
10 to 20 cm	7	2	28.5%
20 to 30 cm	-	-	-
30 cm plus	-	-	-
<u>Fort Washita North Parade Ground Structure</u>			
0 to 10 cm	75	57	76.0%
10 to 20 cm	4	2	50.0%
20 to 30 cm	-	-	-
30 cm plus	-	-	-
<u>Fort Washita Hospital</u>			
0 to 10 cm	180	112	62.2%
10 to 20 cm	9	5	55.5%
20 to 30 cm	-	-	-
30 cm plus	-	-	-
<u>Posey Site</u>			
0 to 10 cm	649	270	41.6%
10 to 20 cm	8	4	50.0%
20 to 30 cm	1	1	100.0%
30 cm plus	-	-	-
<u>Fort Towson East Barracks</u>			
0 to 10 cm	72	34	47.2
10 to 20 cm	5	4	80.0%
20 to 30 cm	1	1	100.0%
30 cm plus	-	-	-

for 73 percent of the artifacts.

Based on this consideration of size and condition, two conclusions can be reached. First, considering size, it is apparent that the general size of artifacts at primary refuse contexts is substantially less than that at in situ-de facto contexts. Based on a comparison of the importance of artifacts larger than 10 cm, sites from these two formation contexts can easily be separated from one another.

Considering the importance of whole artifacts in the collection, however, the information from primary refuse contexts shows little difference from in situ-de facto contexts and in fact shows a surprisingly high percentage of whole artifacts within primary contexts. This is caused by the large number of whole, small artifacts such as buttons and gun flints at primary refuse contexts.

Although the general importance of whole artifacts was greater at primary refuse contexts than expected, and although the importance is roughly equal to that observed for in situ-de facto contexts, in several cases the percentage of whole artifacts was increasingly important as the artifact size category decreased. This is opposite the trend observed for the in situ-de facto contexts and may represent an important variable to consider in attempting to distinguish these types of sites.

In general, a consideration of this hypothesis provides only partial support for it. This support concerns the general size of artifacts; this analysis shows they are indeed small at primary refuse contexts. No support is found for the part of the hypothesis which considers the condition of the artifacts; whole artifacts were surprisingly important at the primary refuse contexts and were in fact

of roughly equal importance as they are at in situ-de facto contexts.

Hypothesis 5

Hypothesis 5 concerns the spatial distribution of artifacts within the site. Since artifacts in primary refuse contexts are deposited at or very near the locations of their use, the distribution of artifacts in these contexts should be patterned to reflect the distribution of patterns of activities at the site. Thus, for primary refuse contexts, the distribution of artifacts is expected to be non-random and is expected to reflect activity patterning at the site. Although for different reasons, this hypothesis is essentially the same as that for in situ-de facto site contexts. At the Fort Towson Commanding Officer's Quarters, distinct patterning in artifacts was documented and was related to the patterning of activities and the structure of the building.

In order to examine this hypothesis, the reports for the six sites with primary refuse contexts will be examined for discussions of the spatial patterning of artifacts. The degree and sophistication of distributional analyses in these reports varies considerably.

Fort Towson East Barracks

Excavations at the Fort Towson East Barracks were restricted to the interior of the structure and the area immediately surrounding it. Lewis (1972) noted that disturbances in the interior of the structure restricted his ability to consider spatial questions. Some concentrations of materials did apparently remain in situ and were given functional interpretations by Lewis:

as noted, a concentration of bone seems to be associated with the south hearth and metal pot fragments occur in small quantity around the north hearth, suggesting a particular function for each of these features in the original building. Other artifacts of the period of the fort's occupation seem to occur in greater numbers at these locations as well and decrease in the areas between the hearths and at the building's north end [Lewis 1972: 87].

In addition to the noted patterning near the hearths, Lewis also noted "a cache of discarded bones and trash" along one of the outside walls, and which he interpreted as evidence of the location of a door to the outside (Lewis 1972: 87).

Although apparently hampered by post-occupation disturbances, Lewis was able to identify spatial patterning in artifacts at this site. He was further able to interpret these spatial patterns as being a reflection of the patterning of activities which characterized this structure during its occupation.

Jotham Meeker Farmstead

The area investigated at the Jotham Meeker Farmstead was associated with the documented locations of the dwelling and an adjacent printing office. Architectural evidence for the dwelling was discovered during the 1985 excavations, but none was discovered that could be associated with the printing office. A focus of my report on this site was to determine if there was archeological evidence, based on the distribution of artifacts, for the presence of the printing office within the area investigated.

As a result of the spatial analysis of the artifacts from this site, I examined the distribution of high frequency architectural artifacts--nails and window glass--to see if the two areas differed enough to have been the location of two buildings or whether the

materials in both areas could be explained by the presence of a single structure. Analysis of the artifacts in these two areas supported an interpretation of the excavated areas as having been the location of two buildings (Lees 1986: 119-124).

Further spatial analysis was directed at investigating functional differences between these two areas. Using the full range of non-architectural artifacts, I documented patterns in the distribution of artifacts that were interpreted to be related to functional differences in the site. These functional interpretations mirrored the hypothesis provided by documentation that the excavated area contained both the site of Meeker's dwelling and the site of his printing office (Lees 1986: 124-131).

The Posey Site

Four different areas were investigated at the Posey site, but most effort was expended on the two most productive of these. These two areas, Feature Area 3 and Grid A, also received the most attention when it came to distributional analyses, which were conducted to examine the functions of the different areas. By examining the classes of artifacts found in each of these two areas, and by comparing the importance of different classes in the different areas, Wyckoff and Barr were able to determine that there were indeed differences in the distribution of artifacts on the site, and that these spatial patterns could be related to functional differences. In considering Feature Area 3, Wyckoff and Barr concluded:

it is of some interest to point out that all construction accessories which might be associated with a house [were] found in the Feature Area 3 vicinity. Of the other artifact categories, 50% of the container (glass and stoneware sherds, 70% of the porcelain [i.e., earthenware] sherds, and 87% of

the personal possessions were recovered from this area. These artifact associations would tend to infer usage of this structure as a residence [Wyckoff and Barr 1968: 77].

In Grid A, a rock feature tentatively identified as a forge was found, along with artifactual evidence for sustained activities:

distributional analyses of the artifacts revealed that all of the tools (awls, chisels, files, hammers, hoes, wedges, etc.), 56% of the harness and wagon equipment, and 95% of the metal scrap were recovered in the Grid A area. The association of metal working tools, blacksmith and wagon items, and metal scrap along with a possible forge would logically infer metal working as a prime activity in this area [Wyckoff and Barr 1968: 78].

Analysis of the distribution of artifacts at the Posey site therefore clearly identified spatial patterning, which was interpreted to be directly related to the patterning of activities characteristic of this site during its early nineteenth century occupation.

The Pate-Roden Site

Investigation of the Pate-Roden site involved the excavation of isolated units across the site. These resulted in the discovery of a sample of artifacts and two pit features, interpreted as refuse pits. In the analysis of the discovered artifacts, several pages were spent in considering the distribution of the artifacts in an attempt to "determine activity areas within the site". While it is clear from the discussion of the distribution of artifacts that there was definite patterning in the occurrence of different types of artifacts across the site, no interpretive conclusions were offered to explain this patterning. While it is assumed that this patterning was related to the activities once conducted on this site, this cannot be determined from the report (Rohrbaugh et al. 1971: 137-140).

Fort Washita North Parade Ground Structure

Excavations at this site were focused within and in the immediate vicinity of features that were thought to represent a structure. Analysis of this site included consideration of the spatial distribution of artifacts in order to determine: 1) if patterning existed that could be related to an identification of this as the site of a structure, 2) to an identification of the type of structure present, and 3) to an identification of the function of the structure.

In examining whether a structure was present at this site, and the type of structure that may have been present, Lewis did an exhaustive analysis of the distribution of nails across the site. Based on patterns in the distribution of nails, in conjunction with discovered features, he was able to determine that a structure had indeed existed there and was able to present suggestions about its size and internal layout (Lewis 1975: 67-70).

Lewis also examined the distribution of non-architectural artifacts in order to determine if the historically suggested identification of this building was an accurate interpretation. This historical identification suggested this site first served as a barracks and later was divided into an adjutants office and schoolhouse. Based largely on the spatial patterning of artifacts that he associated with use as a schoolhouse, Lewis was able to provide tentative verification of the historical interpretation of this site (Lewis 1975: 73-74).

Fort Washita Hospital

Excavations at this site focused on the interior of the structure and on the area surrounding it. Very little consideration of the spatial patterning of artifacts was made in the analysis of this site.

What little was done considered the patterning of nails in an attempt to estimate the location of partitions within the building. Although only a minor part of the report, patterning in the distribution of nails was observed and was interpreted as being the result of patterns in the structure of the site during its use (Penman 1975: 191-192).

Discussion

Review of the reports for the six sites with primary refuse contexts shows that patterns in the distribution of artifacts existed at each. These patterns were interpreted as non-random patterns that were related to the patterning of activities and buildings that characterized the sites during the period when they were occupied. Although the extent and sophistication of analyses of spatial patterns varied in these report, taken together they provide strong confirmation for Hypothesis 5.

Hypothesis 6

Hypothesis 6 concerns the differential importance of durable and consumable/breakable goods in the collections from primary refuse contexts. Since primary refuse contexts generally develop over a long period of time, and since small fragments of consumable and breakable goods are more likely to enter these contexts than larger, durable goods, consumable and breakable goods are expected to be significantly more important here than in the other site formation contexts examined.

In order to evaluate this hypothesis in the diverse site formation contexts considered in this dissertation, a comparison based on the ratio between non-architectural, durable goods and ceramic sherds was proposed in Chapter 4. The durable goods from each of the primary

refuse contexts was indicated on Tables 20, 21, 22, 23, 24, and 25, which were presented in the discussion of Hypothesis 2 earlier in this chapter. These tables can be used to develop a tabulation of durable goods present at the six sites with primary refuse contexts, and which is summarized in Table 35. Also presented in this table is the number of ceramic sherds per site, and the ratio of durable goods to ceramic sherds developed by dividing the number of sherds by the number of durable goods.

Table 35

Ratio of durable goods (non-architectural) to
ceramic sherds, primary refuse contexts

<u>Site</u>	<u>Durable goods</u>	<u>Ceramic sherds</u>	<u>Ratio of durable goods to ceramic sherds</u>
Fort Towson E. Barracks	102	275	1 : 2.6
N.P.G.S.	89	49	1 : .5
Hospital	163	397	1 : 2.4
Posey	562	4412	1 : 7.8
Pate-Roden	44	1316	1 : 29.0
Meeker Farm	61	761	1 : 12.4

An examination of Table 35 shows that the ratios of durable goods to ceramic sherds for primary refuse contexts very evenly covers a very wide range from 1:.5 to 1:29. Within this range, there is certainly no clustering of ratios that might indicate a central tendency or that

might indicate certain sites as anomalous. Rather, this range indicates that diversity in this measure is characteristic of primary refuse contexts.

In looking at the range for these primary refuse contexts, it is interesting that the three with the lowest ratios (1:1.5 to 1:2.6) represent excavations conducted within or immediately around a building (Fort Towson East Barracks, Fort Washita North Parade Ground Structure, Fort Washita Hospital). In contrast, the three sites with the highest ratios (1:7.8 to 1:29) represent excavations that include a significant amount of toft or which are confined entirely to toft areas removed from structures (Posey site, Pate-Roden site, Jotham Meeker Farmstead). This may represent a behaviorally based difference since the building areas themselves, while still representing a primary refuse context, may have been kept clean of ceramic sherds while no similar effort may have been made in toft areas.

A comparison of the ratios of durable goods to ceramics for primary refuse contexts to the same ratio developed for the in situ-de facto contexts brings the predictions of Hypothesis 6 into question. The ratio for the Fort Towson Commanding Officer's Quarters is 1:14.3 and that for the Arkansas Post Bank is 1:13.0. These ratios fall very soundly at the center of the range documented for the six sites with primary refuse contexts and indicates that this measure does not separate these types of site formation contexts. Even if the primary refuse contexts with the lowest ratios are removed, based on a theorized difference between these and the other sites, the ratios for the Fort Towson Commanding Officer's Quarters and the Arkansas Post bank still fall within the remaining range.

Hypothesis 7

This hypothesis concerns the importance of the architectural assemblage in the collections from primary refuse contexts. Unlike in situ-de facto contexts, where a full range of architectural artifacts is expected, and secondary refuse deposits, where very few architectural artifacts of any type should be found, the primary refuse context is expected to have a high frequency of a limited range of architectural artifacts. Specifically, salvagable hardware such as hinges and locks are expected to be rare or non-existent, but artifacts that would less likely be salvaged, such as window glass and nails, are expected in quantity.

Archeologically, this hypothesis should be expressed as an architectural assemblage that is incomplete; that is, one that is composed of few classes of architectural artifacts. Except for classes represented by nails and window glass, artifacts should also occur in very low frequencies.

The number of classes of architectural artifacts present in the collections from the six sites with primary refuse contexts is presented earlier in this chapter in Tables 20, 21, 22, 23, 24, and 25. This information is summarized in Table 36. Based on this table, it can be seen that the number of classes of architectural artifacts at these sites ranges from 4 to 9, substantially lower than the 14 and 18 classes present at the Arkansas Post bank and the Fort Towson Commanding Officer's Quarters, respectively. Further, except for window glass and nails, the number of artifacts in these classes was, with one exception, less than 8 and typically included only one and two artifacts. The

single exception consists of 28 wood screws from the Fort Washita Hospital. From this information, it is apparent that the architectural collections from the six primary refuse contexts examined do not possess a complete set of architectural hardware, and that they do differ significantly from those from in situ-de facto contexts.

Table 36

Summary of architectural artifacts from sites
with primary refuse contexts

<u>Site</u>	<u>Number of Classes</u>	<u>Window Glass</u>	<u>Nails</u>	<u>% of all artifacts</u>
Fort Towson E. Barracks	6	998	1626	64.2%
N.P.G.S.	4	482	337	69.5%
Hospital	9	3959	8378	70.0%
Posey	6	?	702	-
Pate-Roden	7	526	260	22.1%
Meeker Farm	8	1466	1113	68.8%

The percentage of the entire site collection represented by the window glass and nails is also summarized in Table 36. These percentages range from 22.1 percent at the Pate-Roden site to 70.0 percent at the Fort Washita Hospital. The Pate-Roden site appears anomalous, however, because without it the range tightens up considerably to 64.2 percent to 70.0 percent. These figures very clearly indicate the importance of the nails and window glass in the

overall site collection.

The importance of nails and window glass at these primary refuse contexts can better be appreciated in comparison to a similar figure for the Fort Towson Commanding Officer's Quarters. At this site, formed by in situ-de facto processes, nails alone account for 78.6 percent of the artifacts. Given the nature of in situ-de facto formation, architectural artifacts such as nails and window glass should be more common, in a relative sense, at this site than at any other in the study collection. That the figures for the primary refuse contexts even approach the figure for the commanding officer's quarters indicates the importance of these artifacts in these contexts.

The information for the primary refuse contexts therefore supports Hypothesis 7. It has been shown that primary refuse contexts are characterized by a lack of diversity of artifact classes with few specimens per class. This indicates an incomplete architectural assemblage. At the same time, the importance of window glass and nails has been shown to be high in these contexts. This pattern of a generally incomplete architectural assemblage in conjunction with an important complement of nails and window glass differs significantly from that observed for in situ-de facto contexts, where there is a much more complete architectural assemblage as well as a very significant complement of window glass and nails.

Discussion

Four out of seven hypotheses have been supported, one has been partially supported, and two have been rejected following the analysis of the primary refuse contexts. Hypotheses 1, 5, and 7 had been supported after a consideration of the in situ-de facto contexts and

were also supported in this chapter's analysis of primary refuse contexts. These hypotheses were concerned with the importance of burned artifacts, the presence of activity patterns in the collections, and the importance of the architectural assemblage. Analysis of Hypothesis 3, which is concerned with the diversity of artifacts within types, likewise yielded results similar to those for the in situ-de facto contexts. These results were, however, negative and this hypothesis was therefore rejected for both the in situ-de facto and primary contexts.

Conclusions regarding hypotheses 2, 4, and 6 were changed following the analysis of the primary refuse contexts. Hypothesis 2, which considered the diversity of artifact types within the collection, was rejected after a consideration of in situ-de facto contexts but, following adoption of a modified approach, was supported in this chapter. This hypothesis was originally measured using a simple approach which compared the total number of classes of artifacts occurring at a site. The new approach adopted in this chapter involved a measure of the diversity of artifact classes within five functional artifact groups. Looking at the sites this way, two distinct patterns were observed. For in situ-de facto sites, the greatest diversity of classes was observed in the Architecture Group, and the diversity in the Furniture Group was of equal or greater importance to that in the Personal and Clothing Group. In contrast, on sites with primary refuse contexts, the greatest diversity was in the Non-Kitchen Tool Group. The Architecture, Kitchen, and Personal and Clothing groups were observed to be of roughly similar importance, but the Furniture Group was consistently and substantially the lowest in terms of class diversity.

Based on these observed patterns, it appears possible to separate in situ-de facto collections from collections from primary refuse contexts. Based on this new approach to assessing diversity within the collections, it is Hypothesis 2 does appear to have validity for predicting site formation and should be retained.

Hypothesis 4, supported in Chapter 4, received only partial endorsement after a consideration of primary refuse contexts. This hypothesis considered the size and condition (whether whole or not) of artifacts, and it was predicted that primary refuse contexts would be characterized by very small artifacts and that very few of the artifacts in the collection would be whole. An analysis of the sites with primary refuse contexts showed that the artifacts were small, with artifacts larger than 10 cm being rare. The size distribution of artifacts between primary and in situ-de facto contexts was demonstrated to be substantially different and discrete.

The number of whole artifacts in the primary refuse contexts was, however, surprising, and was similar to that observed for in situ-de facto contexts. Based simply on the importance of whole artifacts in the collections, therefore, these different types of site formation could not be distinguished from one another.

Hypothesis 6, supported for in situ-de facto contexts, was rejected after a consideration of primary refuse contexts. This hypothesis concerns the importance of durable goods in the collection, and its analysis is based on a comparison of the ratio between durable goods and ceramic sherds. Durable goods were expected to be of little importance within primary refuse contexts.

At sites with in situ-de facto contexts, there was a high degree of

comparability between the resulting ratios, and it was believed that these reflected a high degree of importance of durable goods in the collections. At the primary refuse contexts examined, however, these ratios were extremely variable, and their range comfortably included the ratios from the in situ-de facto contexts. There appeared to be, therefore, both significant variability in the importance of durable goods within primary refuse contexts, and an inability to differentiate primary site collections from those from in situ-de facto contexts on the basis of this ratio.

Through the introduction of comparative data from different formation processes, this chapter has been able to provide an increasingly sophisticated evaluation of the models of site formation proposed in Chapter 2. It has also been possible to begin to assign absolute values to the hypotheses, which is necessary for the quantitative comparison of sites and for the evaluation of the models under investigation in this dissertation.

CHAPTER 6

EXPLORING SECONDARY REFUSE CONTEXTS

The model for secondary refuse disposal is built upon the same seven hypotheses used to model in situ-de facto and primary refuse. These hypotheses have been specifically modified to reflect the archeological patterns thought to characterize secondary refuse contexts. In the following chapter, these hypotheses will be compared to the data from four sites with very well defined and documented secondary refuse deposits. These sites are the Vandever-Haworth site, the Pate-Roden site, site 34PS212, and site 14SH315.

The Vandever-Haworth site was introduced into this study in Chapter 5 because it also has important primary refuse contexts. This site, which is interpreted as a trading post and residence dating from the early nineteenth century, also contains important secondary refuse deposits in the form of fourteen trash pits or basins. The Pate-Roden site, interpreted as a Choctaw habitation site, was also introduced in Chapter 5 because of its primary refuse contexts. This site is characterized by secondary refuse deposits in the form of two trash pits.

Site 14SH315 and 34PS212 are new to this study since the data from them are restricted to secondary refuse deposits. Site 14SH315 is interpreted as being associated with an early to mid-nineteenth century Pottawatomie habitation, and 34PS212 is interpreted as being associated with a roughly contemporary Creek habitation. The secondary refuse contexts present at each consists of a single trash pit.

EXAMINING THE MODEL

In the following discussion, the data from these four sites with secondary refuse contexts will be examined and will be compared against the seven hypotheses making up the model of secondary refuse disposal. At the same time, the patterns observed at these sites will be compared to patterns observed during the analysis of the in situ-de facto and primary refuse models. This chapter will present, therefore, the last evaluation of the models under consideration in this dissertation, and will provide the final data needed to develop an assessment of these models and the general hypothesis to which they are related.

Hypothesis 1

Hypothesis 1 concerns the presence of evidence for burning in the collections from the sites. For secondary refuse disposal, this hypothesis is necessarily rather vague since this type of disposal may or may not have involved burning as a routine aspect of trash disposal. Extensive burning of artifacts is therefore acceptable under this hypothesis, but the data from the four sites may allow a much more precise prediction. In order to evaluate this hypothesis, the reports on each of the four sites with secondary refuse contexts is examined to determine the extent to which the collections from these contexts have been affected by heat.

Site 14SH315 is a trash filled pit containing 200 artifacts. Only three of these showed evidence of burning. These artifacts consist of a sherd of an olive green bottle, a sherd of hand painted whiteware, and a sherd of undecorated whiteware (Reynolds 1987).

At the Vandever-Haworth site, a total of 5,587 artifacts were found

in 14 trash pits. Of these, however, only one bone table utensil handle, thirty-one sherds of aqua bottle glass, and seven pieces of lead were described as having been burned or melted. The seven pieces of melted lead probably became melted as a result of bullet manufacture rather than refuse disposal (Baugh 1970).

A total of 1,374 artifacts were found in a single trash pit designated as 34PS212. Of these, only a single ceramic sherd and twenty-one sherds of aqua and colorless bottle glass are reported as burned. The bottle glass was described as "badly burned" (Gettys 1980).

The two trash pits excavated at the Pate-Roden site contained 173 artifacts. Of these, none were described in the report as having been burned (Rohrbaugh et al. 1971)

Based on this data, the pattern from secondary refuse contexts was seen to be essentially similar to that from primary refuse contexts, and significantly different from that for the in situ-de facto contexts considered in this research. Like the secondary refuse contexts, burned artifacts were extremely rare in the primary contexts. In the in situ-de facto contexts considered in this dissertation, however, which resulted from the destruction of the sites by fire, burned artifacts were extremely plentiful.

Hypothesis 2

Hypothesis 2 concerns the diversity of artifact classes present in a collection. Given that a secondary refuse deposit should accumulate both consumable and discarded durable goods of all sizes, a great diversity of classes is expected. Given that a secondary refuse deposit may accumulate goods from a wide range of activities that may have

occurred at a wide range of settings on a site, it is possible that the diversity of classes may exceed that found at in situ-de facto deposits from a single building.

As the basis for an examination of this hypothesis, the artifacts from 14SH315, 34PS212, the Pate-Roden site, and the Vandever-Haworth site have been listed in tables 38, 39, 40, and 41. These tables list the artifacts by class under the five functional artifact groups presented earlier. For use later on in this chapter, durable goods have been indicated with a (D) following the class listing.

Based on tables 37-40, the numbers of classes of artifacts for each site and for each functional artifact group can be determined and have been summarized in Table 41. From this table, it can be seen that the Pate-Roden site diverges drastically from basically similar patterns observed at 14SH315, 34PS212, and the Vandever-Haworth site. This divergence is in terms of the total number of classes present and the distribution of classes within artifact groups.

At 14SH315, 34PS212, and the Vandever-Haworth site, the number of classes present range from 30 to 56, but only 6 are present at Pate-Roden. At 14SH315, 34PS212, and Vandever-Haworth, the Non-Kitchen Tool Group accounts for between 40 and 47 percent of all the classes, with both the Kitchen and Personal and Clothing groups accounting for between 20 and 27 percent each. At these three sites, the Architecture and Furniture groups consistently account for the least number of classes. At Pate-Roden, however, the six classes are distributed between the Architectural and the Kitchen groups, with no classes under the other groups.

Table 37

Artifacts from secondary refuse contexts, 14SH315

<u>Artifact Class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Common cut nails (D)	26
Strap hinge (D)	1
<u>Kitchen Group</u>	
Ceramics	118
Bottle glass fragments	10
Kettle bail ears (D)	5
Kettle bail (D)	1
Tin cup (D)	1
Pot hook (D)	1
<u>Non-Kitchen Tool Group</u>	
Trigger guard (D)	1
Bullet mold (D)	1
Iron arrow point	1
Brass sleigh bell (D)	1
Cut sheet lead	1
File (D)	1
Axe head (D)	1
Chain link (D)	1
Stirrup (D)	1
Snaffle bit (D)	1
Harness buckle (D)	1
Harness rings (D)	2
Whetstone (D)	1
Thimble (D)	1
<u>Personal and Clothing Group</u>	
Tubular bone beads (D)	2
Tobacco pipes (D)	3
Marbles (D)	2
Hand molded ceramic figurines (D)	4
Brass hawk bell (D)	1
Brass wire bracelets (D)	3
Cut sheet brass (D)	6
<u>Furniture Group</u>	
Key (D)	1

Table 38

Artifacts from secondary refuse contexts, 34PS212

<u>Artifact Class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Square nails (D)	119
Door handle (D)	1
<u>Kitchen Group</u>	
Ceramics	502
Tin cans	9
Pot handle (D)	1
Cast iron cookware fragments (D)	5
Bottle glass	238
Bucket (D)	3
Table knives (D)	8
Table forks (D)	7
Teaspoons (D)	6
Table or serving spoons (D)	8
Bone handles (D)	5
Butcher knife (D)	1
Candlesticks (D)	2
<u>Non-Kitchen Tool Group</u>	
Firearms parts (D)	2
Gunflints	6
Lead shot	64
Percussion caps	4
Fish hook (D)	1
Handle (D)	1
Bell clapper (D)	1
Chain fragments (D)	6
Chisel (D)	1
Gimlets (D)	2
Axe (D)	1
Hoes (D)	2
Scissors (D)	4
Thimbles (D)	4
Straight pins (D)	16
Padlocks (D)	3
Padlock key (D)	1
Horseshoes (D)	5
Bridle bits (D)	7
Harness buckles (D)	16
Harness rings (D)	5

Table 38 (Cont'd)

Wedges (D)	3
Spur (D)	1

Personal and Clothing Group

Buttons (D)	41
Garment eye (D)	1
Garment rivets (D)	5
Hook eye (D)	1
Garment buckle (D)	1
Suspender buckle (D)	1
Finger rings (D)	2
Silver jewelry (D)	3
Trade beads (D)	40
Tobacco pipe fragments (D)	56
Harmonica (D)	1
Marbles (D)	25
Gaming piece (D)	1
Tinkling cones (D)	20
Clasp knives (D)	4

Furniture Group

Tack (D)	1
Lock escutcheon (D)	1

Table 39

Artifacts from secondary refuse contexts, Vandever-Haworth site

<u>Artifact Class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Machine cut nails (D)	1685
Window glass (D)	142
Hook and staple (D)	1
Lock (D)	1
Keys (D)	2
Staples (D)	4
Wood screws (D)	2

Table 39 (Cont'd)

Kitchen Group

Ceramics	1898
Bottle glass	1084
Glass tableware (D)	71
Table forks (D)	2
Table spoons (D)	3
Handles for tableware (D)	5
Skillet fragment (D)	1
Tin can	1
Coffee mills (D)	6
Bail fragments (D)	251

Non-Kitchen Tool Group

Animal trap (D)	1
Hoe (D)	1
Pitchfork (D)	1
Wood chisel (D)	1
Scissors (D)	1
Straight pin (D)	1
Strike-a-light (D)	1
Thimble (D)	1
Horseshoes (D)	1
Bridle bit (D)	2
Harness buckles (D)	9
Chain fragments (D)	1
Bullet molding debris	9
Butt plate (D)	1
Gunflints (D)	12
Files (D)	1
Lead balls	50
Percussion caps	3

Personal and Clothing Group

Beads (D)	40
Buttons (D)	62
Coins (D)	2
Coin pendant (D)	1
Marbles (D)	2
Umbrella (D)	1
Jaw harp (D)	2
Brass pin (jewelry) (D)	1
Tobacco pipe fragments (D)	103

Furniture Group

Brass tacks (D)	9
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Table 40

Artifacts from secondary refuse contexts, Pate-Roden site.

<u>Artifact Class</u>	<u>Number found</u>
<u>Architecture Group</u>	
Machine cut nails (D)	10
Window glass (D)	111
<u>Kitchen Group</u>	
Ceramics	25
Bottle glass	6
Tin cans	3
Food grater (D)	1

Table 41

Summary of artifact classes for secondary refuse contexts
(percentages are indicated in parentheses)

<u>Artifact Group</u>	<u>14SH315</u>	<u>34PS212</u>	<u>Vandever-Haworth</u>	<u>Pate-Roden</u>
Architecture	2 (6.6)	2 (3.5)	7 (15.5)	2 (3.3)
Kitchen	6 (20.0)	13 (23.2)	10 (22.2)	4 (66.6)
Tools	14 (46.6)	24 (42.8)	18 (40.0)	-
Personal	7 (23.3)	15 (26.7)	9 (20.0)	-
Furniture	1 (3.3)	2 (3.5)	1 (2.2)	-
TOTAL	30	56	45	6

Comparing the number of classes present at the secondary refuse contexts to those present in the in situ-de facto and primary refuse contexts, it is immediately apparent that there is no patterned difference between these formation processes based on the total number of classes present. The number of classes for the four secondary refuse contexts range from 6 to 56. At the sites with in situ-de facto contexts, the number of classes ranges from 39 to 69. At the primary refuse contexts, the number of classes ranges from 26 to 53. These figures clearly overlap.

While the number of classes does not appear to be significantly different between in situ-de facto, primary, and secondary refuse, the distribution of classes within artifact groups does appear to be significantly different. As has already been discussed, at the secondary refuse contexts (excluding the Pate-Roden site), the Non-Kitchen Tool Group contains the most classes, followed by the Kitchen and Personal and Clothing groups. The Architecture and Furniture groups are poorly represented. At the in-situ-de facto contexts, there is a more even distribution of classes within groups. In these contexts, the Non-Kitchen Tool Group does not stand out as significantly more important than the Kitchen, Personal and Clothing, or Furniture groups. The Architecture Group, however, accounts for the most classes of artifacts of any of the five groups and the Furniture Group is as or more important than the Personal and Clothing Group. At primary refuse contexts, the Non-Kitchen Tool Group has the most classes and the Furniture Group is very poorly represented. Of importance, however, at the primary refuse contexts, the Architecture Group is well represented, and is generally equal in importance to the Kitchen and Personal and

Clothing groups.

This comparison of the patterns from secondary refuse contexts to that from in situ-de facto and primary contexts has shown that there are discrete differences between these patterns. These differences appear to be well based on differences in site formation. Given the results of this analysis, it is apparent that comparison of the patterning of classes within groups is a valid approach to assessing artifact diversity, and is sensitive to the differences between in situ-de facto, primary, and secondary refuse contexts.

Hypothesis 3

This hypothesis considers the amount of variation present within artifact classes. Depending on variables such as the length of time a secondary refuse dump was in use, variation within classes is expected to range between that seen in primary refuse contexts and that seen in contexts of in situ-de facto site formation. In general, however, variation is expected to be less than that seen in primary refuse contexts and much more than that seen at in situ-de facto contexts.

This hypothesis was rejected in chapters 4 and 5 after a consideration of in situ-de facto and primary refuse contexts. This variable was seen to behave somewhat randomly, with no patterned similarities within site formation contexts and no patterned differences between processes being apparent. This variable is therefore believed to be related to processes other than site formation. It will nevertheless be examined for secondary refuse contexts.

In the following discussion, evidence for diversity within classes as well as similarity within classes and evidence for the presence of

sets of artifacts will be presented. Due to the way that the artifacts are presented in the reports on the Vandever-Haworth and Pate-Roden sites, however, specific artifacts associated with the secondary refuse contexts cannot be identified. These sites cannot, therefore, be used to examine this hypothesis.

14SH315

In general, most artifact classes from 14SH315 had only one specimen associated with them. Clearly, classes with only one specimen tell us little of type diversity within the collection. The Kitchen Group, however, possessed sufficient numbers to provide some insight into this question.

In looking at the Kitchen Group artifacts, little diversity is noted in the types of earthenwares present (Table 42). No more than four types are present, and there is little diversity within types.

Based on the ceramics from 14SH315 a general lack of type diversity is apparent. Considering the small numbers involved, however, care should be used in assigning this lack of diversity at this site too much

Table 42

Distribution of earthenwares, 14SH315

<u>Ware type</u>	<u>Number</u>	<u>Percent</u>
Undecorated whiteware	32	39.0%
Hand-painted	33	40.2%
Transfer printed	15	18.2%
Annular ware	2	2.4%
TOTAL	82	99.8%

significance.

34PS212

The greater number of artifacts present at site 34PS212 makes it a somewhat better site with which to examine Hypothesis 3. Within the Kitchen Group, limited evidence for the presence of a set of artifacts exists. At the same time, however, this same group contains ample evidence for type diversity within classes.

The best evidence for type similarity and possibly even evidence for a set of artifacts is found in the table knives and forks and in the serving spoons. A total of eight table knives and seven tables forks were recovered from 34PS212. Of these, one knife and six forks share an identical pattern and may have been part of a set. Another pattern is represented by a single knife and fork. Three of eight serving spoons from the site are also identical.

Despite the similarities documented for the table and serving knives and spoons, the earthenware ceramics from the site provide evidence of diversity (Table 43). A total of eleven different ware types are present in the collection from 34PS212. If the traditional Creek pottery is deleted, this number is decreased to nine. The diversity is nevertheless much greater than that observed at 14SH315.

In general then, the collection from 34PS212 presents evidence for both type similarity and diversity within the collection. Type diversity in the collection does appear to be greater than that observed at the commanding officer's quarters, but is similar to that observed at the Arkansas Post bank. It will be remembered that the Arkansas Post bank was a very type-diverse collection.

Table 43
Distribution of earthenwares, 34PS212

<u>Ware type</u>	<u>Number</u>	<u>Percent</u>
Undecorated whiteware	196	39.3%
Hand-painted	92	18.4%
Transfer printed	62	12.4%
Edge decorated (shell-edged)	47	9.4%
Annular	40	8.0%
Creek pottery	31	6.2%
Yellow glazed	10	2.0%
Sponge decorated	7	1.4%
Appliqued	6	1.2%
Copper lustre	5	1.0%
Tortoise shell	2	.4%
TOTAL	498	99.7%

Discussion

The evidence from 14SH315 and 34PS212 is relatively ambiguous because so little information could be brought to bear on this hypothesis. The ceramics from 14SH315 provided a view of a lack of diversity in this type of artifact. At 34PS212, however, a high degree of diversity was apparent among the ceramics, but evidence of a set of table "silver" was also present in the collection. A great amount of variation is therefore suggested for secondary refuse contexts in terms of diversity within classes of artifacts. Given the lack of patterning in this variable for the in situ-de facto and primary contexts, this "pattern" from secondary refuse contexts only confuses the issue and supports the wisdom of the rejection of this hypothesis as recommended in two previous chapters.

Hypothesis 4

Hypothesis 4 is concerned with the size of artifacts and the percentage of whole artifacts in the collection. In secondary refuse contexts, large artifacts are expected to be common but whole artifacts are expected to be more common than at primary refuse contexts but much less common than at in situ-de facto contexts. It is important to interject here that in Chapter 5 it was found that there was basically no difference in the importance of whole artifacts between in situ-de facto and primary refuse contexts. Given this, there is clearly a problem with the second half of this hypothesis for secondary refuse contexts.

Consideration of this hypothesis is restricted to the secondary refuse contexts at 14SH315 and 34PS212. The reports on the Pate-Roden and Vandever-Haworth sites do not break down the artifact descriptions by provenience so it is impossible to match specific artifacts with specific features. It is therefore impossible to develop tabulations of artifact sizes per feature, and to determine the number of whole and incomplete artifacts for each feature for these sites.

Since the collection from 14SH315 was available for examination during this research, the needed information is completely available for this site. At 34PS212, good information on size and condition of artifacts is available for most of the materials found, but is not recorded for every artifact. There may be some skewness towards large size and whole artifacts from 34PS212 since the complete artifacts, which were generally larger than incomplete specimens of the same class, were more typically described in sufficient detail to determine size and condition.

Table 44 presents a summary of the size distributions of artifacts from 14SH315 and 34PS212. These tabulations do not include nails, ceramics, or bottle glass so that the results are comparable with those presented in chapters 3, 4, and 5 .

Table 44

Summary of artifact sizes, without nails, ceramic sherds, and fragments of bottle glass, sites 14SH315 and 34PS212

<u>Size range</u>	14SH315		34PS212	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
0 to 10 cm	34	79.0%	334	91.5%
10 to 20 cm	6	13.9%	24	6.5%
20 to 30 cm	3	6.9%	5	1.3%
30 cm plus	-	-	2	.5%
TOTAL	43	99.8%	365	99.8%

A review of Table 44 shows that artifacts larger than 10 cm account for roughly 21 percent of the artifacts from 13SH315 and about 8 percent of the artifacts from 34PS212. These figures are relatively high, but they are below comparable figures of 24 and 36 percent for the commanding officer's quarters and the Arkansas Post bank, respectively and above the range of 1.3 to 8.0 percent observed at the sites with primary refuse contexts. Based on this information, the sizes of artifacts for these three site formation contexts appear to form a continuum, but one which can be separated into fairly discrete ranges

for the individual formation processes.

Looking at the importance of whole artifacts at 14SH315 and 34PS212, it is immediately apparent from Table 45 that the larger the artifact from these sites, the more likely it is that it is whole. This mirrors findings from the commanding officer's quarters and the Arkansas Post bank, but differs slightly from that seen at the sites with primary refuse contexts. At a majority of the primary refuse contexts, there were more whole artifacts among the smaller size categories than among the larger ones.

Table 45

Total versus whole artifacts by size category, without nails, ceramics, and bottle glass, sites 14SH315 and 34PS212.

<u>Size range</u>	<u>Total</u>	<u>No. whole</u>	<u>Percent of total</u>
<u>SITE 14SH315</u>			
0 to 10 cm	34	11	32.3%
10 to 20 cm	6	3	50.0%
20 to 30 cm	3	2	66.6%
30 cm plus	-	-	-
<u>SITE 34PS212</u>			
0 to 10 cm	334	193	57.7%
10 to 20 cm	24	16	66.6%
20 to 30 cm	5	4	80.0%
30 cm plus	2	-	0.0%

Of more comparative importance, however, is the overall importance of whole artifacts in the collections. At 14SH315, whole artifacts account for 37.2 percent of all artifacts. At 34PS212, whole

artifacts account for a more impressive 58.3 percent of all artifacts. Both of these figures are substantially below the figure of 73 percent for the commanding officer's quarters, but only the figure for 14SH315 falls below the 52 percent figure for Arkansas Post. There is also overlap between the percentages for the secondary contexts and the range of 41.7 to 74.6 percent noted for the primary refuse contexts. From this, it can be seen that there is clearly no patterned difference between the three site contexts with respect to the overall importance of whole artifacts in the collection.

From this consideration of Hypothesis 4, it can be seen that there is a difference in the importance of large artifacts between the three site formation contexts examined in this dissertation, with the importance for secondary refuse contexts being intermediate between that for in situ-de facto and primary contexts. This variable appears to be sufficiently well patterned and discrete to be of importance in discriminating between different site formation processes.

It can also be seen from this analysis that the importance of whole artifacts in the collections from in situ-de facto, primary, and secondary contexts does not differ systematically from one another. This adds additional support for the conclusion presented in the previous chapter that this measure cannot be used to distinguish between site formation contexts.

Hypothesis 5

Hypothesis 5 concerns the spatial distribution of artifacts and holds that the distribution of artifacts within a secondary refuse context should be more or less random. That is, the distribution of artifacts should not reveal patterns that can be related to activities

resultant from the actual use of the artifacts present there. Patterns may exist in the secondary refuse context, however, but these should be restricted to patterns resulting from dumping.

Reports on the four sites with secondary refuse contexts did not present information on the spatial distribution of artifacts. Further, information was not contained in these reports with which the spatial distribution could be reconstructed. The reasons for this varied, but was generally related to the methodological approach to the excavation of the secondary refuse contexts. In general, these secondary refuse contexts represented relatively small refuse pits, and they were typically approached as a culturally meaningful unit within which no horizontal or vertical control was necessary.

Consideration of this hypothesis suggests that more attention should be paid to recovering and reporting depositional variation within secondary refuse contexts, especially those that are relatively small in size. Due to their sizes, larger refuse contexts such as large military or community dumps are more typically excavated and reported with concern for horizontal and vertical patterning. Definite dumping patterns have been documented in these types of sites (see, for example, Cheek 1976), and may be present and visible in the smaller refuse contexts as well.

Hypothesis 6

Hypothesis 6 considers the relationship between durable and consumable/breakable goods. It is expected that the ratio of durable to consumable goods in secondary refuse contexts will be between similar ratios for primary and in situ-de facto contexts. This is because the

secondary refuse context should receive more consumables than would be present at the in situ-de facto context and more durables than would find their way into a primary refuse context.

In Chapter 4, a quantitative measure of this variable was presented as the ratio between durable, non-architectural goods and ceramic sherds. The durable goods from 14SH315, 34PS212, the Vandever-Haworth site, and the Pate-Roden site have been indicated on Tables 37, 38, 39, and 40 (See the section on Hypothesis 2 in this chapter). From these tables, the total number of durable, non-architectural goods can be calculated and can be compared to the number of ceramic sherds from the secondary refuse contexts at these sites.

