12-1979

The Allegan Dam Site: An Upper Mississippi Occupation in the Lower Kalamazoo River Basin

George B. Spero
Western Michigan University

Follow this and additional works at: https://scholarworks.wmich.edu/masters_theses

Part of the Archaeological Anthropology Commons

Recommended Citation
https://scholarworks.wmich.edu/masters_theses/2049

This Masters Thesis-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Master's Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact maira.bundza@wmich.edu.
THE ALLEGAN DAM SITE: AN UPPER MISSISSIPPI OCCUPATION IN THE LOWER KALAMAZOO RIVER BASIN

by

George B. Spero

A Thesis
Submitted to the
Faculty of the Graduate College
in partial fulfillment
of the
Degree of Master of Arts

Western Michigan University
Kalamazoo, Michigan
December 1979

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
ACKNOWLEDGEMENTS

This thesis is the culmination of an investigation of the Allegan Dam site that began more than ten years ago. Many persons have been involved in this study and this report is in part a tribute to their interest and help. A number of individuals contributed to the preparation of specific sections of this report and their contributions are acknowledged in the text.

My deepest gratitude goes to my advisor, Dr. Elizabeth B. Garland, for inspiration and guidance and for her helpful suggestions and discussions throughout the course of this study. Special thanks are due Dr. William M. Cremin for assistance in flotation and isolation of the faunal remains and his general contributions to my appreciation of subsistence activities. My thanks also to Nenedia C. Kennedy for serving as a member of my thesis committee.

I owe much to many graduate student colleagues for helpful comments and discussions and particularly to Robert G. Kingsley for his help with the ceramics. Thanks are also due Tim Desley for preparing drawings of the pottery vessels, to David Hoxie for the plates, to Richard Huff for preparing the maps, to Rhonda Spero for typing the rough draft, and to Dorothy Bauckham for the final typing.

Finally, my most sincere appreciation goes to my wife, Maxine. Her constant interest and actual involvement in the various phases of this study, from excavation through analysis, was of invaluable aid to the completion of this report.

George B. Spero
INFORMATION TO USERS

This was produced from a copy of a document sent to us for microfilming. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help you understand markings or notations which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure you of complete continuity.

2. When an image on the film is obliterated with a round black mark it is an indication that the film inspector noticed either blurred copy because of movement during exposure, or duplicate copy. Unless we meant to delete copyrighted materials that should not have been filmed, you will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed the photographer has followed a definite method in “sectioning” the material. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For any illustrations that cannot be reproduced satisfactorily by xerography, photographic prints can be purchased at additional cost and tipped into your xerographic copy. Requests can be made to our Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases we have filmed the best available copy.

University Microfilms International
310 N. ZEEB ROAD, ANN ARBOR, MI 48106
18 BEDFORD ROW, LONDON WC1R 4EJ, ENGLAND

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
SPERO, GEORGE BASIL
THE ALLEGAN DAM SITE: AN UPPER MISSISSIPPI
OCCUPATION IN THE LOWER KALAMAZOO RIVER
BASIN.

WESTERN MICHIGAN UNIVERSITY, M.A., 1979

University
Microfilms
International
300 N. ZEEB ROAD, ANN ARBOR, MI 48106

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
PLEASE NOTE:
In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ☑.

1. Glossy photographs ☑
2. Colored illustrations
3. Photographs with dark background ☑
4. Illustrations are poor copy
5. Print shows through as there is text on both sides of page
6. Indistinct, broken or small print on several pages throughout
7. Tightly bound copy with print lost in spine
8. Computer printout pages with indistinct print
9. Page(s) lacking when material received, and not available from school or author
10. Page(s) seem to be missing in numbering only as text follows
11. Poor carbon copy
12. Not original copy, several pages with blurred type
13. Appendix pages are poor copy
14. Original copy with light type
15. Curling and wrinkled pages
16. Other