Table 46 presents the ratios of durable goods to ceramic sherds from the secondary refuse contexts at 14SH315, 34PS212, the Vandever-Haworth site, and the Pate-Roden site. As has been shown elsewhere in this chapter, this table shows a basic similarity between sites 14SH315,

Table 46

Ratio of durable goods (non-architectural) to ceramic sherds,
secondary refuse contexts, 14SH315, 34PS212, Vandever-Haworth,
and Pate-Roden sites

<u>Site</u>	<u>Durable goods</u>	<u>Ceramic sherds</u>	<u>Ratio of durable goods to ceramic sherds</u>
14SH315	37	118	1 : 3.1
34PS212	332	502	1 : 1.5
Vandever-Haworth	505	1898	1 : 3.7
Pate-Roden	1	25	1 : 25

34PS212, and Vandever-Haworth, and presents the Pate-Roden site as somewhat of an anomaly.

As Table 46 shows, the range for ratios of durable goods to ceramics is from 1:1.5 at 34PS212 to 1:25 at the Pate-Roden site. Deleting the Pate-Roden site, this range tightens up to 1:1.5 to 1:3.7. This three site range shows little variation between secondary refuse contexts, and clearly stands out as different from that documented for the two in situ-de facto contexts examined. At the commanding officer's quarters and the Arkansas Post bank, ratios of durable goods to ceramic sherds were 1: 14.3 and 1:13, respectively. This range for secondary refuse contexts, as well as the range for in situ-de facto contexts, falls, however, within the wide range documented for primary refuse contexts in Chapter 5. This range for primary refuse contexts is from 1:.5 to 1:29.

The fact that the ranges of ratios for both secondary and in situ-de facto site contexts falls within the range for primary refuse contexts indicates that this measure has little utility in differentiating between the various site formation contexts under consideration in this research. This finding mirrors that of Chapter 5, and further supports the recommended retirement of this hypothesis.

Hypothesis 7

Hypothesis 7 concerns the importance of the architectural assemblage in the site collections. This can be measured in two ways: by examining the range and frequency of classes of architectural artifacts present in the collection, and by examining the relative numerical importance of these artifacts in their respective site collections.

The architectural artifacts from the sites with secondary refuse contexts have been summarized in Table 47. It is immediately apparent from this table that the architectural artifacts from 14SH315, 14PS212, the Pate-Roden site, and the Vandever-Haworth site do not present a complete assemblage of building hardware. Artifacts besides nails and window glass are pitifully scarce or totally absent at each of these sites. None of these sites has more than five classes of architectural artifacts, and except for nails and window glass, no class has more than two artifacts per site.

The range of artifact classes for these four sites is from two at 14SH315 and the Pate-Roden site to five at the Vandever-Haworth site. This range is somewhat lower but also overlaps the range of from four to

Table 47

Architectural artifacts from sites with secondary refuse deposits

<u>Site</u>	<u>Artifact class</u>	<u>Frequency</u>
14SH315	nails	26
	strap hinge	1
34PS212	nails	97
	door handle	1
	lock escutcheon	1
Pate-Roden	nails	10
	window glass	111
Vandever-Haworth	nails	1685
	hinge	1
	lock	1
	keys	2
	wood screws	2

nine classes at primary refuse contexts, but is substantially lower than the fourteen and eighteen classes present at the two in situ-de facto sites examined. The architectural artifacts from the secondary refuse contexts are further similar to those from primary contexts in that artifacts other than nails and window glass are present in exceptionally low numbers. They differ, however, in that at secondary refuse contexts, nails and window glass are also in exceptionally low numbers whereas at primary contexts these artifacts occur in great quantity. At in situ-de facto contexts, on the other hand, all classes of architectural artifacts occur in quantity.

This consideration of the three different site contexts suggests that primary and secondary refuse contexts are similar in the number of classes present, but differ significantly from in situ-de facto contexts in these same terms. Collections from primary and secondary contexts are further similar in that architectural artifacts other than nails and window glass are rare, and once again differ from in situ-de facto contexts where these classes occur with frequency. A difference does exist, however, between primary and secondary contexts in that with primary contexts nails and window glass are common and with secondary contexts these classes are poorly represented.

Looking next at the numerical importance of the architectural assemblages from secondary refuse contexts within the total site collections, a great amount of variability comes to light (Table 48). At these four sites, the architectural artifacts range in importance from 7.3 to 69.1 percent of the total site collections. The upper end of this range is caused by the Pate-Roden site where 69.1 percent of the artifacts were architectural. At the three other sites architectural

artifacts comprise less than 31 percent of the site totals. As has been shown elsewhere, this suggests that the Pate-Roden site is anomalous. It is here suggested that the three site range of 7.3 to 30.1 percent be used for comparative purposes.

Table 48

Relative importance of architectural artifacts
from secondary refuse contexts

<u>Site</u>	<u>No. nail + window glass</u>	<u>Total all artifacts</u>	<u>% of all artifacts</u>
14SH315	26	200	13.0%
34PS212	97	1318	7.3%
Pate-Roden	121	175	69.1%
Vandever-Haworth	1685	5587	30.1%

Comparing this three site range for secondary refuse contexts to figures from other site contexts, it can be seen that the range for secondary refuse contexts is significantly below that for primary and in situ-de facto contexts. At primary refuse contexts, nails and window glass make up from 64.2 to 70.0 percent of the total site collections. At in situ-de facto contexts, nails and window glass account for from 55.1 to 78.6+ percent of all the artifacts. While primary and in situ-de facto contexts are similar in this measure, both are significantly higher than the range observed for secondary refuse contexts.

This examination of the importance of nails and window glass in the

total site collection provides strong support for Hypothesis 7 by showing that architectural artifacts are of relatively minor importance at secondary refuse contexts. It further shows that the differences between secondary refuse contexts and other site contexts are significant and discrete, and that this measure can be used to differentiate between site formation contexts.

Discussion

In this chapter, the model of secondary refuse disposal originally presented in Chapter 2 has been evaluated against the data from four sites with secondary refuse contexts and against comparative data from sites with in situ-de facto and primary refuse contexts. This combined information has provided strong support for three of the seven hypotheses making up the model, has provided strong support for part of another hypothesis, and was unable to address yet another because of lack of data. Only two hypotheses were rejected.

As was the case with in situ-de facto and primary refuse contexts, Hypothesis 1 was supported for contexts of secondary site formation. This hypothesis concerned the importance of burned artifacts in the collection, and it was found that burned artifacts were rare in secondary refuse contexts. This finding indicates a great amount of similarity between secondary and primary contexts, and significant differences between these two contexts and in situ-de facto contexts, where burned artifacts are common.

Strong support was also found for Hypothesis 2, which concerned the diversity of artifact classes within the collections. By looking at the number of classes of artifacts per artifact group within the secondary refuse contexts, a distinct pattern was observed. This

pattern was found to be discretely different from patterns observed for in situ-de facto and primary refuse contexts. The patterns for each of these three site formation contexts are therefore distinct from the others, indicating that these patterns should have a great amount of predictive utility.

Hypothesis 3 was rejected after a consideration of secondary refuse contexts. This hypothesis is concerned with the degree of variability within artifact classes. An examination of this hypothesis showed a total lack of patterning. Similar problems resulted in the rejection of this hypothesis for in situ-de facto and primary site contexts.

Hypothesis 4 concerns the size and condition of artifacts. As predicted, examination of the secondary refuse contexts showed that large artifacts were important at secondary refuse contexts. Comparison of the data from secondary contexts with in situ-de facto and primary contexts further indicated that secondary refuse contexts were intermediate between in situ-de facto contexts, where large artifacts were very important in the collection, and primary refuse contexts, where very small artifacts predominated. Based on variables of artifacts size, it appears feasible to distinguish between these three site formation contexts.

It was also predicted with Hypothesis 4 that whole artifacts would be important in secondary refuse contexts. This was found to be true, but this portion of the hypothesis was rejected when it was determined that whole artifacts were no more important in secondary contexts than they were in primary and in situ-de facto contexts.

Hypothesis 5 was not addressed for secondary refuse contexts

because of a lack of data. Hypothesis 6 was successfully examined in this chapter, but was rejected. It has also been rejected in Chapter 5. This hypothesis considered the importance of durable goods in the collection. Using a ratio of durable goods to ceramics, consideration of this hypothesis found that durable goods were much less important at secondary refuse contexts than at in situ-de facto contexts. It was also found, however, that the range for primary refuse contexts encompassed the ranges for both in situ-de facto and secondary contexts, making it impossible to distinguish between these contexts.

The final hypothesis, Hypothesis 7, received strong support after a review of secondary refuse contexts. This hypothesis considered the importance of the architectural assemblage, and predicted that it would be relatively unimportant at secondary refuse contexts. This was found to be true, with the secondary refuse contexts having both a low number of classes of architectural artifacts and a low number of specimens within each class. The number of classes of architectural artifacts present at secondary contexts was found to be similar to that at primary contexts, with both of these differing significantly from the number of classes present at in situ-de facto contexts. This provides the theoretical ability to distinguish between in situ-de facto contexts and other site contexts, but does not allow the secondary and primary contexts to be differentiated. Such a differentiation between primary and secondary contexts is provided, however, by the fact that the numerical importance of architectural artifacts in the total site collection is high in primary and in situ-de facto contexts but very low in secondary contexts.

Although this consideration of secondary refuse contexts has

resulted in the rejection of several hypotheses, it provides generally strong support for the model of secondary refuse disposal as presented in Chapter 2. It further has provided additional support for the models of in situ-de facto and primary refuse disposal, and has indicated that these three models are sufficiently sophisticated to allow the differentiation between site formation processes on the basis of the properties of archeological collections alone.

CHAPTER 7

CONCLUSIONS

The preceding chapters have presented an empirical consideration of three models of site formation: in situ-de facto site formation, formation through primary refuse disposal, and formation through secondary refuse disposal. These models are based on a general theory, which states:

Different site formation processes will result in systematic, patterned differences in the archeological record. Due to differences between the operation of various site formation processes, their patterns in the archeological record will be distinct and will allow the identification of and differentiation between parent process(es).

As originally presented, each of these models consisted of seven hypotheses. These seven hypotheses considered the same seven variables for each process of site formation:

- 1) the importance of burned artifacts,
- 2) the diversity of artifact classes,
- 3) the diversity of artifact types within classes,
- 4) the size and condition (whether whole or not) of artifacts,
- 5) the presence of patterns of spatial distribution within the site,
- 6) the importance of durable goods, and
- 7) the importance of the architectural assemblage.

For each process of site formation, the expected archeological manifestation of each variable was described, and together represents the model.

SUMMARY AND IMPLICATIONS

The following pages present a summary of the evaluation of the hypotheses. Some liberty is also taken within this summary to discuss the implications of the variables in terms of the success or failure of the hypothesis, in terms of direction for future research, and in terms of applicability for use in other areas of archeology.

Hypothesis 1

Hypothesis 1 was concerned with the importance of burned artifacts in the study collections, and was supported in this research. It was predicted that for the in situ-de facto refuse contexts examined in this research, burned artifacts would be very common, for primary refuse contexts they would be rare or absent altogether, and at secondary refuse contexts they could be variable between that observed for primary and in situ-de facto contexts.

Review of the site reports and collections indicated that burned artifacts were very common at in situ-de facto contexts but were rare in both primary and secondary site contexts. The variability that was expected for secondary refuse contexts was thus not present, and with respect to the presence of burned artifacts, this context was essentially identical to primary refuse contexts.

Therefore, while it was not possible to separate primary from secondary refuse contexts on the basis of this variable, both of these processes could be easily separated from the in situ-de facto contexts. It should be noted that the results observed here will apply only to in situ-de facto contexts caused by site destruction by fire. While this is certainly the most common origin of in situ-de facto deposits, other natural events such as flood or avalanche can also result in this type

of context. These other forces would very clearly not be characterized by a preponderance of heat altered artifacts. The presence of burned artifacts is thus not key to defining in situ-de facto formation in all its forms. Variation is also possible if not probable in terms of the importance of burned artifacts in the secondary refuse contexts. Although burned artifacts were rare in the secondary contexts examined here, burning of refuse may be a routine aspect of disposal in other settings.

For a variety of reasons, therefore, the patterns observed in this study, and which support the first hypothesis, may not be found in all settings. This illustrates the danger of placing too much reliance on any individual variable. Interpretations should rather rely on the consideration of as many variables as possible.

The use of this variable for historic sites with an Euro-American material assemblage is clear. Such assemblages have a variety of material types, most notably glazed ceramics and glass, that are readily altered by heat. Non-European historic cultures and prehistoric cultures may be lacking in these heat sensitive materials and site collections may not, as a result, so clearly reflect burning. This may make it difficult to distinguish between different types of in situ-de facto formation for certain sites, but by using the other variables discussed in this study the differentiation of in situ-de facto from other processes of site formation should nevertheless be possible.

Hypothesis 2

Hypothesis 2 predicted that the diversity of classes of artifacts would differ between formation processes. Diversity of artifacts was expected to be high at in situ-de facto contexts because the full range of artifacts present and in use at the time the site was destroyed would be represented. At primary refuse contexts, diversity was expected to be low because certain classes of artifacts would be commonly deposited there, especially consumable and breakable artifacts such as ceramics and bottle glass, and other classes of artifacts, especially larger, durable goods, would be less commonly deposited there or might be absent altogether. Diversity was expected to be high at secondary refuse contexts because the full range of artifacts from at least one and possibly several activity areas could be expected there.

This hypothesis was initially considered by a simple comparison of the diversity of classes as expressed by the total number of artifact classes present on the site. This figure was found to be extremely variable both within and between formation contexts, and no clear patterning capable of separating formation contexts could be identified. Further comparative study revealed, however, that distinct patterns existed in the distribution of the numbers of artifact classes within five functionally based artifact groups, which included an Architecture Group, a Kitchen Group, a Non-Kitchen Tool Group, a Personal and Clothing Group, and a Furniture Group. The pattern for in situ-de facto formation is characterized by two factors: the Architecture Group predominates in number of classes present, and the Furniture Group is roughly equal to that for the Personal and Clothing Group (Table 49). The patterns for primary and secondary refuse contexts differ

significantly from this pattern for in situ-de facto formation. For both primary and secondary contexts, the Non-Kitchen Tool Group predominates and the Furniture Group is relatively insignificant. Despite these similarities between the primary and secondary contexts, these contexts differ from one another in the importance of the Architecture Group. At secondary refuse contexts, the Architecture Group is much less important than at the primary contexts, and is relatively insignificant in the pattern for secondary contexts as a whole. At secondary contexts, the Architecture Group is much less important than the Kitchen and Personal and Clothing Group, but with primary contexts the Architecture, Kitchen, and Personal and Clothing groups are roughly equal in importance.

The presence of these patterns, and the fact that they can be related to expected differences between site formation, provides strong support for Hypothesis 2. The observation that the three patterns

Table 49

Average percentages, number of classes per artifact group,
in situ-de facto, primary, and secondary site formation

F o r m a t i o n P r o c e s s			
<u>Artifact group</u>	<u>In situ- de facto</u>	<u>Primary</u>	<u>Secondary</u>
Architecture	29.6%	17.6%	8.3%
Kitchen	20.3%	18.6%	22.1%
Non-Kitchen Tools	20.3%	37.6%	42.7%
Personal/Clothing	13.8%	22.3%	23.6%
Furniture	15.7%	3.7%	3.0%

differ from one another, and that these differences are such that the patterns can be used to identify the different formation contexts, adds further support to this hypothesis. The clarity of these patterns, and the ability to relate them to expected differences in the operation of different formation processes indicates that this approach to artifact diversity is useful.

With historic Euro-American cultures, the effect of differences in architecture on this pattern could be an important area for additional research. Architectural types that are not heavily reliant on nails, window glass, and metal hardware would certainly have patterns different than those presented here. Certain early Colonial Period sites in the eastern United States or late nineteenth century dugouts or sod houses on the Great Plains, for example, would present a useful comparison to the sites used in this study.

Hypothesis 3

Hypothesis 3 was also concerned with artifact diversity, but rather than considering the diversity of classes within a collection it considered the diversity of types within classes. It was predicted that diversity within classes would be least at contexts of in situ-de facto formation because of their catastrophic origins and greatest at primary contexts because of their accretion over a long period of time. Diversity within classes at secondary contexts was expected to be intermediate between in situ-de facto and primary contexts.

This was a difficult hypothesis to examine because of the variability in the classes present at sites and because in certain site contexts the number of artifacts per class was very low. The most consistently available data with which to address this hypothesis was

the ceramic data. Consideration of the ceramic data and data from other classes, as available, showed a great amount of variability in the diversity of types within classes both within and between site formation contexts. The predicted patterns did not materialize, and there appeared to be no systematic difference between the three processes of site formation.

The analysis of this variable suggests that it is more closely linked to cultural processes other than site formation. The diversity of ceramics can easily differ between sites on the basis of status, for example, with the high status site having one or two sets of matched ceramics and the low status site having a single set of mis-matched pieces of many types. If patterns of discard were held constant between these two sites, they would nevertheless differ with respect to diversity within artifact types.

That this variable is not linked to site formation therefore indicates its utility in the interpretation of other cultural variables such as status, ethnicity, function, and so fourth. With site formation held constant, it is variables such as these that become important in defining similarities or differences in the cultural identity of sites or parts of sites, and from which generalizations on culture process can be constructed.

Hypothesis 4

Hypothesis 4 is concerned with the size and condition of artifacts in the collections. Large artifacts were expected to be relatively common at in situ-de facto and secondary formation contexts, and rare in primary refuse contexts. At in situ-de facto contexts, large artifacts

were expected because the full range of artifacts, and artifact sizes, present at the time of the site's catastrophic destruction should be present. At primary refuse contexts, large artifacts were expected to be rare because the larger fragments of broken artifacts and the larger, complete artifacts that were being discarded would have been deposited in a secondary refuse deposit. This process of removing the larger materials from their use contexts and disposing of them in secondary refuse contexts resulted in the prediction that large artifacts would be common there.

Since the part of this hypothesis dealing with size was concerned more with the importance of large artifacts, its analysis focused on these larger artifacts. Artifacts which were by their very nature very small, and which occurred in very high frequencies at sites, were therefore excluded from consideration. These included nails, ceramic sherds, and fragments of glass bottles. The remaining artifacts were assigned to four size categories which were the basis for analysis and comparison.

Artifacts from in situ-de facto and secondary contexts were distributed throughout all four categories but the artifacts from primary contexts were almost exclusively contained in the two smallest categories. Further it was noted that artifacts larger than 10 cm were most common at in situ-de facto contexts and least common at primary contexts. For primary refuse contexts, artifacts larger than 10 cm represented from 1.3 to 8.0 percent of the total site collection, for secondary refuse contexts they accounted for from 8.0 to 21.0 percent, and for in situ-de facto contexts they comprised from 24.0 to 36.0 percent of the collections. These findings support the hypothesis.

The size of artifacts probably represents one of the most universally applicable variables with which site formation can be examined. This variable can be used to describe all types of materials and artifacts, and is certainly a factor that can be considered productively in all cultural settings.

The second half of Hypothesis 4 concerned the importance of whole artifacts in the collections. It was predicted, for essentially the same reasons presented for the importance of large artifacts, that whole artifacts would be most common at in situ-de facto contexts and least important at primary refuse contexts. Analysis of this variable involved consideration of the same artifacts used in the consideration of size, and involved the computation of a percentage reflecting the overall importance of whole artifacts in the collection and the importance of whole artifacts within each of the four size categories discussed above.

Whole artifacts were, somewhat surprisingly, found to be of relatively equal importance for in situ-de facto, primary, and secondary contexts. A difference was observed, however, in the importance of whole artifacts in the four size categories. For both in situ-de facto and secondary formation contexts, the importance of whole artifacts increased as the size category increased. For a majority of the primary contexts examined, the importance of whole artifacts was greatest in the smallest size category. This pattern was not, however, consistent enough to have immediate predictive uses, and the second half of this hypothesis was rejected.

Hypothesis 5

Hypothesis 5 predicted that patterns of artifacts related to patterning of activities would be present at both the in situ-de facto and primary refuse contexts but would be absent at the secondary refuse contexts. It is recognized that the dumping of secondary refuse is in itself a cultural activity that results in patterns in and of itself (Binford 1983). Here, however, we are interested in the presence of patterns reflecting non-discard behavior; the behavior that produced the items discarded in the secondary refuse deposit.

Unfortunately, because it was not presented in the site reports, information on the spatial distribution of artifacts was not available at the secondary refuse contexts and for one of the in situ-de facto contexts. Analysis of the distribution of the artifacts from the in situ-de facto context represented by the Fort Towson Commanding Officer's Quarters revealed very definite spatial patterning that could be associated with the pattern of the building and the pattern of activities within the building during its occupation. Likewise, discussions of spatial distributions presented in the reports on the primary refuse contexts revealed spatial patterning that was interpreted to reflect differing activities carried on at different parts of these sites.

It was possible to address this hypothesis using site report data because the reconstruction of activity patterning has at some level been a concern of archeology for many years. This was, however, very notably not the case in terms of the secondary refuse deposits. The presumption seemed to be that these deposits were the homogeneous result of a single event, and therefore consideration of patterning within them was

unnecessary. This is unfortunate because without a concern for recovering and reporting the information needed to determine the nature of the formation of these deposits, they may never be understood to their fullest. A secondary refuse dump may very well contain a number of depositional or episodal units or contexts, which may be important for site interpretation. When combined with horizontal and vertical stratigraphic control, the procedures used in this study can help to determine whether or not units within a dump represent contexts worth of individual study and interpretation.

Hypothesis 6

Hypothesis 6 was concerned with the importance of durable goods in the various site contexts and predicted that they would be common at in situ-de facto contexts, rare in primary refuse contexts, and of intermediate importance in secondary refuse contexts. This relationship was expected for two reasons: first, durable goods have a greater longevity and would less frequently find their way to refuse contexts, second, durable goods that did make it to the refuse contexts would be overshadowed numerically by consumable goods which would be regularly deposited there.

Analysis of this hypothesis was originally proposed to involve the comparison of the total number of durable goods to the total number of consumable and easily broken goods (such as ceramics). Problems with this approach arose from a consideration of the in situ-de facto contexts, where much of the bottle glass, which makes up a significant portion of the consumable goods, was melted beyond recognition, and thus could not be quantified. Problems also arose with the ceramics from

these sites, which certainly represented whole vessels immediately prior to the destruction of these sites but which are now represented by innumerable sherds.

In order to combat these problems, and to develop a more easily comparable approach to the analysis of the importance of durable goods, a comparison of durable goods to ceramic sherds was proposed. The number of durable goods and ceramic sherds was thus tabulated, and a ratio of durable goods to ceramic sherds was calculated by dividing the number of ceramic sherds by the number of artifacts related to durable goods. Computation of this ratio for the sites within the three site formation contexts showed the range of values for both the in situ-de facto and secondary contexts were discrete and separated from one another by a considerable distance. These values were, however, subsumed within the very wide range of values for the primary refuse contexts. Although this approach may provide some guidance, in conjunction with other data, in distinguishing between in situ-de facto and secondary contexts, it has little utility for describing and separating the three site formation contexts from one another.

The dichotomy between durable and consumable goods undoubtedly has potential for understanding site formation but is itself in need of focused, intensive research. Defining durability and consumability in both cultural (what was perceived as durable) and archeological (what was durable) terms is a necessary step here. For example, ceramic were probably perceived as durable, but they were consumed relatively rapidly in archeological terms. Are ceramics therefore better understood somewhere on a continuum between durability and consumability? Pursuit of an understanding of the perception and reality of durability and

consumability is a topic with interpretive potentials well beyond the realm of site formation.

Hypothesis 7

Hypothesis 7 concerns the importance of the architectural assemblage within the site collections. Importance was conceived of in two terms: importance as a complete assemblage of architectural hardware, and numerical importance in the total site collection. Consideration of each type of importance was conducted independently.

The architectural assemblage was expected to represent a relatively complete set of hardware for the in situ-de facto contexts, but was expected to be very incomplete at the primary and secondary contexts. This expectation was of course closely linked to the fact that the in situ-de facto contexts were the subject of catastrophic destruction while the buildings were in use; the full set of hardware present on the building presumably found its way directly into the archeological record.

To examine this first part of Hypothesis 7, the number of classes of architectural artifacts and the number of specimens for each was calculated for each site. The total number of classes was found to range from two to five at secondary refuse contexts, from four to nine at primary refuse contexts, and from fourteen to eighteen at in situ-de facto contexts. The number of artifacts per class was found to be similarly very low at both the primary and secondary contexts and high at the in situ-de facto contexts. Based on this variable, then, the primary and secondary contexts were essentially similar, and were discreetly distinct from the in situ-de facto contexts which could be

characterized as having a relatively complete architectural assemblage.

The numerical importance of the architectural assemblage, which of course is ultimately determined by the importance of high frequency artifacts such as nails and window glass, was expected to be high at both the in situ-de facto and primary refuse contexts and very low at the secondary contexts. The presence of these artifacts in the in situ-de facto contexts is not mysterious, innumerable nails and sherds of window glass would have been present in the building at the time it was burned. Window glass, from breakage, and nails, from construction, modification, and repair, would also be expected in primary refuse contexts adjacent to a building. These artifacts, on the other hand, would only rarely be expected to make their way to a secondary refuse context removed from the building.

To examine the second part of the hypothesis, the percentage of the total site collection represented by the nails and window glass was computed for each site. These figures were seen to range from 55.1 to 78.6+ at the in situ-de facto contexts, from 64.2 to 70.0 percent at the primary refuse contexts, and from 7.3 to 30.1 percent at the secondary refuse contexts. As predicted, these figures showed that the numerical importance of the architectural assemblage within the total site collection was high for both the in situ-de facto and primary contexts, but was very low at the secondary site contexts.

The importance of these considerations of architectural artifacts for most historic sites in North America is clear. As was noted in the discussion of Hypothesis 3 in this chapter, however, not all sites can be expected to have an important component of architectural artifacts.

Prehistoric sites, or historic sites associated with Native American architecture or Euro-American sod houses may have a very insignificant architectural assemblage. As has been cautioned elsewhere, these cultural factors must be considered, and conclusions on site formation should be based on the results of an evaluation of as many variables as possible.

Discussion

The above review of the critical evaluation of the seven hypotheses making up the models of in situ-de facto, primary, and secondary site formation shows that four hypotheses were accepted, one was accepted after it was modified to delete an unsuccessful portion, and two were rejected (Table 50). The acceptance of five out of seven hypotheses indicates a high level of validity for the models of site formation originally presented in Chapter 2. Although two hypotheses were rejected, each of the five that remain have been shown to be sufficiently sensitive to allow the differentiation between the three

Table 50

Summary of evaluation of hypotheses

<u>Number</u>	<u>Subject</u>	<u>Results</u>
1	Presence of burned artifacts	Accept
2	Diversity of artifact classes	Accept
3	Diversity within artifact classes	REJECT
4	Size and condition of artifacts	Modify
5	Presence of spatial patterns	Accept
6	Importance of durable goods	REJECT
7	Importance of architectural artifacts	Accept

different site formation contexts. Taken together, these individually sensitive hypotheses present sophisticated models of each of the three formation processes, and should be predictive for other sites.

CONCLUSIONS AND RECOMMENDATIONS

This study has demonstrated the existence of variability in the archeological record which can be related to in situ-de facto, primary, and secondary site formation. Several attributes of site collections have been identified that are capable of identifying which of these three processes resulted in the collection. Further, by comparing sites with widely divergent cultural profiles, this study has determined these attributes to act independently of other cultural variables.

The difficulty of perceiving cultural processes of site formation as distorting factors has been clearly apparent in this study (Binford 1983). This study has shown that different site contexts possess systematic attributes that can be used to develop interpretations of these contexts. A refuse dump, for example, has a number of specific attributes which can be used to interpret it as a refuse dump. The models developed here describe the attributes of three site contexts, allow their recognition archeologically, and, therefore, allow an interpretation of their function within a cultural system. These interpretations are certainly not as distortions of culture, but rather as specific manifestations of cultural processes related to catastrophic site destruction and refuse disposal.

This study has also shown that the very systematic differences which allow the identification and interpretation of site contexts can lead to problems in interpretations at several different levels

(Schiffer 1976). These levels include the use of patterns from one context to make inferences about the operation of cultural processes operating in other contexts, and the development of inferences on cultural processes based on comparisons of two or more contexts. It is at this point that the distortions seen by Schiffer (1976, 1983, 1987) are most clearly manifest.

Archeology typically deals with fragments of sites (site contexts) which serve as the basis for inferences on the entire site or for cultural processes operating above the level of the site. The examination of the models of in situ-de facto, primary, and secondary site formation has very clearly shown how different contexts within a site can develop different archeological signatures despite the relationship of these contexts to the same general cultural process. If not recognized, these different signatures can lead to improper interpretations of the site or improper comparison between sites.

The importance of this study has therefore been to offer an approach whereby different site contexts can be identified and interpreted. Further, this study contributes an approach whereby the differences between site contexts can be taken into consideration in developing inferences and in constructing interpretations based on a comparison of several different contexts, both within a single site or between sites.

Recommendations

As with any methodological work, an important result of this research has been the development of a number of recommendations on how to proceed in the future. Some of these recommendations are the result of difficulties encountered with the data used in this study, while

others derive from the more general implications of this work.

The site report is and must remain a vital source of comparative data for archeology. While the examination of comparative data sets is preferable to the sole reliance on the site report, this is rarely feasible, and difficulties are bound to occur. Indeed, it was with some difficulty that the data needed for this study was extracted from site reports, many of them several decades old. During the course of examining site reports, it was very apparent that the type of data needed to adequately consider site formation was not systematically or consistently presented.

Problems with descriptive reporting are, of course, a result of the fact that the questions of interest in the present study were not of interest for the studies which resulted in the site reports consulted. Questions addressed in these reports were very typically related to chronology and gross site function, and the artifacts were described primarily with these needs in mind. Clearly, good descriptions must be to some degree problem oriented, and there is no reason to expect that an earlier research effort will or should foresee the data needs of later work. Nonetheless, several recommendations in terms of reporting are forthcoming and, if implemented, will make other comparative studies of site formation considerably easier and will increase the versatility of the reports.

The condition of artifacts has been shown in this dissertation to have important utility for examining differentials in site formation and, therefore, site contexts. Condition was very inconsistently treated in the site reports examined. Variables of condition that are

indicated as important from this study, and which lend themselves to relatively consistent and easy reporting, include 1) whether an artifact has been effected by heat, 2) the size of the artifact, and 3) whether an artifact is complete (usable) or broken. These are probably the variables that will be the most useful in general considerations of site formation, and it is recommended that they be included as standard variables to record in site reports.

Related to condition is the problem of how to compare certain aspects of collections from burned and unburned contexts. Due to differences in material culture, it is probable that this problem is peculiar to historical archeology. Specifically of interest are glass artifacts; the disfiguration and amalgamation of glass artifacts by heat makes a quantitative comparison with non-burned contexts, at both the inter- and intra-site levels, impossible. Under certain circumstances, this may have serious effects on the general quantitative comparability of entire site assemblages. The recording of glass weight, in addition to sherd count, is recommended as a means to improve the comparability of burned and unburned site assemblages. While specimen counts are probably the best approach to collection quantification, if weight is also recorded the settings in which valid comparisons can be accomplished will be expanded.

The reason that these variables of condition need to be recorded is, of course, so that they might be used to examine and interpret differences and similarities between collections. By using these variables to examine three types of site formation, this study has illustrated the importance of understanding the site in terms of site contexts; it should be the context rather than the site that is the

fundamental unit of analysis in archeology. This has importance at all levels of site comparison.

Every site is clearly composed of a number of different contexts. These contexts can be differentiated chronologically or they may represent contemporary contexts defined on the basis of, for example, differentials in function. The definition of these contexts and their interpretation is a major focus of site interpretation and is, therefore, a fundamental exercise of site analysis. The ways in which site contexts are identified, defined, and interpreted can be greatly enhanced through the approaches developed in this research. Consideration of the variables used in this study can, for example, provide important insight into whether superimposed stratigraphic deposits are comparable or whether they result from differing cultural processes of site formation. Consideration of variables such as size and condition may reveal a seemingly homogeneous scatter of sheet refuse to instead be composed of different contexts of disposal related to differences in site function or structure. This research has offers an expanded range of variables and methodological approaches that can be used to identify and interpret contexts within a site.

Comparisons conducted between sites are rarely of total site assemblages or of truly representative samples of such assemblages. Before comparisons of site assemblages are attempted, therefore, it is essential that some accounting of what is being compared is made. The question must be asked, What is the nature of the contexts being compared, are these contexts comparable, and do they serve the needs of the question being asked? Once again, this research has resulted in

the development of an approach which offers to expand the archeologist's abilities to examine these questions.

A more rigorous consideration of site context using an expanded repertoire of variables and the related methodological approaches is therefore the major recommendation of this study. This involves not only determining what processes of formation resulted in clearly identified contexts and whether different contexts are comparable, but also using the approaches to defining site formation as a means to identify and interpret additional, perhaps more subtle site contexts. Seen in this light, the major contribution offered by the research conducted in this dissertation is not in determining how to differentiate between in situ-de facto, primary, and secondary site contexts; it is rather the development of a refined methodology directed at the identification and interpretation of site contexts.

The utility of this study is thus not bounded by historical archeology; the approach developed and recommended here can have important applications for studies of prehistory as well. While modifications in expectations would be needed because of differences in material culture, a consideration of variables such as artifacts size and condition could with little doubt be used to gain a better understanding, for example, of the structure of an Archaic Period site in Kansas.

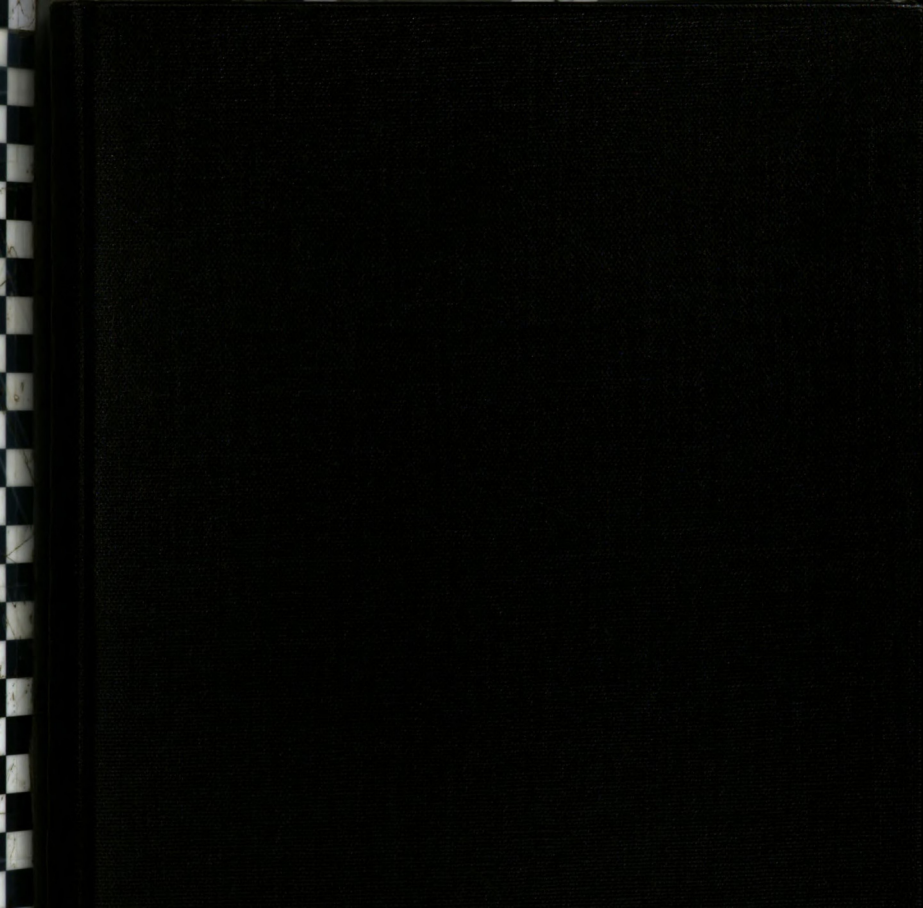
The importance of this work is nonetheless seen to be greatest for historical archeology. For the most part, historic sites are diverse and complex. These sites nevertheless represent the data for the development of cultural inferences based largely on comparisons, both within and between sites. It is therefore essential that the nature of

the contexts being used for comparison be both fully understood and valid for the comparisons being attempted. There is little question that Binford (1983) was correct when he insisted that archeological patterns are the direct result of the operation of a cultural process; through the consideration of site formation as proposed in this research we will be somewhat closer to ensuring that inferences drawn from the archeological record are just as direct.

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SITE FORMATION PROCESSES IN HISTORICAL ARCHEOLOGY

VOLUME II

By

William Bennett Lees

A DISSERTATION

Submitted to
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in partial fulfillment of the requirements
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APPENDIX

APPENDIX

DESCRIPTION OF ARCHEOLOGICAL COLLECTIONS FROM THE FORT TOWSON COMMANDING OFFICER'S QUARTERS, FORT TOWSON NATIONAL HISTORIC SITE, OKLAHOMA

INTRODUCTION

This appendix presents a description of the archeological collections from the Fort Towson Commanding Officer's Quarters. These collections resulted from the 1975 excavations of this site, which were conducted by the Oklahoma Historical Society under the direction of Douglas D. Scott. These collections are part of the holdings of the Oklahoma Historical Society and are housed at the Fort Towson National Historic Site, administered by the Society. For this research, these collections were loaned to the Kansas State Historical Society where the analysis was conducted.

The purpose of the analysis of the material from the commanding officer's quarters was to make this previously unreported collection available for use in this dissertation. The collection from this site serves as the focus of this research into site formation processes. The descriptions of the collections are included here as background data for this dissertation; other data discussed are available in the form of published research monographs.

It was not the intent of this research to develop a full report on the excavations at the commanding officer's quarters, but rather to develop the information needed to examine the questions of relevance to this dissertation. The descriptions of the collections presented

here supplement Scott's earlier report on the commanding officer's quarters, which summarized the history of the site, the field methodology, and which describes and interprets the discovered archeological and architectural features (Scott 1983). Taken together, Scott's 1983 manuscript and this description of the collections go far to present a full descriptive reporting of the 1975 excavations of this important site.

Catalog System

The system used to catalog the artifacts from the commanding officer's quarters is specific only to the provenience; that is, a catalog number on an artifact matches that artifact only with a provenience and not with a specific entry in the artifact catalog. Each provenience may have several catalog numbers, but the meaning of these has been lost. It is assumed these once referred to subdivisions of specific proveniences. A 25 foot long trench, for example, may have been excavated in five foot sections with each section being assigned a different catalog number. If this is the case, these subdivisions were not recorded in the catalog, and much detailed provenience information has therefore been lost.

The artifact catalog is itself very inconsistent and general. By comparing artifacts now in the collection against the catalog, it is clear that a small number (in the case of the ceramics, a large number) of artifacts have been separated or lost from the collections. Due to problems in interpreting the catalog entries, however, the exact extent of this problem is uncertain and the number and nature of any missing materials can only be imperfectly reconstructed. Except

for the ceramics, however, the problem of missing artifacts appears to be minimal.

The catalog numbers and the proveniences they identify are presented in Table 51. In the following discussions, artifacts are identified by catalog numbers. If information on their provenience is needed, this table should be consulted. In many cases artifacts did not carry a catalog number. These artifacts have been indicated as "Cat. no. ?" in the following descriptions. The locations of the various test trenches listed in the above table are described in Table 52.

The descriptions of artifacts presented in this appendix are broken down into the five major functional categories used in this dissertation. These categories describe architectural artifacts, kitchen artifacts, non-kitchen tools, personal and clothing artifacts, and furniture artifacts. An additional two categories describe non-recognizable melted glass artifacts and miscellaneous artifacts. These latter two groups include artifacts which for one reason or another could not be assigned to one of the five functional groups.

Table 51

Catalog numbers for the Fort Towson Commanding
Officer's Quarters and the proveniences they identify

<u>Catalog number</u>	<u>Provenience</u>
50 to 52	East kitchen, northeast quadrant
53	East kitchen, southeast quadrant
54 to 59	East kitchen, southwest quadrant
60	East kitchen, northeast quadrant
61 to 62	East kitchen, northwest quadrant
63 to 64	East kitchen, northeast quadrant
65 to 74	East kitchen, no quadrant
75 to 78	West kitchen, northwest quadrant
79 to 81	West kitchen, southwest quadrant
82 to 83	West kitchen, southeast quadrant
84 to 85	West kitchen, northeast quadrant
86 to 90	West kitchen, no quadrant
91	West kitchen, southeast quadrant
92 to 93	West kitchen, brick rubble pile
94 to 106	Hallway
107 to 110	Test trench 1
111 to 112	Test trench 2
113 to 119	Test trench 3
120	Test trench 4
121	Test trench 5
122	Not used
123	Test trench 6
124 to 125	Test trench 7
126 to 130	Test trench 8
131	Test trench 9
132	Test trench 8
133	Test trench 9
134	Test trench 11
135 to 138	Test trench 12
139 to 140	Test trench 13
141	Test trench 14
142	Test trench 15
143	Test trench 16
144	Test trench 17
145	Test trench 18

Table 51 (Cont'd).

146 to 147	Test trench 19
148	Test trench 20
149	Test trench 21
150	Test trench 22
151	Test trench 24
152	Test trench 25
153 to 154	Stair well
155	Surface
156 to 164	General provenience

This list does not include proveniences for the two privies associated with the commanding officer's quarters. Materials from the privies are not described in the manuscript.

Table 52

Descriptions of location of test trenches,
Fort Towson Commanding Officer's Quarters

<u>Test Trench</u>	<u>Description</u>
1	Along and both sides of west wall
2	Across west alley
3	Along and both sides of south (front) wall
4	Under south line of south (front) wall
5	Under south line of south (front) wall, porch piers in trench
6	Under south (front) porch steps, piers for steps in trench
7	South of south (front) porch steps, ruts for post street in trench
8	Along and both sides of east wall
9	Along and south of east-west interior wall

Table 52 (Cont'd).

10	Gravel paving representing ground floor porch, no catalogued artifacts from this trench
11	Within southwest corner of enclosed dooryard
12	Along east side of enclosed dooryard, pier for walkway to privy within trench
13	Gravel path and piers for north (back) walkway and porch steps
14	Along north edge of enclosed dooryard at north gate to dooryard
15	Northeast part of enclosed dooryard
16	Across east alley, cobble drain in trench
17	Across east alley
18	Across east alley, cobble drain in trench
19	Across east alley
20	Across east alley, cobble drain in trench
21	Across east alley, cobble drain in trench
22	Across east alley, cobble drain in trench
23	Across east alley, no catalogued artifacts from this trench
24	Across west alley, cobble path in trench
25	Across west alley, cobble path in trench

ARCHITECTURAL ARTIFACTS

Architectural artifacts were by far the most numerous recovered during the 1975 excavations of the Fort Towson Commanding Officer's Quarters. Most common among these artifacts were nails and nail fragments, but also included were impressive numbers of other types of artifacts such as window glass (the majority of which was melted), rim locks, hooks and staples, hinges, door latches, and shutter latches. The following provides detailed considerations of these artifacts.

The architectural component from the commanding officer's quarters presents an incredible information resource. Represented here is one of the largest single-structure inventories of architectural artifacts from an excavated site on the Great Plains or Trans-Mississippi west. On most sites, it is common to find, for example, a single butt hinge or rim lock. At the commanding officer's quarters, there are twenty-one architectural sized butt hinges and six rim locks, many with the mounting hardware still in place. This collection provides an excellent view, therefore, of the selections that were made in building the commanding officer's quarters on the then western frontier and during what was a transitional period in the history of architectural hardware.

The potential of this collection has nevertheless been lessened somewhat by a number of factors. First, the precise provenience of the architectural artifacts was apparently not recorded in the field, and was therefore not preserved in subsequent cataloging of the collection. Information once present on bags, such as date excavated

and excavator, could possibly have helped reconstruct certain associations, but is not preserved in the catalog. Associations between artifacts and building features noted in the field are not preserved in the collection, and therefore have been lost. Being able to examine these contextual relationships would have been very useful for a consideration of these materials.

Another serious problem has been the treatment of the collection since excavation. Many of the significant architectural artifacts have without question deteriorated significantly since excavation, and some are almost lost due to an accelerated post-excavation deterioration. In fact, some artifacts which are missing from the collection may simply have disintegrated into an unrecognizable pile of rust. This advanced state of deterioration of some of the architectural artifacts has certainly lessened their information potential. This deterioration is an ongoing process, and continues to theater the collection.

Nails

A total of 24,059 whole nails are included in the study collection. Added to this are numerous nail fragments, 3,119 of which have heads. Taken together, these head fragments and whole nails represent a minimum number of whole nails once present of 27,178. The distribution of sizes of the whole nails from the collection is presented in Table 53.

Included among the nails were a variety of types, including common cut, finish, "L" head, and rose head nails. Common cut nails were by far the most frequent, although finish nails occurred in number. "L" head and rose head nails were rare in the collection.

Table 53

Frequency of whole nails, all types.

<u>Pennyweight (d.)</u>	<u>Inch Equivalent</u>	<u>Number</u>	<u>Percent</u>
2 d.	1"	133	.6
3 d.	1.25"	9,249	38.4
4 d.	1.5"	220	.9
5 d.	1.75"	807	3.4
6 d.	2.0"	4,324	17.9
7 d.	2.25"	3,330	13.8
8 d.	2.5"	761	3.1
9 d.	2.75"	1,250	5.1
10 d.	3.0"	2,745	11.4
12 d.	3.25"	414	1.7
16 d.	3.5"	722	3.0
20 d.	4.0"	98	.4
30 d.	4.5"	1	.0
40 d.	5.0"	2	.0
50 d.	5.5"	3	.0
60 d.	6.0"	-	-
TOTAL		24,059	99.7

Table 54

Sizes of common cut and finish cut nails

<u>Pennyweight (d.)</u>	<u>Common</u>		<u>Finish</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
2 d. (1")	133	.6		
3 d. (1.25")	9248	42.1	1	-
4 d. (1.5")	216	1.0	2	-
5 d. (1.75")	802	3.7	4	.2
6 d. (2.0")	4301	19.6	17	.8
7 d. (2.25")	1323	6.0	2000	96.4
8 d. (2.5")	736	3.4	9	.4

Table 54 (Cont'd.)

9 d. (2.75")	1238	5.6	9	.4
10 d. (3.0")	2718	12.4	26	1.2
12 d. (3.25")	408	1.9	6	.3
16 d. (3.5")	722	3.2		
20 d. (4.0")	97	.4		
30 d. (4.5")	1	-		
40 d. (5.0")	2	-		
50 d. (5.5")	3	-		
TOTAL	21948	100.0	2074	99.7

Table 55

Sizes of "L" head and rose head nails.

<u>Pennyweight (d.)</u>	<u>"L" head</u>	<u>Rose head</u>
2 d. (1")		
3 d. (1.25")		
4 d. (1.5")		1
5 d. (1.75")		
6 d. (2.0")		
7 d. (2.25")		4
8 d. (2.5")	1	5
9 d. (2.75")	1	
10 d. (3.0")		
12 d. (3.25")		
16 d. (3.5")		
20 d. (4.0")		1
30 d. (4.5")		
40 d. (5.0")		
50 d. (5.5")		
TOTAL	2	11

In looking at the distribution of common cut nails in the collection, small to medium sized nails were by far the most common (Table 54). Nails 8 d. or smaller accounted for 16,759 nails, or 76.4 percent of all the common cut nails. Of these nails, most common were the 3 d. size, accounting for 9,248 or 42.1 percent of all common cut nails, and the 6 D. size, accounting for 4,301 or 19.6 percent of the common cut nails. Of the larger size nails, roughly half were of the 10 d. size; nails larger than 10 d. were rare in the collection of common cut nails.

The 2,074 finish cut nails from the commanding officer's quarters were almost entirely of the 7 d. size. This size accounted for 2,000 or 96.4 percent of the finish nails. The other finish nails were distributed between 5 d. and 12 d., but in no cases represented an important number. The fact that the finish nails were predominately of one size suggests a singular function for the nails.

Other nail types were rare at the commanding officer's quarters (Table 55). Only two "L" head, eleven rose head, and six hand forged nails were observed in the study collection. The "L" head nails, one 8 d. and one 9 d., probably served a function similar to the finish nails. The rose head cut nails, including one 4 d., four 7 d., five 8 d., and one 20 d., were used for decorative purposes, perhaps to fasten building hardware such as door latches or strap hinges.

Window Glass

The majority of the glass recovered from the commanding officer's quarters was melted (See general discussion of bottle and non-recognizable glass). Although much of the melted aqua glass from this

site is believed to have been window glass, for most sherds this cannot be demonstrated empirically. Thus, no quantitative statement of the importance of window glass in this assemblage of melted glass is possible. Since most of the melted aqua glass cannot satisfactorily be sorted into window glass and other aqua glass, it will not be further discussed here but is instead placed in a special section devoted to a discussion of all the melted glass from the site.

Two sherds of moderately melted aqua glass were recovered from the commanding officer's quarters and which could be identified as window glass. This identification was based on the color and relatively consistent thickness of the fragments but more importantly was based on the observable presence of finished, ninety degree corners on both pieces. These ninety degree corners are clearly the corner of a window pane. The melted condition of this glass did not allow a measure of thickness. This clear identification as window glass of two sherds of single thickness glass among the melted glass does help in supporting the tentative identification of other heat altered aqua sherds as window glass.

In addition, numerous fragments of unmelted glass were recovered from the site including thirty-eight which could be identified as window glass. These sherds were very small; eleven were smaller than two cm., twenty-six ranged in size from two to four cm., and only one was larger than four cm. Although the number of sherds is too small to be used in any of the available dating formulas for window glass, the thickness in 1/1000ths of an inch for the unmelted sherds has been recorded and is presented in Table 56.

Table 56
Summary of non-melted window glass

<u>Thickness</u>	<u>Number</u>	<u>Catalog numbers</u>	<u>Proveniences</u>
27/1000"	1	136	Test 12
35/1000"	1	149	Test 21
40/1000"	2	135, 136	Test 12
41/1000"	1	136	Test 12
42/1000"	3	118, 136, 143	Test 3, 12, 16
43/1000"	2	143, 150	Test 16, 22
44/1000"	1	136	Test 12
45/1000"	1	136	Test 12
46/1000"	3	135, 135, 135	Test 12
47/1000"	2	136, 136	Test 12
49/1000"	1	136	Test 12
50/1000"	1	134	Test 11
51/1000"	3	116, 126, 136	Test 3, 8, 12
52/1000"	4	77, 143, 147, 153	West kitchen, stair well, Test 16, 19
53/1000"	1	136	Test 12
54/1000"	2	135, 136	Test 12
55/1000"	2	108, 135	Test 1, 12
56/1000"	2	135, 157	Test 12, general
58/1000"	1	134	Test 11
60/1000"	1	111	Test 2
65/1000"	1	143	Test 16
68/1000"	1	120	Test 4
70/1000"	1	134	Test 11

Except for the two sherds from the west kitchen and stair well, all of the unmelted specimens are from test trenches. Further, all except one of these sherds found in test trenches were found in trenches located outside the limits of the commanding officer's quarters building. These contexts are expected to contain refuse deposited prior to the destruction of the building in addition to that

generated during the fire.

These unmelted sherds are clearly sherds deposited prior to the building destruction. In this context, the very small numbers of sherds present is interesting considering the long use of the area. Since the windows present in this building when it was destroyed presumably were all melted, the low density of unmelted sherds may indicate that on sites where window glass sherds occur in high frequency, and where the buildings are not burned, most of the sherds may result from the destruction of the building or to some catastrophic event associated with it rather than to its normal, active use.

Rim Locks

A total of twenty-one artifacts are included with this discussion of rim locks (Figures 20, 21, and 22). These include six lock mechanisms, two back plates of lock mechanisms, one side to a rim lock case, one cast iron rim lock fact plate, one rim lock bolt spring, seven lock "staples", two key fragments, and one complete key. One of the back plates and one of the key fragment are associated with one of the lock mechanisms, and will be discussed with that mechanism. In addition to these artifacts that are included in the collection, the artifact catalog provides mention of five specimens probably related to rim locks that are now missing. These include one large door key (Cat. no. 58), one "large lock fact-no interior" (Cat. no. 112), one "box lock with interior parts" (Cat. no. 112), one "door lock" (Cat. no. 116), and one "door facing" (rim lock?) (Cat. no. 160).

Rim locks were surface mounted on the interior of a door and were very common during the eighteenth and nineteenth centuries. Although

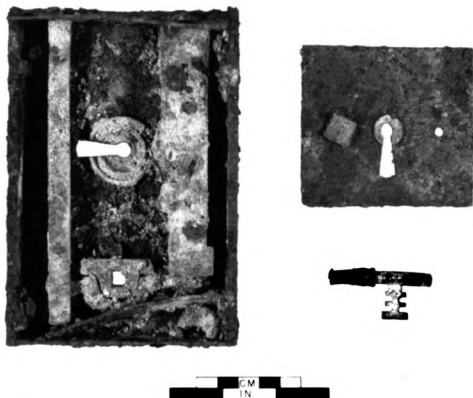


Figure 20. Double bolt rim lock. Left: rim lock showing internal mechanism; Upper right: back plate; Lower right: fragment of key.

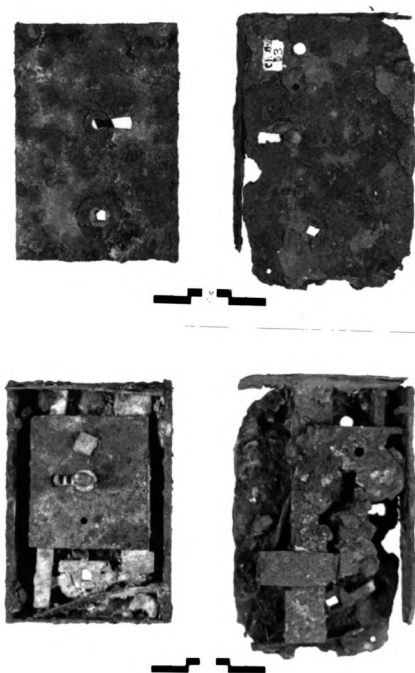


Figure 21. Rim locks. Top row: obverse views showing faces; Bottom row: reverse views showing internal mechanisms.



Figure 22. Rim locks and staples. Top row: closet locks; Bottom row: rim lock staples.

rim locks came in a number of sizes and varied in some of their characteristics, they were all very similar in design and proportion (Streeter 1974). The key, the lock mechanism, and the lock staple (also called box staples or keepers) represent a functional unit; the key operated the lock mechanism, mounted to the door, and the lock staple, mounted to the door jamb, received the bolt(s). Except for the key fragment, back plate, and lock mechanism that are obviously part of the same unit, and since associations observed in the field have been lost, it is impossible to associate the key, lock mechanisms, and lock staples from this site and each will be discussed independently of the others.

Rim Locks

Rim Lock Number 1 (Cat. no. 63)

This all-iron rim lock is the largest in the collection, and is also the most sophisticated. Its face measures approximately 4.3 inches in height, 7 inches in width, and 1 inch in thickness. The iron case of this lock was manufactured from three pieces. A single, relatively thin piece of rolled iron was bent to form the top plate and the left and right sides. The top and bottom sides were made of a heavier gauge iron, and were fastened to the top plate with iron studs which were riveted to the top plate and to the sides.

One complete flathead wood screw, measuring 1.5 inches in length, and one fragment of a similar screw remain with this lock and served to anchor it to the door. Locks of this type were intended to be anchored with round head screws, which were also called "lock screws" because they were developed for this purpose (Streeter 1974: 53).

This lock would have been fastened to the inside, left hand side of the door.

A very corroded stub of an iron key remains inserted in this lock although none of its characteristics can be determined other than the fact that the bit of the key is symmetrical and split for a single "ward". A ward is an obstruction placed in the path of the key and through which the key must pass in order to engage the mechanism (Streeter 1974: 49). The ward in this lock is a single, simple ward made of a thin piece of rolled iron. Such a simple ward system is characteristic of inexpensive locks with a short life span. According to Streeter:

...well made locks added one or more wards to the main ward or to the front or back plates, which were continuous arcs, or radii from the center of the keyhole. This kind of ward provided a smooth and constant track for the travel of the key, preventing any pressure, and hence any wear, on the center collar or the keyholes. Such construction assured trouble free operation for the life of the lock. Clearly, this sort of assembly called for precision and patience in layout and assembly (Streeter 1974: 49).

This lock was a "three bolt" lock; it had a large deadbolt operated by the key, a smaller latch bolt operated by a door knob, and a small "night" bolt operated by a slide on the bottom of the lock. This night bolt was not found on all locks, and was designed to allow the door to be locked from the inside only, and prevented entry from the outside even with a key.

All three of the bolts on this lock are currently withdrawn into the mechanism, indicating the door was unlatched and unlocked at the time the building was destroyed. Noticeably missing on this lock is

any evidence of a door knob shaft. Considering the fact that a portion of a key remains in this lock, it is probable that the lack of a knob shaft indicates it was not present on the lock at the time of the destruction of the building.

This specimen has a size range of 20 to 25 cm.

Rim Lock 2 (Cat. no. 64)

This rim lock is in incredibly poor condition and was not at first recognized as a lock. What otherwise appeared as a bag of small rusted fragments of iron turned out to be the disintegrated remains of a rim lock with a few recognizable pieces including a small iron bolt and several fragments of the lock case. From the fragments, the case for this lock appears to have been constructed in the same manner as the others described from this site.

Unfortunately, the size or exact type of lock represented by these fragments cannot be reconstructed. Based on the size of the bolt present, however, this lock compares most favorably with the two small closet locks , rim locks 3 and 4 below, from the commanding officer's quarters.

Rim Lock Number 3 (Cat. no. 80) and 4 (Cat. no. 104)

Rim locks number 3 and number 4 are identical closet locks. Both measure 3.1 inches in height, 5 inches in width, and .8 inches in thickness. Both are entirely of iron construction. Their cases are composed of three sections and are manufactured in a fashion identical to that described for lock number 1. Both were intended to be fastened to the door with three screws. Lock number 4 has one complete flat head screw, 1.2 inches in length, and one fragment of a similar flat

head screw associated with it. Lock number 5 has three round head or lock screws associated with it, all of which measure approximately 1.3 inches in length.

Both locks were intended to be mounted on the inside, left hand side of a door. These locks have only a single, relatively light-weight dead bolt. The bolts on both of these locks are withdrawn, indicating their unlocked status when the commanding officer's quarters was destroyed. There are no keys or key fragments associated with these closet locks. Both used identical keys with symmetrical bits and a single rolled iron ward.

These specimens have size ranges within 15 to 20 cm.

Rim Lock Number 5 (Cat. no. 123)

Rim lock number 5 is a type of lock known as a closet lock. A closet lock is characterized by the presence of a single, key operated dead bolt. Absent are the knob actuated latch bolt and the slide operated night bolt. The dead bolt for this lock is withdrawn into the lock, indicating the unlocked status of this mechanism at the time of the building's destruction. This lock measures approximately 3.5 inches in height, 5.5 inches in width, and 1.1 inches in thickness. The manufacture of the three-piece case of this closet lock is identical to that described for lock number 1.

This all-iron closet lock was originally intended to be fastened to the inside of a door by four screws. Still present with the lock are two round head screws measuring about 1.6 inches in length. Present in one of the screw holes is a broken, relatively large penny (ca. 10 d.) cut nail which obviously served as a replacement for a

missing screw. This lock was intended to be mounted on the inside, right hand side of a door.

Also present with this lock is a relatively long section of a badly corroded iron key. This iron key has a bit that is divided for a single, simple rolled iron ward, and no box of wards are present. Of interest, unlike the other locks from this site, the key for this lock has an asymmetrical bit. Such a key will only fit into one side of the lock. In this case, assuming the lock was mounted on the inside of the door, this lock could be locked and unlocked from the outside of the door only.

This specimen has a size range of 15 to 20 cm.

Rim Lock Number 6 (Cat. no. 153)

This rim lock is substantially different from rim lock number 1 in that it contains much brass and in that it is a two bolt lock. The case for this lock, including the back plate, is of iron but all of the internal parts except for the latch bolt spring are made of brass. The case for this lock is of three piece, riveted construction identical to that observed for lock number 1. The bit end of a brass key remains associated with this lock. This lock is somewhat smaller than number 1, with a height of 4.1 inches, a width of 6 inches, and a thickness of .8 inches.

The three screws which served to fasten this lock to the door are still with the lock. These include two round head or lock screws, which measured about 1.6 inches in length, and one flat head screw of indeterminate length. This lock was intended to be fastened to the inside, right hand side of a door.

This lock was further characterized by two bolts, both of brass, and which include a dead bolt and a latch bolt. Both of these bolts are withdrawn into the lock mechanism, indicating the lock was unlatched and unlocked when the commanding officer's quarters was destroyed. The brass key associated with this lock has a one piece, symmetrical bit; the only wards used in the lock were the "box of wards" attached to the inside front and back plate of the lock.

The brass key associated with this lock is incomplete, and is severed along the midsection of the barrel. It appears that rather than having broken at this point, that the missing half of the key simply melted away in the intense heat of the fire. The portion of the key which remains would have been within the lock and the actual door. This may have afforded the preserved portion some protection from the fire.

As was the case with lock number 1, no knob shaft was present. Once again, the presence of a key fragment with this lock mechanism and the lack of any sign of a knob shaft would appear to indicate the lack of a knob shaft at the time of the building's destruction.

This specimen has a size range of 15 to 20 cm.

Rim Lock Case Fragment (Cat. no. 132)

A heavy cast iron side to a rim lock case is included in the collection. This side measures 5.6 inches in length and .8 inches in width. It was fastened to the lock face with two iron studs which are riveted to the side and which would have been riveted to the lock face as well. The exterior of the side is channeled; this channel is .5 inches wide and is formed by the presence of two beveled ridges running

longitudinally along the edges of this specimen. It has a size range of 10 to 15 cm.

Back Plate (Cat. no. 68)

This back plate, which measures 2.9 by 3.2 inches, can not be associated with any of the lock mechanisms recovered from the commanding officer's quarters. It is identical to the back plate present on rim lock number 6. Given the fact that all the lock mechanisms except number 2 still have their backs with them, and given the extremely deteriorated condition of lock number 3, the presence of this isolated lock back probably serves to indicate that there was yet another lock present. The fact that this back plate is identical to that on Lock number 6 and also that it differs from those observed on the other four lock mechanisms in the collection provides evidence that another lock identical to number 6 was present.

This specimen has a size range of 10 to 15 cm.

Cast Iron Face Plate (Cat. no. 63)

This is a fragment of a face plate of a cast iron rim lock. It measures 3.2 inches in width, but is broken so that the other dimension cannot be determined. Present on this fragment are two screw holes, and a .5 inch diameter hole for a door knob shaft. This face plate is decorated with a single raised line running parallel to its edges. Due to its cast iron construction, this lock part differs from the other rim locks documented in this collection. It has a size range of 10 to 15 cm.

Dead Bolt Spring (Cat. no. 96)

This is a broken dead bolt spring from a rim lock. It has an incomplete length of 3.2 inches and a width of .4 inches.

Rim Lock Staples

The term lock staple originated when a simple iron staple was used to receive the bolt of a lock. The lock staples associated with rim locks are actually more like boxes open at one end and are sometimes called "box staples". They were similar in dimension to the height and thickness of the lock they were used with.

Lock Staple Number 1 (Cat. no. 63)

This specimen is a severely rusted and fragmented one. From the number and sizes of the many fragments making up this artifact, it is interpreted as the remains of a lock staple. It is also possible that this represents the remains of a rim lock. No information on the dimensions of this artifact can be reconstructed from its fragmentary remains. It is possible to say, however, that this was of composite construction similar to that observed for the rim locks.

Lock Staple Number 2 (Cat. no. 82)

This staple measures 4.2 inches in height, 1.3 inches in width, and .9 inches in thickness. It appears to be of three piece construction with the front and two side plates being formed by bending a single piece of iron and the third side plate being attached to these by studs riveted to the side plate and to the face plate. A separate strike plate, missing from this specimen, was apparently attached to the top plate with two small rivets as indicated by two small holes on the edge of the top plate. This staple was fastened to the door jam

with two wood screws, of which only a very corroded head for one flat head screw remains. It has a size range of 10 to 15 cm.

Lock Staple Number 3 (Cat. no. 103)

This lock staple is relatively small in size, measuring approximately 1.1 inches in length, 2.8 inches in height, and .5 inches in thickness. It is of one piece construction, and was fastened with two screws. Neither of the screws remain with this specimen, and there is no evidence for the presence of a strike. This specimen has a size range of 6 to 8 cm.

Lock Staple Number 4 (Cat. no. 128)

This is a fragmentary lock staple. It was apparently of one piece construction, and its reconstructed measurement is .8 inches in length, 2.9 inches in height, and .6 inches in thickness. It was fastened with two screws, neither of which remain with the specimen. There is no evidence for the presence of a strike on this artifact. This artifact has a size range of 6 to 8 cm.

Lock Staple Number 5 (Cat. no. 132)

This lock staple is extremely well preserved. It has a face that is 2.9 inches in height and 1.0 inches wide, and is .6 inches thick. It is of one piece construction, and was fastened with two screws. Present in one of the screw holes is a flathead wood screw 1.3 inches in length; this is obviously a substitute for the lock type screw that was the intended fastener for this artifact. There is no evidence on this specimen for the presence of a strike plate. This specimen has a size range of 8 to 10 cm.

Lock Staple Number 6 (Cat. no. 153)

Lock staple number 6 is the smallest in the collection, and measures approximately 3.8 inches in height, 1 inch in width, and .8 inches in thickness. It appears to have been of three piece construction. A single piece of thin rolled iron was bent to form the face, the top, and the bottom plates. The long side plate was made of heavier iron and was fastened to the top plate by means of studs which were riveted to the side plate and to the top plate. This type of construction was identical to that used to make the boxes for all the rim locks described above. Although no strike plate is present on this specimen, it was apparently a separate piece which was riveted to the top plate through two small holes observed on the edge of the top plate. The lock staple itself was certainly fastened to the door jamb with two screws, neither of which remains with this artifact.

This specimen has a size range of 10 to 15 cm.

Lock Staple Number 7 (Cat. no. 153)

Lock staple number 7 is made of a single piece of thin, rolled iron. This iron was bent to form the face plate, all three sides, and the strike plate. Such construction differs markedly from that observed on the rim locks from this site. Compared to the construction observed for these rim locks and for other lock staples, this staple could easily be characterized as inexpensive and of relatively poor quality.

The dimensions of this staple are 4.2 inches in height, 1.3 inches in width, and 1.1 inches in thickness. The strike protrudes .3 inches above the top plate. This lock staple was fastened to the door jamb

by two, round head screws, both of which remain with this artifact. One of these screws is fragmentary, but the complete one measures 1.7 inches in length.

This specimen has a size range of 10 to 15 cm.

Keys

A single, complete iron key is included in the collection (Cat. no. ?). This is a large key measuring 6 inches in length. Of interest, it has an asymmetrical bit which is split for a single, simple rolled iron ward. The bit forms an "S" shape which is similar to the bit observed on lock number 3. The "S" shape of this bit would have made it impossible to insert the key into both sides of the lock, and would thus have allowed the lock to be opened from one side of the door only. This would best fit the description of a closet lock, and it is probable that this key fit such a lock. It does not appear to have fit any of the locks discovered in the commanding officer's quarters, but is not necessarily evidence for the presence of another, undiscovered lock in this building. It could easily have been for a lock in another building altogether. This key has a size range of 15 to 20 cm.

A small fragment of a large key is also present in the collection (Cat. no. 63). This section, which measures only 1.5 inches in length, is from the barrel of the key between the bow and bit. It includes some ornamentation. Most details of this key cannot be reconstructed since only a small part remains, but it would appear to have been similar in size to the complete key described above.

General Considerations

There are a number of interesting characteristics of these locks that deserve consideration. One of the most obvious things to discuss is the status of the locks at the time the commanding officer's quarters was destroyed. On the five complete locks, the bolts are withdrawn into the lock mechanisms indicating that all were open. Also of interest but harder to assign a particular interpretation to is the fact that the two room locks and the larger of the three closet locks still had their keys inserted into the mechanism. This may indicate the active use of the building, and possibly the presence of people in the building at the time of its destruction.

Also of interest is the lack of door knobs on the two room locks. Both were made to be operated with a door knob; the lack of a door knob shaft in these mechanisms indicates that these locks were not operated in this fashion. Some other means of latching the doors was probably in use; in reference to this the discussion of Suffolk type latches from this site is of interest.

The means by which the door locks were fastened to the doors is also of interest. Door locks such as these were intended to be fastened with round head or lock screws. While this was the predominant type of screw observed on the locks and the lock staples, flat head wood screws were observed on some lock mechanisms and one machine cut nail was apparently used in place of a screw on one of the room locks. The presence of these different fasteners on these locks indicates a make-do approach to either the installation of these locks or the maintenance of the buildings. Since this was not a new

building at the time of its destruction, the haphazard use of fasteners on these locks probably represents a maintenance choice.

Wrought Iron "Suffolk" Type Thumb Latches

At the turn of the nineteenth century two primary types of lock-independent door latches were in use. These were the "Suffolk" and the "Norfolk" type latches. The Suffolk latch was the earlier form, and during this period was being replaced by the Norfolk latch. This replacement process was very much a part of the industrial revolution which made available to latch makers cast iron parts, sheet steel, and a variety of new manufacturing tools and procedures.

The Suffolk and Norfolk latches were both similar in many respects. They consist of an assembly of parts mounted on both sides of a door. On the outside is a surface mounted handle (pull) and thumb press (Figure 23). The thumb press is attached to a lift which passes through the door and which lifts the latch bar on the other side of the door. On the inside of the door is an assembly which consists of a latch bar fastened to the door; a staple, also fastened to the door and which guides and restricts the movement of the latch bar; and a keeper, which is fastened to the door frame and which secures the door when the latch bar is dropped (Figure 24). The latch bar can be raised by both the thumb press from the outside or simply by lifting it manually from the inside.

The Suffolk latch was mounted to the door by clinched nails or screws placed through two "cusps" which actually represented extensions of the handle. With the Suffolk latch, the latch bar assembly consisted of a latch bar mounted to the door with a clinched nail; a



Figure 23. Suffolk latches: Handle and thumb press assemblies.

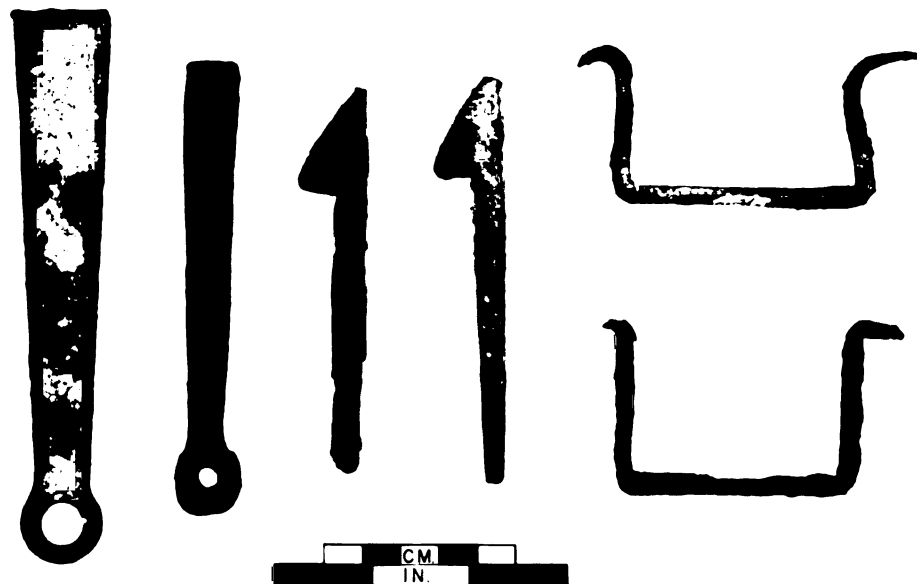


Figure 24. Hardware associated with Suffolk-type thumb latches. Left: two latch bars; Center: two driven keepers; Right: two clinched, driven staples.

staple, also driven through the door and clinched; and a keeper which was driven into the door frame. The Norfolk latch differed from the Suffolk in that it had a full-length mounting plate rather than the simple cusps found on the Suffolk latch, and because it also replaced the hand driven and clinched keeper, staple, and latch bar with a similar screw mounted assembly (Streeter 1971).

The reasons for the success of the Norfolk latch can be found not only in innovations of the industrial revolution which increased the efficiency of its manufacture, but also in its ease of installation:

The Norfolk latch was a cheap latch, but it had more to offer than its cheapness, when compared to its predecessors [the Suffolk latch]...it...eliminated some rather untidy carpenter work required by older Suffolk latches. No longer need the carpenter drive and clinch a staple through the door to guide the bar, clinch a nail for its pivot, or drive a spike into the door frame for the keeper. Now the entire bar assembly came on plates, for mounting with now plentiful machine made wood screws (Streeter 1971: 19).

It would seem, then, that the latch bar apparatus is the sensitive part of the latch assembly in terms of obsolescence.

The general trend during the first decades of the nineteenth century was towards the replacement of the Suffolk with the Norfolk latch and with the increasing use of cast iron in the construction of both. The use of cast iron was especially prevalent in the handles, although all parts could be and were made of cast iron. Cast iron was not necessarily perceived as a better choice, however, and many manufacturers continued to make forged Norfolk latches well after the common availability of cast iron counterparts.

The collection from the commanding officer's quarters contained numerous parts probably representing five Suffolk type thumb latches.

Parts represented include the actual door pull/thumb press assembly, latch bars, staples, and keepers. In addition to these artifacts present in the collection, the catalog contains evidence of several other artifacts that may be associated with Suffolk latches, but which are now missing. These include a "door handle" (Cat. no. 143) and what may be a driven keeper (Cat. no. 63).

Door Pull/Thumb Press Assemblies

Key to identifying the presence of Suffolk type thumb latches is the form of the door pull/thumb press assembly. Six Suffolk type parts, probably representing five assemblies, are present in the study collection. These assemblies consist of the door pull itself and the thumb press which passes through and is attached to the pull.

Door Pull/Thumb Press Assembly 1 (Cat. no. 50)

This specimen consists of a relatively well preserved example, although the thumb press/lift is heavily corroded. It appears to be completely of wrought-iron construction. The reverse side of this handle is flat but is slightly beveled on the right and left side of the face to form a ridge running the length of the handle. The identical cusps are leaf-shaped, and the extreme tip of each cusp has been rolled over onto itself in a decorative curl. There are three non-countersunk holes in each cusp for fastening the pull to the door, but neither screws or nails remain with the specimen to indicate which was used to fasten it. Due to their non-symmetrical placement on the cusps, these holes were obviously hand placed and punched.

The thumb press/lift is a single wrought iron piece. It passes through a relatively thick portion of the pull above the handle and

below the cusp. The thumb press is oval and is concave in cross section. The lift, attached to the thumb press, is flat in cross section and curves downward.

This artifact measures 10.0 inches in overall length, from cusp tip to cusp tip. The cusps measure about 2.0 inches in height and 1.6 inches at their widest point. At its widest point, the handle measures 1.0 inches across. The thumb press/lift bar currently measures 4.3 inches in length although this probably does not represent its original length due to corrosion.

This specimen has a size range of 25 to 30 cm.

Door Pull/Thumb Press Assembly 2 (Cat. no. 85)

This specimen appears to be identical to Assembly 1 above except that it is badly corroded; the thumb press, the upper cusp, and part of the lift bar are entirely missing. The dimensions and configuration of those parts that can be observed, however, match those of Assembly 1. The overall length of this piece, which has been shortened considerably due to corrosion, is 7.5 inches. It has a size range of 15 to 20 cm.

Door Pull/Thumb Press Assembly 3 (Cat. no. 96)

This specimen is incomplete due to corrosion, and includes the thumb press/lift bar, the upper cusp, and about the upper one-third to one-half of the handle. Represented by a separate fragment is the lower cusp and part of the handle. This smaller fragment is extremely rusted and rust encrusted.

The overall length of the larger portion of this assembly is 6.1 inches. The smaller fragment measures 3.5 inches in length. Although

badly corroded and incomplete, this specimen appears to have been radically different than the others from this site in at least one characteristic. This characteristic is the handle which, although extremely rusted, was round in cross-section, with a diameter probably close to .6 inches. Faintly visible about 2.75 inches from the top of the handle are three closely spaced (.1 inch), shallow grooves which encircle the handle and which obviously represent a decorative treatment.

Except for the handle, this artifact is similar to others from the site. The handle, as well as all remaining parts of this artifact, appear to be forged rather than cast. The handle is topped by a leaf shaped cusp (incomplete, measures 1.4 inches in width) with three non-symmetrical holes for fastening. The lift bar passes through a thickened portion of iron between the cusp and the handle, and which is about 1.2 inches in length and .4 inches square in cross section.

Due to its somewhat better condition, a little more can be said about the thumb press and lift bar than on previous specimens. The thumb press and lift bar are a single piece of iron with an overall length of 5.2 inches. The thumb press is concave in cross-section and circular in plan, and measures 1.3 inches in diameter. Attached to this is a thin lift bar, radically rectangular in cross section (.5 x .05 inches) and which curves downward in a slow arc. The end of the lift bar is decoratively finished by rolling the iron in a tight spiral. It has an overall size range of 15 to 20 cm.

Door Pull/Thumb Press Assembly 4 (Cat. no. 101)

The specimen represented here is extremely corroded and rust encrusted. It is so rust encrusted that it was not immediately recognizable as part of a Suffolk latch. This specimen represents the upper half of a Suffolk latch including the upper leaf-shaped cusp, thumb press, and upper half of the handle. Because of the condition of this specimen, its specific characteristics cannot be further described. It does appear, however, to have a basically flat handle, and thus appears similar to all the latches except number 3, which has a round handle. This specimen has a size range of 15 to 20 cm.

Door Pull/Thumb Press Assembly 5 (Cat. no. 104)

This specimen is similar to the others from this site, yet it differs in the shape of the cusps. It also has the best preserved thumb press-lift bar. The overall length of this artifact is 10.0 inches, but this does not reflect the original length because this specimen has been bent and because part of the lower cusp is missing due to corrosion. The normal curve of this handle has been flattened and the lower cusp bent out of shape.

The handle on this specimen is similar to that on Assembly 1 and 2 above; it is basically flat in cross section but is slightly beveled on the face to form a ridge running the length of the handle. The lift bar passes through a thickened portion of iron between the handle and the upper cusp, and which measures about 1.4 inches in length and .4 inches square in cross section. The cusps are both leaf shaped and both have three holes for fastening. The lower cusp is badly corroded, but the upper cusp is well preserved. While this cusp is

leaf shaped and while its tip is rolled over onto itself for decorative purposes, this cusp draws to a much sharper point and is longer than others from the site. It measures 1.8 inches at its widest point and is 2.4 inches in length.

The thumb press-lift bar is well preserved on this latch. It has an overall length of 4.5 inches, and consists of a circular thumb press, concave in cross section, attached to a lift bar that measures .5 by .1 inches in cross section. The lift bar curves slowly down and is finished on the end by bending the iron clockwise into a tight spiral. It is notable that the pin that fastens the lift bar to the handle, and on which the lift bar pivots, can be observed. This pin appears to be about .1 inches in diameter. This specimen has a size range of 25 to 30 cm.

Door Pull Cusp (Cat. no. 101)

This artifact consists of a heavily corroded and rust encrusted leaf-shaped cusp from a door pull/thumb press assembly similar to those described above. It is probable that this cusp is associated with assembly 3 or 4 above. This cusp measures about 2.0 inches in length and 1.5 inches at its widest point. Its tip has been rolled over onto itself in a fashion similar to that described for assembly 1 and 4 above. It has a size range of 6 to 8 cm.

Latch Bar Assembly Parts

Latch bar assembly parts include the latch bar itself, the staple, and the keeper.

Latch Bars

Latch Bar 1 (Cat. no. 94). This latch bar is completely intact and in good condition. It consists of a flat strip of thin (.05 inch thick) iron 4.6 inches in length; one end has been perforated for fastening and the other had been folded over onto itself in a tight, decorative curl. The perforated end has also been enlarged to form a circular cusp, .8 inches in diameter, surrounding the perforation. This artifact has a size range of 10 to 15 cm.

Latch Bar 2 (Cat. no. 103). This is a very corroded artifact represented by two fragments that apparently once articulated but for which the articular surfaces are no longer present. It is interpreted as a latch bar because of the lack of holes for fasteners on the body of the artifact and because the body has a relatively consistent width. These characteristics, while not overly conclusive due to the condition of the artifact, serve to suggest that this is not the end of a strap hinge, which would have a roughly similar shape to that of a latch bar.

This specimen has a reconstructed length of at least 6.0 inches. It is similar to latch bar 1 in that it is perforated on one end for attachment, and because this end has also been flattened into a circular cusp. This cusp measures approximately 1.0 inches in diameter. Other characteristics of this artifact cannot be determined due to its condition. It has a size range of 10 to 15 cm.

Latch Bar 3 (Cat. no. 104). Latch Bar 3 is a rusted artifact much larger than the others from this site. It is similar in configuration to the end of a strap hinge, but is interpreted as a latch bar due to the lack of mounting holes along its body and by the fact that it

narrows very slightly at the distal end. This artifact measures 8.3 inches in overall length, and has a perforated, circular cusp 1.1 inches in diameter on one end and a body which expands slightly from this cusp to the distal end. The remains of a fastener are still present, but it is so highly corroded that it cannot be determined whether it is a nail or a screw. It has an overall size range of 20 to 25 cm.

Latch Bar 4 (Cat. no. 143). This specimen is heavily rusted and bent out of shape. It has an overall length of 6.0 inches and is made of a thin piece of rolled or otherwise flattened iron. It has a circular, perforated cusp measuring 1.5 inches in diameter on one end, and a body which expands from this for about .8 inches. After this .8 inches, the body of this artifact is a consistent 1.5 inches in width. The distal end of this bar is irregular, and may be broken.

About 4.2 inches from the proximal end of this latch bar, there is what appears to be the head of a rivet present in a perforation in the body of the bar. The purpose of this rivet is uncertain, but it may have served to fasten a knob to the latch bar. Such knobs were present on some latch bars, and were used to raise the bar from the inside of the door (Streeter 1971).