University Microfilms International
300 N. Zeeb Rd., Ann Arbor, MI 48106 (313) 761-4700
Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>- The Site</td>
<td>1</td>
</tr>
<tr>
<td>- History and Method of Excavation</td>
<td>5</td>
</tr>
<tr>
<td>- Radiocarbon Dates</td>
<td>7</td>
</tr>
<tr>
<td>- Historic Material</td>
<td>7</td>
</tr>
<tr>
<td>II. FEATURES</td>
<td>9</td>
</tr>
<tr>
<td>- Fire Pits</td>
<td>16</td>
</tr>
<tr>
<td>- Deep Storage Pits</td>
<td>16</td>
</tr>
<tr>
<td>- Hearths</td>
<td>18</td>
</tr>
<tr>
<td>- Deep Earth Oven</td>
<td>18</td>
</tr>
<tr>
<td>- Unclassified Features</td>
<td>19</td>
</tr>
<tr>
<td>- Feature Distribution</td>
<td>19</td>
</tr>
<tr>
<td>- Postmolds</td>
<td>20</td>
</tr>
<tr>
<td>- Burial</td>
<td>20</td>
</tr>
<tr>
<td>III. CERAMICS</td>
<td>23</td>
</tr>
<tr>
<td>- Method of Analysis</td>
<td>24</td>
</tr>
<tr>
<td>- Surface Finish</td>
<td>26</td>
</tr>
<tr>
<td>- Temper and Paste</td>
<td>28</td>
</tr>
<tr>
<td>- Color, Hardness and Thickness</td>
<td>30</td>
</tr>
<tr>
<td>- Rim Profile and Lip Shape</td>
<td>31</td>
</tr>
<tr>
<td>- Rim Height and Diameter</td>
<td>34</td>
</tr>
<tr>
<td>- Collars</td>
<td>34</td>
</tr>
<tr>
<td>- Neck Angle</td>
<td>35</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Rim and Body Decoration</td>
<td>37</td>
</tr>
<tr>
<td>Lip Decoration</td>
<td>38</td>
</tr>
<tr>
<td>Comparison of Grit and Shell Tempered Wares</td>
<td>38</td>
</tr>
<tr>
<td>Ceramic Typology</td>
<td>43</td>
</tr>
<tr>
<td>Allegan Ware</td>
<td>46</td>
</tr>
<tr>
<td>Allegan Dam Ware</td>
<td>51</td>
</tr>
<tr>
<td>Ceramics Relationships and Chronology</td>
<td>57</td>
</tr>
<tr>
<td>IV. LITHICS</td>
<td>65</td>
</tr>
<tr>
<td>Chipped Stone Artifacts</td>
<td>65</td>
</tr>
<tr>
<td>Other Stone Artifacts</td>
<td>74</td>
</tr>
<tr>
<td>V. FAUNAL REMAINS</td>
<td>76</td>
</tr>
<tr>
<td>VI. FLORAL REMAINS</td>
<td>89</td>
</tr>
<tr>
<td>Plant Remains from the Allegan Dam Site, Allegan County, Michigan. By C. Wesley Cowan</td>
<td>91</td>
</tr>
<tr>
<td>VII. DISTRIBUTION OF POTTERY AND CHIPPED STONE</td>
<td>96</td>
</tr>
<tr>
<td>Lateral Distribution</td>
<td>101</td>
</tr>
<tr>
<td>Vertical Distribution</td>
<td>106</td>
</tr>
<tr>
<td>VIII. CULTURAL IMPLICATIONS</td>
<td>113</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>123</td>
</tr>
<tr>
<td>APPENDIX Vessel Description</td>
<td>128</td>
</tr>
<tr>
<td>PLATES</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Deep Storage Pit, Feature 14</td>
</tr>
<tr>
<td>II</td>
<td>Hearth, Feature 19</td>
</tr>
<tr>
<td>III</td>
<td>Allegan Cordmarked</td>
</tr>
<tr>
<td>IV</td>
<td>Allegan Smoothed</td>
</tr>
<tr>
<td>V</td>
<td>A. Allegan Punctate B. Allegan Crosshatched C. Allegan Cord Impressed</td>
</tr>
</tbody>
</table>

iv
VI Allegan Collared ............................................. 178
VII Unclassified Vessels 21 and 20 ................. 179
VIII Allegan Dam Ware. Group 1. Cordmarked ...... 180
IX Allegan Dam Ware. Group 2. Smoothed ........ 181
X Allegan Dam Ware. A. Group 3, Plain
     B. Group 5, Decorated ............................. 182
XI Allegan Dam Ware. Group 4. Castellated .... 183
XII Allegan Dam Ware. Group 4. Castellated ...... 184
XIII Projectile Points. A. Triangular. B. Corner
     Notched. C. Side Notched. D. Stemmed ....... 185
XIV A. Drills. B. Scrapers ............................. 186
XV A. Chopper. B. Adze .............................. 187

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
LIST OF TABLES

Table | Page
--- | ---
1. Surface Finish | 27
2. Comparison of Grit and Shell Tempered Wares | 40
3. Chipped Stone | 66
4. Percent Triangular Points | 71
5. Soil pH | 78
6. Animal Bone Distribution | 81
7. Total Animal Bone Remains | 87
8. Identified Animal Remains | 88
9. Floral Material Identified from Non-Feature Contexts | 94
10. Floral Material Identified from Feature Contexts | 95
11. Lateral Distribution of Pottery and Chipped Stone | 97
12. Vertical Distribution of Sherds and Projectile Points | 108