Latch Bar 5 (Cat. no. 155). This latch bar is in relatively good condition. It has an overall length of 5.7 inches, and has a circular cusp .8 inches in diameter punctuated by a circular hole .4 inches in diameter. At the cusp, the body of the latch bar is .6 inches wide; it expands to 1.0 inches in width at its distal end. At the distal end, the iron is curled over onto itself. This specimen has a size range of

10 to 15 cm.

Staples

Staple 1 (Cat. no. 101). This staple is in relatively good condition. It is "U" shaped with sharp, ninety degree corners. Its face is .5 inches wide and 2.6 inches long. The sides are also initially .5 inches wide but quickly narrow to form spikes which taper to a point. The tips of these spikes are clinched. Based on the length of the spikes and the point at which they were clinched, this staple was probably fastened through a piece of wood, probably the door, about 1.0 inches in width. The exposed portion of the staple would have projected about .4 inches from the surface of the door. This artifact has a size range of 8 to 10 cm.

Staple 2 (Cat. no. 104). This staple is extremely rusted but is otherwise complete. It is identical in form to Staple 1. Its face is .6 inches wide and 2.4 inches long. The sides are also initially .6 inches wide but quickly narrow and taper to a point. The tips of these spikes are clinched. Based on the length of the spikes and the point at which they were clinched, this staple was probably fastened through a piece of wood between 1 and 1.2 inches in thickness. The exposed portion of the staple would have projected about .4 inches from the surface of the door. This staple has a size range of 8 to 10 cm.

Staple 3 (Cat. no. 123). Although identical in form to Staple 1, this staple is extremely rusted and is incomplete. Its face is about .5 inches wide, but its length is incomplete. The single spike present with this staple is clinched, and would have been fastened through a piece of wood about .7 inches in thickness. The exposed portion of

this staple would have projected about .4 inches from the door. This specimen has a size range of 6 to 8 cm.

Staple 4 (Cat. no. 123). This staple is moderately rusted and is complete except for the tips of the spikes. It is identical in form to Staple 1. It has a face that is .65 inches wide and 2.3 inches in length. The tips to the spikes have rusted off, and it is uncertain whether they were clinched. The exposed portion of the staple would have extended about .5 inches from the face of the door. This artifact has a size range of 8 to 10 cm.

Staple 5 (Cat. no. 151). Although only moderately rusted, this staple is bent and broken. It is, however, identical in form to Staple 1. Its face is .5 inches wide; its length cannot be determined. The tip of the one spike remaining with this specimen is broken, so it is uncertain if it was clinched. The exposed portion of this staple would have extended about .3 inches above the face of the door. This specimen has a size range of 8 to 10 cm.

Keepers

Keeper 1 (Cat. no. 57). This specimen is heavily rusted and has probably lost some of its original length. It consists of a single, probably hand forged piece of iron 3.9 inches in length and about 2.5 inches thick at its widest point. One end has the shape of a right triangle which gives way to a 2.9 inch long spike which is square to rectangular in cross section and which tapers to a point on two sides. The upper point of the triangle also has been flattened to taper to a blunt point. It has a size range of 8 to 10 cm.

To fasten this keeper, the spike was driven into the door frame

almost up to the triangular end, or stop. When dropped by the lift bar, the latch bar would rest on the exposed portion of the spike, and the triangular stop would secure the latch bar from horizontal travel; i.e., it would latch the door closed.

Keeper 2 (Cat. no. 102). This keeper is essentially identical to Keeper 1 except that it is in a much better state of preservation. This specimen has an overall length of 4.1 inches of which 3.1 inches is the spike and 1.0 inches the triangular stop. Like Keeper 1, the spike and the upper point of the triangular stop taper to a point. This artifact has a size range of 10 to 15 cm.

Keeper 3 (Cat. no. 103). Keeper 3 is the most heavily corroded in the collection but probably has maintained close to its original dimensions. This specimen measures 3.9 inches in length, of which 2.8 inches are taken up by the spike and 1.1 inches by the triangular stop. The triangular stop on this specimen is much more massive in proportion than the others from the collection. The point of the spike, while still formed by tapering two sides, has been formed differently than on Keepers 1 and 2. While in these specimens the tapering was carried out on the vertical faces, on this specimen the tapering has been accomplished on the horizontal faces. Further, the upper point of the triangular stop has not been flattened towards a point as with keepers 1 and 2. Thus, this specimen is of a uniform thickness while keeper 1 and 2 vary in thickness due to the pointing of the spike and the upper point of the stop. This difference would seem to indicate different manufacture, with those tapering on the vertical faces resulting from a hammering process during hand forging, and with those tapering on the

horizontal faces probably resulting from a process of cutting the keeper, in its final form, from a blank of sheet iron. Both approaches could have been utilized in the centralized manufactory or at the level of the local smith. This keeper has a size range of 8 to 10 cm.

Keeper 4 (Cat. no. 132). This specimen is the best preserved in the study collection. Like Keeper 3, this artifact is of a relatively uniform thickness with the point of the spike being formed by the tapering of the horizontal faces. The good condition of this specimen allows an observation that despite the general uniformity in thickness, there are minute variations in this variable which suggests, perhaps, that this artifact was hand wrought rather than machine cut from factory manufactured plate. This specimen measures 4.4 inches in length with a 3.3 inch long spike and a 1.1 inch long stop. It is approximately .2 inches thick. This specimen has a size range of 10 to 15 cm.

Hand-Forged, Clinch Type Nails

A small number of hand-forged, clinched nails were found in the ruins of the commanding officer's quarters (Table 56). These nails are interpreted as having served to fasten architectural hardware, and specifically suggested is an association with the Suffolk latches found at the site. These nails would have been of the type used, for example, to fasten the latch bars of these locks, although other similar uses are possible.

These nails are highly variable but conform to a standard pattern. They have large, circular heads which are slightly convex on top and

Table 56

Hand-forged, clinch-type nails.

<u>Catalog no.</u>	<u>Head diam.</u>	<u>Shank length</u>	<u>Clinched?</u>
104	.6"	1.7"	No
132	.6"	2.4"	1.9" below head
132	.6"	2.0"	No
132	.7"	1.8"	1.2" below head
132	.6"	2.3"	No
152	.6	2.0	No

concave on the reverse, where the shank is attached. The shanks are generally squared, and taper on all sides to an apex or to a flattened point. Most of the specimens are clinched. Table 57 describes these nails individually.

Bar Staple

A large iron staple is included in the collection (Cat. no. 63) and is interpreted as a bar staple. This artifact would have served to secure a bar that was thrown across a door or shutter. This staple is essentially similar to the much smaller latch bar staples described with the Suffolk latches above. It has a face that is 1.5 inches wide by 4.1 inches in length. At each end of this face the iron is bent to form a ninety degree angle. The side maintains the 1.5 inch thickness observed for the face for a distance of about 1.5 inches, at which point it narrows to a width of .4 inches and then tapers for 3.0 inches to form a spike. This spike would have been driven into a wooden member; neither end of the spikes on this staple have been clinched.

This staple would have held a piece of wood about four inches wide by about one inch in thickness.

Cast Butt Hinges

Cast butt hinges, overwhelmingly of iron, were very common in the study collection (Figures 25 and 26). These butt hinges ranged in size from two inches to 4 1/4 inches, and clearly represent hinges used architecturally and in the construction of cabinets and furniture. No sources could be found which identified the sizes of hinges used for these different purposes. While it is easy to speculate that the smallest hinges were used for cabinet and furniture work, and the largest for architectural purposes, dividing the in-between sizes by function is difficult. For this report, therefore, hinges have been somewhat arbitrarily divided at three inches: Those smaller than three inches are discussed with the furniture artifacts and those three inches or larger are discussed here with the architectural artifacts. As will be discussed under the furniture section, it is likely that many if not most of these hinges were used in built in cabinets, in essence built in furniture.

The butt hinge was invented in 1775 and came into common use for interior doors by the turn of the nineteenth century. This hinge type differs from other types in that it was designed to be fastened to the edge of the door and the inside of the door frame, making it inconspicuous when the door was closed. According to Streeter:

The cast butt was, in its way, an important development as the invention of the cut nail, machine cut screw, or the circular saw, in its effect on building construction. No longer need hinges be mounted on the surface with clinched nails, nor doors be hung flush with the trim, thus allowing

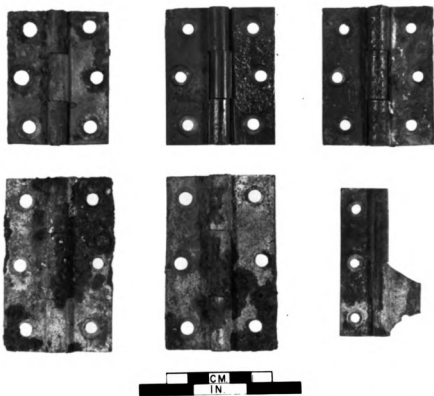


Figure 25. Example of well preserved butt hinges. Lower right hinge is a loose jointed brass hinge; others are fast jointed cast iron hinges.

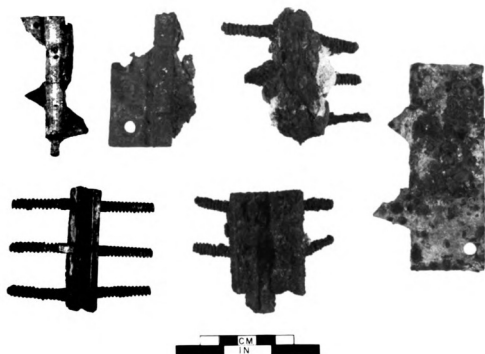


Figure 26. Cast iron butt hinges showing ranges of conditions in the collection.

deeper moldings around them, and calling in turn for mortise locks (Streeter 1973: 43).

Early forms of hinges, which continued in use for exterior applications after with the adoption of the butt hinge, were fastened conspicuously to the face of the door and door frame.

Cast butt hinges consist of a "male" and a "female" half, which are made up of "flaps" or faces of varying sizes, and with varying numbers of "knuckles" or joints. The male and female parts were fastened by a pin. Unlike earlier forms of hinges, the cast butt hinge was intended to be fastened with a screw, which also became readily available in the early nineteenth century, and each flap had varying numbers of usually countersunk screw holes in it (Russell and Erwin 1865: 116; Streeter 1973).

During the first half of the nineteenth century, butt hinges were typically "fast jointed", meaning that the two halves were permanently joined by either riveting the pin on both ends or by casting the pin into the female part. Hinges with "loose joints" were, however, available; in these hinges the pin was usually permanently anchored in one half of a two-joint hinge, allowing the door or shutter to be lifted off without unscrewing the hinge. Cast hinges were sometimes marked with a manufacturer's mark or with the size (length) of the hinge (Russell and Erwin 1865: 116; Streeter 1973).

The manufacture of the cast butt hinge was significantly more efficient than for other, hand made types:

All the hand work expended on each hinge before, was saved by putting great care into the making of the wooden pattern, and by the molder and finisher. It seems clear from examination of broken butts that something like the following process took place. First the male part was cast, perhaps with a

core for the pin hole, to center it and keep it straight for reaming or drilling, and with the countersunk screw holes in the pattern. Hundreds of these could be cast, all alike, from the same pattern. All the male parts were cleaned, bearing surfaces inspected and trued if need be, and wire pins inserted, with proper clearance for easy movement. Then in a mold prepared for it and its mate, with pin in place, it was ready for casting. Molten iron flowed in, up to the male half hinge, and around the pin, shrinking tight upon it, and, at the same time, shrinking away from the male part, allowing proper movement. A little filing finished the hinge (Streeter 1973: 47).

This represented a vast improvement in manufacture and allowed the cast butt hinge to replace other hinge types for use on interior doors within a few years of its large-scale introduction.

A total of twenty-three whole or fragmentary cast iron butt hinges three inches or larger are included in the study collection from the commanding officer's quarters. In addition to these twenty-three hinges present in the collection, the catalog provides information on 10 others—for which size cannot be determined—that are now missing from the collection. These hinges has catalog numbers of 50, 59, 60, 63, 82, 88, 90, 128, 132, and 155.

These hinges are in varying states of preservation ranging from almost rust-free and still workable to a barely recognizable mass of rotted and rust-encrusted iron. Some of these hinges still have screws associated with them, and some bear recognizable makers and size marks. They further vary in size, number of joints, and number of screw holes. Due to this variability, each hinge or hinge fragment will be described independently.

Despite this variability, some grouping is possible. A variable which probably had the most relevance to the builders of the commanding officer's quarters was probably the size, expressed as the length of

the hinge. The following discussion will therefore be broken down in reference to this measure.

3" Cast Iron Butt Hinges

Cast Iron Butt Hinge 1 (Cat. no. 50)

This specimen is extremely corroded and parts of each flap are broken off; it is rusted in a slightly open position. This is a three joint hinge with three screws fastening each flap. It measured 3.0 inches in length. The remains of five incomplete flat head screws remain with this hinge.

Cast Iron Butt Hinge 2 (Cat. no. 53)

This hinge is extremely corroded and rust encrusted. It is probable that the entire artifact is completely rusted through. This specimen is rusted in a closed position, and measures 3.0 inches in length. The badly corroded and broken remains of two flat head screws remains with this hinge, and indicate that it was fastened with three screws through each flap. Additional characteristics of this hinge are totally obscured by rust.

Cast Iron Butt Hinge 3 (Cat. no. 70)

This hinge is completely consumed by rust and is heavily rust encrusted. It is also fractured on at least one flap. It measures 3.0 inches in length, and is rusted in a closed position. The remains of three badly rusted and broken flat head screws remain in one flap. Additional characteristics of this specimen cannot be observed due to its condition.

Cast Iron Butt Hinge 4 (Cat. no. 128)

Somewhat better preserved is this hinge. This hinge has part of the female half broken off, and is rusted in a closed position. This hinge is a five joint hinge which measures 3.0 inches in length and which probably measured 2.4 inches in width when open. Three countersunk screw holes are present on each flap, although no screws remain with this specimen.

Cast Iron Butt Hinge 5 (Cat. no. 138)

This specimen consists of a portion of one of the flaps of a butt hinge. None of the joint is present, and only two countersunk screw holes remain. Extrapolating from these screw holes, which were placed symmetrically in cast hinges, this fragment can be said to have been part of a hinge with a length of 3.0 inches. Other characteristics of the hinge can not, of course, be identified due to its fragmentary nature.

Cast Iron Butt Hinge 6 (Cat. no. 143)

This fragmentary specimen has most of the male and female flaps broken off. As a result, all that can be said is that this was a five joint hinge that measured 3.0 inches in length.

3 1/4" Cast Iron Butt HingesCast Iron Butt Hinge 7 (Cat. no. 79)

This specimen is complete and is fairly well preserved. It consists of a three joint hinge that is rusted in an open position. It measures 3.2 inches in length and 2.0 inches in width when open. It has three countersunk screw holes in each flap, and there are two complete flathead, pointless screws associated with it. These screws

measure 1.2 inches in length.

Cast Iron Butt Hinge 8 (Cat. no. 104)

This three-joint hinge is rusted in a closed position. It measures 3.25 inches in length and probably measured about 2.0 inches in width when open. It has three countersunk screw holes in each flap, and four complete and two fragmentary screws remain in association. The four complete screws are flat head, pointless screws measuring about 1.2 inches in length.

3 1/2" Cast Iron Butt Hinges

Cast Iron Butt Hinge 9 (Cat. no. 50)

This specimen is extremely fragmented, corroded, and rust encrusted. Other than noting that it was rusted in an open position and that it measured 3.5 inches in length, little can be said about this hinge.

Cast Iron Butt Hinge 10 (Cat. no. 103)

This hinge consists of a fragment of the female half. There are three countersunk screw holes present in this incomplete half. Using the placement and spacing of these screw holes, the original length of this hinge can be extrapolated to have been 3.5 inches. Based on the size of the single joint remaining, this specimen is interpreted as a five joint hinge. No screws remain with this specimen.

Cast Iron Butt Hinge 11 (Cat. nos. 116 & 117)

Two fragments combine to make this specimen. The largest of these fragments consists of a hinge (Cat. no. 116) with both halves represented but in a very fragmentary condition. The smaller fragment represents a portion of the female half (Cat. no. 117). Put together,

these fragments indicate a hinge 3.5 inches in length and about 2.2 inches in width when open. This five joint hinge was rusted in an open position, and had three countersunk screw holes in each flap. No screws remain with this specimen.

4 1/4" Cast Iron Butt Hinges

Cast Iron Butt Hinge 12 (Cat. no. ?)

This fragmentary, rusted hinge consists of a complete female half, the joint, and a small part of the flap of the male half. This five joint hinge was rusted in an open position and measured 4.25 inches in length and probably about 2.6 inches wide when open. The intact, female flap has four offset countersunk screw holes present, and three rusted flat head, pointless screws are present in these holes. These screws measure about 1.3 inches in length.

Cast Iron Butt Hinge 13 (Cat. no. 76)

This specimen is also fragmentary, and consists of a complete female half, a complete male joint, and part of the male flap. This hinge is five jointed, and measures 4.25 inches in length. It was rusted in a slightly less than open position, and probably measured 2.6 inches in width when open. Although no screws are present with this specimen, the complete female flap has four offset countersunk screw holes.

Fragmentary Cast Iron Butt Hinges

The remaining cast iron butt hinges are represented by fragments which are too small or too rusted to allow a reconstruction or estimation of their original sizes.

Cast Iron Butt Hinge 14 (Cat. no. 50)

This highly fragmentary specimen includes a fragment of a flap, one whole flat head screw and three screw fragments. The complete screw measures 1.3 inches in length; no other characteristics of this hinge can be reconstructed from these fragments.

Cast Iron Butt Hinge 15 (Cat. no. 53)

This fragmentary and rust encrusted butt hinge is frozen in a closed position. Although its size cannot be reconstructed due to its condition, its original measurement can be determined to have been in excess of 2.0 inches.

Cast Iron Butt Hinge 16 (Cat. no. 55)

This specimen consists of a fragmentary and heavily rusted and rust encrusted hinge. While the size of this hinge cannot be reconstructed, it was larger than 2.25 inches in length. It is rusted in an almost closed position. A single complete pointless flat head screw remains with this specimen; it measures 1.3 inches in length.

Cast Iron Butt Hinge 17 (Cat. no. 77)

This specimen consists of several hinge fragments that apparently once articulated as a single hinge. These specimens are extremely corroded and fragmented, and little can be said besides the fact that this was once a hinge that was at least but probably larger than 2.25 inches in length.

Cast Iron Butt Hinge 18 (Cat. no. 80)

This hinge is extremely corroded, fragmented, and rust encrusted. It was rusted in an almost closed position and measured more than 1.75 inches in length. Other characteristics cannot be reconstructed due to

the condition of this artifact.

Cast Iron Butt Hinge 19 (Cat. no. 94)

Included with this specimen are several fragments of what was probably a larger section of a hinge. This hinge was rusted in an almost open position, but other details on size and form cannot be reconstructed from the extremely corroded, fragmented, and rust encrusted remains.

Cast Iron Butt Hinge 20 (Cat. no. 100)

This consists of a heavily rusted fragment of a hinge. Included are a partial or whole joint, and portions of the two flaps. It was rusted in an almost open position. Other characteristics of this hinge cannot be reconstructed.

Cast Iron Butt Hinge 21 (Cat. no. 103)

This specimen is the pin and fragments of the flaps of a hinge. It is extremely rusted, and the original characteristics of the hinge cannot be reconstructed. The pin measures 2.8 inches in length, but it may not be complete.

Screws

Many of the hardware specimens from the commanding officer's quarters still had screws associated with them. These screws with known associations have been discussed with that associated hardware. Within the collection there are also a number of screws that were not associated with a particular piece of hardware. These unassociated screws were probably if not certainly associated with architectural hardware, and are therefore discussed in this chapter. The proveniences and sizes of these screws are presented in Table 57.

Table 57

Provenience and Sizes, Unassociated Screws

<u>Provenience</u>	<u>Length</u>	<u>Type</u>
51	1.3"	Flathead wood screw, pointless
52	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointless
53	1.0"	Flathead wood screw, pointless
54	1.3"	Flathead wood screw, pointless
	1.3"	Flathead wood screw, pointless
55	fragment	
	fragment	
59	fragment	
	fragment	
62	.8	Flathead wood screw, pointless
63	1.2"	Flathead wood screw, pointless
64	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointed
67	2.5"	Flathead wood screw, pointed
68	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
70	1.5"	Flathead wood screw, pointless
73	1.2"	Flathead wood screw, pointless
75	1.2"	Flathead wood screw, pointless
76	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
78	1.5"	Flathead wood screw, pointless

Table 57 (Cont'd).

79	.8"	Flathead wood screw, pointless
	.8"	Flathead wood screw, pointless
	1.0"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
80	.8"	Flathead wood screw, pointless
	1.3"	Flathead wood screw, pointless
	1.3"	Flathead wood screw, pointless
81	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointless
	1.8"	Flathead wood screw, pointless
85	1.7"	Flathead wood screw, pointless
	1.7"	Flathead wood screw, pointless
	1.8"	Flathead wood screw, pointless
95	fragment	
99	1.2"	Flathead wood screw, pointless
	1.7"	Flathead wood screw, pointless
	fragment	Flathead wood screw
	fragment	
100	1.3"	Flathead wood screw, pointless
	1.5"	Flathead wood screw
101	1.5"	Flathead wood screw
102	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
103	1.2"	Flathead wood screw, pointless
	fragment	
104	1.2"	Flathead wood screw
	fragment	
115	1.2"	Flathead wood screw, pointless
	1.4"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless
	fragment	
116	1.2"	Flathead wood screw, pointless
	1.2"	Flathead wood screw, pointless

Table 57 (Cont'd).

	1.2"	Flathead wood screw, pointless
	1.4"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointless
121	1.0"	Flathead wood screw, pointless
	1.4"	Flathead wood screw, pointless
	1.5"	Flathead wood screw, pointless
128	1.2"	Flathead wood screw, pointless
132	.7"	Flathead wood screw, pointless
	.7"	Flathead wood screw, pointless
	1.3"	Flathead wood screw, pointless
	1.6"	Flathead wood screw, pointless
	1.6"	Flathead wood screw, pointless
	1.6"	Flathead wood screw, pointless
	1.8"	Flathead wood screw, pointless
	1.8"	Flathead wood screw, pointless
	1.8"	Flathead wood screw, pointless
143	1.7"	Flathead wood screw, pointless
153	.5"	Flathead wood screw, pointless
	1.7"	Lock head screw, pointless

Strap Hinges and Pintles

Six strap hinges, some with pintles still in association, and eleven unassociated pintles are included in the study collection (Figure 27). The strap hinge and pintle (also known as "hooks and hinges"), represents one of the oldest forms of iron hinges. Strap hinges were commonly used on the exterior of buildings, with other types of hinges such as the wrought iron "H" and "HL" hinges and later the cast iron butt hinge being used on the interior. Strap hinges continued to be used to hang shutters during the nineteenth century well after the widespread availability of the cast iron butt hinge (Streeter 1975).

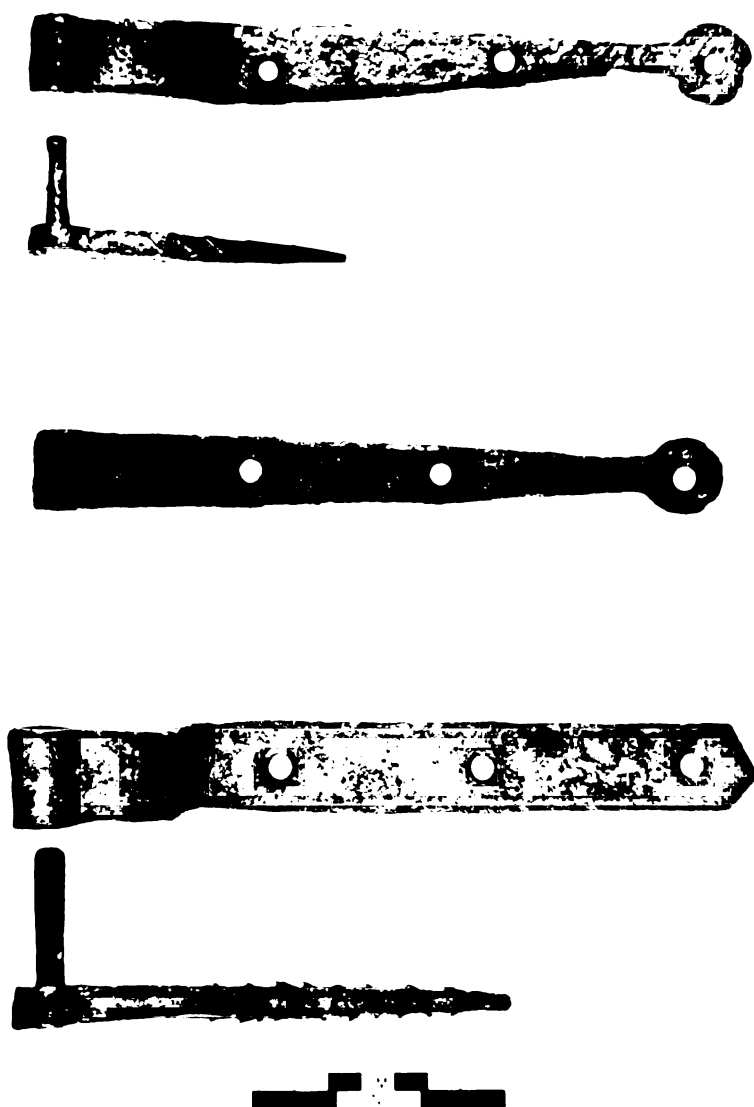


Figure 27. Strap hinges and driven pintles. Note barbs on pintles.

The strap hinge consists of a long strap or iron with a joint on one end. This strap is fastened to the door and pivots on a pin which is part of a pintle anchored to the door or window frame. The pintle consists of an iron pin attached either to a spike placed at a 90 degree angle to the pin and which is driven into the door or window frame, or which is fastened to a plate which is screwed to the frame. The latter approach is later, and was apparently not in use until the nineteenth century (Streeter 1975).

After about 1825, the strap hinge was modified and the driven or screw mounted pintle became less common. Here, the pin was incorporated into the strap itself by the use of a "halved joint":

...the hinge was made with a halved joint, the pin welded in the hinge instead of the pintle, and the other part of the hinge set back in the opening along the wall, beside the frame, and fastened to one or the other (Streeter 1975: 55).

Although Streeter (1975) suggests this development led to the elimination of earlier forms, archeological evidence suggests these earlier forms continued in common use long after 1825.

Strap Hinges

In addition to the strap hinges discussed below, the artifact catalog contains information on a possible strap hinge which is now missing from the collections. This artifacts has a catalog number of 116.

Strap Hinge 1 (Cat. no. 68)

This strap hinge, minus the pintle, is in a very good state of preservation. It has an overall length of 8.1 inches and is offset about .6 inches at the proximal end. This hinge would have mounted on

a pin about .25 inches in diameter. At the joint, this hinge measures .9 inches in width and narrows to .4 inches just above a circular cusp, which measures .9 inches in diameter. This hinge was probably fastened with three screws, two on the body of the strap and one through the cusp. The mounting holes are slightly countersunk and measure about .25 inches in diameter. This specimen has a size range of 20 to 25 cm.

Strap Hinge 2 (Cat. no. 76)

This specimen is heavily corroded. It consists of an almost complete strap hinge and driven pintle. The current length of the hinge, minus the cusp, is 7.9 inches; close to its original overall length since only the cusp is missing. At the joint, this hinge measures .8 inches in width and it tapers to .3 inches at its distal end. This hinge is offset approximately .5 inches at its proximal end. One fragmentary screw can still be observed in one of three mounting holes present on the strap. The pintle with the specimen measures 2.6 inches in length, which has probably been shortened through corrosion. The pin is flush with the top of the joint. This specimen has a size range of 20 to 25 cm.

Strap Hinge 3 (Cat. no. 87)

This complete strap hinge and driven pintle set is in an excellent state of preservation. This specimen is identical to hinge 1 in its basic shape, and is very similar in dimension. Like hinge 1, this hinge is offset at the proximal end. On this specimen, the offset is about .5 inches. The overall length of this hinge is 8.5 inches, and it measures .8 inches in width at the joint and 3.5 inches just above the 1.0 inch diameter cusp. This specimen has three .2 inch diameter,

countersunk mounting holes, two in the body and one in the cusp, which were probably designed for screws.

The pintle associated with this hinge has a spike 3.8 inches in length. It tapers to a point on all four sides, and is unusual in that it has been barbed on two opposite corners. These barbs have been formed by cutting opposite edges of the spike, perhaps with a chisel; there are four barbs on one corner and five on the other. These barbs were obviously intended to make it difficult for the pintle to work its way loose.

The pin has a diameter of 2.5 inches and extends 1.1 inches above the spike. When the hinge is mounted on the pintle, the pin extends .2 inches above the joint of the hinge. This specimen has a size range in excess of 30 cm.

Strap Hinge 4 (Cat. no. 96)

This hinge and driven pintle set is extremely rusted. It is similar in shape and dimension to hinges 1 and 3. Like these hinges, this specimen is offset at the proximal end. This offset is about .5 inches, and the overall length of the specimen is 7.8 inches (minus the cusp). At the joint, this hinge is 1.0 inches wide and just above the cusp it is .45 inches in width. There are two mounting holes present, both in the body. A third mounting hole was probably present in the cusp. These measure about .25 inches in diameter. Still present in one is a very rusted flat head screw about 1.2 inches in length.

The pintle associated with this hinge measures 3.7 inches in overall length as measured along the spike. It has a pin of indeterminate diameter but which extends 1.0 inches above the spike.

When inserted into the joint, the top of the pin is flush with the top of the joint. This specimen has an overall size range of 20 to 25 cm.

Strap Hinge 5 (Cat. no. 99)

This specimen is extremely rusted, rust encrusted, and fragmentary. No pintle is present with this specimen. The circular cusp at the distal end of the hinge is 1.2 inches in diameter. No other characteristics of this strap hinge can be determined due to its advanced state of deterioration. It has a size range of 15 to 20 cm.

Strap Hinge 6 (Cat. no. 117)

This well preserved hinge and pintle set differs markedly from the others from this site. Although this is an offset hinge like the others described above, this offset is .9 inches and is formed by bending the hinge at 90 degree angles. The offset of the hinges described above is much more modest. This hinge is also significantly different in that it is made of a strap of iron of fairly consistent width. At both the joint and the distal end this strap measures 1.1 inches in width. Further, the end is finished by cutting the strap to form a point rather than a circular cusp.

The overall length of this specimen is 8.8 inches. Like the other hinges, this strap was fastened through three evenly spaced holes. These holes are slightly countersunk and are approximately .25 inches in diameter. They were probably designed for flathead wood screws.

The pintle associated with this hinge has a barbed spike measuring 5.9 inches in length. The barbs on this spike have been formed by cutting all four of its edges; there are from five to six barbs on each

edge. The pin measures .35 inches in diameter and extends 1.6 inches above the spike. When inserted into the joint of the hinge, this pin extends .4 inches above the top of the joint.

Fully extended, this specimen has a size range in excess of 30 cm.

Unassociated Pintles

In addition to the pintles described below, the artifact catalog contains evidence of another pintle that is now apparently missing from the collection. This pintle has a catalog number of 115.

Pintle 1 (Cat. no. 60)

Pintle 1 is a driven pintle that is in a very rusted state. It has a spike 4.1 inches in length and which tapers on all four sides to a point. Attached to this spike is a pin that is about .35 inches in diameter and which extends 1.8 inches above the spike. This specimen has a size range of 10 to 15 cm.

Pintle 2 (Cat. no. 61)

This driven pintle is in relatively good condition. It has a barbed spike 4.9 inches in length and which tapers on all sides to a point. These barbs have been formed by cutting each of the four corners of the spike. There are from six to seven barbs on each corner, and each barb protrudes less than .1 inch from the spike. The pin on this pintle is about .35 inches in diameter and it extends 1.6 inches above the spike. It has a size range of 10 to 15 cm.

Pintle 3 (Cat. no. 63)

This driven pintle is extremely corroded; the tip of the spike is missing and the diameter of the pin has been greatly reduced by rusting. The fragmentary spike measures 2.8 inches in length and the

pin extends 1.4 inches above it. The diameter of the pin cannot be estimated due to its poor condition. It has a size range of 6 to 8 cm.

Pintle 4 (Cat. no. 71)

This driven pintle is a very large specimen and is in relatively good condition. It has a spike that is 6.0 inches in length and which tapers on all four sides to a point. The pin is .4 inches in diameter and extends 2.2 inches above the spike. It has a size range of 15 to 20 cm.

Pintle 5 (Cat. no. 77)

This specimen is relatively rusted. The spike of this driven pintle measures 3.7 inches in length, and tapers on all four corners to form a point. The extreme tip of this spike has been clinched. The pin extends 1.4 inches above the spike, and is .25 inches in diameter. This specimen has a size range of 8 to 10 cm.

Pintle 6 (Cat. no. 96)

Driven pintle 6 is moderately rusted. It has a spike that is currently 4.0 inches in length but it is bent at the end; possibly but not certainly the result of clinching. This spike has been barbed by cutting the edge of the corners of the spike. Due to the rusted condition of this specimen, the number of barbs present cannot be determined. The pin for this pintle measures .4 inches in diameter and extends 1.6 inches above the spike. This specimen has a size range of 10 to 15 cm.

Pintle 7 (Cat. no. 102)

This driven pintle is moderately rusted. It has a barbed spike 5.5 inches in length. Due to the condition of this specimen, the

number of barbs cannot be determined. This pintle has a pin that is .35 inches in diameter and which extends 1.5 inches above the spike. This specimen has a size range of 10 to 15 cm.

Pintle 8 (Cat. no. 107)

This pintle differs markedly from other in the collection. Unlike the others, this specimen is fastened not with a driven spike but with a mounting plate probably fastened with nails. This pintle was made by taking a piece of strap iron, folding it around a pin, and welding it back to itself. This is similar to the way that driven pintles were manufactured, but is different from most pintles anchored by a mounting plate.

The mounting plate measures 6.3 inches in overall length, and varies in width from 1.1 inches adjacent to the pin to 1.3 inches away from it. There are three circular mounting holes .25 inches in diameter on the plate, and one square mounting hole .2 inches on a side located between two of the circular holes. The face of the plate has been filed on the edges. Overall, the mounting plate is of crude manufacture. The pin has a diameter of .35 inches and extends 1.5 inches above the mounting plate. It has a size range of 15 to 20 cm.

Pintle 9 (Cat. no. 117)

The spike on this driven pintle is in extremely good condition but the pin is moderately corroded. The spike measures 4.6 inches in length and tapers on all four sides to a point. The pin measures about .3 inches in diameter and extends 1.2 inches above the spike. It has a size range of 10 to 15 cm.

Pintle 10 (Cat. no. 137)

This large driven pintle is in fairly good condition. It has a clinched spike that currently measures 5.5 inches in length but prior to clinching measured 6.5 inches. The four sides of the spike taper to a point, but in cross section this specimen is significantly more rectangular than others observed from the site. It has a heavy pin that measures .5 inches in diameter and which extends 2.1 inches above the spike. It has a size range of 15 to 20 cm.

Pintle 11 (Cat. no. 162)

This also large, driven pintle is in a relatively good state of preservation. It has a bent but not clinched spike which measures 6.5 inches in length. It has a heavy pin which measures .45 inches in diameter and which extends 1.7 inches above the spike. This specimen has a size range of 15 to 20 cm.

Shutter Bolt

Only one artifact that could be identified as a shutter bolt is included within the collection from the commanding officer's quarters. This specimen (Cat. no. 73) consists of an incomplete portion of a plate mounted, slide-type shutter bolt. It is bent and moderately rusted. The portion represented here is the actual bolt portion; the "staple" half does not remain in the study collection. Central to this specimen is a mounting plate made of thin, rolled iron measuring 8.4 inches in length and 1.8 inches in width. This plate was fastened to the shutter with six screws. The six screw holes are located at the corners and along the mesial edges of this piece. Two small flat head wood screws .5 inches in length remain with the specimen. Attached to

the mounting plate by riveting are two halves to an open staple which served to hold the slide bolt; this staple is open at the top probably so the thumb slide could pass through it. Close to this open staple, at the end of the mounting plate, is a riveted stop which restricted the movement of the bolt. The presence of two sets of two rivets further down on the mounting plate reveals the location of two other staples which no longer remain with the artifact. The bolt no longer remains with this specimen. This specimen has a size range of 15 to 20 cm.

Wrought Iron Hooks and Staples

Wrought iron hooks and staples are very common in the study collection (Figure 28). The hook and staple was a common device used to fasten doors and shutters during the nineteenth century. As a unit, a hook and staple would include three parts: the hook itself, a "U" shaped staple to fasten the hook to wood, and a similar "U" shaped staple to receive the hook itself. The collection from the Commanding Officer's Quarters includes hooks without staples, hooks with one or both staples still associated, and staples which are not associated with hooks. These unassociated staples may possibly have been used on other architectural hardware. For example, iron rings used as interior pulls on shutters were often fastened with iron staples. Iron staples were also often used on hasps.

In addition to the hooks and staples described below, the artifact catalog provides information on nine specimens that are now apparently missing. The catalog numbers for these artifacts are 68, 76, 95, 103, 103, 114, 117, 132, and 139.

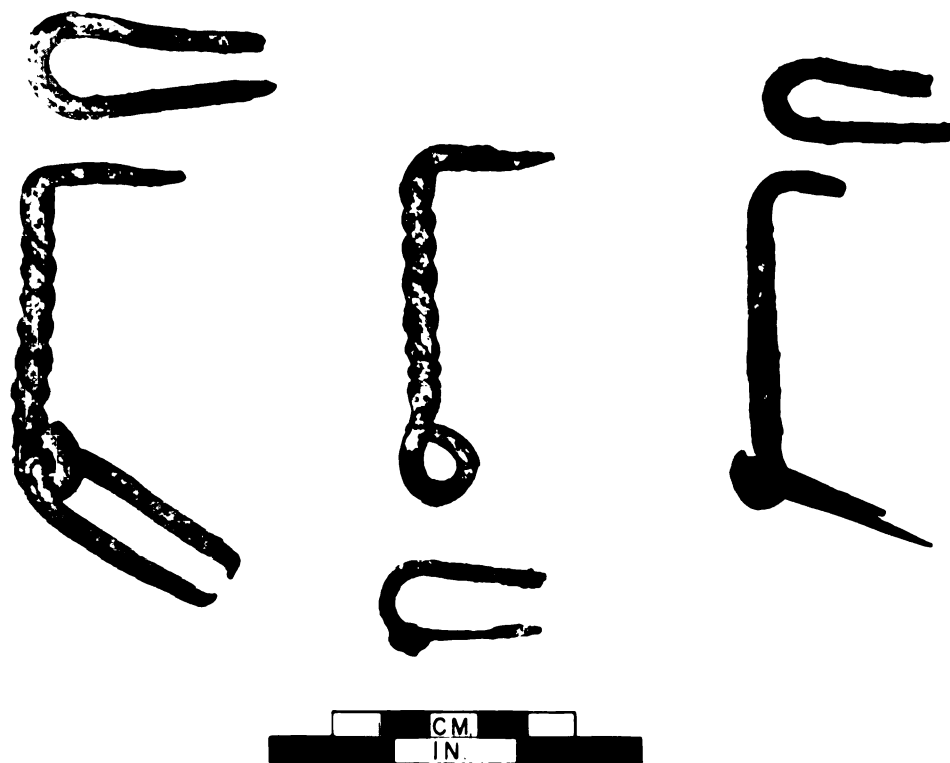


Figure 28. Hooks and staples. Left and center: Type 1 hooks with twisted shanks; Right: Type 2 hook with straight squared shank.

Hook and Staple Type 1

Although they vary in dimension, there are only two basic types of hooks and staples represented in the collection. The differences between these types is recognized in the hook itself rather than the staples used to fasten it. The most common type, accounting for eighteen of the nineteen hooks present, is set apart from the other type because it has a twisted shank. The proximal end is circular in cross section and is bent to form a circular eye through which a staple passes to fasten it to the door frame. The distal end is square in cross section, draws to a point, and is bent to form a simple ninety degree hook.

Hook and Staple 1 (Cat. no. 63)

This small, badly corroded specimen consists of a hook and an associated eye staple. The hook measures only 2.5 inches in length, and the symmetrical staple measures 1.6 inches in length. The very tips of both points of the staple are clinched, indicating that this hook was fastened to a board approximately one inch in thickness.

Hook and Staple 2 (Cat. no. 68)

Only one staple remains with this hook. The hook is extremely well preserved, but the single remaining staple is badly corroded on one point. The hook itself measures 2.8 inches in length and the symmetrical eye hook is 1.8 inches in length.

Hook and Staple 3 (Cat. no. 76)

This specimen is extremely badly corroded, and includes a hook and part of a staple still in place in the eye of the hook. The hook measures 3.3 inches in length, and the staple, of which only one point

remains, measures 1.8 inches in length.

Hook and Staple 4 (Cat. no. 76)

This hook and associated eye staple are badly corroded. The hook measures 3.4 inches in length, and the staple, part of which is missing, measures 1.6 inches in length.

Hook and Staple 5 (Cat. no. 76)

This specimen consists of a badly corroded hook without any associated staples. It measures 3.3 inches in length.

Hook and Staple 6 (Cat. no. 77)

This specimen consists of a hook and an associated staple. The badly corroded hook measures 3.3 inches in length, and the symmetrical staple measures 1.6 inches in length. The points of the staple are clinched at their tips; this staple was probably driven through a board approximately one inch in thickness.

Hook and Staple 7 (Cat. no. 77)

This rusted hook has a broken staple associated with it. The hook measures 3.0 inches in length while the remaining half of the staple measures 1.4 inches in length.

Hook and Staple 8 (Cat. no. 80)

This specimen, consisting of the hook and a single staple, is heavily corroded. The hook measures 4.1 inches in length and the single symmetrical staple remaining in the eye measures 1.6 inches in length.

Hook and Staple 9 (Cat. no. 85)

This specimen is extremely corroded and consists of the remains of a hook and an associated eye staple. The hook includes only the eye

and shank, with the ninety degree bend forming the hook being missing apparently due to corrosion. The portion remaining of the hook measures 4.0 inches in length. The staple is also badly corroded, with one point missing. Based on the remaining point, this staple measured 1.8 inches in length.

Hook and Staple 10 (Cat. no. 96)

Consisting of a hook without any associated staples, this specimen is moderately rusted. This hook measures approximately 4.0 inches in length.

Hook and Staple 11 (Cat. no. 100)

This is an extremely corroded, rust encrusted, and fragmented portion of a hook. Present are two fragments which articulate to form the proximal end of the hook and part of the twisted shank of the hook. No staples are present with this specimen, which measures 2.8 inches in length.

Hook and Staple 12 (Cat. no. 101)

This specimen is extremely corroded but appears to meet all the criteria established to define the type 1 hook. The hook is about 3.3 inches in length, and the identical, symmetrical staples measure about 1.7 inches in length. The staple that is still present in the eye of this hook does not appear to have been clinched.

Hook and Staple 13 (Cat. no. 102)

This well rusted hook measures 4.3 inches in length and has a single, symmetrical staple remaining in its eye. This staple, also rust covered, measures 1.6 inches in length.

Hook and Staple 14 (Cat. no. 104)

The hook and the eye staple of this specimen are extremely corroded but the hook staple is well preserved. Although corroded, this hook has all the characteristics of the type 1 hook. The hook measures 4.4 inches in length, and the two symmetrical staples measure 1.6 inches in length.

Hook and Staple 15 (Cat. no. 104)

This hook and associated staple are badly rusted. The hook measures 4.4 inches in length, and the symmetrical staple, still in place in the eye of the hook, measures 1.7 inches in length.

Hook and Staple 16 (Cat. no. 107)

This hook, which measures 3.4 in length, is badly corroded. No staples remain with this artifact.

Hook and Staple 17 (Cat. no. 114)

This hook and staple set is very well preserved but has melted glass adhering to the hook and both associated staples. The hook itself measures 2.5 inches in length, and both symmetrical staples measure about 1.7 inches in length. The staple passing through the eye of the hook is clinched at the very tip of both points. This indicates that this hook was fastened to a board approximately one inch in thickness.

Hook and Staple 18 (Cat. no. 121)

This hook and staple set is the best preserved in the collection, and includes the hook and both staples. The hook itself measures about 2.7 inches in length. The symmetrical staples are identical and both measure 2 inches. The staple which passes through the eye of the

hook is clinched at the very tip of both points. This clinching suggests that this hook was fastened to a board that was probably one to one and a quarter inches in thickness.

Hook and Staple 19 (Cat. no. 135)

This hook is rusted and is missing the eye. The remaining section of shank and the hook measure 4.4 inches in length. No staples remain with this specimen.

Hook and Staple Type 2

The second type of hook present in the collection is similar to Type 1 except that its shank and both ends are square in cross section. Like the Type I hook, the proximal end is bent to form an eye through which a staple passes for attachment, and the distal end is bent to form a simple ninety degree hook.

Hook and Staple 20 (Cat. no. 117)

The only example of this type in the study collection measures 2.7 inches in length and has two staples associated with it. The staple which is still in place in the eye measures 1.6 inches in length and is asymmetrical; it is matched by an identical 1.6 inch long, asymmetrical staple.

Loose Staples

In addition to the staples which remain associated with particular hooks, there are fourteen individual staples included in the collection (Table 58). These staples may have been part of a hook and staple assembly as described above, or they may have been used with hasps or in some other fashion. These staples are all basically similar; they are symmetrical and all are formed from a round bar that has been bent

to a "U" shape and flattened on two sides to form points. Only one of these staples has been clinched.

Table 58

<u>Provenience</u>	<u>Length</u>	<u>Clinched?</u>	<u>Condition</u>
?	2.0"	No	Light rust
67	1.7"	YES	Heavy rust
99	1.9"	No	Rusted
108	1.6"	No	Heavy rust
114	1.8"	No	Light rust
114	2.5"	No	Light rust
115	1.9"	No	Rusted
115	1.7"	No	Rusted
117	2.0"	No	Rusted
117	1.7"	No	Light rust
118	1.6"	No	Rusted
152	2.8"	No	Rusted
153	1.7"	No	Light rust
159	1.6"	No	Light rust

Most of these staples, the two 1.9 inch and the single 2.9 inch staples being notable exceptions, are of a size similar to that observed in association with hooks. Given the number of hooks in the collection for which one or both staples are missing, it is probable that most of these staples were indeed used as part of a hook and staple set.

Hasps

A single hasp fragment is included in the study collection (Cat. no. 85). This specimen measures 3.1 inches in overall length, and

consists of the distal end of the hasp. This fragment has an oval opening which would be closed over a clinched staple and either padlocked or pinned closed. This oval opening, which measures 1.2 by .4 inches in size, is itself within an enlarged, oval portion of the hasp. While this hasp could have served various architectural and non-architectural functions, an architectural interpretation is assumed here. It has an overall size range of 6 to 8 cm.

Mud Dauber Nests

Included with the architectural artifacts are a number of mud dauber nests (Table 59). While these are not explicitly architectural artifacts, they do provide a limited amount of architectural information. Mud dauber nests are often found in buildings and evidence on the type of surface on which they were built is often preserved on that portion of the nest attached to that surface. These earthen nests also provide another type of information; they would not have been preserved if they had not been fired to a high temperature. They thus provide additional verification for the destruction of the commanding officer's quarters by fire.

The mud dauber, a term which dates to 1856 (ironically the year before the fire which preserved these specimens from Fort Towson), builds a mud nest within which a paralyzed spider or other insect and mud dauber eggs are placed. The paralyzed insect and eggs are sealed inside the nest until the eggs hatch. Of interest, the cells on several of the nests are still sealed. Whether or not this provides any information on the time of year the structure burned has not been explored.

Table 59

Summary of mud dauber nests

<u>Provenience (Cat.)</u>	<u>Description</u>
East Kitchen (51)	Complete, one open cell, melted glass adhering to nest; built on a smooth flat surface.
East Kitchen (55)	Fragment, one open cell, on fragmented cell; built on a flat wood-grained surface.
West Kitchen (76)	Fragment, two of four cells sealed; built on a smooth, flat surface.
West Kitchen (76)	Fragment, five partial cells; built on a smooth, flat surface.
West Kitchen (79)	Largely complete, four open cells, one sealed cell; built on a smooth, flat surface.
West Kitchen (79)	Fragment, two open cells, two fragmentary cells; built on a smooth, flat surface.
Hallway (98)	Complete, unknown number of sealed cells; built on a flat, wood-grained surface.
Hallway (102)	Complete, four sealed cells; built on a flat, wood-grained surface.
Hallway (102)	Complete, one sealed cell, two open cells
Hallway (103)	Fragment, three partial cells; built on a flat, open-grain wood surface.
Test 8 (129)	Largely complete, twelve open cells; built on a flat wood-grained surface.
Test 12 (138)	Fragment, two open cells; built on a flat, wood-grained surface.
Test 12 (138)	Fragment, three partial cells.
Test 12 (138)	Fragment, two partial cells; Built on a flat, wide wood grained surface (shingle?)

Flashing

Several large fragments of what appears to be flashing were recovered from the commanding officer's quarters. In addition, much of the small tin fragments described within the miscellaneous section, and especially those with nail holes, may also represent fragments of flashing. Five large fragments of flashing, none of which possessed catalog numbers, are identified as flashing that would have been used to make the "valley" between intersecting roof surfaces (Figure 29). Such intersecting roof surfaces would be commonly found at the intersection of a dormer and the main roof of a structure. These pieces were generally large (two were within the 25 to 30 cm size range and three were in excess of 30 cms), and all were rusted and fragmentary. Another fragment of flashing (Cat. no. 64), also in excess of 30 cm in size, is interpreted as flashing used to make repairs. This sheet of tin, which measures about ten by twenty inches, is randomly perforated with approximately fifteen square holes. These holes were probably made by relatively small nails, perhaps 3 d., and were undoubtedly used to fasten this flashing to the building. Use in roof repair is suggested. The numerous small pieces of nail perforated tin described in the miscellaneous section may also represent flashing used to make repair to this structure.

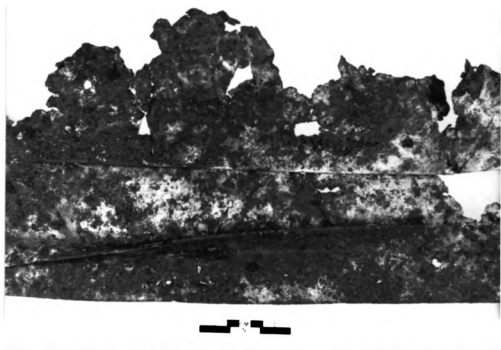


Figure 29. Flashing.

KITCHEN ARTIFACTS

An impressive collection of kitchen-related artifacts were recovered from the commanding officer's quarters, but not quite as impressive as might be expected when it is considered that the two most artifact laden contexts were kitchens. Represented among the kitchen artifacts are ceramics, tin cans, knives, forks, oven lids, handles to tin vessels, miscellaneous cast iron vessel fragments, a grater, fishhooks, a coffee mill, and artifacts of punch decorated tin. A tin and a ceramic candle holder is also included among the kitchen artifacts, although it is recognized this may have been utilized in other contexts as well.

Ceramic Vessels

A large number of sherds of ceramic vessels were excavated at the commanding officer's quarters. Based on the artifact catalog, the total number of sherds recovered numbered 5,649. Most of these were, however, missing from the collection and could not be examined. Only 1,275 sherds were examined as part of this research. Due to the limited availability of the ceramics from this collection, only a general consideration of this artifact class was undertaken.

A total of ten different ceramic types were included within the 1,275 sherds examined for this study. These included undecorated and mold-decorated whitewares, of which the vast majority were ironstones; and minority numbers of blue edge decorated (shell, feather) wares, transfer printed wares, hand-painted wares, annular wares, cream-colored wares, decorated and undecorated soft-paste porcelain, alkaline glazed redwares, and salt-glazed stonewares. Of these, the sherds of

soft paste porcelain were generally from decorative or special purpose vessels, and the redware and stoneware were from utilitarian and storage vessels. The other ware types were generally from table and serving vessels.

Overall, the burned ceramics in the collection greatly outnumbered those that were unburned. A total of 1,053 of the 1,275 sherds in the collection were identified as burned. The distribution of ceramic types between burned and unburned contexts varied. Except for the hand painted whitewares and the alkaline glazed redwares, all the types listed above occurred in both burned and unburned contexts. In the burned contexts, however, the importance of ceramics other than undecorated and mold-decorated whitewares, soft paste porcelains, and stoneware was negligible whereas in the unburned contexts these other wares occurred with some frequency.

Despite the presence of ten ceramic types in the collection, the undecorated and mold-decorated whitewares predominated in the collection. Of these, the vast majority, and virtually all of this type within the commanding officer's quarters, were ironstone. The ironstone sherds that were examined in this study were typically very small sherds. Although numerous reconstructible vessels and maker's marks are listed in the catalog, there were not present for this study nor were they described in any useful fashion in the catalog.

It is clear from examining the ironstones that they are very similar in style and probably represent one or two sets of ceramics. The single transfer printed maker's mark on ironstone probably, therefore, identifies all the ironstone although it would certainly

have been useful to examine the dozens of marks alluded to in the catalog. The single mark examined (Cat. no. 51) was of the "Pankhurst & Co.". This company name was above a lion and unicorn device with the word "Ironstone" present on a banner. Below this device was the single word "China". This mark dates to the period 1850 to 1882 (Godden 1964: 481). Considering the date of this mark, this sherd suggests the ceramics present in the commanding officer's quarters were a relatively recent acquisition at the time of the 1857 fire.

Vessel forms present among the ironstones are very difficult to reconstruct from the limited number and small size of the sherds examined. They most clearly include important numbers of both table and serving wares. The serving wares most commonly include heavy platters but also included covered vessels and a spouted tea pot. Among the sherds of table wares, most commonly represented are plates and soup plates, but small bowls or saucers, handleless and handled cups, and small mugs are also represented. The only complete specimen is a badly burned ironstone mug (Figure 30). Also present among the ironstones is a badly burned and fragmented vase decorated with anthropomorphic figures, and a chamber pot.

Among the soft paste porcelains, vessel forms represented include a candle holder and an open weave basket. The candle holder is discussed in more detail later in this section. The open weave basket was fragmented into numerous small pieces, but probably was used for bread or fruit or a similar function peripheral to serving.

The stonewares from the site included utilitarian wares such as bottles and crocks. The redwares were also utilitarian in form but,

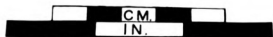


Figure 30. Complete white ironstone mug.

based on the very small sherds present, probably included vessels such as bowls.

Among the other ware groups, vessel forms were very difficult to reconstruct due to the small numbers represented in the collection and due to the small sherd size. These ware groups appeared, however, to include a majority of table wares such as plates, bowls, and cups. Included among the transfer printed wares, for example, was a deep footed bowl decorated in blue.

Punch-Decorated Tin

One of the most unusual groups of artifacts found in the burned remains of the commanding officer's quarters is a group of tin panels that were once part of a pie safe. These panels consist of a flat piece of tin that have been decorated by perforating the tin with two types of punches. Represented in the collection are two complete panels of punch-decorated tin, one nearly complete piece, and twenty-seven fragments (Table 60). These twenty-seven fragments probably represent altogether too much surface area to have come from the three relatively intact panels in the collection, and therefore indicate the presence of one or more additional panels at the site. A description of the three relatively intact panels follows.

Punched Tin Specimens 1 and 2 (Cat. nos. ?)

These specimens are closely similar (Figure 31). They consist of flat, rectangular pieces of tin which measures 12.3 inches wide by 16.0 inches long. They are both rusted, and several areas within their interiors have rusted through. Along one of the long sides on each of these pieces, .15 inches of metal has been crimped over onto itself.

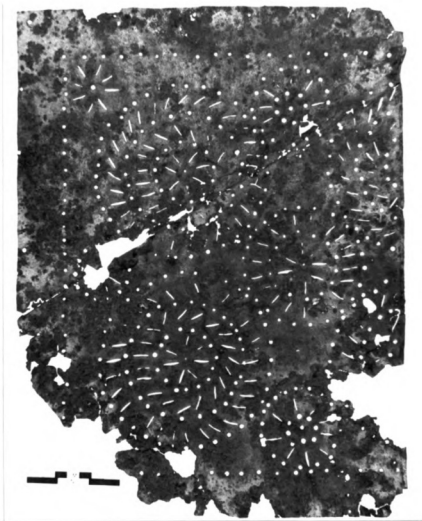


Figure 31. Punch-decorated tin panel from a pie safe.

Table 60

Miscellaneous punch-decorated tin

<u>Provenience</u>	<u>0 - 10 cm</u>	<u>10 - 20 cm</u>	<u>20 - 30 cm</u>
East Kitchen	4	2	
Stair Well	5	1	
T 6	7		
T 8	3	2	
Unknown	1	2	
Totals	20	7	

These panels have been decorated using a combination of two different punches, one resulting in a circular perforation and the other a lenticular perforation. The circular perforations vary in size from about .05 to .1 inches. This variation is probably the result of a tapering awl or punch being driven different distances into the tin. The differences in the sizes of these circular perforations appears totally random and does not appear to be a function of the design.

The lenticular perforations are all about .4 inches in length. The lenticular form of these perforations and their near identical size suggests they may have been made by a small, double-edged knife with roughly parallel sides; the parallel sides would prevent variation depending on the distance the device was driven through the tin.

The designs on these pieces are very crudely done and was clearly handwork accomplished without a pattern. The two panels appear to combine to form a single design field; when the crimped edges are placed together partial design elements along these edges combine to

form a complete element. The design field represented by these two panels is bordered by a row of circular punches placed about .5 inches apart and about 1.5 inches from the edge of the tin. This border is lacking along the crimped edges. Within this border, the design consists of randomly ordered, circular design elements. These individual elements vary in diameter from about 1.5 to about 5.5 inches, but they are similarly constructed. This construction involves the placement of concentric rings alternating between circular and lenticular perforations. These are all placed around a central, single circular perforation, and the lenticular perforations radiate from the center with a slightly clockwise or counterclockwise lean.

These panels were fastened, presumably to a wood frame, by driving nails through the tin. A series of small nail holes, measuring less than .1 inches across, are present along three sides of the tin. Interestingly, there are no nail holes along the crimped edges. These nail holes are located between .1 and .2 inches from the edge, and are unevenly spaced along the edge. They can be differentiated from the circular punch holes used in decorating the pieces in that they were driven in a direction opposite that used in the decoration.

Both specimens have a size range in excess of 30 cm.

Punched Tin Specimen 3 (Cat. no. 66)

This specimen measures only 6.0 inches in width. It appears to be broken on both the top and the bottom. Although much smaller in width, this piece is very similar to specimens 1 and 2 described above. Like these pieces, specimen 3 was crimped on one side and on this side the design continued right up to the edge. This would indicate the

carryover of the design on this panel to another panel. Characteristics of the border, internal design elements and design element construction, and the method of fastening of this panel are identical to that described above. This fragmentary panel has an overall size range of 20 to 25 m.

Knives and Forks

With one possible exception, the knives and forks recovered from the commanding officer's quarters can generally be identified as eating rather than food preparation utensils. Larger knives and other utensils used for food preparation are, surprisingly, entirely absent from the collection.

Forks

There are four types represented among the seven forks in the collection (Figure 32). All examples have three tines; the differences lie in their shanks and handles. In addition to the seven forks present in the study collection, the catalog provided information on three forms which are now apparently missing. These forks have catalog number of 51, 62, and 121. The forks with catalog numbers of 51 and 121 may represent Type I forks since the four remaining examples of this type share these catalog numbers.

Type I Forks (Cat. nos. 51, 51, 121, 121)

Four examples of the Type I fork are included in the collection (an additional two may have once been present, but are now missing from the collection). Only one of these examples is complete; the other three are characterized by broken tines and one by a broken mounting pin. These forks are of cast manufacture. The complete specimen (Cat.

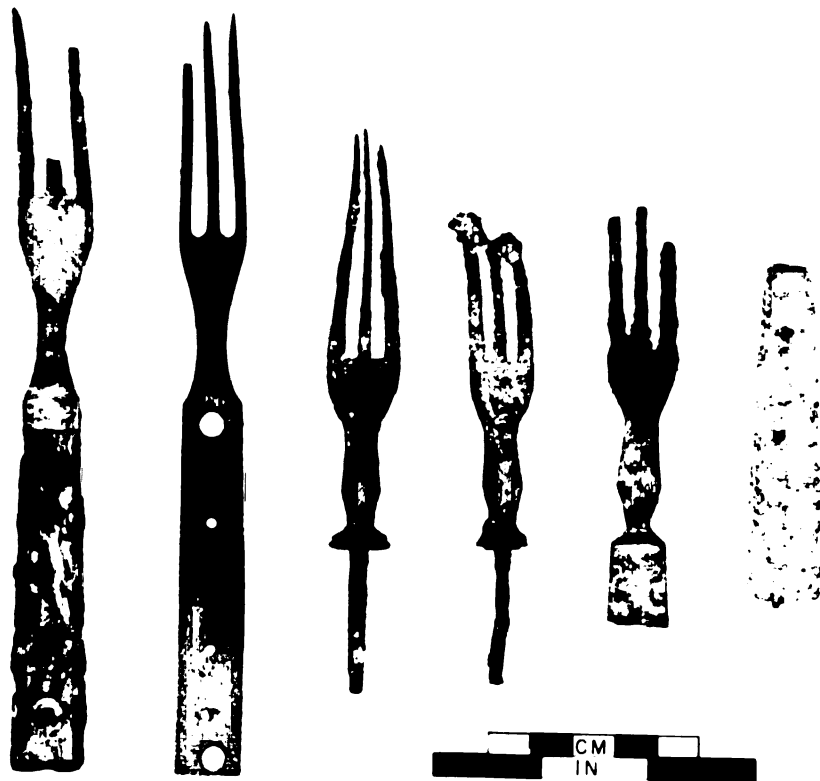


Figure 32. Table forks.

no. 121) consists of three tines, a balustroid shank, a stepped bolster, and a tang that would have been inserted into a probably bone handle. The overall length of this complete specimen is 5.2 inches, including a blade of 2.7 inches (tines measure 2.1 inches), a shank of 1.2 inches (including the bolster), and a tang of 1.4 inches. At its widest point, the blade is .7 inches wide.

The shank is the most distinct part of this fork. It is diamond-shaped in cross section and tapers from both ends to form a mid-section bulge. The shank expands at its proximal end to form a bolster or cap for the end of the supposedly bone handle. This stepped bolster measures about .4 by .5 inches and is a rounded rectangle in shape. It is important to note that this bolster is identical to those found on most of the table knives from the site. According to Noel Hume (1980: 180), "Fork handles were invariably similar in shape to those of the knives they accompanied". The similarities in this design element is strong enough to suggest these Type I forks were part of a set which also included most of the table knives from the site.

Size ranges of the Type I forks are: Cat. no. 51: 6-8 cm; Cat. no. 51: 4-6 cm.; Cat. no. 121: 10-15 cm; Cat. no. 121: 10-15 cm.

Type II Forks (Cat. no. 150)

Only one specimen of this type fork was included in the collection. This fork is very similar to the Type I forks in the blade and diamond shaped shank, but differs in the form of the bolster and in way the handle was attached. Like the Type I forks, it is of cast manufacture. Rather than being mounted on a tang extending from the shank, the shank expands to a plain bolster beyond which is a flat

strip of metal .5 inches in width. A probably bone handle was riveted to this flat strip or handle plate. This handle plate and the three tines are broken on this specimen. Overall, the dimensions and proportions of this specimen mirror those found on Type I forks. This broken specimen measures 3.9 inches in length, and has a size range of 8-10 cm.

Type III Forks (Cat. no. 54)

This type is represented by a single specimen. Except for two broken tines, this fork is complete. The blade, shank, and handle plate of this fork are made of a single piece of thin iron. The overall length of this piece is 7.0 inches, including a 2.7 inch long blade, a 1.0 inch long shank, and 3.3 inch long mounting plate. The constricted shank has been struck to be convex/concave in cross-section. Fastened to each side of the flat handle plate are two plano-convex wood grips. These grips measure 3.1 inches in length and from .5 inches in width at the shank to .65 inches in width at the butt end. These have been fastened to the handle plate with two iron rivets. Where the handle meets the shank, these wood grips are capped by cast pewter bolsters. These bolsters have apparently been cast in place on the fork, and are probably fastened to one another through a hole in the iron handle plate. Overall, this fork fits within a 15-20 cm size range.

Type IV Forks (Cat. no. 121)

This type is represented by a single specimen which is very similar to the Type III fork described above. This fork differs from the Type III fork in that the shank has not been struck and is instead

flat, and in that the handle grips were fastened with three brass rivets. Two additional rivet holes are present on the handle, but were apparently not used. The grips and bolsters are missing from the specimen, but otherwise this artifact is complete. There are holes, .2 inches in diameter, at each end of the handle plate, which may have served to mount pewter bolsters. The overall length of this specimen is 7.0 inches; the other dimensions mirror that of the Type III fork described above.

Bone Handle

A single bone grip (Cat. no. 150), probably from a fork, is included in the collection. This grip was fastened to a probably iron mounting plate with iron rivets. It fits well on the single Type II fork described above. This handle is plano-convex in cross section, and measures 3.2 inches in length and from .5 to .7 inches in width. It is decorated by engraving a cross hatched pattern along each side of the grip, and by a pattern of perpendicular lines, in repeating groups of three, along the center. It has not been affected by heat. This artifact fits within a size range of 6-8 cm.

Knives

A total of eleven knives or knife fragments are included in the study collection, representing three basic types of knives (Figure 33).

In addition, the catalog lists a knife, of unknown type, which is now missing from the collection.

Type I Knife (Cat. nos. 51, 51, 51, 51, 51, 51, 54, 76, 82)

This type includes nine specimens in varying states of preservation. None of these specimens are complete, but all include



Figure 33. Table knives.

portions of the blade, the entire bolster, and a mounting tang. All were clearly intended to be mounted on a wood or, more likely, a bone handle. Complete mounting tangs among these specimens are circular in cross-section. From a number of fragmentary examples, the blades of these knives can be reconstructed to have been parallel sided with rounded tips. The top of the blade was even with the top of the bolster, while the cutting edge dropped significantly below the bolster. The stepped bolster on these knives is identical in design to that present on the Type I forks described above.

Although identical in design, there are two different sizes of Type I knives represented in the collection. The smaller had a blade that is .7 inches in width while the larger has a blade that is .9 inches wide. On the smaller knives, the mounting tang is 1.5 inches in length while on the larger, it is only 1.2 inches long. The smaller knife is represented by two specimens (Cat. nos. 51 and 51), with the remaining specimens all being of the larger variety.

The conditions and size ranges of these specimens differ drastically: Small variety: Cat. no. 51, extremely rusted, 8-10 cm size range; Cat. no. 51, extremely rusted, 10-15 cm size range; Cat. no. 51, good condition but broken, 10-15 cm size range; Cat. no. 51, rusted, 10-15 cm; Cat. no. 51, rusted, 10-15 cm; Cat. no. 51, rusted, 15-20 cm; Cat. no. 54, extremely rusted and fragmentary, six fragments less than 10 cm; Cat. no. 76, extremely rusted and fragmented, four fragments less than 8 cm.; Cat. no. 82, extremely rusted and fragmented, three fragments less than 8 cm.

Type II Knife (Cat. no. 99)

This type is represented by a single specimen. It is heavily corroded and the original shape of the blade cannot be reconstructed with any certainty. The overall length of this artifact is 8.3 inches which may or may not represent its original length. This knife has a mounting tang which was used to fasten it into a wood or bone handle. This tang is horizontal in cross-section and draws to a point. It measures 2.3 inches in length. The blade measures a consistent 1.0 inches in width, with both edges being straight and parallel. At the tip end, the top of the blade angles sharply towards the cutting edge; this may represent the original point of the knife or may have resulted from breakage. No evidence of a bolster is present on this specimen.

The size of this knife suggests it may have served as a tableware. Its shape and difference from the predominant Type I knives, however, lends the suggestions that it may have served in food serving or, perhaps, in its initial preparation. This specimen fits within a size range of 20 to 25 cm.

Type III Knife (Cat. no. 53)

This specimen consists of a handle to a knife; no part of the blade remains. This knife differs markedly from other eating utensils observed at the site in that the handle is entirely of one-piece, cast iron construction. It is presumed that the blade was also cast as part of this piece. This handle measures 4.0 inches in length and is ovoid in cross section. It is rounded at the butt end, where it measures .65 inches in width, and narrows to .5 inches at the blade end. A bolster is present on this handle and is delineated by two grooves, one on each

side of the handle and which run perpendicular to the handle. This specimen fits within a size range of 10 to 15 cm.

Cast Iron Cooking Wares

Included here are six cast iron artifacts that appear to be from some sort of cast iron cooking wares. Represented are two complete lids, four lid fragments, and one vessel body fragment. The lids are all from covered cooking vessels such as dutch or deep ovens, bake spiders, or biscuit spiders (Russell and Erwin 1865: 392-293). These are described individually below.

Cast Iron Lids

Cast Iron Lid 1 (Cat. no. 97)

This is a complete lid to a heavy cast iron vessel (Figure 34). It has a diameter of 9.0 inches, and is convex in profile. Although mostly broken off, this lid had a raised lip around its outside edge that extended at least .5 inches above the lid. This lip would have allowed hot coals to be placed on top of the lid, and would have prevented their falling into the vessel when the lid was removed.

This lid was decorated with two concentric ridges spaced about .5 inches apart with the outside ring being about 1.0 inches from the edge of the lid. It is impossible to tell now, but there may have been writing or further decoration between these concentric rings. Within the smallest of these rings is the handle to the lid. This handle, cast as part of the lid, is circular in cross section. At its widest point, where it attaches to the lid, this handle measures 5.0 inches from end to end. Where it attaches, each end of the handle measures 1.3 by .7 inches. It tapers to a circular .4 inches at its center,



Figure 34. Cast iron dutch oven lid.

where it is about 1.2 inches above the lid. This artifact has a size range of 20 to 25 cm.

Cast Iron Lid 2 (Cat. no. ?)

This complete lid, also to a heavy cast iron vessel, is similar to lid 1 but differs in many design elements (Figure 35). This lid measures 8.5 inches in diameter and has a raised lip around the edge which extends .6 inches above the lid. As was the case with lid 1, this raised lip was designed to keep hot coals on top of the lid but out of the vessel when the lid was lifted.

This lid is characterized by a single line of writing which has been cast into the lid and which runs parallel to the curved edge of the lid. The observed letters are about .5 inches in height and are placed about 1.2 inches from the edge of the lid. Letters on only a small portion of the lid remain to be observed, and these are difficult to interpret. These include " (N H or M I?) I L A (C or G?) E ..."

The center of the lid is graced by a handle which is circular in cross section. At its widest, where it attaches to the lid, this handle is 4.0 inches across. Where they attach to the lid, this ends of this handle are about .75 inches in diameter. At its center, the handle narrows to a diameter of about .3 inches. At this point, the handle extends to about 1.2 inches above the lid. This lid fits within a size range of 20 to 25 cm.

Cast Iron Lid 3 (Cat. no. ?)

This is identified as a lid fragment by its slightly convex form and by the presence of cast letters which would have been parallel to a curved edge. No handle or edge to this lid remain. The cast letters



Figure 35. Cast iron dutch oven lid

that can be observed on this artifact are "S A (V or W)..." These letters measure .6 inches in height. This artifact has a size range of 15 to 20 cm.

Cast Iron Lid 4 (Cat. no. 114)

This is a small fragment from the edge of a cast iron lid. From the curvature of the edge, this fragment was probably from a lid nine or ten inches in diameter. This fragment has a portion of a large letter on it, probably a "C", which is located about one inch from the edge. The height of this letter cannot be measured, but it is similar in size to those documented on lids 5 and 6 below. Although broken off, this lid had a raised lip similar to that noted on lids 1 and 2. This specimen has a size range of 4 to 6 cm.

Cast Iron Lid 5 (Cat. no. 128)

This specimen consists of a fragment from the center of a lid (Figure 36). The handle is still present on this artifact, as is an "S" and part of another, indistinguishable letter. These letters were cast into the lid, and measure about 1.1 inches in height. Due to a similarity in letter size, it is possible that lid fragment 4 and 6 were once a part of this lid.

The handle on this lid fragment is circular in cross section. It is approximately .8 inches in diameter where it attaches to the lid, but narrows to only about .35 inches in diameter at its center point. The handle extends to a height of about .9 inches above the lid, and at the outside the handle is 3.7 inches wide where it attaches to the lid. This fragment has an overall size range of 10 to 15 cm.

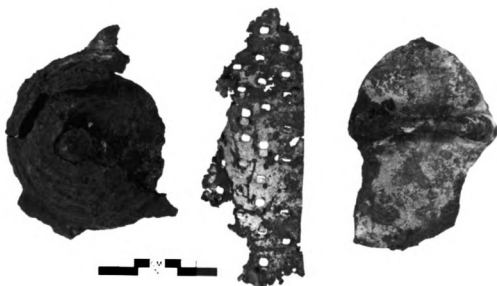


Figure 36. Miscellaneous kitchen artifacts. Left, coffee mill; Center, food grater; Right, cast iron lid fragment.

Cast Iron Lid 6 (Cat. no. 128)

This is a small fragment of a cast iron lid including part of the outside edge. Based on the curvature of this outside edge, this fragment can be identified as having come from a lid approximately nine to ten inches in diameter. Although it has been broken off, this lid once had a raised lip similar to that observed on Lids 1 and 2. Portions of two letters cast into this lid can be observed on this artifact. These letters are 1.1 inches in height, but cannot be identified. This artifact fits within a size range of 4 to 6 cm.

Cast Iron Vessels

Only one artifact represents the remains of the body of a cast iron cooking vessel. This artifact (Cat. no. 67) consists of a fragment of the base and sides of a vessel with relatively thin, vertical walls (ca. 1.0 to 1.5 inches thick). Based on the diameter of the base of this vessel, it had a diameter in excess of thirteen inches. No other characteristics of this vessel can be reconstructed from this fragment. It fits within a size range of 10 to 15 cm.

Grater

What has been interpreted as a fragment of a food grater consists of a piece of tin which has been punched to form teeth on its surface (Cat. no. 131) (Figure 36). These teeth were formed by using a punch of unknown form to cut three sides of a rounded rectangle about .20 by .175 inches in size, and to bend the cut "tongue" slightly above the surface of the other tin. This creates a sharp if crude cutting surface over which foods could be grated. This specimen is very fragmentary, and has a maximum length of 7.0 inches. Only one edge

remains, this being straight and otherwise unfinished. This artifact fits within a size range of 15 to 20 cm.

Tin Candle Holder

This tin candle holder (Cat. no. 79) is extremely rusted and very fragmented. It was apparently in better condition upon excavation but is almost unrecognizable at this point. It appears to consist of a socket which was fastened to a flat, circular plat, and to which was attached a broad tin handle. The socket is the best preserved of these parts, and consists of a cylinder of tin approximately 1.0 inches in diameter and 1.6 inches in height. This cylinder is open along one side, and probably held a slide used to push candle stubs out of the socket. The top of this socket has been finished by crimping a separate piece of tin over to make a smooth lip. The plate on which this socket was attached is circular and had a diameter of about 4.0 inches. The edges of this plat were crimped over to form a rounded edge. What is probably the handle to this holder is very fragmentary, but measures approximately 1.2 inches in width. These fragments fit within an 8 to 10 cm size range.

Ceramic Candle Holder

A single ceramic candle holder is included in the collection (Figure 37). This specimen is an elaborately decorated soft paste porcelain artifact which is largely reconstructible from thirteen pieces (12 cat. no. 76; 1 cat. no. 115). The decoration on this piece is a polychrome overglaze executed in an abstract geometric pattern. This piece has very obviously been affected by heat, with most of the sherds being damaged to some extent. Occasional sherds, however, show



Figure 37. Ceramic candle holder.

little affect of heat, indicating the artifact broke prior to intensive burning and showing quite well the differential affects of heat on fragments of the same artifact in this collection. Colors used in the overglaze decoration are difficult to precisely identify due to extensive heat damage, but certainly included a rusty orange and perhaps black and white as well.

Coffee Mill

An extremely corroded and fragmented portion of a coffee mill was recovered from the site (Cat. no. 76) (Figure 36). This artifact may have been part of a box mill, but it is so corroded and fragmented that precise description is impossible. It fits within an overall size range of 10 to 15 cm.

Bail

A single wire bail is included in the collection. This specimen (Cat. no. 147) is made of 134/1000 inch wire. The overall length of this bail is about 23.5 inches; it has been bent from its original, semi-circular shape. The ends of this wire bail have been bent to form loops which were used to attach it to the bail ears of a bucket. This artifact has a size range in excess of 30 cm.

Tin Handles

Three handles made of folded tin are included in the study collection. These are assumed to represent the handles from tin cups and similar utensils, and are thus included among the kitchen artifacts. These are described individually below.

Tin Handle 1 (Cat. no. 51)

This is the smallest tin handle in the collection. Its overall length is only 2.6 inches. It was made by folding over the edges of a thin piece of tin. One end is cut to taper to a blunt point; this was probably inserted into a cut or under a fold in another piece of tin and soldered to it. At this end, the handle measures .3 inches in width. Its straight sides diverge towards the other end, which is cut straight across its width and where it measures .7 inches in width. This handle is of a size that would probably be found on a tin cup. It fits within a size range of 2 to 4 cm.

Tin Handle 2 (Cat. no. 128)

This handle is similar in manufacture to handle 1, but is substantially larger. The overall length of this handle is 6.5 inches. Like handle 1, this handle is formed by folding over the edges of a thin piece of tin, and it too expands in width along its length. At the narrow end, the corners of the tin have been trimmed to form a very broad and blunt point. At this end, the handle is .7 inches in width. At the other end, the handle is cut straight across its width, which is 1.1 inches. This handle is further decorated by two subtle, stamped ridges running longitudinally down the handle inside the crimped edges. This handle is probably larger than would have been used on a tin cup; it is uncertain what type of utensil it would have been fastened to. this artifact fits within a size range of 10 to 15 cm.

Tin Handle 3 (Cat. no. 153)

This tin handle is the largest in the study collection; it measures about 7.2 inches in overall length. This handle is similar

in manufacture to handles 1 and 2, but differs in that each end is perforated. Like handles 1 and 2, the edges of this handle are crimped over, and it tapers from .8 to 1.5 inches in width. It is similar to handle 1 in that it is not decorated. At the narrow end, the tin corners have been trimmed to form a wide, blunt point, and a single perforation is present. At the wide end, the tin has been cut straight across the width, and two perforations are present. It is presumed these perforations are for the attachment of this handle to another object, probably with rivets. This specimen has been badly crushed, and fits within a size range of 10 to 15 cm.

Tin Cans

A large number of tin can fragments are included within the study collection. These include a few examples that could date from the mid-nineteenth century, but most substantially post-date this period.

Simple Seam, Hole-in-Top Cans

The preservation of food in tin cans was a technology first introduced during the early nineteenth century. Food preserved in tin cans was first introduced to the United States in 1819, enjoyed increasing popularity through the 1850s, and finally gained wide acceptance during and following the Civil War. Although many innovations in manufacturing occurred during the nineteenth century, the form of the tin can did not change measurably until the beginning of fully automatic manufacture around 1900 (Clark 1977: 12-17).

Nineteenth century tin cans were made of a body and separate caps and tops. The body was made from a sheet of tin with a simple overlapping, soldered seam. The bottom of the can consisted of a cup

shaped piece of tin which fit over and was soldered to the body. The top was a similar cupped piece of tin, but it had a large hole punched through it. Once the can was complete, food was put into the can through this hole, and a cap with a pin hole in its center was soldered over the larger hole. The food was then cooked in the can, and, when fully heated, a drop of solder was placed over the pin hole, sealing the contents. Because of this distinctive type of seal, this type of can is often referred to as a hole-in-cap can (Clark 1977: 12-17).

Several specimens from the collection can be identified as parts of hole-in-cap cans. These cans may date to the mid-nineteenth century, but may date much later as well. These include a pin-hole cap, the edge of a top or bottom of a can, and ten fragments which are probably all from a single can.

A single concave metal cap, 1.8 inches in diameter, is represented in the collection. This cap has a pin-hole in the center, and certainly represents the cap to a hole-in-cap can. This cap would have been soldered to the top of the can, covering up a large opening through which food was inserted after the can was finished. The pin-hole would be covered with solder to seal the contents after it had been fully cooked. This specimen has a size range of 4 to 6 cm.

Also included in the collection is a single specimen (Cat. no. 56) which is the edge of a top or bottom to a simple-seam, hole-in-cap can.

This fragment has the edge bent to a ninety-degree angle which would have slipped over and been soldered to the body of the can. This specimen has a size range of 6 to 8 cm.

The ten fragments (Cat. no. 75) include a body fragment which has

the simple, overlapped and soldered seam characteristic of nineteenth century manufacture. Also included are four fragments from the top or bottom of cans, the edges of which are bent at a simple ninety-degree angle to slide over and be soldered to the sides of the can. The balance of the fragments appear to be from the same can, but do not themselves possess diagnostic characteristics. The size ranges of these ten fragments are 2 to 4 cm ($n = 3$), 4 to 6 cm ($n = 1$), 6 to 8 cm ($n = 5$), and 8 to 10 cm ($n = 1$).

Zinc or Pewter Can

A single base to a zinc or pewter can is included in the collection (Cat. no. 147). This base has a diameter of 2.0 inches and has three concentric ridges stamped into it. The edges of the base are bent to form simple 90 degree seams. The uses and contents of this can are uncertain.

Sanitary Cans

A vast majority of the can fragments from the site are relatively late cans manufactured with the use of an double or interlocking seam characteristic of the "sanitary" can (Table 61). Patents for this type of double seam were issued in the 1890s, and large scale manufacture of cans using this type of seam was begun by the Sanitary Can Company in 1904 (Clark 1977: 18; Rock 1980). Cans and can fragments with interlocking seams therefore date after about 1900. Cans of this type are clearly intrusive to the 1850s collection from the Commanding Officer's Quarters, and are not further discussed in this report.

Table 61
Summary of sanitary seam can fragments

<u>Provenience</u>	<u>No.</u>	<u>Comments & size ranges</u>
66	2	4-6, 6-8
96	1	6-8
103	20	0-2(1), 2-4(11), 4-6(6), 6-8, 8-10
111	1	hole-in-top seal, 15-20
123	3	6-8, 10-15, 20-25
124	6	4-6, 6-8, 8-10(2), 10-15(2)
145	1	6-8
153	1	10-15
155	1	hole-in-top seal, 15-20
157	6	2-4, 4-6, 8-10, 10-15(3)
184	1	8-10
?	1	25-30

Recognizable Melted and Unmelted Glass Artifacts

Despite the presence in the collection of a large number of glass artifacts, only a very few remained in a condition that would allow an interpretation of their original form. Most of these are from contexts removed from the commanding officer's quarters building. Those that were in the immediate vicinity of the building have been variously affected by the heat of the fire which destroyed it in 1857 (Figures 38 and 39).

Glass artifacts recognized as window glass have been discussed in the section on architectural artifacts.

Green Bottle Glass

Although a relatively uncommon constituent among the unrecognizable bottle glass, green glass artifacts make up a sizable



Figure 38. Melted bottle fragments. Left, base of an olive green bottle; Right, shoulder of an olive green bottle.



Figure 39. Bottle finishes showing differential affects of heat in the collection. Top row: melted aqua and olive green finishes; Bottom row, finishes unaffected by heat.

percentage of the recognizable, diagnostic artifacts.

Green Bottle Glass Specimen 1 (Cat. no. 54)

Represented by this specimen are the shoulder and part of the neck of a deep olive green bottle. This artifact has been extensively affected by heat, and is completely collapsed and was molded over debris lying beneath it. Although its dimensions cannot be reconstructed, this was obviously part of a fairly large bottle. The broken edges of this specimen are all sharply fractured, indicating breakage after the bottle had completely cooled. The articulating fragments have not been identified. This specimen has a weight of 130 grams, and a size range of 10 to 15 cm.

Green Bottle Glass Specimen 2 (Cat. no. 54)

This is a small fragment of a base which has been moderately affected by heat. Besides observing that this base had a flat resting surface and that it was probably part of a relatively large bottle, little can be said about the original form of the bottle of which this was once a part. This specimen has a weight of 9 grams, and a size range of 4 to 6 cm.

Green Bottle Glass Specimen 3 (Cat. no. 76)

This finish is from a relatively large bottle. It is a two part finish consisting of two, down-tooled "V" shaped string rims. This finish is similar to those found on a variety of alcohol and bitters bottles. This specimen has a weight of 25 grams and a size range of 4 to 6 cm.

Green Bottle Glass Specimen 4 (Cat. no. 79)

This specimen consists of a reconstructed base and lower body section of a dark olive green bottle. It has been reconstructed from six fragments. Of note, only one of these six fragments has been affected by heat, indicating that the bottle was broken before this piece was heated to the melting point. This bottle is circular in cross section and has a diameter at the base of 3.1 inches. It has a molded based with a flat resting surface and an otherwise mamelon form. The lack of mold marks on this specimen, and the fact that the bottle tapers towards the base, suggests that it was made in a three-piece mold with a dip mold forming the body and base. This specimen weighs a total of 435 grams. The sherds making up this specimen range in size from 6 to 8 cm to 10 to 15 cm (6-8 cm = 2; 8-10 cm = 3; 10-15 cm = 1).

Green Bottle Glass Specimen 5 (Cat. no. 79)

This is a base and the lower part of the body of an olive green bottle. It was reconstructed from seven sherds, none of which have been affected by heat. It is circular in cross section, and has a diameter at the base of 3.1 inches. The base is conical in profile, and has a rounded heel. The diameter of this bottle appears consistent throughout the body, and the base was not mold-formed. Based on these characteristics, this bottle was probably free-blown. This specimen weighs 400 grams. The seven pieces that make up this specimen range in size from 2 to 4 cm to 8 to 10 cm (2-4 cm = 1; 4-6 cm = 1; 6-8 cm = 3; 8-10 cm = 2).

Green Bottle Glass Specimen 6 (Cat. no. 79)

This artifact consists of a fragment of a bottle finish characterized by a long, down-tooled lip. This was once part of a relatively large bottle, probably of a size similar to the other three-inch diameter bottles described in this section. It has not been affected by heat. This specimen weighs 9 grams and has a size range of 2 to 4 cm.

Green Bottle Glass Specimen 7 (Cat. no. 79)

This is a fragment of the neck and finish of a dark olive green bottle of relatively large size. It has not been affected by heat. The finish is a two part finish with two "V" shaped, down-tooled string rims similar to those found on liquor bottles. This specimen has a weight of 20 grams and a size range of 4 to 6 cm.

Green Bottle Glass Specimen 8 (Cat. no. 80)

Included here are seven articulating base fragments of an olive green bottle. The reconstructed horizontal cross section of this bottle is circular with a diameter of about 3.0 inches. The base of this bottle was clearly made in a mold. It has a flat resting surface and is identical to other mamelon bases from the site (Jones and Sullivan 1985). These seven fragments combine to weigh 182 grams. The largest fragment has a size range of 6 to 8 cm (0-2 cm = 1; 4-6 cm = 5; 6-8 cm = 1).

Three of the seven fragments of this base are distorted by heat. Two of these are badly distorted, and the third is distorted only on its body section. This differential heat alteration indicates that the bottle was broken prior to its subjection to severe heat, possibly

during the collapse of the building. Of interest, also from provenience 80 is a large olive green body sherd (size range 10-15). This sherd is extremely heat distorted on one end, but only minimally if at all on the other end. This indicates that very little distance may have separated the heat distorted and the apparently non-distorted base fragments discussed above and elsewhere in this section.

Green Bottle Glass Specimen 9 (Cat. no. 86)

This specimen consists of a portion of the neck and the finish of a relatively large bottle. This artifact has been partially melted but it originally had a straight finish with a flattened string rim applied just below the lip. This type of finish is typically described as a champagne finish. This specimen weighs 37 grams and has a 6 to 8 cm size range.

Green Bottle Glass Specimen 10 (Cat. no. 87)

This specimen consists of six articulating fragments of the upper half of an olive green bottle. Present are part of the body, the shoulders, and the neck. The finish is broken off. This bottle had a circular horizontal cross section with a diameter at the shoulders of about 3.3 inches. This bottle section has not been affected by heat. Mold marks present on this specimen indicate it was made in a three piece mold with a dip mold forming the body and with a two part mold forming the shoulders and neck. These six articulating pieces weigh 160 grams. The largest section has a size range of 10 to 15 cm (2-4 cm = 1; 6-8 cm = 2; 8-10 cm = 1; 10-15 cm = 1).

Green Bottle Glass Specimen 11 (Cat. no. 95)

This is a fragment of the base of a relatively large bottle. In horizontal cross section, this bottle was circular and it was characterized by a slightly mamelon, dome shaped basal profile with a rounded heel. This fragment has not been affected by heat. This specimen weighs 55 grams and has a size range of 6 to 8 cm.

Green Bottle Glass Specimen 12 (Cat. no. 95)

This consists of two articulating sections of a bottle finish characterized as a two-part finish consisting of two down-tooled, "v" shaped string rims. This finish has not been affected by heat. This specimen weighs 10 grams and has a size range of 2 to 4 cm.

Green Bottle Glass Specimen 13 (Cat. no. 95)

This is the fragment of the base to a relatively large bottle with a circular horizontal cross section. It appears to have had a rounded cone type of basal profile, and a rounded heel. This fragment has not been affected by heat. This specimen weighs 50 grams and has a size range of 4 to 6 cm.

Green Bottle Glass Specimen 14 (Cat. no. 95)

This is a section of the base of a relatively large bottle with a circular horizontal cross section. It has been melted, which has obscured many of the characteristics of this artifact. This specimen weighs 42 grams and has a size range of 4 to 6 cm.

Green Bottle Glass Specimen 15 (Cat. no. 99)

This specimen consists of the base of a deep olive green bottle. This bottle is circular in horizontal cross section, has a flat resting point, and is generally mamelon in profile (Jones and Sullivan 1985).

These characteristics indicate that this base was mold formed. This base has been distorted by heat, so its dimensions cannot be precisely reconstructed; its basal diameter probably ranged between 2.5 and 3.0 inches. This bottle has been extensively altered by heat, but clearly after the base had broken from the rest of the bottle. From the way it is melted, it appears that this base was lying on its side during the period it was heat affected. This fragment has a weight of 300 grams, and a size range of 10 to 15 cm.

Green Bottle Glass Specimen 16 (Cat. no. 102 and 103)

This consists of two articulating fragments of a green glass finish (Cat. no. 102) which articulate with a third fragment (Cat. no. 103). Two of these fragments do not appear to have been affected by heat but the third is slightly distorted. This indicates that this bottle broke before it was extensively heated, perhaps during the collapse of part of the building. Reconstructed, this finish was characterized by a down-tooled lip and a V-shaped string rim. It was obviously from a fairly large bottle. Together, these three articulating specimens weigh 29 grams and each has a size range of 2 to 4 cm.

Green Bottle Glass Specimen 17 (Cat. no. 103)

This specimen consists of a shoulder fragment which is embossed with the letters "E N". This is probably part of the word "PATENTED"; a case of cylindrical amber bottles so marked on the shoulder was part of the cargo of the steamer Bertrand, which sank on the Missouri River in 1865 (Switzer 1974: 29). These bottles from the Bertrand contained an unknown substance with a small alcohol content. This artifact has a

weight of 10 grams and a size range of 6 to 8 cm.

Green Bottle Glass Specimen 18 (Cat. no. 103)

This small sherd of green glass is part of the base of a relatively large bottle. This bottle was probably cylindrical and probably had a diameter of around three inches. This specimen carries embossed lettering that once encircled the base. Letters present on this specimen are "(V or W) I L L". Amber and green bottles with similarly marked bases were discovered aboard the 1865 Bertrand wreck, and contained bourbon whiskey. Comparison of this sherd with the embossing on the Bertrand bottles is non-conclusive; it could belong to either the "WELLINGTON GLASS WORKS" or the "ELLENVILLE GLASS WORKS". The Ellenville Glass Works was established in 1836 in New York state, and the Wellington Glass Works were established in 1815 in Connecticut (Switzer 1974).

Green Bottle Glass Specimen 19 (Cat. no. 116)

This specimen has been reconstructed from three fragments, and consists of the finish and most of the neck of a relatively large bottle. The finish has a low, flattened string rim applied to an otherwise straight finish. This finish is similar to those found on champagne bottles. It has a weight of 70 grams and a size range of 10 to 15 cm.

Green Bottle Glass Specimen 20 (Cat. no. 152)

This artifact consists of the base and lower half of an olive green bottle. This has a molded base with a flat resting point; the lack of mold marks and the fact that this bottle tapers slightly towards the base suggests it was made in a three-piece mold with a dip

mold forming the body and base. This bottle is circular in cross section, and measures 3.0 inches in diameter at the base. It has not been affected by heat. Its weight is 270 grams and its maximum size range is 10 to 15 cm.

Aqua Bottle Glass

Aqua Bottle Glass Specimen 1 (Cat. no. 51)

This small fragment of a bottle finish has been altered by heat. It is probably from a fairly small bottle, and the finish is a simple one part finish characterized by a very slight flanging of the lip. This specimen weighs 4 grams and has size range of 0 to 2 cm.

Aqua Bottle Glass Specimen 2 (Cat. no. 54)

This specimen is a relatively small fragment of the body of an embossed bottle. This sherd has not been affected by heat. The embossing is on a flat panel and includes fragments of two lines of embossing separated by a decorative motif of unknown form. The embossing ran longitudinally down the body, with the upper line including the letters "...D I (P, F or R)..." and the lower line the letters "... (P or R) A...". These letters were insufficient for an identification of the bottle. This fragment weighs 4 grams and has an overall size range of 4 to 6 cm.

Aqua Bottle Glass Specimen 3 (Cat. no. 54)

Included here are four fragments of a bottle, two of which certainly once articulated and all of which probably articulated. This bottle was probably very similar to the almost complete bottle described as specimen 8 (Cat. no. 76). Represented in this specimen are three body fragments and one base. Two of the body fragments and

the base have been affected by heat, and one body fragment has not been so affected. The unheated body fragment articulates with one of the heated fragments, indicating the bottle broke before it had been completely affected by heat.

From mold marks present on one of the body fragments and from the obviously molded form of the base and body fragments, this bottle was clearly made in a hinged mold of some sort. The base has no evidence of a pontil scar, so it may have been finished using a snap case device instead, which leaves no marks. The bottle was obviously roughly circular in horizontal cross section, but it was characterized by a series of ribs with broad, flat faces. The four fragments considered here have a combined weight of 68 grams, and have sizes ranges including 4 to 6 cm ($n = 3$) and 10 to 15 cm ($n = 1$).

Aqua Bottle Glass Specimen 4 (Cat. no. 54)

This is the upper portion of a medium sized bottle including part of the body, the neck, and the finish. In horizontal cross section, the body was probably round with flat sides. A portion of an embossed letter, probably an "F" or a "P" is present on one of the sides. The finish consists of a flattened side type finish made by applying a wide band of glass about .6 inches in width to the finish. This specimen has been affected by heat. This specimen weighs 35 grams and has an overall size range of 6 to 8 cm.

Aqua Bottle Glass Specimen 5 (Cat. no. 67)

This specimen has been severely affected by heat, and consists of a small section of a bottle finish. This finish appears to be a two part finish with one rounded string rim below which is either a rounded

or a slightly "V" shaped string rim. It is similar to a Perry Davis type finish, although its melted condition precludes its definite identification with this type of finish. It has a weight of 6 grams and a size range of 2 to 4 cm.

Aqua Bottle Glass Specimen 6 (Cat. no. 75)

This specimen consists of the finish, neck, and part of the shoulders of a small bottle that has been slightly affected by heat. This specimen has a flanged lip formed by taking an otherwise straight finish and folding the lip over so that it is roughly perpendicular to the neck. This bottle was probably round in horizontal cross section. It weighs 5 grams and has a size range of 2 to 4 cm.

Aqua Bottle Glass Specimen 7 (Cat. no. 75)

This is one of the few complete bottles in the study collection (Figure 40). It has, however, been severely altered by heat and after cooling broke into three large pieces. It is obvious from the fact that the three pieces articulate along sharp breaks that it remained in one piece until well after the destruction of the building.

Despite the severely melted condition of this bottle, many of its original characteristics can be reconstructed. It was a relatively large bottle which was in the vicinity of 11.0 inches in height. It has a circular horizontal cross section and was between 2.0 and 3.0 inches in diameter. The base was probably concave and appears to have jagged glass adhering to it as evidence of the attachment of a glass tipped pontil to the base during the finishing process. The finish was an otherwise straight finish with a flattened string rim applied .1 to .2 inches below the lip; in a fashion similar to that described on

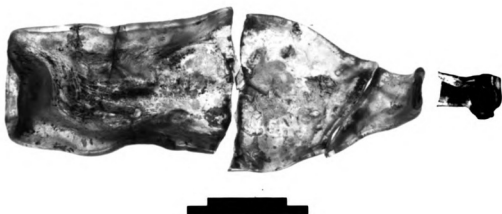


Figure 40. Melted aqua bottle showing affects of fire on some specimens.

champagne bottles. The reconstructed bottle has a weight of 385 grams and a size range of 25 to 30 cm.

Aqua Bottle Glass Specimen 8 (Cat. no. 76)

This specimen consists of two articulating fragments of an almost complete bottle; only the finish of this bottle is missing (Figure 41). This bottle is broken horizontally through the lower body; the base has not been affected by heat, while the upper body, shoulders, and finish have been moderately heat affected. This indicated that this bottle broke prior to being heated to the melting point.

This bottle was originally at least 7.5 inches in height and about 2.3 inches across at the base, which is basically circular in horizontal cross section. From mold marks running longitudinally down the body, and by the obviously molded form of the base and body, this bottle was very clearly manufactured in some form of a hinged mold. The base has a flat heel and a shallow concave basal profile. The jagged glass remains of a glass tipped pontil remain in the basal concavity. The body of this bottle is characterized by distinctive ribbing. A total of eight longitudinal ribs grace the 4.7 inch tall body of this bottle. These ribs have flat faces separated by "V" shaped flutes. Although the actual finish of this bottle is missing, the neck is decorated with neck rings. These neck rings consist of semi-circular beads of glass applied to the neck. On this specimen, the neck rings are adjacent to one another.

The two fragments making up this specimen have a combined weight of 235 grams. Articulated, these fragments have an overall size range of 15 to 20 cm (6-8 = 1; 15-20 = 1).



Figure 41. Broken aqua bottle showing differential affects of heat on fragments of the same artifact. Base is not affected by heat; upper section has been distorted by heat.

Aqua Bottle Glass Specimen 9 (Cat. no. 76)

This is the finish to a relatively large bottle that has been seriously affected by heat. The finish is a flattened side type which was probably formed by the application of a single, wide band of glass to the neck. This specimen weighs 15 grams and has an overall size range of 2 to 4 cm.

Aqua Bottle Glass Specimen 10 (Cat. no. 76)

This specimen consists of a portion of the neck and the finish to a medium sized bottle. It has been severely affected by heat and its characteristics are difficult to reconstruct. The finish consists of a flattened band of glass about .6 inches wide which was added to the neck. This specimen weighs 20 grams and has a size range of 6 to 8 cm.

Aqua Bottle Glass Specimen 11 (Cat. no. 76)

This specimen consists of two bottle fragments that appear to have once articulated. Each has been affected by heat to some degree, however, and articulation cannot be proved. One fragment consists of a body section of a medium sized bottle. It has been fairly seriously affected by heat and all the broken edges have been rounded. The other fragment consists of a base of a bottle with a circular horizontal cross section and a diameter of approximately 1.2 inches. The bottle was made in a two piece mold as is evidenced by the presence of a mold mark across the base. It has a slightly concave basal profile and has a circular ring of jagged glass adhering to the base. This provides evidence that this bottle was finished by attaching a glass tipped blowpipe to the base as a pontil (Jones 1971). The combined weight of these two pieces is 25 grams. The body sherd has a

size range of 4 to 6 cm and the base of 2 to 4 cm.

Aqua Bottle Glass Specimen 12 (Cat. no. 76)

This is an almost complete bottle which is missing only the finish (Figure 42, center). It has not been affected by heat. In horizontal cross section, this bottle is round with flat sides, and the base measures 1.5 by 1.0 inches. It has a shallow concave base with an open glass pontil scar on it. This indicates that blowpipe was used as the pontil rod after it was broken from the mouth (Jones 1971). This bottle was blown into a two part mold as evidenced by mold marks running down the sides of the bottle and across the base. The type of finish used on this bottle cannot be determined. This bottle is 3.1 inches high from the base to the top of the shoulders, and has an overall length of 3.9 inches. It weighs 90 grams and has a size range of 10 to 5 cm.

Aqua Bottle Glass Specimen 13 (Cat. no. 79)

This is a small body fragment of a bottle which appears to have been identical in form to that described above as specimen 3 (Cat. no. 54) and specimen 8 (Cat. no. 76). This specimen clearly possesses the distinctive ribbing found on these other specimens. It has been moderately affected by heat. It has a weight of 5 grams and a size range of 4 to 6 cm.

Aqua Bottle Glass Specimen 14 (Cat. no. 80)

This specimen consists of a severely melted neck and finish of a medium sized bottle. Although it is in a very melted condition, this bottle appears to have had a basically straight finish with a broad, flattened string rim applied at or just below the lip. It has a



Figure 42. Small bottles.

weight of 25 grams and a size range of 8 to 10 cm.

Aqua Bottle Glass Specimen 15 (Cat. no. 100)

This specimen consists of four articulating fragments of a bottle which has been affected by heat. Represented are part of the body and base of a relatively small bottle. The presence of a mold mark on one of the body sherds indicates manufacture of this bottle in some form of a hinged mold. The bottle appears to have been ovoid in horizontal cross section with a concave base of unknown profile. Jagged fragments of glass left by the use of either a glass tipped pontil or blowpipe remain in the basal concavity. The four fragments have a combined weight of 44 grams and an overall size range of 6 to 8 cm (4-6 cm = 3; 6-8 cm = 1).

Aqua Bottle Glass Specimen 16 (Cat. no. 121)

This very small sherd is part of a finish to a relatively small bottle. It has been moderately affected by heat, and consists of a straight finish with a folded in lip. It weighs 2 grams and has a size range of 2 to 4 cm.

Aqua Bottle Glass Specimen 17 (Cat. no. 128)

Represented here are five articulating sections of a small bottle which, while not complete, includes the entire base, much of the body, and the shoulders, neck and finish (Figure 42, right). These fragments have not been affected by heat. This bottle has a circular horizontal cross section and measures .8 inches in diameter. Its reconstructed overall length is 4.4 inches. The base of this bottle is slightly concave and it has on it glass remaining from the detachment of a glass-tipped pontil rod. This bottle was formed in a two piece mold as

is evidenced by the presence of mold marks running longitudinally along the body and across the base. The bottle has a straight finish with a folded in lip. The combined fragments of this bottle weighs 32 grams and it has a reconstructed size range of 10 to 15 cm (size ranges of individual fragments: 2-4 cm = 4; 4-6 cm = 1).

Aqua Bottle Glass Specimen 18 (Cat. no. 142)

This is a small fragment of the body of a square or rectangular bottle with chamfered corners. It has not been affected by heat. Of note is the presence of embossing on the two sides represented on this specimen. The embossing on one side is very fragmentary and cannot be reconstructed. On the other, .5 inch high letters running longitudinally down the bottle and covering the entire .8 inch wide side can be observed. These letters are "... Y ' S...". This specimen weighs 5 grams and has a size range of 2 to 4 cm.

Aqua Bottle Glass Specimen 19 (Cat. no. 151)

This specimen consists of two articulating fragments of an embossed panel bottle that has been altered by heat. The sharp edges of the fragments indicated that they broke after the bottle was melted. Very little about this bottle can be reconstructed from these fragments except that its embossed label included three lines with "...ou..." being two of the letters on the first line and with "...r..." being one of the letters on the last line. No identification has been possible based on this fragmentary label. Together, these fragments weigh 14 grams with a size range of 4 to 6 cm.

Aqua Bottle Glass Specimen 20 (Cat. no. 152)

This is a very small fragment of the finish of a bottle. It has not been affected by heat. It appears to have consisted of a two part, club sauce type finish. This has a rounded string rim at the lip and a wider, down-tooled string rim below this. This specimen has a weight of 2 grams and a size range of 0 to 2 cm.

Aqua Glass Bottle StoppersAqua Stopper 1 (Cat. no. 115)

This "club sauce type" stopper has been rather seriously affected by heat but it still maintains its original shape (Figure 43). It has a horizontally oriented, circular top measuring about 1.0 inches in diameter and a shank which extends for about .9 inches below the top. The characteristics of manufacture and finishing of this stopper cannot be identified, but based on similarities in proportion and dimension, it was probably identical to stoppers 2 and 3 described below. This stopper weighs 7 grams and it fits within a size range of 2 to 4 cm.

Aqua Stopper 2 (Cat. no. 133)

This specimen is also a "club sauce type" stopper. It has been moderately affected by heat (Figure 43). It is virtually identical to aqua stopper 1 except that there is visible embossing on the circular top. Although somewhat distorted by heat, there is no doubt that this embossing reads "Lea and Perrins", especially when compared to aqua stopper 3. This specimen weighs 7 grams and has an overall size range of 2 to 4 cm.

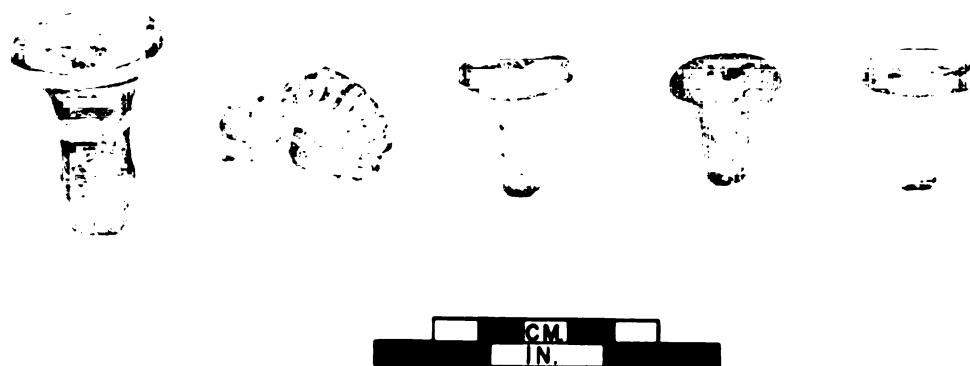


Figure 43. Glass bottle stoppers. From left to right: clear glass stopper; clear glass "target" stopper; three stoppers on right are aqua club sauce type stoppers.

Aqua Stopper 3 (Cat. no. 152)

This specimen is a "club sauce type" stopper which is apparently identical to aqua stoppers 1 and 2 (Figure 43). This stopper, however, has not been affected by heat. It has a circular top which measures .9 inches in diameter and a shank which extends 1.0 inches below the top. The top is clearly embossed "Lea and Perrins". This specimen weighs 7 grams and has a size range of 2 to 4 cm.

Colorless Bottle GlassColorless Bottle Glass Specimen 1 (Cat. no. 67)

Included here are two specimens which do not articulate but which, based on similarities in patination, thickness, and form, appear to be from the same bottle. Neither has been affected by heat. Included is a fragment including body and shoulder parts and a base fragment. The base fragment is interesting in that it contains part of a diamond device embossed in the base. Although the lettering contained within the diamond cannot be identified, this type of device is a maker's mark that was used by several bottle manufacturers. All date, however, to the twentieth century (Toulouse 1971).

Colorless Bottle Glass Specimen 2 (Cat. no. 81)

This specimen consists of a complete, small bottle which has been severely affected by heat (Figure 42, left). This bottle has been melted virtually flat, and many of its original characteristics cannot now be identified. This bottle was probably rectangular in horizontal cross section, and has an original length of about 3.5 to 4 inches. It has a simple, one part finish probably consisting of a semi-circular lip. This bottle has a weight of 70 grams and an overall size range of

10 to 15 cm.

Colorless Bottle Glass Specimen 3 (Cat. no. 156)

This consists of three articulating fragments of the base to a modern bottle or jar. Based on mold seams and scars observed on this base, it was made with an automatic or semi-automatic bottle machine sometime after the turn of the twentieth century. These specimens have not been affected by heat. Due to their modern nature, further description is not presented here.

Colorless Glass Bottle Stoppers

Colorless Stopper 1 (Cat. no. 108)

This specimen is interpreted as a stopper despite its fragmentary nature (Figure 43). This artifact consists of what appears to be the finial to a "target" type stopper; no evidence of a neck or shank remain (Jones and Sullivan 1985: 156). A target type stopper has a disc shaped, vertically oriented finial characterized by a circular concavity in the center of the disc. This particular specimen has been pinch molded to give a crenulated appearance to the outer rim of the disc. It has a weight of 14 grams and a size range of 2 to 4 cm.

Colorless Stopper 2 (Cat. no. 155)

This stopper differs from the aqua stoppers described above (Figure 43). Although it has a horizontally oriented circular top, 1.3 inches in diameter, this top tapers gradually to form a neck approximately 1.2 inches in length. Below this is the shank, which is only about .5 inches in length. The overall length of this artifact is 1.8 inches. Due to damage to this artifact from heat, it could not be determined if this beveled shank had been ground. This specimen weighs

35 grams and has a size range of 4 to 6 cm.

Amber Bottle Glass

The amber bottle glass described below was probably not in the commanding officer's quarters when it was destroyed in 1857. This conclusion is based in part on the form of the specimens described below but perhaps more importantly on the basis that there was no amber bottle glass among the melted glass from this site.

Amber Bottle Glass Specimen 1 (Cat. no. 121)

This consists of a base fragment of a bottle that was probably square in horizontal cross section. This bottle was formed in a two piece mold with a separate base part. An interpretation of this as a snuff type bottle is suggested. This fragment probably post-dates the mid-nineteenth century. It has not been affected by heat. This specimen weighs 12 grams and has a size range of 4 to 6 cm.

Amber Bottle Glass Specimen 2 (Cat. no. 121 and 129)

This specimen consists of two articulating fragments of a base of a bottle that was circular in horizontal cross section and which had a diameter of approximately 3.0 inches. This bottle had a rounded heel and a shallow concave basal profile with a mamelon in the center. It has an overall weight of 35 grams and an overall size range of 6 to 8 cm (6-8 cm = 2).

Amber Bottle Glass Specimen 3 (Cat. no. 145)

This is the finish and part of the neck of a relatively large bottle. The finish has two parts and consists of a lip created by an otherwise straight finish and a broad, flat string rim applied to the neck about .2 inches below the lip. This type of finish is similar to

those identified on champagne bottles.

Colorless Glass Tablewares

A variety of fragments of colorless glass tablewares are included in the collection, many of which have been badly affected by heat (Figure 44). In addition, much of the melted colorless glass, described elsewhere, is believed to be largely from glass tablewares.

Colorless Glass Tableware Specimen 1 (Cat. no. 57)

This is a very small fragment of a tumbler that was decorated with a series of panels that are press-molded on the exterior of the vessel. It has been affected by heat. It weighs 8 grams and has a size range of 2 to 4 cm.

Colorless Glass Tableware Specimen 2 (Cat. no. 57)

This specimen is a rim section of a tumbler that was decorated with a series of pressed panels. This specimen has been seriously affected by heat. It weighs 10 grams and has a size range of 4 to 6 cm.

Colorless Glass Tableware Specimen 3 (Cat. no. 57)

This artifact, which has been severely affected by heat, is a rim and body section of a pressed molded tumbler that was decorated with a series of panels reaching from its base to just below the rim. It weighs 35 grams and has a size range of 8 to 10 cm.

Colorless Glass Tableware Specimen 4 (Cat. no. 57)

This is a fragmentary and seriously heat-affected section of a stemmed serving vessel; an interpretation made on the basis of the size and weight of the glass. Represented here are a portion of the stem and bowl. No interpretation of the original form of this vessel is



Figure 44. Colorless glass tableware fragments. All have been affected by heat.

possible from its fragmentary remains. It weighs 75 grams and has a size range of 6 to 8 cm.

Colorless Glass Tableware Specimen 5 (Cat. no. 57)

This specimen is similar to the above described artifact in that it consists of a fragmentary, heat-affected section of a stemmed serving vessel. Represented here are the stem and very partial portions of the foot and bowl. The form of the bowl and foot cannot be reconstructed from this artifact, but the stem is a baluster type characterized by six pressed faces. This artifact weighs 90 grams and has a size range of 6 to 8 cm.

Colorless Glass Tableware Specimen 6 (Cat. no. 137)

This is a small fragment of the body of a tumbler decorated with a number of pressed panels. This specimen weighs 8 grams and has a size range of 2 to 4 cm.

Colorless Glass Tableware Specimen 7 (Cat. no. 138)

This specimen is a small fragment of the base of a tumbler. It appears to have been made in a dip mold, and was decorated with a number of pressed panels, .9 inches wide at the base, which formed a multi-sided base. This artifact has not been affected by heat. It weighs 15 grams and has a size range of 4 to 6 cm.

Colorless Glass Tableware Specimen 8 (Cat. no. 143)

This is a small base fragment of a tumbler decorated by a series of pressed panels, which measured about 1.0 inches at the base. It has not been affected by heat. This specimen weighs 12 grams and has a size range of 2 to 4 cm.

Colorless Glass Tableware Specimen 9 (Cat. no. 143)

This is a very small fragment of the base of a piece of stemware. This is identified by its form and by the fact that it has obviously been turned in a mold. This specimen weighs 5 grams and has a size range of 2 to 4 cm.

Colorless Glass Tableware Specimen 10 (Cat. no. 149)

This is a small body sherd of a tumbler decorated with pressed panels. It weighs 10 grams and has a size range of 2 to 4 cm.

Colorless Glass Tableware Specimen 11 (Cat. no. 152)

Represented here are fifteen articulating fragments of a tumbler. This tumbler had six pressed panels, 1.2 inches wide at the base, forming the sides with formed a hexagonal base but a circular rim. None of these fragments has been affected by heat. At the base this tumbler was 2.1 inches across. Its reconstructed height is 3.6 inches. This tumbler has a shallow concave basal profile, and was probably formed in a dip mold. The overall weight of the fifteen fragments making up this specimen is 225 grams. The sizes of the fragments range from 2 to 4 to 6 to 8 cm (2-4 cm = 8; 4-6 cm = 5; 6-8 cm = 2).

Colorless Glass Tableware Specimen 12 (Cat. no. 157)

This is a small fragment of an unidentified tableware vessel. It consists of a portion of the body of a vessel and a small fragment of a heavy handle where it attaches to the vessel body. It has been moderately affected by heat. It weighs 15 grams and has a size range of 4 to 6 cm.

PERSONAL AND CLOTHING ARTIFACTS

Personal and clothing artifacts in the collection include bone tooth brushes, a straight razor, ceramic pipes and pipe fragments, a plume holder, a piece of melted silver, a carpet bag frame, writing implements, a suspender buckle, buttons, and a marble. In addition, the artifact catalog provides information on other personal and clothing artifacts which are apparently now missing. These include two eagle hat devices, a complete pipe and several pipe fragments, a hair pin, and shell, metal, and bone buttons.

Personal Artifacts

Bone Tooth Brushes

The remains of five bone tooth brushes are included in the collection.

Tooth Brush 1 (Cat. no. 75)

This brush consists of three articulating fragments, and has clearly been burned. Represented is the head and part of the shank of the brush, the handle is missing. The oval head measures 1.7 inches long by .3 inches in width. It is perforated by holes which once held bristles. The overall length of this specimen is 3.2 inches. It fits within a size range of 8 to 10 cm.

Tooth Brush 2 (Cat. no. 75)

This specimen consists of a small section of the head of the brush. It measures 1.0 inches in length and is split down the middle. Present on this specimen, which has clearly been burned, are a number of bristle holes. This artifacts has a size range of 2 to 4 cm.

Tooth Brush 3 (Cat. no. 75)

This brush fragment has clearly been burned, and consists of a section of the head of the brush. This incomplete head measures 1.0 inches and its width is .3 inches across. Present on this specimen are numerous bristle holes. It fits within a size range of 2 to 4 cm.

Tooth Brush 4 (Cat. no. 105)

This specimen consists of a very small fragment of the head showing the perforations where the bristles were inserted. This specimen, which fits within a 0 to 2 cm size range, also has melted glass adhering to it.

Tooth Brush 5 (Cat. no. 150)

This consists of a surface find of a handle to a tooth brush. Its fragmentary length is 2.7 inches, and it has a width of .5 inches. On one end, the handle tapers to a shank with a width of .25 inches. This specimen fits within a size range of 6 to 8 cm.

Straight Razor

This is a broken and bent iron straight razor (no cat. no., provenience listed as Test 3). It has an incomplete length of 5.4 inches, and a width of .7 inches. On its proximal end it constricts to a shank which was inserted into a probably bone handle. This specimen fits into a size range of 10 to 15 cm.

Elbow Pipes

A complete elbow pipe and a fragment of another are included in the study collection. In addition, a complete elbow pipe is listed in the artifact catalog but is now missing from the collection. This missing specimen (Cat. no. 134) is listed in the catalog as a "woman's

head elbow pipe". It is also listed as a burned artifact.

Elbow Pipe 1 (Cat. no. 81)

This is a complete elbow pipe that has been severely burned. The glaze that was certainly once present on this artifact is totally burned off, leaving a rough, black surface (Figure 45). This pipe does not appear to have been mold decorated at all. It has a bulbous bowl that is about 1.5 inches in height and a stem that extends about .6 inches from the base of the bowl. It fits within a size range of 4 to 6 cm.

Elbow Pipe 2 (Cat. no. 138)

This is a very small (0 to 2 cm size range) fragment of a mold-decorated and glazed elbow pipe. It is glazed with a light yellow glaze. Its other characteristics cannot be determined due to its small and fragmentary nature.

Stemmed White Clay Pipes

Nine ceramic pipe stems and two largely complete pipe bowls of white ball clay are included in the collection. In addition, the catalog lists one pipe stem (Cat. no. 76) which is now missing from the collection.

The pipe stem fragments include seven unmarked specimens which measure between 1.0 and 2.0 inches in length (Cat. no. 105 = 1.0"; 149 = 1.1"; 149 = 1.4"; 149 = 2.0"; 152 = 1.3"; 152 = 1.4"; 152 = 1.7"). Two other specimens are decorated at one end, near where they would have attached to the bowl of the pipe. On both specimens (Cat. no. 84 and 152), this decoration consists of dots and bands encircling the

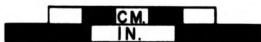
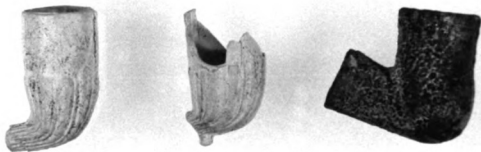


Figure 45. Pipe bowls. Left two specimens are white ball clay bowls from stemmed pipes; specimen on right is a severely burned, glazed elbow pipe bowl made for a detachable stem.

stem, and bands running parallel to the stem. Specimen number 84 has a length of .8 inches and specimen number 152 has a length of 2.5 inches.

White Clay Pipe Bowl 1 (Cat. no. 152)

Also included among the white ball clay pipes are two bowls. One of these is complete except for the stem, which has been broken off just below the base of the bowl (Figure 45). This pipe is mold-decorated with a series of tightly spaced ribs and lines running parallel to the bowl and extending onto the stem. The ribs start about halfway down the bowl, with the upper half being plain. The height of this bowl is about 1.5 inches. It fits within a size range of 2 to 4 cm.

White Clay Pipe Bowl 2 (Cat. no. 152)

The second white clay pipe bowl is broken around the rim and along the stem just below the base of the bowl (Figure 45). Despite this, this specimen is identical in pattern to the bowl described above. This specimen fits within a 2 to 4 cm size range. Its height cannot be reconstructed.

Marble (Cat. no. 81)

This is about one-half of a white porcelain marble with a diameter of .8 inches. It is decorated in blue with a broad band flanked by two narrow bands, and which encircle the marble. It has been burned, and fits within a size range of 2 to 4 cm.

Melted Silver (Cat. no. 76)

A small piece of melted silver is included in the collection. It is melted onto a small piece of iron, and has a size range of 4 to 6

cm. Although its original form cannot be recognized, it was probably a personal item such as a piece of jewelry or, more probably, a coin.

Hair Pin (Cat. no. 143)

An artifacts described only as a "hair pin" is listed in the artifact catalog. This artifact is apparently no longer present in the study collection.

Carpet Bag (Cat. no. 129)

This is a section of the inverted "U" shaped iron frame for a carpet bag or similar device (Figure 46). It is made of a thin strip of rolled iron that was originally about .9 inches in width but which has been folded over onto itself to form a narrow and deep channel. Before it was folded over, cloth was riveted to this piece by placing the cloth against the frame, laying a thin strip of metal over the edge of the cloth, and by riveting through the frame, the cloth, and this thin piece of metal. One end of this frame is broken, but the other has a perforation that would have been used to rivet it to an identical piece. Loosely riveted together, these two pieces would have allowed to bag to be opened and closed.

It is difficult to estimate the original size of this bag since the only remains identified are fragmentary. From the dimensions of the remaining piece, however, it was probably relatively large. This fragment has an overall size range of 20 to 25 cm.

Slate Pencils (Cat. no. ? and 136)

Two fragments of slate pencils are included in the collection. One of these fragments (Cat. no 136) measures .9 inches in length and the other (Cat. no. ?) has a length of 2.0 inches.



Figure 46. Portion of the frame to a carpet bag.

Clothing ArtifactsPlume Holder (Cat. no. 147)

This is a flattened out fragment of a stamped brass plume holder. This type of plume holder was used on military dress hats during the early nineteenth century. It has an overall size range of 6 to 8 cm.

Hat Devices (Cat. nos. 128 and 129)

Two "eagle" hat devices are listed in the catalog. Unfortunately, these are no longer present in the study collection.

Suspender Buckle (Cat. no. 54)

This complete iron suspender buckle has an overall dimension of 1.1 by .9 inches. It has two teeth on its pivoting cross bar, and fits within a size range of 2 to 4 cm.

Porcelain Buttons

A total of ten white porcelain buttons are included in the collection. Represented are three basic types.

Type 1 Porcelain Buttons (Cat. 57, 57, 79, 79, 79, 80, 81, 116)

These buttons all have four button holes. They are basically lenticular in cross section but on the front the button holes are located within a concave depression. These buttons are identical except in their diameters, which include three that are .45 inches in diameter (Cat. nos. 57, 57, 116) and five that are .55 inches in diameter (Cat. nos. 80, 81, 79, 79, 79).

Type 2 Porcelain Buttons (Cat. no. 107)

This button type is essentially identical to the Type 1 buttons except that there are only three button holes. This specimen has a diameter of only .3 inches.

Type 3 Porcelain Buttons (Cat. no. 81)

This four hole button differs markedly from the Type 1 and 2 buttons. Both the front and back are slightly concave, and the four button holes are surrounded on the front by a raised lip which borders the edge of the button and which is semi-circular in cross-section. This button, which is broken, measures .65 inches in diameter.

Bone Buttons

Three bone buttons, each different, are included in the collection. Two of these are burned, and each represents a distinct type. An additional bone button is listed in the artifact catalog (Cat. no. 80) but is now missing from the collection.

Bone Button Type 1 (Cat. no. 108)

This simple bone button has been blackened by fire and is also fragmentary. It is circular and has a single hole through its center. Slightly offset from the center is a small, sharp indentation. This button has circular saw-marks on the front and back, but on the front these have been removed around the edges. This button has a diameter of .85 inches.

Bone Button Type 2 (Cat. no. 117)

This four hole button has a convex back and a flat front; the front is recessed around the button holes. It measures .5 inches in diameter.

Bone Button Type 3 (Cat. no. 158)

This five hole button was turned on a lathe; this is the function of the central, fifth hole. This button is flat on the back, but on the front the button holes are surrounded by a narrow, raised ridge and

a low, rounded lip. It has a diameter of .65 inches.

Shell Buttons

Only two shell buttons, each different, are included in the collection. Another shell button (Cat. no. 141) is listed in the catalog but is no longer present with the collection.

Shell Button Type 1 (Cat. no. 81)

This is a small, four-hole button that is .35 inches in diameter. It has a flat back, but the face tapers toward the center where there is a recessed area about .1 inch in diameter. The button holes are located within the recessed area.

Shell Button Type 2 (Cat. no. 134)

This four-hole button is flat on both the front and back, although the front is slightly recessed around the button holes. It has a diameter of .4 inches.

Metal Buttons

A total of eight metal buttons are present in the collection. These include buttons made of copper alloys, iron, and lead. Four additional metal buttons are listed in the catalog but are now missing from the collection. These include two listed as "metal uniform buttons" (Cat. nos. 57 and 57), one listed as a brass button (Cat. no. 79), and one simply identified as a metal button (Cat. no. 115).

Copper Alloy Button 1 (Test 2)

This is a two piece military issue button consisting of a flat copper alloy body with a copper alloy shank soldered to its back. The back of this button is unmarked, but the front carries a raised, cast motif. This motif consists of an eagle perched on top of a cannon with

the slogan "CORPS" below. This button is .55 inches in diameter. This type of button was in official use by the United States from 1814 to 1821, being then replaced by a spread eagle device with an "A" in the center of a shield on the eagle's chest. The presence of this button at Fort Towson, not established until 1824, is of interest in considering the actual period of use of this style of button (Wyckoff 1984: 41-42).

Copper Alloy Button 2 (Test 4)

This is a two piece military button consisting of a flat copper alloy body. The shank of this button has broken off, but was originally soldered onto the back. This button has a back mark which consists of the slogan "* * * UNITED * * * STATES" placed between two concentric rings composed of very small beads. On the front, the button carries a device consisting of "US" above which is a flying eagle and below which is an oval wreath. It has a diameter of .8 inches.

This button is a general service button in use by the United States in its two piece form from about 1820 to about 1840. It is often referred to as a great coat button (Wyckoff 1984: 85).

Copper Alloy Button 3 (Cat. no. 80)

This is a very corroded copper alloy button that has a diameter of about .7 inches. Other details of this button cannot be reconstructed because of its condition.

Copper Alloy Button 4 (Cat. no. 107)

This is a two piece, four hole button made by crimping two pieces of stamped copper alloy metal together. The back of this button is

convex and has the slogan "WILLIAM ASTONS PATENT N & N" around its edge. The front has a flat rim with a cross-hatched design and a continuous bead around the edge. The center of the front is concave and is perforated with four button holes. This button has a diameter of .5 inches.

Copper Alloy Button 5 (Cat. no. 107)

This is a three piece button consisting of a convex stamped front which is crimped over a flat back and which has a wire shank. The front is stamped with a decorative motif, and the back is unmarked except for a circular impression around the shank. The shank is made of copper alloy wire which is bent to form an eye and which was fastened to the button by inserting it through a hole in the back and folding the ends of the wire shank over. This button has a diameter of .55 inches.

Copper Alloy Button 6 (Cat. no. 108)

This is the back and shank or eye of a three piece button. The back is unmarked, and measures .55 inches in diameter. The shank consists of a piece of copper alloy wire bent to form an eye. This shank is inserted through a hole in the back and the ends of the wire are bent over to fasten it to the back.

Copper Alloy Button 7 (Cat. no. 114)

This four-hole button is almost identical to specimen 5 (Cat. no. 107) except that the face is not decorated with hatch-marking. The back is similarly marked with "WILLIAM ASTONS PATENT N & N". It has a diameter of .5 inches.

Copper Alloy Button 8 (Cat. no. 140)

This button is smashed beyond clear description. It had a rounded back which is perforated for a shank which is no longer present. It has a reconstructed diameter of about .5 inches, but other characteristics of form or manufacture cannot be interpreted.

Lead or Pewter Buttons

The two lead or pewter buttons from the site are corroded and fragmentary. They are, however, identical in pattern, and consist of a thin sheet of lead which has been stamped or otherwise formed to have a flat rim and a convex indentation in the center and within which the four button holes are located. One of these buttons (Cat. no. 143) is extremely corroded, but has a diameter of about .6 inches. The other button (Cat. no. 143), less corroded but fragmentary, has a similar .6 inch diameter.

Iron Buttons

The single iron button (Cat. no. 138) is made from a thin sheet of iron with the edge crimped over onto the back. The face is slightly concave, and there are four button holes in its center. This button has a diameter of .8 inches.

NON-KITCHEN TOOLS

Although relatively small in number, an interesting selection of tools and tool parts are included in the collection. Some of these are recent and are obviously intrusive into the deposits. Most, however, are clearly of the mid-nineteenth century and include certain items that are rarely recovered archeologically. In addition to items present in the collection, the artifact catalog provides information on a variety of tools which are no longer present within the collection. These include two fire pokers, a sleigh bell, and four spurs or spur fragments.

Spades

The collection contains the blades of two spades which differ only in their states of preservation and in very minor variations in dimension; they are identical in design and construction. These spades are basically rectangular in shape, although the sides taper very slightly towards the point and the point is slightly rounded. They are similar to nursery or grafting spades shown in the 1865 catalog of the Russell and Erwin Manufacturing Company (Russell and Erwin 1865: 293).

The blades of these spades are of four part construction. The blade itself is made of two pieces of sheet iron which are welded together at the sides and point. These iron pieces have both been stamped to give the blade a slight horizontal and vertical curvature and to provide room for a wooden handle to be inserted between the two pieces. The handle would have extended only about one-third of the way into the blade, and below this the two halves of the blade are of

identical curvature and fit closely together. To give the handle more strength, a tongue of iron extends above the blade on both halves. These tongues were stamped into a semi-circular form so that they would fit tightly around a round handle. The handle was fastened by means of a rivet which passed through both halves of the blade as well as through the handle. Of interest, on one of the specimens, this rivet has been replaced with a machine cut nail.

The blade was finished by capping the top of the blade with two pieces of relatively thick metal, with one on each side of the handle. Along the top, the blade is welded together only at the sides and becomes increasingly open toward the handle opening. These metal pieces served both to cover the opening between the blade section and to provide a strong platform for the foot which was, of course, used to drive the shovel into the ground. These foot plates were fastened to the shovel by folding them over the blade and riveting them to the blade at its edges, and by driving a small, spiked protuberance into the wood of the handle. The presence of the spike on the end of the foot plate would indicate that the handle was probably inserted into the blade before the foot plates were installed.

Dimensions of Spade 1 (Cat. no. 90, 91, or 104)

This specimen is slightly smaller than the other (Figure 47). Its blade is 11.3 inches in length, and tapers from 7.4 inches in width at the top to 7.0 inches in width at the point. Although neither the front or back handle tongues are complete on this specimen, the most complete tongue extends 1.2 inches above the top of the blade. The rivet used to fasten the handle was placed 1.7 inches below the top of

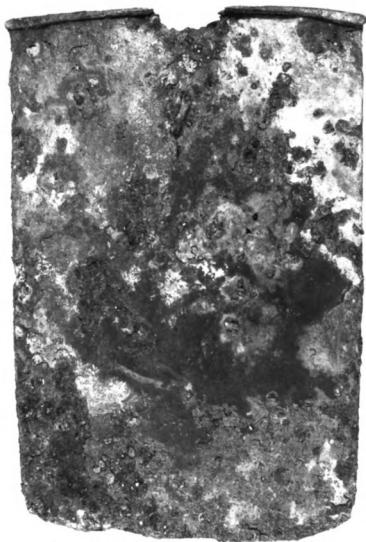


Figure 47. Spade.

the blade. The two identical foot plates measure 3.1 inches in length, and taper from a point at the spade's edge to a width of .8 inches at the handle. Based on the opening, the shovel handle would have been 1.5 inches wide by about 1.0 inches thick where it entered the blade.

Dimensions of Spade 2 (Cat. no. 90, 91, or 104)

This spade has a blade 11.3 inches in length (Figure 48). It tapers from a width of 7.7 inches at the top to 7.3 inches at the point. The handle tongues are entirely missing from this specimen. The rivet used to fasten the handle, which on this specimen has been replaced with a machine cut nail, is located 1.3 inches below the top of the blade. The identical foot plates measure 3.3 inches in length and taper from a point at the edge to a width of .8 inches at the handle. Where it enters the blade, the handle would have measured about 1.5 by 1.0 inches.

Other Spade Fragments

Also included in the collection are two artifacts which probably represent parts of spades. Both of these are fragments of the iron tongues making up the handle socket. One of these (Cat. no. ?) is very small (maximum dimension of 1.9 inches), and consists only of a slightly curved section of iron with a 1.5 inch long rivet passing through it. The other artifact (Cat. no. 116) is substantially larger and consists of a front and a back tongue fastened by a rivet 1.6 inches in length. This piece has an overall length of 7.2 inches. It is broken on both ends, but on one end a portion of one side of the spade's two part blade remains. Although in very different states of preservation, these two artifacts are identical in form and are

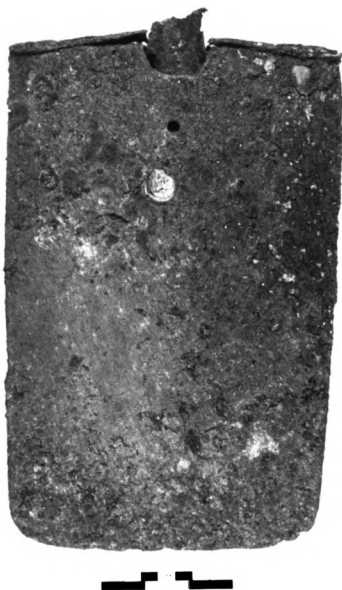


Figure 48. Spade.

identical in form to the handle socket remaining on Spade 1 above.

Since it has part of the blade still attached, the larger of these fragmentary handle sockets can be identified as having come from a spade other than the largely intact spades discussed above. The smaller fragment, however, could have been associated with either spade 1 or 2 above, or with an entirely different spade.

Broad or Planter's Hoe

A single hoe (Cat. no. 104) is included in the study collection (Figure 49). This hoe is almost complete but is in an advanced state of deterioration. It consists of a broad, iron blade, and a round iron socket or eye for the attachment of a wooden handle. The iron socket is about 1.5 inches long, and is slightly beveled so that a beveled handle will not pass through it. The diameter of this socket is about 2.7 inches on one end and 2.3 inches on the other.

The blade has curved shoulders, sides which taper gradually to the point, and a flat point. The blade is curved slightly towards the handle. The overall height of the blade, from the top of the shoulders to the point, is 7.7 inches. It is 7.4 inches wide at the base of the shoulders and 9.0 inches wide across the point. There is a ridge running about halfway down the front of the blade from the socket, and which gives the socket and the blade additional strength. The overall size range of this hoe blade is 25 to 30 cm.

Broom Handle

Numerous charred sections of what has been interpreted as a broom handle were discovered in the northeast quadrant of the west kitchen. Intact, relatively uncharred sections of this handle have a diameter of



Figure 49. Broad or planter's hoe.

about .9 inches. The wood used to make this handle has been identified as either Tanoak or Liveoak (Bob Timberlake, personal communication 1987). Both species are known to have been used to make handles although neither was an important commercial source of wood for this use.

Logging Pike

Perhaps the most unexpected artifact in the study collection is a logging pike (Cat. no. 73) (Figure 50). This artifact, which measures 15.8 inches in overall length, is of hand-forged construction. It consists of a solid iron point 10.4 inches long. At its proximal end, this point is about 1.7 inches in diameter. As it tapers irregularly toward the tip, where it measures .8 inches in diameter, this point is octagonal. Approximately 1.5 inches from the tip, this octagonal point tapers to an abrupt four sided tip. At the approximate mid-point of the point, a hook has been welded on. This hook initially projects from the point at a ninety-degree angle, and then is bent back away from the tip of the point. This hook, which has a diameter of about .6 inches at its base, extends away from the point approximately 2.8 inches. It is a rounded square in cross section, and tapers gradually to a point.

Wrapped around and welded to the proximal end of this solid iron point and hook is a socket. This socket is approximately 7 inches in overall length, of which about 5.3 inches extends beyond the solid point. At its open end, this socket has an internal diameter of 1.8 inches. This socket was intended to receive and hold a heavy wood handle of indeterminate length. This handle was held in place in the

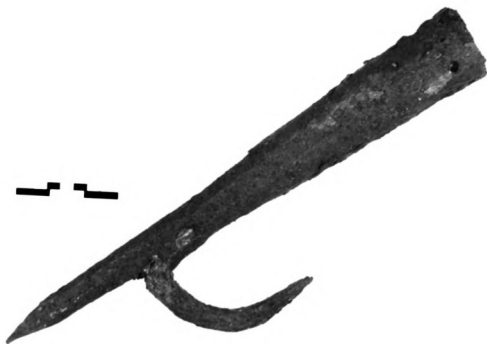


Figure 50. Logging pike.

socket by a fastener, probably a nail, that was driven through a .3 inch diameter hole that can be observed about .8 inches from the end of the socket. This artifact fits within a size range of 30+ cm.

This artifact was clearly made for use in the logging trade. Its context within the 1850s fill of the Commanding Officer's Quarters is clear. It is unclear, however, what this type of tool would have been doing in the Commanding Officer's Quarters within an assemblage which otherwise appears domestic.

Fire Pokers

Two fire pokers (Cat. no. ? and 91) were found during the excavation of the east and west kitchens (Scott 1983). These apparently had brass handles, and one was found in front of the fireplaces in the east and west kitchens. These pokers were, however, not present with the study collection.

Hammer

A single iron hammer head (Cat. no. 138) is included in the collection (Figure 51). This hammer apparently had an iron handle, which was broken off flush with the head. This, and the fact that the poll is chisel-shaped, may indicate that this was a smith's hammer, although it could have served a wide variety of functions.

This hammer head is 3.8 inches in length, and has been extensively battered on both ends; this has resulted in the mushrooming of the metal. The face of the hammer is approximately .8 inches square, although the edges have been beveled slightly from the face back to the mid-section of the head. The poll tapers from the mid-section, where it measures 1.0 inches wide by .7 inches thick, to the tip, where it is



Figure 51. Miscellaneous tools. From left to right: hammer head, scissors, balance, hook and slide from a balance, triangular file.

.8 inches wide and .25 inches thick. The mid-section of the head bulges slightly around the handle, which measures .6 by .4 inches.

Scissors

A pair of small, iron scissors are included in the study collection (Cat. no. 100) (Figure 51). These are very rusted, but are otherwise complete. These scissors are identical to the "Ladies' Scissors" described in the 1865 Russell and Erwin catalog (Russell and Erwin 1865: 369). Both halves of the Russell and Erwin scissors are symmetrical except for the blades and points; one blade tapers gradually to a sharp point, the other remains relatively wide until near the tip, where it angles radically to form a blunted point. This description of the Russell and Erwin scissors is identical to a description of the scissors the Commanding Officer's Quarters. The Russell and Erwin Ladies' Scissors were offered in sizes varying from five to seven inches long. The specimen from the Commanding Officer's Quarters measures a somewhat smaller 4.5 inches in length. It fits within a 10 to 15 cm size range.

File

This file (Cat. no. 87) is extremely rusted and may be broken (Figure 51). The body of the file is triangular in cross section; a very small section of the body reveals that this is a very fine cut, bastard type file. The body of the file is 3.2 inches in length and it measures 4.5 inches in overall length. The faces of the file taper from .4 inches wide at the proximal end to .2 inches wide at the distal end. A tapering, 1.3 inch long mounting tang is attached to the proximal end. This specimen fits within a 10 to 15 cm size range.

Balances

Three artifacts interpreted with varying degrees of certainty as parts of balances, or scales, are included in the collection. One of these is extremely corroded and its identification is tentative at best.

Balance Specimen 1 (Cat. no. 61)

This is a badly rusted and heat affected spring balance. It consists of an iron housing which is semi-circular in cross section, closed at both ends, and which has flanges running along both sides. On the top of the housing is a semi-circular lug with a hole through it. This piece was apparently cast as part of the housing, and served as a point from which to suspend the balance. At the bottom of the housing, the closed end is pierced by a slot through which a slide passed.

This slide was attached to a spring inside the housing, and a hook of some sort was attached to the other end of the slide. The slide served to restrict the movement of the spring, which was attached to the top of the iron housing, to a pre-determined range. The upper end of the slide also would have had a pointer on it which would have indicated the weight of the suspended object. The open side of the housing was covered with a thin brass plate which was riveted to the iron flanges. This plate, which has been partially melted away, has a slot at its lower end through which the pointer traveled. This slot measures 2.3 inches in height. To the right of this slot are twenty-four horizontal lines which indicate pounds. In between these lines are dots, which indicate half-pounds. Numerals indicate pounds 0, 4,

8, 12, 16, 20, and 24.

This balance is 6.0 inches in total length, of which 5.4 inches is the housing. The semi-circular portion of the housing is approximately 1.0 inches wide; the balance is 1.5 inches wide measured between the outside edges of the flanges. The brass face of the balance is 1.4 inches wide; its length is incomplete due to melting. This artifact fits within a 15 to 20 cm size range.

Balance Specimen 2 (Cat. no. 96)

This specimen is extremely corroded and rust encrusted; it appears that much of the original metal has been totally consumed by rust. Interpretation of this specimen as a balance is therefore tentative and is based largely on similarities to the definite balance represented by Balance 1, described above.

This specimen has an overall length of about 5.0 inches. It consists of a semi-circular, hollow metal housing approximately 1.0 inches wide, and which is closed on at least one end. On this closed end, two curved flanges extend from the edges of the housing. An open slot is present in the closed end of the housing. Except for the shape of the flange, this is virtually identical to the housing described for Balance 1. This appears, therefore, to be the housing for a spring loaded balance for which the face and internal mechanisms are missing. This artifact fits within a size range of 10 to 15 cm.

Balance Specimen 3 (Cat. no. 96)

This artifact is interpreted as the hook from a spring balance similar to that represented by balance specimens 1 and 2. It is certainly not associated with specimen 1, since a portion of the hook

mechanism is present with it. It is possible, therefore, that this hook is associated with balance specimen 2.

This artifact consists of three parts. The hook itself, made from a heavy gauge wire, is attached to a slide made of a piece of flat iron. A small section of coiled wire, certainly representing the very lower section of the spring used in the balance, is still attached to the upper end of the slide. The slide is "L" shaped on each end, and would have allowed the hook to travel up and down within a proscribed range. On the slide, opposite the top "L", is a small projection of iron which extends slightly from the slide and which is bent over to form a right angle. This projection of iron is pointed, and certainly represents the pointer which would indicate the weight of the object being weighed.

The slide measures 2.5 inches in length, and would have allowed 1.8 inches of travel. This amount of travel is insufficient for balance 1, which required 2.3 inches of travel. The smaller amount of travel indicated by this artifact would probably have been sufficient for balance 2, which is somewhat smaller. Further, balance 2 is missing a face plate, and the slide could easily have fallen out when the face plate came off. The hook on this specimen is "S" shaped and measures 2.8 inches overall. The top curve of the "S" forms a tight, closed loop passed through a hole in the bottom of the slide. The lower curve of the "S" is wide and open. This open curve represents the hook from which an object would be suspended in order to be weighed. The small remnant of a spring on this specimen measures .4 inches in diameter. This artifact fits within a size range of 10 to

15 cm.

Fish Hooks

The study collection includes two fish hooks. These are both made of a very thin wire which is bent to form the hook and which are finished by a single barbed point. At the proximal end, the wire is bent to form a very small eye for the attachment of the hook to line. These hooks measures 1.5 (Cat. no. 76) and 1.8 (Cat. no. 134) inches in overall length. The smaller hook fits within a 2 to 4 cm size range and the larger within a 4 to 6 cm range.

Sleigh Bells

Two sleigh bells were found at the commanding officer's quarters (Cat. nos. ?, 107). Only one of these remains, however, with the study collection.

The single sleigh bell still present in the collection (Cat. no. 107) is relatively small and is of cast brass construction. It consists of a hollow, globe shaped housing approximately .9 inches in diameter. Within this housing, there is a slit-type opening about .15 inches wide across the entire lower half. The housing is further punctuated by small holes (.1 inches in diameter) on each side of the stud hanger. This stud hanger is fastened to the top of the bell, and measures .4 inches on a side. It is apparently riveted to the bell housing. A small, apparently brass, free rolling clapper is present within the bell. It fits within a size range of 2.4 cm.

Spurs

Four spurs are listed in the catalog, but none remain with the study collection. One of these spurs (Cat. no. 108) was apparently

complete, and is listed as an "eagle headed spur". The other three (Cat. nos. 107, 109, and 114) are simply listed as spur fragments.

Curry Comb

This specimen consists of an almost complete six bar, solid back curry comb (Cat. no. 70) (Figure 52). One of the six bars is smooth, the other are teathed. It is made of stamped and cut sheet iron, with the back and two of the bars being made from a single piece of metal. The other four bars consist of sets of two each made from a single, "U" shaped piece of iron. The "U" shaped sets are riveted to the back. Four, large head (.5 inch diameter) brass rivets present on the reverse of the back served to fasten a leather strap handle to this artifact. Overall, this specimen measures 4.2 by 3.0 inches, and it fits within a size range of 10 to 15 cm..

Harness Hardware

Sixteen artifacts associated with harness are present in the collection. These include a snaffle, a bradoon, a snap and ring, two harness bosses, six harness buckles, and five harness rings.

Bradoon (Cat. no. 135)

A bradoon (bridoon) is a light bridle commonly used by the military (Figure 52). It consists of two iron rings connected by two jointed iron bars. The iron bars would be placed in the horses mouth, and the reigns would have been attached to the two iron rings. The specimen from the study collection includes an iron ring 2.9 inches in diameter, and two solid iron bars 3.2 inches in length and which have loops on each end. One of these loops attaches the bar to the iron ring, and the other passes through the loop on the other iron bar,

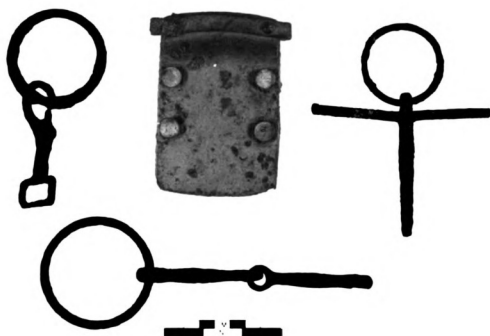


Figure 51. Equestrian related artifacts. Top row: Left, snap and ring; Center, curry comb; Right, bradoon bit; Bottom, snaffle bit.

forming a loose joint. Fully extended, this artifact has a size range of 20 to 25 cm.

Snap and Ring (Cat. no. 136)

This consists of an iron ring, 2.5 inches in diameter, to which an iron snap is attached (Figure 52). This snap has a rectangular loop on one end through which a leather strap would have passed, and an oval loop on the other end which can be opened and closed with a spring loaded slide built into the body of the snap. Based on the manufacture of the snap, this artifact probably dates to the period after the 1850s context of most of the material from the site. Fully extended, this artifact has a size range of 10 to 15 cm.

Snaffle (Cat. no. 137)

A snaffle is a bridle bit which has a joint in the middle, rings on each end for the attachment of reins, and which occasionally has cheeks or side bars designed to keep the rings out of the horses mouth (Table 52). The specimen from the Commanding Officer's Quarters consists of one iron ring 2.1 inches in diameter which passes through a loop in one end of a cross-shaped bar. This bar measures 3.7 inches in length, and has a side bar or cheek 4.6 inches long. The other ring and cross-shaped bar are missing. Fully extended, this artifact has a size range of 10 to 15 cm.

Harness Bosses

The two harness bosses in the collection are identical in construction but vary slightly in form. They consist of thin, circular to oval disks of brass with convex fronts and concave backs, and to which two iron wires are riveted. These wires are located

adjacent to one another at the center of the brass disk. They were used to attach these devices, which probably served as decorative bosses on harness.

The first specimen (Cat. no. 51) has an oval shaped disk measuring 1.0 by .7 inches. The two iron wires, neither of which is bent, measure about .7 inches in length.

The second specimen (Cat. no. 58) has a circular brass disk that is 1.0 inches in diameter. The two iron wires riveted to this disk, neither of which is bent, measure about .9 inches in length.

Both bosses fit within a size range of 2 to 4 cm.

Harness Buckles

The six harness buckles in the collection include two rectangular roller-type buckles, two simple rectangular buckles, and two "D" shaped buckles.

The rectangular, roller type buckles include one complete but heavily rusted specimen (Cat. no. 54) which measures 1.4 by 1.2 inches.

The other roller type buckle, which is also complete but which is much better preserved, measures 1.6 by 1.2 inches.

The two simple rectangular buckles include one small specimen (Cat. no. 157) which measures .9 by .7 inches. The other example of this variety (Cat. no. 151) has a reconstructed measurement of 1.7 by 1.1 inches.

The two "D" shaped buckles are both complete. One of these (Cat. no. 54) is extremely rusted and measures 1.1 inches in height along the straight side and 1.2 inches in width. The other buckle (Cat. no. 131) has a height of 1.1 inches along the straight side and a width of

.8 inches.

Harness Rings

The five harness rings in the collection include one brass specimen and four iron rings. The brass ring and three of the iron rings are circular; the other iron ring is "D" shaped.

The brass ring (Cat. no. 136) has a diameter of 1.6 inches. The circular iron rings have diameters of 1.4 inches (Cat. no. 105), 2.2 inches (Cat. no. 94), and 2.5 inches (Cat. no. 146). The single iron "D" ring (Cat. no. 144) measures 2.5 inches along its straight side and has a width of 2.0 inches.

Horse Shoes

Six horse shoes or horse shoe fragments are included in the collection (Cat. nos. 116, 123, 130, 130, 130, and 131).

Adjustable Wrench

The lower jaw and case, made of cast iron, of an adjustable wrench is included in the collection (Cat. no. 106). This wrench is unmarked and is missing its top jaw and working mechanism. Although it could not be precisely dated, this wrench was probably manufactured around the turn of the twentieth century or later (Finch 1983). It is therefore interpreted as intrusive into the commanding officer's quarters collection, and is not further described.

FURNITURE HARDWARE

A number of artifacts in the collection could be identified as furniture or cabinet hardware. These include small size butt hinges, casters, bed screws, cabinet locks, small keys, brass tacks, a brass hook, a lock plate, and several iron clothing hooks. In addition to the artifacts present in the collection, the artifact catalog provides information on ten specimens which appear to be furniture related but which are now missing from the collection. These include two keys (Cat. nos. 80 and 153), two casters (Cat. nos. 126 and 153), three glass pendants (Cat. nos. 126, 126, and 129), two door knockers (?) (Cat. nos. 153 and 153), and one clothing hook (Cat. no. 155).

Furniture Sized Cast Butt Hinges

The butt hinges discussed below are defined as furniture hinges because of their size. A somewhat arbitrary division of the hinges from this site into architectural and furniture hinges was made, with those smaller than three inches being defined as furniture hinges. It is of course possible that these smaller hinges could have been used for built-in cabinets, and it is also possible that hinges larger than three inches could have been used on furniture.

In addition to the furniture sized butt hinges discussed below, the artifact catalog provided evidence for five hinges that are now missing from the collection and which seem to fit within the furniture category. In the catalog, these are usually described as "cabinet hinges". The catalog numbers for these hinges are 63, 80, 80, 81, and 152.

2" Cast Iron Butt HingesCast Iron Butt Hinge 22 (Cat. no. 57)

This cast iron butt hinge is in an extremely corroded and rust-encrusted condition and is therefore difficult to describe. It appears to be entirely consumed by rust. This hinge measures 2.0 inches in length and, probably, when open measured about 1.5 inches in width. This hinge is in the "closed" position; that is, the flaps are folded together such as would occur when the door is closed. The remains of four screws of indeterminate length are visible on this artifact. Other characteristics of this hinge cannot be determined due to its rusted condition.

Cast Iron Butt Hinge 23 (Cat. no. 57)

Although from the same general provenience as cast iron butt hinge 22, this specimen is in very good condition with most of it covered by only moderate rusting. This hinge, represented by two articulating fragments, is in an open position, and measures 2.0 inches in length and 1.4 inches in width. It is characterized by three countersunk screw holes on each flap and by three joints. Of interest, between each joint there is an iron washer measuring about 1/20th of an inch in thickness. A single, possibly broken flat head screw measuring .7 inches in length remains with this hinge.

Cast Iron Butt Hinge 24 (Cat. no. 62)

This hinge is identical to cast iron butt hinge 23 except that it is in slightly better condition (the joints are still free). Like hinge 23, it consists of two articulating pieces. A total of four flat head, pointless wood screws remain with this specimen. These screws

are identical and measure .7 inches in length.

Cast Iron Butt Hinge 25 (Cat. no. 66)

This hinge is extremely rusted. It is rusted in an open position, and measures 2.0 inches by 1.4 inches. This hinge has three joints and three countersunk screw holes on each flap. The two flat head screws which remain with this hinge are badly bent and rusted, but each measures about .7 inches in length.

Cast Iron Butt Hinge 26 (Cat. no. 75)

This hinge is extremely rusted, and is forever locked in an open position. It measures 2.0 inches in length by 1.7 inches in width. It had three countersunk screw holes on each flap, in which five screws or screw fragments remain. The two complete flat head, pointless screws remaining with this hinge measure 1.2 inches in length. The number of joints on this hinge could not be determined.

Cast Iron Butt Hinge 27 (Cat. no. 81)

This hinge is extremely rusted, and is locked in an open position. It measures 2.0 inches by about 1.5 inches, and has three joints. The remains of four flat head screws are present with this specimen, one on each end of the flaps. It is uncertain whether there were two or three holes per flap. One possibly complete but badly rusted screw remaining with this hinge measures 1.0 inches in length.

Cast Iron Butt Hinge 28 (Cat. no. 95)

This specimen is relatively well preserved. It consists of a hinge, 2.0 by 1.7 inches, that is rusted in an open position. It has three joints and three countersunk screw holes on each flap. Five complete pointless flat-head screws remain with this hinge, each

measuring 1.2 inches in length.

2 1/4" Cast Iron Butt Hinges

Cast Iron Butt Hinge 29 (Cat. no. 81)

This specimen is the only complete 2.25 inch cast iron butt hinge from the collection. It is extremely corroded, and is rusted in an open position. It measures 2.25 inches in length and 1.8 inches in width. It has three countersunk screw holes on each flap, with the remains of four flat head screws remaining with this specimen. The number of joints on this hinge could not be determined.

Cast Iron Butt Hinge 30 (Cat. no. 125)

This hinge is represented by the lightly rusted male half. The measurement of the complete hinge was 2.25 inches in length and probably about 1.4 or 1.5 inches in width when open. It had three countersunk screw holes on each flap. Two pointless flat head screws measuring .9 inches in length remain with this hinge.

2 1/2" Cast Iron Butt Hinges

Cast Iron Butt Hinge 31 (Cat. no. 50)

This specimen is extremely rusted and has a portion of each flap broken off. It is rusted in an open position, and measures 2.5 inches by 1.9 inches. It is a three joint hinge, and has three countersunk screw holes on each flap. Two pointless flathead screws remain with this artifact; one measures 1.7 and one 1.9 inches in length.

Cast Iron Butt Hinge 32 (Cat. no. 51)

This specimen, rusted in an open position, is extremely corroded. It measures 2.5 inches in length and 1.9 inches in width. It is a three jointed hinge with three countersunk screw holes on each flap.

Two complete flat head screws, measuring 1.5 and 1.7 inches in length, and a portion of another flat head screw remain with this hinge.

Cast Iron Butt Hinge 33 (Cat. no. 53)

This extremely corroded hinge is rusted in a closed position. It measures 2.5 inches in length and probably measured about 1.8 or 1.9 inches in width when open. Five complete or partial flat head screws remain with this hinge, two complete screws measure about 1.3 or 1.4 inches in length. Other details of this hinge could not be determined due to its condition.

Cast Iron Butt Hinge 34 (Cat. no. 59)

This hinge is extremely corroded with portions appearing to be entirely consumed by rust. It is rusted in an almost closed position, and measures 2.5 inches in length and when open probably measured 1.8 inches. It is a three joint hinge with three screw holes on each flap. Two very rusted flat head screws, apparently complete, remain with this lock, and measure 1.4 and 1.6 inches in length.

Cast Iron Butt Hinge 35 (Cat. no. 76)

This specimen consists of a relatively well preserved three joint hinge rusted in an open position. It is of interest because it is a marked hinge. It measures 2.5 inches in length by 2.0 inches in width when open. It has three countersunk screw holes on each flap, and has six complete or fragmentary flat head screws remaining with it. The single complete screw measures about 1.3 inches in length.

The mark on this hinge is located on the reverse, and is placed parallel to but faces away from the joint. This mark, which is molded into the male half of the hinge, reads "2 1/2 In". No other marks can

be observed on the relatively clean female half of this hinge, but the face of the male half is too rusted to show marks if they are present there.

Cast Iron Butt Hinge 36 (Cat. no. 77)

This specimen is extremely corroded and rust encrusted. It consists of a hinge with both flaps partially broken and which has been rusted in a closed position. It measures 2.5 inches in length. It was fastened with three screw holes through each flap. Other characteristics of this hinge cannot be determined due to its poor state of preservation.

Cast Iron Butt Hinge 37 (Cat. no. 79)

This hinge is one of the better preserved in the collection and is of special interest in that it is also marked on its reverse. This three joint hinge measures 2.5 inches by 1.9 inches; it is rusted in an open position. Each flap has three countersunk screw holes in it. Four complete and one fragmentary flat head screws remain with this hinge. The complete screws are all pointless and measure 1.4 inches in length.

The marking on the reverse of this hinge was apparently part of the mold. It is present on the female half of the hinge, runs along the joint, but faces away from the joint. The mark reads, "E & T C"; its meaning is unknown. Due to the clean nature of this specimen, it is clear that this mark is the only mark on the hinge.

Cast Iron Butt Hinge 38 (Cat. no. 85)

This three joint hinge is extremely corroded and is rusted in an open position. It measures 2.5 inches long by 2.0 inches wide when

open. Each flap has three screw holes on it, and the remains of flat head screws are present in five of these. The sizes of these screws cannot be determined.

Cast Iron Butt Hinge 39 (Cat. no. 80)

This badly corroded three-joint hinge is rusted in a partially open position. It measures 2.5 inches in length and probably measured about 1.8 inches when open. It has three countersunk screw holes on each flap, with complete or broken screws present in each of these holes. The four complete screws are all flathead, pointless screws measuring about 1.3 to 1.5 inches in length.

Cast Iron Butt Hinge 40 (Cat. no. 94)

This hinge is one of the best preserved in the collection, but has no screws remaining with it. It is of interest because it is marked. It is a three joint hinge that is rusted in an open position. It measures 2.5 inches in length and has an open width of 2.0 inches. It has three countersunk screw holes on each flap.

This specimen is marked on both the face and the reverse of the male half. Both marks appear to have been molded into the cast iron. On the face, the marking runs parallel with the joints but faces away from these joints. Unfortunately, the face marking is only partially legible, and reads "[illegible] Patent". On the reverse, the marking is placed in the same location: parallel with the joint but facing away from it. This marking is totally legible, and reads "2 1/2 In". This mark is identical to that observed on the reverse of hinge number 14.

Cast Iron Butt Hinge 41 (Cat. no. 102)

This specimen is extremely rusted, and is frozen in a partially open position (45 degrees). Portions of each flap of this hinge are broken off at the screw holes. This hinge had three screw holes on each flap, and screws remain in the four remaining with the specimen. The two complete screws are flat head, pointless screws that measure about 1.3 inches in length.

Cast Iron Butt Hinge 42 (Cat. no. 102)

This hinge is represented by several extremely rusted fragments that probably were once part of the same hinge. Little can be said of this specimen except that its original length was 2.5 inches.

Cast Iron Butt Hinge 43 (Cat. no. 110)

This relatively well preserved hinge is rusted in a closed position. It is of special interest because it is marked. It measures 2.5 inches in length and, when open, probably measured 1.8 inches in width. It has a three part joint and has three countersunk screw holes on each flap. Six complete flat head, pointless screws remain with this hinge. Each measures 1.5 inches in length.

Since this hinge is rusted in a closed position, it is uncertain if the observed marking is restricted to the reverse of the hinge. The marking observed on the reverse of this hinge is identical to that observed on hinge 37; hinge 37 was marked only on the reverse. The marking observed on specimen 43 is placed on the female half of the hinge and runs parallel to the joint but faces away from the joint. This fully legible marking reads, "E & T C".

Cast Iron Butt Hinge 44 (Cat. no. 114)

This specimen consists of a fractured male half of a hinge. This hinge measures 2.5 inches in length; its width cannot be estimated. It had three countersunk screw holes on the flap that is present, and no screws remain with this specimen.

Cast Iron Butt Hinge 45 (Cat. no. 121)

This hinge is heavily rusted and is frozen in a slightly open position. It is 2.5 inches in length and when open probably measured 1.8 inches in width. It has three countersunk screw holes on each flap, and is probably a three-joint hinge. Four screws or screw fragments remain with this specimen; the three complete screws are all flat head pointless screws measuring 1.5 inches in length.

Cast Iron Butt Hinge 46 (Cat. no. 121)

This specimen is relatively well preserved. It is of interest because of the presence of marking on its reverse identical to that observed on hinges 37 and 43. This three-joint hinge is rusted in a closed position and measures 2.5 inches in length by a probable measure of 1.8 inches in width when open. It has three countersunk screw holes on each flap, and screws or screw fragments remain in four of these. The three complete screws with this specimen are all flat head pointless screws measuring 1.5 inches in length.

The marking on this specimen is on the reverse, and is identical to that described for specimen 37 and 43. It consists of the letters "E & T C" cast into the female half of the hinge running parallel to but facing away from the joints. Based on analogy with specimen 16, this is probably the only marking present on this specimen.

2 3/4" Cast Iron Butt HingesCast Iron Butt Hinge 47 (Cat. no. 76)

The only 2 3/4 inch hinge in the collection is an extremely corroded, broken specimen. Due to its extremely corroded condition, little can be said of this hinge except that it measured approximately 2 3/4 inches in length and that it was fastened by three screws on each flap.

Hinge FragmentsCast Iron Butt Hinge 48 (Cat. no. 81)

This specimen consists of a small section of the male half of a hinge. Included is a single joint and part of the flap. Judging from the width of the flap, which is only .7 inches wide, this was probably a small three joint hinge possibly measuring about 2.0 inches in length. A fragment of a single flat head screw remains with this specimen.

Cast Iron Butt Hinge 49 (Cat. no. 103)

This consists of a very rusted and fragmentary hinge flap. The original size and other characteristics of this hinge cannot be reconstructed due to its deteriorated condition. It has a maximum size or 2.0 inches.

Cast Brass Butt Hinge

A single, fragmentary brass butt hinge is included in the collection (Cat. no. 132). Included with the specimen is a complete flap and joint and the joint and part of the other flap. This hinge is frozen in an open position, and measures 2.75 inches in length and 1.5 inches in width when open. The complete flap has three countersunk

screw holes, and a single iron flat head screw remains with this specimen. This screw measures .6 inches in length.

Unlike the cast iron butt hinges from the commanding officer's quarters, this hinge has only two joints and is a "loose joint" hinge. That is, this hinge could be separated by lifting one half off of the other. This would allow a door to be removed without unfastening the screws holding the hinge in place.

Casters

Six casters and one wheel from a caster are included in the collection (Figure 53). All are totally of iron construction, and they vary drastically in condition. Based on slight variations in form or size, three varieties can be recognized, probably indicating the presence of three pieces of furniture with casters. In addition to the six casters present in the collection, two are listed in the catalog (Cat. nos. 126 and 153) which are now missing.

Variety 1 Casters (Cat. no. ?, 117, 119)

These three casters are identical in pattern and size, but vary in condition and completeness. One of these casters (Cat. no. ?) is in an excellent state of preservation with all movable parts still remaining free. Another caster (Cat. no. 119) is complete, but is rusted heavily. The final caster of this variety (Cat. no. 117) is both rusted and incomplete; it is missing the socket.

This variety of caster is a typical furniture caster similar in pattern and manufacture to several shown in the 1865 catalog of the Russell and Erwin Manufacturing Company (Russell and Erwin 1865: 159).

It consists of three parts: a socket, a pivot and wheel housing (or

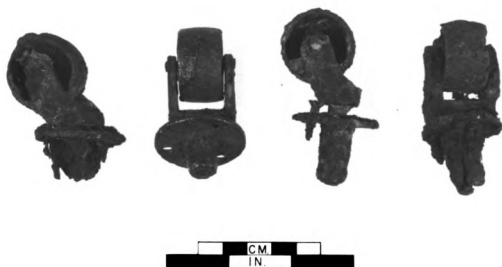


Figure 53. Casters. Left: side and front views of Variety 1 casters; Right: side and front views of Variety 2 casters.

"horn"), and a wheel. Casters of this period typically had an iron socket, an iron or brass horn, and iron, brass, wood, rubber, or porcelain wheels (Russell and Erwin 1865: 159).

Based on the best preserved of the specimens (Cat. no. ?), this variety can be described. The socket on this caster consists of the cylindrical socket itself and a circular mounting flange. The mounting flange measures 1.4 inches in diameter, and has three countersunk screw holes for fastening. The socket extends .5 inches above the mounting flange. This socket, which is an integral part of the caster, allowed the caster to pivot 360 degrees and also served to mount the caster to furniture.

The horn consists of a pivot which fits into the socket and a "U" shaped wheel housing, all part of a single cast piece. The pivot consists of a post which fits within the socket and through which a rivet passes to fasten the horn and the socket together. The wheel housing has the shape of a squared "U" in cross section, and it angles away from the line formed by the pivot in a fashion typical of furniture casters. The wheel is fastened to the housing through holes in each of its ears, through which a rivet passes.

The wheel measures 1.1 inches in diameter and .65 inches in width. The sides are recessed approximately .4 inches on each side leaving a perceptible rim and post through which the fastening rivet passes.

From the bottom of the mounting flange to the bottom of the wheel is 1.5 inches. The overall length of the caster from the top of the socket to the bottom of the wheel is about 2.2 inches. The overall size range of this artifact is 6 to 8 cm. This description mirrors

that for the other specimens of this variety, although their condition varies considerably.

Variety 2 Casters (Cat. no. 126, 126, 126)

The three variety 2 casters are all extremely rusted and one is fragmentary. They are, however, identical in pattern and size. A fourth caster of this variety may have been present: a caster, now missing from the collection, is listed under catalog number 126 in the artifact catalog.

An examination of the best preserved specimen of this variety shows that it is essentially identical in design to the variety 1 casters. Some differences in dimensions exist, however. The socket dimensions include a mounting flange that is only 1.2 inches in diameter but a socket which extends 1.0 inches above the flange. This socket was mounted to the furniture by three screws, two of which remain with the best preserved specimen. These flathead, pointed screws measure .6 inches in length.

The wheel on this variety measures 1.1 inches in diameter and .7 inches in width. From the bottom of the socket mounting flange to the bottom of the wheel is 1.6 inches. From the top of the socket to the bottom of the wheel is 2.7 inches. The overall size range of the best preserved of these casters is 6-8 cm.

Variety 3 Caster (Cat. no. 107)

This variety is represented by an iron wheel. Although this wheel is essentially similar to those for the above varieties, it is substantially smaller. This iron wheel measures .8 inches in diameter and about .6 inches in width. Its sides are recessed between the rim

and rivet hole. Compared to the other specimens, the rivet hole on this specimen appears large, and measures about .2 inches in diameter.

Bed Screws

Six bolts identified as "American Bed Screws" in the 1865 Russell and Erwin catalog (Russell and Erwin 1865: 161) are included in the collection (Table 62) (Figure 54). These are essentially a bolt with a square head and a square nut. The overall length of these artifacts is 6.5 inches. The head accounts for .6 inches of this, and the threads, located on the opposite end, account for about 2.3 inches. The diameter of the bolt is about .4 inches, and the nut has an irregular measure between about .7 and .8 inches square. It is about .35 inches long. Except for condition and location of the nut these six "bed screws" are identical.

Table 62

Summary of bed screws

<u>Cat. no.</u>	<u>Condition</u>	<u>Measure between head and nut</u>
53	Very rusted	4.0 inches
53	Very rusted	4.35 inches
53	Very rusted	4.35 inches
87	Light rust	4.6 inches
132	Light rust	4.8 inches
132	Light rust	4.8 inches

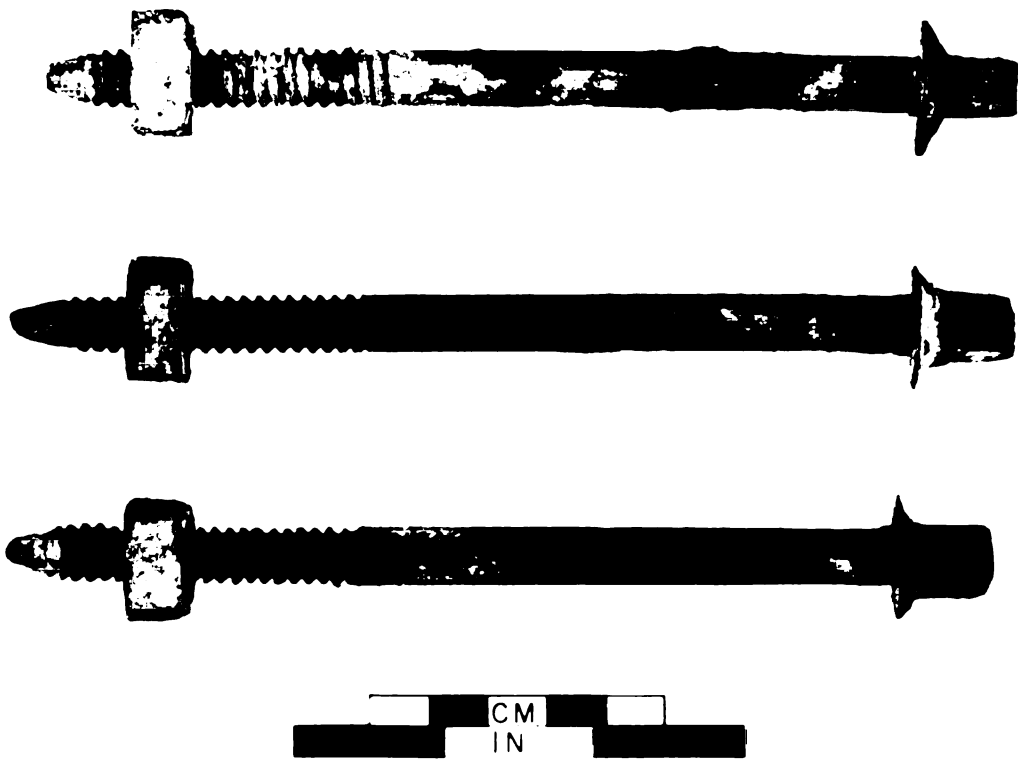


Figure 54. Bed screws.

Clothing Hooks

The five iron clothing hooks in the collection include two varieties (Figure 55). Four of the specimens are identical, while the fifth differs significantly. A sixth clothing hook (Cat. no. 155) is listed in the catalog but is no longer preserved in the collection.

Variety 1 Clothing Hook (Cat. no. 132, 132, 132, 132)

The four examples of this variety are all identical and are all complete, although they differ slightly in condition. These iron hooks are of cast construction and consist of a single, decorative hook and a decorative mounting plate with a single, countersunk mounting hole. On the back of the mounting plate below the mounting hole is a raised dimple which was intended to be pressed into the wood to which the hook was mounted and which would prevent the hook from rotating around the single screw which fastened it.

The mounting plate of this variety measures about 1.0 inches in height and about .8 inches in width. The mounting hole is about .2 inches in diameter. The hook would have extended about 2.0 inches out from the surface it was mounted to. These hooks have maximum size ranges of 6 to 8 cm.

Variety 2 Clothing Hook (Cat. no. 110)

The single specimen of this variety is similar in design but differs markedly in form from the variety 1 hooks. This iron hook appears to be of two part construction, with the hook being riveted or welded to a flat, triangular shaped mounting plate. The hook is circular in cross section and tapers slightly to the point, where it expands to form a ball. The triangular mounting plate is oriented so

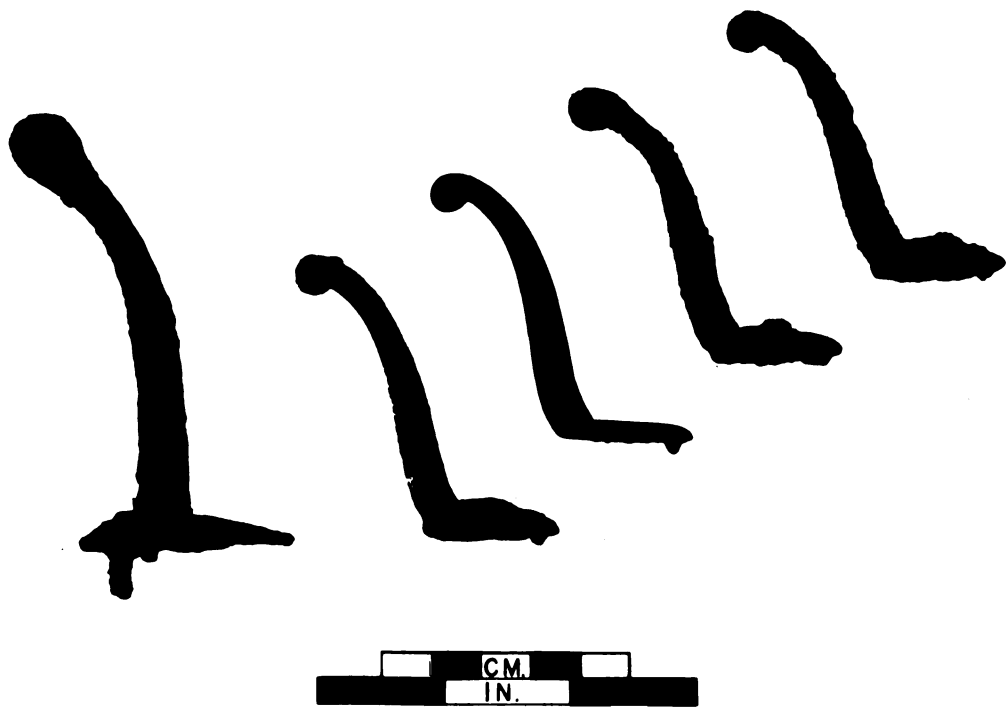


Figure 55. Clothing hooks. Left: Type 2 hook; Right four hooks: Type 1 hooks.

that the top is horizontal and the bottom is pointed. There are three mounting holes in this plate, one at each point, and small flathead, pointless wood screws .6 inches in length are still present in each hole.

The mounting plate measures 1.5 inches across the top and is 1.5 inches in height. The end of the hook would have extended 3.3 inches from the surface to which it was mounted. This artifact has an overall size range of 8-10 cm.

Brass Tacks

The nine brass tacks in the collection are interpreted as upholstery tacks (Cat. nos. 107, 107, 107, 107, 107, 107, 108, 114, 114). These tacks are all essentially identical: they consist of a wide head which is convex on the front and concave on the back and to which is attached a squared shank which tapers to a point on four sides. The head of these tacks is approximately .35 inches in diameter, and from the head to the tip of the shank the tacks are about .5 inches long. They fit within a 0 to 2 cm size range.

Iron Tacks

Five iron tacks are present in the collection (Cat. no. ?, ?, ?, 112, 116), and are interpreted as upholstery tacks. These tacks are identical; each measures about .5 inches in length, has a flat, circular head, and has a shank which tapers on four sides to an acute point.

Keys

The two keys considered here are identified as being associated with furniture due to their small size (Figure 56). Two other keys

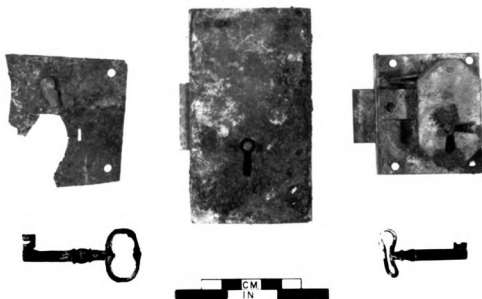


Figure 56. Cabinet locks and keys. Top row: Left, lock plate; Center, surface-mounted lock; Right, mortise-mounted lock; Bottom row: keys.

(Cat. nos. 80 and 153) are listed in the catalog and may also have been furniture sized artifacts. These other keys are, however, now missing.

Key 1 (Cat. no. 51)

This iron key has a symmetrical bit which is slotted for a single ward. The end of the barrel is hollow so that the key can pivot on a key pin. The circular shank is decorated with a balustroid device near the handle, and the handle consists of an open oval. This key has an overall length of 2.3 inches. It fits within a size range of 4 to 6 cm.

Key 2 (Cat. no. 88)

This key is of brass composition and is very similar in design to Key 1. The bit is broken off, but the end of the circular barrel is hollow to pivot on a key pin. The barrel is also decorated with a balustroid device, although on this key it is adjacent to the handle. The bow on this key has been distorted but was originally an open oval. The overall length of this key was approximately 1.8 inches although it measures only 1.7 inches currently. It fits within an overall size range of 4 to 6 cm.

Cabinet Locks

Two cabinet or trunk locks are included in the study collection, each of radically different design and construction. In addition, a fragmentary lock plate is also present (Figure 56).

Cabinet Lock 1 (Cat. no. 132)

This lock is entirely of iron construction and it is in an excellent state of preservation. This lock was designed to be mortised into the back side of a cabinet door or drawer, and was fastened with

screws through four countersunk holes in the backplate. The case for this lock is made of a single piece of iron which is bent at a 90 degree angle to form the selvedge edge of the lock. The back plate measures 2.3 inches parallel with the selvedge and 2.1 inches perpendicular to it. The selvedge edge, through which the bolt passes, measures .5 inches in width. This lock has a single ward and a key pin on which the key would rotate. Of interest, this lock has a double keyhole, which would have allowed it to be mounted either horizontally or vertically, and would have allowed its use on either a cabinet door or a drawer. This specimen has an overall size range of 6 to 8 cm.

Cabinet Lock 2 (Cat. no. 160)

This lock is entirely of iron construction and although it is in fairly good condition is much more rusted than cabinet lock 1. This lock differs significant from lock 1 in that it was designed to be surface mounted to the back of a cabinet door. The lock mechanism is therefore fully enclosed, but can be observed to feature a key pin and two wards. It has a single keyhole which would have only allowed its proper installation along the vertical edge of a door.

The keyhole is cut into the mounting plate, which measures 4.1 inches in height and 2.4 inches in height. There are four mounting holes in this mounting plate, with one at each corner. Small pointless flathead wood screws measuring .7 inches in length are present in three of these holes.

The selvedge edge of this lock, through which the 1.3 by .2 inch bolt passes, is formed by folding the mounting plate over at a ninety degree angle. The corners of this selvedge edge are beveled to meet

the lock mechanism, which is substantially smaller than the mounting plate. The lock mechanism has a maximum dimension of 2.0 by 2.5 inches and is encased by the selvedge edge of the lock, by a back plate which is bent over to form the top edge as well, and by an iron piece which bends around to form the two remaining sides. These pieces are riveted to the mounting plate. This lock has an overall size range of 10 to 15 cm.

Lock Plate (Cat. no. 116)

This iron lock plate is broken and incomplete. It consists of a flat, thin piece of iron which measures 2.5 inches in height and which has an incomplete width of 2.3 inches. On one complete end, mounting holes are observed in each corner. These mounting holes, which are not countersunk probably due to the slight thickness of the plate, measure about .15 inches in diameter. Also of note on this artifact is a fragmentary brass escutcheon which is mounted to the plate through a small hole. This escutcheon certainly covered a keyhole, but this portion of this artifact is missing. This artifact has an overall size range of 8 to 10 cm.

Hook

This brass hook (Cat. no. 132) is identical to a gimlet pointed hook shown in the 1865 Russell and Erwin catalog (Russell and Erwin 1865: 153). It is plano-convex in cross section, and measures approximately 2.5 inches in length. Its proximal end is pierced with a countersunk hole, suggesting that it was fastened with a flathead wood screw. This and the flat reverse of this hook indicates it probably was fastened and traveled flat against the surface to which it was

mounted, a means of mounting typical to cabinets or furniture. This specimen has an overall size range of 6 to 8 cm.

Colorless Glass Pendants

Two colorless glass pendants are present in the collection, and are interpreted as pendants which once decorated a lamp. In addition to these specimens, the catalog lists three other glass pendants (Cat. nos. 126, 126, 129) which are probably identical to these specimens but which are now missing from the collection.

Colorless Glass Pendant 1 (Cat. no. 126)

This is a broken and melted artifact that currently measures approximately 3.0 inches in length and about .9 inches in width. It has straight, parallel sides which angle to form a blunt point at one end. The back is flat, but the front is beveled to form two facets which draw together to form a longitudinal ridge. The two facets are press molded with a repetitive design. This artifact is essentially identical in design to colorless glass pendant 2 (Cat. no. 154) described below. It is interpreted as a portion of a pendant prism, possibly used as a decorative element on a lard fueled lamp:

With these functional parts there was a gracefully shaped glass globe, a handsome golden bronze finish, and perhaps a ring of prism-shaped glass pendants. In spite of its plebeian fuel, the fine appearance and good performance of the solar lamp made it a favoured parlour item between 1845 and 1855 (Russell 1966: 13).

This specimen has a weight of 16 grams and a size range of 6-8 cm.

Colorless Glass Pendant 2 (Cat. no. 154)

This is a small section of a glass prism pendant as described above. It is identical in dimension and shape to the above specimen,

but represents the proximal end. This end is characterized by a small hole which angles from the back of the prism through the top, and through which a small brass wire passes. This brass wire was clearly used to suspend the prism, and further clarifies the identification of this type of artifact as a decorative pendant. This specimen has a weight of 5 grams and a size range of 2 to 4 cm.

UNRECOGNIZABLE MELTED GLASS ARTIFACTS

A total of 4,752 pieces, weighing a total of 26,453 grams, of glass melted beyond certain recognition was included in the study collection from the Commanding Officer's Quarters (Table 63). Although information was collected on the number, weight, and size range of these artifacts, a consideration of this collection suggests that weight is the best measure for melted glass since the same size piece may vary greatly in thickness; it may represent a single fragment or many fragments or an entire bottle melted and compressed together. Although sherd counts tabulated for size certainly presents comparable data for archeological comparison of non-melted assemblies, such is clearly not the case with a glass assemblage melted beyond recognition.

Table 63

Summary of all non-recognizable melted glass

<u>Color/type</u>	<u>Weight</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Aqua	14,091	53%	2,103	44%
Aqua, flat	4,211	16%	1,834	39%
Colorless	6,980	26%	712	15%
Green	876	3%	93	2%
Aggregate	295	1%	10	-
TOTALS	26,453		4,752	

The difficulties of quantifying radically melted glass leads to a problem of comparison at another level; comparison of the melted to the non-melted assemblage on an inter- or intra-site level. While weight

is not seen as a valid approach to non-melted assemblage because it does not best present the true archeological nature of the data, melted and non-melted assemblages are clearly non-comparable when it comes to sherd counts. For reasons of expanding the comparability of the data base, it is recommended that glass weight by color be a part of the routine data collection during the analysis of all historic sites. Presented in a table in the report, such weights could have valuable applications for the interpretation of collections such as that from the Commanding Officer's Quarters.

In looking at the collection from the Commanding Officer's Quarters, the non-recognizable glass was quantified into five different categories based largely on color but also taking form into consideration to some extent. These categories included aqua glass that was clearly melted beyond recognition; moderately melted, single thickness aqua glass that may represent window glass; clear glass; green glass; and glass sherds formed of an aggregate of clear and aqua glass. The single thickness aqua glass is not firmly defined as window glass because in its melted condition it can not be satisfactorily separated from sherds of aqua bottle glass.

Non-Recognizable Aqua Glass

Aqua glass accounted for an overwhelming sixty-nine percent of the non-recognizable glass. Of this, sixteen percent was single thickness. Although it cannot be satisfactorily documented on form alone, it is the belief of this researcher that most if not all of this single thickness aqua glass represents sherds of window glass. It is further believed, although even further from demonstration on the basis of

form, that a sizable portion of the more amalgamated aqua glass also represents window glass.

The vast majority of the melted aqua glass was recovered from the east and west kitchens, although a significant amount was also recovered in the hall and in Test 3, a trench located along the south wall of the structure (Tables 64 and 65). The proportion of single thickness glass to the more severely melted sherds was roughly the same in each of these contexts. This suggests the intensity of the fire was similar throughout the structure, and also adds credence to the interpretation of the single thickness glass as window glass. It is unlikely that aqua bottles would have been equally important in the diverse contexts represented, but windows would have been.

Looking further at the distribution of aqua glass, a vast majority of aqua glass within the east and west kitchens was found within the northern halves of these rooms. The presence of a large amount of aqua glass along the north wall of the structure within the kitchens, along the south wall in Test 3, and the virtual absence of aqua glass in the interior in Test 9 and in the southern halves of the kitchens adds further support to the identification of the aqua glass as window glass. Several things follow from an identification of most of the aqua glass as window glass. First, the close association of the aqua glass with the exterior walls of the structure and the lack of aqua glass at any distance from these walls suggests that the building collapsed into itself and did not lean or fall in any direction. This has important consequences for the interpretations of the materials found in the burned debris from this building, and suggests that the

Table 64

Summary of non-recognizable aqua glass
multiple thickness, puddled, and severely burned specimens

<u>Provenience</u>	<u>Weight (grams)</u>	<u>Number</u>
East Kitchen, No quadrant	1670	272
East Kitchen, NE quadrant	4632	704
East Kitchen, SE quadrant	8	3
East Kitchen, SW quadrant	86	10
East Kitchen, NW quadrant	565	88
Subtotal East Kitchen	6961	1077
West Kitchen, No quadrant	112	9
West Kitchen, NW quadrant	1761	241
West Kitchen, SW quadrant	89	10
West Kitchen, SE quadrant	8	1
West Kitchen, NE quadrant	1535	119
Subtotal West Kitchen	3505	380
Hall	1722	281
Test 3 (outside south wall)	1295	220
Test 5 (under porch)	410	95
Test 7	20	1
Test 8 (interior of bldg)	178	49
Test 9 (interior of bldg)	-	-
Test 12 (path to privy)	-	-
Test 18 (drain)	-	-
TOTALS	14091	2103

Table 65

Summary of non-recognizable aqua glass:
single thickness

<u>Provenience</u>	<u>Weight (grams)</u>	<u>Number</u>
East Kitchen, No quadrant	342	206
East Kitchen, NE quadrant	1787	662
East Kitchen, SE quadrant	3	1
East Kitchen, SW quadrant	5	1
East Kitchen, NW quadrant	180	172
Subtotal East Kitchen	2317	1042
West Kitchen, No quadrant	12	6
West Kitchen, NW quadrant	610	205
West Kitchen, SW quadrant	2	1
West Kitchen, SE quadrant	-	-
West Kitchen, NE quadrant	120	54
Subtotal West Kitchen	744	266
Hall	810	347
Test 3 (outside south wall)	219	111
Test 5 (under porch)	75	39
Test 7	-	-
Test 8 (interior of bldg)	37	22
Test 9 (interior of bldg)	2	1
Test 12 (path to privy)	5	5
Test 18 (drain)	2	1
TOTALS	4211	1834

discovered location probably approximates horizontal location of the artifacts prior to the fire.

Second, it was noted that the aqua glass was found primarily along the north and south walls of the building and was absent in interior contexts associated with the east and west walls. From this, it can be inferred that most if not all of the windows in the building were

located along the north and south walls, and that they were rare or were absent altogether in the east and west walls. Such a conclusion fits well with other information about the building; the four chimneys were located on the east and west walls, which would have interfered with window placement there. It is further noted that the east and west walls of the Commanding Officer's Quarters are adjacent to other officer's quarters, a fact that may also argue against the presence of windows on these walls.

Non-Recognizable Clear Glass

Clear glass melted beyond recognition was second in weight to aqua glass. This clear glass, much of it smoked, accounted for 6,980 grams (Table 66). The distribution of this glass differed significantly from the distribution of aqua glass. A total of ninety-seven percent of the clear glass was found in the east and west kitchens and in the hall between these rooms. More significantly, almost eighty-two percent of all the clear glass was found in the east kitchen, with most of that apparently coming from the northeastern quadrant.

This distribution would argue for a non-architectural function for this glass, and would further suggest that it was either associated with the east kitchen or one of the rooms directly above it. In sites of this period, clear glass artifacts are usually either bottles or table wares. The size and weight of the clear melted glass favors an interpretation as tablewares, which are generally made of thick, heavy glass.

Table 66

Summary of non-recognizable clear glass

<u>Provenience</u>	<u>Weight (grams)</u>	<u>Number</u>
East Kitchen, No quadrant	2061	169
East Kitchen, NE quadrant	3085	427
East Kitchen, SE quadrant	-	-
East Kitchen, SW quadrant	528	37
East Kitchen, NW quadrant	25	4
Subtotal East Kitchen	5699	637
West Kitchen, No quadrant	353	5
West Kitchen, NW quadrant	93	11
West Kitchen, SW quadrant	160	7
West Kitchen, SE quadrant	-	-
West Kitchen, NE quadrant	-	-
Subtotal West Kitchen	606	23
Hall	466	28
Test 1	30	2
Test 3	17	6
Test 5	10	1
Test 8	103	7
Test 9	23	1
Test 24	21	6
C.O.Q., general provenience	5	1
TOTALS	6980	712

Non-Recognizable Green Glass

Represented by a relatively small amount was green, or olive green, glass (Table 67). This green glass certainly represents the remains of bottles. Although small in number, it is interesting that virtually all of the green glass was found in the hall and west kitchen, with more coming from the hall than from the kitchen. The

presence of so much green bottle glass in the hall probably indicates it was present in a room above the kitchen. Based on an interpretation of the recognizable green glass sherds from the site, a liquor cabinet or rack may be indicated.

Table 67

Summary of non-recognizable green glass

<u>Provenience</u>	<u>Weight (grams)</u>	<u>Number</u>
East Kitchen, SW quadrant	10	3
West Kitchen, No quadrant	205	4
West Kitchen, SW quadrant	90	4
Hall	527	73
Test 3 (along south wall)	29	7
Test 8 (interior of bldg)	15	2
TOTALS	876	93

Non-Recognizable Aggregate Glass

A small amount of aggregate glass formed by the combination of melted clear and aqua glass was present in the collection (Table 68). This has little interpretive value to add to the above discussion but the small amount of this aggregate glass does suggest that aqua and clear glass were probably not present in close proximity prior to or during the fire. This adds tacit support for the interpretation of the aqua glass as having served a largely architectural function and the clear as having served as tablewares.

Table 68

Summary of non-recognizable aggregate
(clear + aqua) glass

<u>Provenience</u>	<u>Weight (grams)</u>	<u>Number</u>
East Kitchen, no quadrant	130	1
East Kitchen, NE quadrant	165	7
West Kitchen, NW quadrant	-	2
TOTALS	295	10

Non-Glass Inclusions in Melted Glass

A variety of non-glass inclusions were observed in the melted glass from the site (Figure 57). This discussion presents an overview of the more prominent of these inclusions but does not discuss them all. Small inclusions of mortar, for example, were very common in the collection, but only the large inclusions are mentioned here. Further, small pieces of melted glass were found to be adhering to many artifacts throughout the collection. The inclusions discussed here are nevertheless very representative of the range present.

Table 69 presents a list of recorded inclusions. By far the most common inclusions were architectural in nature. These included nails and nail fragments, mortar, plaster, and glazing putty. Nails included were most commonly small and common cut, with 3 d. being the most frequently found. Nails up to 8 d in size occurred, however. Ceramics were also a commonly found inclusion in the melted glass. Sherds represented in this way were very typically small, but some larger sherds were also trapped in the once-molten glass. Included



Figure 57. Mass of melted glass clearly showing inclusion of a nail.

among the ceramics are sherds of undecorated ironstone, part of the strainer and pouring spout of an ironstone teapot, and a handle fragment of soft-paste porcelain. Two large pieces of thoroughly melted clear glass contained inclusions of deteriorated copper oxide apparently resulting from a melted copper artifact, and small beads of either brass or gold, likewise derived from some melted artifact.

The documentation of the presence of these inclusions in the melted glass from the commanding officer's quarters does much to establish the contextual relationship between the glass, the inclusions, and the site settings they represent. Clearly, the inclusions were introduced to the glass when it was in a molten state.

Table 69

Non-glass inclusions found within melted glass

<u>Prov</u>	<u>Color</u>	<u>Size</u>	<u>Description of inclusion</u>
50	Aggregate	6-8"	Ceramic sherd
51	Aqua	6-8"	Large ceramic sherd
51	Clear	4-6"	Small ceramic sherds
51	Aggregate	2-4"	Handle fragment, porcelain
51	Clear	4-6"	6 d. common cut nail
51	Clear	0-2"	3 d. common cut nail
51	Aqua	4-6"	Glazing putty
51	Aqua	6-8"	Mortar
51	Aqua	8-10"	Glazing putty
51	Aqua	2-4"	Common cut nail, indeterminate size
51	Aqua	2-4"	Ceramic sherd
51	Clear	2-4"	Ceramic sherd
51	Clear	2-4"	Ceramic sherd
51	Aqua	2-4"	3 d. common cut nail
52	Aqua	2-4"	7 d. finish nail
52	Clear	2-4"	3 d. common cut nail
67	Aqua	10-15"	Large ceramic sherd
67	Aqua	4-6"	3 d. common cut nail; ceramic sherd
67	Aqua	4-6"	Ceramic sherd
67	Aqua	4-6"	Ceramic sherd: fragment of strainer and spout of teapot
67	Clear	10-15"	7 d. finish nail
67	Aqua	8-10"	5 d. common cut nail
67	Aqua	6-8"	8 d. common cut nail
67	Clear	2-4"	4 d. common cut nail
69	Aqua	4-6"	Ceramic sherd
69	Clear	2-4"	3 d. common cut nail
69	Clear	2-4"	3 d. common cut nail
76	Aggregate	4-6"	Ceramic sherd
76	Aqua	4-6"	3 d. common cut nail
76	Aqua	2-4"	3 d. common cut nail
77	Aqua	8-10"	Plaster
84	Aqua	8-10"	Common cut nail, indeterminate size
85	Aqua	4-6"	Common cut nail, indeterminate size
85	Aqua	4-6"	Common cut nail, indeterminate size
85	Aqua	6-8"	Mortar

Table 69 (Cont'd).

85	Aqua	8-10"	Mortar; glazing putty
102	Aqua	2-4"	3 d. common cut nail
103	Aqua	6-8"	3 d. common cut nail
103	Aggregate	2-4"	3 d. common cut nail
103	Aqua	2-4"	Mortar
118	Aqua	10-15"	Common cut nail, indeterminate size
118	Aqua	8-10"	Mortar
118	Aqua	4-6"	3 d. common cut nail
128	Aqua	4-6"	3 d. common cut nail
126	Clear	6-8"	Copper oxide; beads of brass or gold
126	Clear	6-8"	Beads of brass or gold

MISCELLANEOUS ARTIFACTS

Artifacts described in this section were very obviously once part of something, but that something could not be identified by this researcher. These artifacts could not, therefore, be confidently placed with one of the five functional artifact groups discussed earlier in this report.

Unidentifiable Tin Fragments

A large quantity of fragments of tin, usually of small size, could not be identified as to their original forms. Many of these fragments are without doubt pieces of some of the identifiable artifacts described elsewhere in this report. Since these identifiable tin artifacts include items that date to the 1850s destruction of the commanding officer's quarters as well as items clearly dating well after this period, the unidentifiable tin artifacts cannot be comfortably assigned to any particular age context. Further, the number of tin fragments is of little importance since the rusted tin from the site is very fragile and is constantly fragmenting into more and smaller pieces. These unidentifiable fragments are therefore of little interpretive value, but are nevertheless summarized in the tables 70 and 71 below.

Table 70

Unidentifiable tin fragments

<u>Provenience</u>	<u>0 - 10 cm</u>	<u>10 - 20 cm</u>	<u>20 - 30 cm</u>
East Kitchen	148	13	3
West Kitchen	149	5	
Hallway	112		
Stair Well	12	1	
T 1	5		
T 3	22	2	
T 4	4	1	
T 6	39	2	1
T 7	8	1	
T 8	17	1	1
T 9	26	2	
T 12	8		
T 14	1		
T 18	8		
T 19	8	1	
T 20	3		
T 25	5	2	

Table 71

Unidentified tin fragments with one or more
nail perforations

<u>Provenience</u>	<u>0 - 10 cm</u>	<u>10 - 20 cm</u>	<u>20 - 30 cm</u>
East Kitchen	7	2	1
West Kitchen	5		
Hallway	4		
Stair Well			
T 6	2		
T 8	1		
T 9		2	
T 18	1		

Rolled Lip Tin Sheets

A large number of sheets of tin with one rolled edge were included in the collection (Table 72) (Figure 58). These sheets of tin were originally thought to represent flattened guttering, but a close inspection of their characteristics ruled out this interpretation. These sheets share a consistent width of about 10.5 inches, and each has an edge that is rolled to form an open bead about .5 inches in diameter. The width of these pieces, and the form of their rolled lips is very similar to certain types of guttering. These pieces are, however, a very consistent 10.0 inches in length, and none were observed to have any nail holes or other perforations. Due to this, these pieces are not believed to represent guttering or other conventional flashing. The function of these approximately ten inch square sheets, with one rolled edge, remains uncertain.

Table 72

Summary of tin squares with rolled edges.

<u>Provenience</u>	<u>Size Range</u>	<u>Description</u>
64	8-10 cm	Very rusted, fragmentary piece with rolled edge.
64	10-15 cm	All edges fragmentary, rolled edge smashed flat.
64	25-30 cm	Length 10.0 inches, width incomplete.
64	25-30 cm	Both ends fragmentary, width 10.0 inches.
64	30+ cm	Length 10.0 inches, width ca. 10.0 inches.

Table 72 (Cont'd).

65	15-20 cm	Fragmentary and rusted piece, rolled edge.
95	25-30 cm	Very rusted, 10.0 inches in length, 10.5 inches wide.
96	10-15 cm	Crushed, incomplete pieces with rolled edge.
96	25-30 cm	Both ends fragmentary, rolled edge smashed flat, about 10.5 inches wide.
115	25-30 cm	Two articulating pieces, 10 inches in length, width incomplete.
131	20-25 cm	Two articulating pieces, 10.0 inches long, rusted and fragmented.
133	25-30 cm	Length 10.0 inches, width 10.5 inches.
152	25-30 cm	Three articulating pieces, both ends fragmentary, length 7.5 inches.
152	25-30 cm	Bent in half, 10.0 inches long, 10.5 inches wide.

Iron Strap

Numerous pieces of iron strap were included in the collection. These may have served a wide variety of functions ranging from associations with building hardware (nail kegs), use in the kitchen (food containers, buckets), and use on artifacts such as trunks. They are therefore extremely difficult to associate with a specific functional category, and are included as miscellaneous artifacts. These strap iron artifacts are summarized in Table 73.

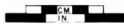
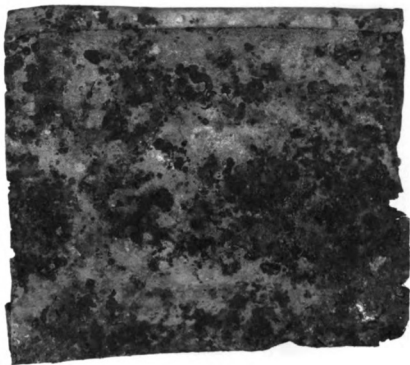


Figure 58. Unidentified tin artifact. Edge at top of photo is rolled.

Table 73

Summary of strap iron artifacts.

<u>Provenience</u>	<u>Width</u>	<u>Size range</u>	<u>Description</u>
64	1.3"	10-15 cm	Both ends broken. 5.6" long.
65	1.0"	10-15 cm	Small perforations along edge, possibly from a trunk, both ends broken. 5.7" long.
65	1.3"	20-25 cm	Heavy strap, both ends broken. 8.3" long.
65	.75"	varies	Six sections: 1.2", 1.4", 2.6", 2.8", 3.0", 4.7" in length. One section has a steel rivet with a brass head.
85	.7"	4-6 cm	29 fragments of curved strap.
86	.9"	6-8 cm	Both ends broken. 3.8" long.
115	.9"	25-30 cm	One finished end, one perforation. 13" long.
115	1.0"	10 - 15 cm	One finished end, two perforations. 4.8" long.
115	1.0"	10-15 cm	Both ends broken. 5.0" long.
131	1.2"	10-15 cm	Both ends broken. 4.8" long.
131	.8"	4-6 cm	Both ends broken. 2.7" long.
131	.8"	6-8 cm	Both ends broken. 2.0" long.
131	.8"	10-15 cm	One finished end, brass rivet with brass washer. 5.8" long.
136	1.2"	4-6 cm	One finished end. 2" long.
141	1.3"	10-15 cm	Two heavy straps riveted together with an iron rivet with .5 inch head. 4.0" long.

Table 73 (Cont'd).

153	1.0"	20-25 cm	Both ends broken, small perforations along one edge, possibly from a trunk. 8.7" long.
153	1.0"	4-6 cm	Both ends broken, small perforations along one edge, possibly from a trunk. 1.5" long.
153	1.0"	6-8 cm	Both ends broken, small perforations along one edge, possibly from a trunk. 2.5" long.
174	1.0"	10-15 cm	Both ends broken, one perforation. 7.0" long.

Miscellaneous Melted Metal

Several pieces of melted metal are present in the study collection which cannot be functionally identified. These nevertheless present a certain amount of information and will be very briefly summarized in Table 74.

Table 74

Summary of miscellaneous melted metal

<u>Cat. no.</u>	<u>Metal</u>	<u>Weight</u>	<u>Size range</u>
57	Brass	13 grams	2-4 cm
57	Brass	17 grams	2-4 cm
57	Brass	23 grams	4-6 cm
57	Copper	9 grams	0-2 cm
57	Copper	11 grams	0-2 cm
57	Copper	15 grams	2-4 cm
63	Brass	18 grams	4-6 cm
81	Lead alloy	10 grams	0-2 cm
81	Copper	9 grams	0-2 cm
102	Copper	150 grams	8-10 cm
102	Copper	60 grams	6-8 cm
102	Copper	14 grams	4-6 cm
102	Copper	10 grams	2-4 cm
102	Copper	6 grams	2-4 cm
114	Brass	15 grams	2-4 cm
118	Brass	6 grams	2-4 cm
118	Brass	75 grams	6-8 cm
126	Brass	14 grams	2-4 cm
126	Brass	12 grams	0-2 cm
129	Brass	18 grams	2-4 cm
152	Lead alloy	8 grams	2-4 cm
153	Lead alloy	28 grams	6-8 cm

Miscellaneous Iron Artifacts

A number of artifacts are included in the collection that could not be identified. A very brief description of these follows.

Catalog No. ?

This is a heavy iron bar that was fastened to wood. It consists of a straight bar that is 26.0 inches long and rectangular in cross section (.7 by .9 inches). Welded to each end of this bar are mounting plates consisting of thin straps of iron that are about .9 inches in width and which extend from the bar about 3.5 inches. Each of these straps has three screw holes, and one flat head wood screw remains in one of these. One of the straps projects at 90 degrees from the bar, the other at about 45 degrees.

Catalog No. 61

This is a heavy iron artifact which may have served a function on a wagon axle. It is cylindrical in shape, with an internal diameter of about 3.0 inches and an external diameter ranging from 3.6 inches on one end and 3.8 inches on the other. It is 2.2 inches long, and has three raised ridges on the exterior of the cylinder and which run longitudinally along its length.

Catalog No. 80

This is a very corroded section of iron which is circular in cross section, about .3 inches in diameter, and which is slightly bent. This specimen is broken on both ends, and has a length of about 4.0 inches. It is reminiscent of a handle.

Catalog No. 80

This is essentially identical to the artifact described above, except that it is about 6.0 inches in length. It is possible that they once were part of the same artifact.

Catalog No. 99

This is a very heavy piece of iron. It is square in cross section, and about .9 inches on a side. It is broken on both ends, and has an overall length of about 11.0 inches. It is bent at mid-section to form a 90 degree angle.

Catalog No. 99 and 100

Represented here are four basically identical double-ended bolts. They are very rusted and rust encrusted. The bolts measure about 3.8 inches in length, and have irregular square nuts measuring around .8 inches on a side. The functions of these bolts is uncertain.

Catalog No. 103

This is an oval band measuring about 2.7 by 4.5 inches. It is made of iron that has a width of about .9 inches. This probably served as a reinforcing band which was placed around of wood member, probably on some wagon-related piece.

Catalog No. 115

This is a heavy strap of iron that measures 7.0 inches in length, .7 inches in width, and .2 inches thick. It is broken on one end, and has two .2 inch diameter holes through it. It is flat on one side, but the corners are beveled on the other.

Catalog No. 117

This is a heavy iron washer that has a diameter of 4.0 inches. The washer is made of metal that is .3 inches by .6 inches. This may have served a function on a wagon or similar piece of equipment.

Catalog No. 152

This is a diamond shaped plate made of thin iron. It measures about 2.3 by 1.1 inches, and is broken on one end. There are three holes in it; one which measures .2 inches in diameter at one of the acute points, and two .1 inch diameter holes at the two obtuse points. In one of these smaller holes, a .5 inch long iron tack is present; this tack has been clinched.

Miscellaneous Copper Alloy ArtifactsCatalog No. 57

This is a cylindrical piece of cast brass that measures .7 inches in length by .7 inches in diameter. The exterior is decorated with three ridges which run around the circumference of this artifact. This probably served as decoration on some wooden artifact of unknown type.

Catalog No. 107 and 108

These three artifacts are identical in that they consist of strips of brass that has elaborate decorative motifs cast onto one side. One of these (Cat. no. 108) has been affected by heat, while the other two (Cat. no. 107), have not. These sections range in length from 1.0 to 2.5 inches, and are less than .8 inches in width. The patterns present on these pieces cannot be identified.

Catalog No. 108

This is a small brass artifact made of a thin sheet of brass. It measures .7 inches by about .7 inches, and is "D" shaped. It has a narrow slit in it, below which is a keyhole shaped hole. This may have served as part of a lock on a carpet bag or other such artifact, but this is uncertain.

Catalog No. 118

This is a hollow brass tube that is bent into a "U" shape. The tube measures about 6.5 inches in length, and is about .35 inches in diameter. The tube is not cylindrical, but instead has seven pronounced ridges running longitudinally.

Miscellaneous Bone Artifacts

Five unidentifiable carved bone artifacts are included in the collection. These have catalog numbers of 75 and 76, and each has been burned severely.

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