LIST OF FIGURES

Figure | Page
--- | ---
1 Rim Profiles and Lip Shapes | 31
2 Rim Profiles (Grit Tempered Pottery) | 32
3 Rim Profiles (Shell Tempered Pottery) | 33
### LIST OF GRAPHS

<table>
<thead>
<tr>
<th>Graph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lateral Distribution of Combined Pottery and Chipped Stone</td>
<td>102</td>
</tr>
<tr>
<td>2 Distribution of Pottery and Chipped Stone</td>
<td>104</td>
</tr>
<tr>
<td>3 Lateral Distribution of Grit and Shell Tempered Sherds</td>
<td>105</td>
</tr>
<tr>
<td>4 Distribution of Grit and Shell Tempered Sherds in Features</td>
<td>107</td>
</tr>
<tr>
<td>5 Vertical Distribution of Grit and Shell Tempered Sherds</td>
<td>110</td>
</tr>
<tr>
<td>6 Vertical Distribution of Projectile Points</td>
<td>111</td>
</tr>
</tbody>
</table>

### LIST OF MAPS

<table>
<thead>
<tr>
<th>Map</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Allegan Dam and Sites Referred to in Text</td>
<td>2</td>
</tr>
<tr>
<td>2 Allegan Dam Site</td>
<td>3</td>
</tr>
<tr>
<td>3 Allegan Dam Site Feature Location</td>
<td>4</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

The Site

The Allegan Dam site (20 AE 56) is located on the north bank of the Kalamazoo River in the Allegan State Game area in the west half of the northwest quarter of Section 10, Valley Township, Allegan County, Michigan (Map 1). It is situated on a prominent ridge approximately 70 feet above the river lowland at an elevation of 671.7 feet (at datum) above sea level. The ridge is located a little over one-half mile downstream from Allegan Dam and three-tenths of a mile from the present-day main river channel which meanders through the marshy lowland.

At this particular location, the Kalamazoo River flows in a northerly direction, resulting in the ridge being situated on the east bank of the river and the site having a general southwest-northeast orientation. Except for the south end, the site covers the top of the ridge, is approximately 430 feet long, and has an average width of 60 to 70 feet. It slopes gently upwards to the north, and culminates in a small knoll at the north end almost 20 feet above datum (Map 2). The south end of the ridge is separated by a ravine 30 to 40 feet in depth. Test excavations across the ravine did not produce any indication of occupation. At the west edge of the site, the ground slopes sharply down to the river marsh. This drop is very steep, making this side of the site an unlikely access to the river. A more favorable approach is through the ravine at the south end. At the north end of the site, the knoll drops off gradually for about 20 feet, and at the east edge the land drops gently for a few
Map 1

1. Allegan Dam
2. Elam
3. 46th Street
4. Fennville
5. Schwerdt
6. Hacklander
7. Spring Creek
8. Juntunen
9. Riviere au Vase
10. Moccasin Bluff
11. Fifield
12. Griesmer
13. Oak Forest
14. Fisher
15. Lawrence

(Whiteside Co., Ill.)
Map 2

ALLEGAN DAM SITE
20 AE 56

CONTOUR INTERVAL = 1 FT
0 10 TO 30 FT
Map 3

ALLEGAN DAM SITE
20 AE 56

FEATURE LOCATION

0 5 10 15 ft.
The site is densely covered with deciduous and coniferous growth. Oak predominates and some of these trees are of substantial size. It does not appear that the site has been disturbed by farming in recent times, although it was probably used for pasturage at one time. Remnants of a barbed wire fence were found at the west edge of the site, probably placed there to prevent stock from falling down the steep incline.

The land on which the site is situated is presently part of the Allegan State Forest. The Forest was established, beginning in 1940, as part of the State Submarginal Land Program. It was estimated at that time that the area was 90% submarginal for agriculture (Rogers 1972:47). The soil consists of deep, dry yellow sand which is generally covered, as at the site, with some vegetation and a thin layer of humus. Because of the sandy nature of the soil, even modern farmers have been largely unsuccessful in growing crops in this area. It is doubtful that it was any more suitable for agriculture in aboriginal times. A possible exception might have existed at the south end of the site where the ravine flares out into the river lowland. This small area was utilized for farming vegetable crops during World War II. It could have been likewise used by the aboriginals, but there is no direct evidence to support this inference.

History and Method of Excavation

The first excavations at the Allegan Dam site were conducted in the summer and fall of 1968 by the Western Michigan University Field
School and by the Kalamazoo Valley Chapter of the Michigan Archaeological Society under the direction of Dr. Elizabeth Baldwin Garland of the Department of Anthropology, Western Michigan University. At that time squares A through T and test pits 2 and 3 were excavated (1626 ft.²). More recently, in June of 1977, the Western Michigan University Field School, under the direction of Dr. William Cremin, excavated squares U through Z and AA and BB (488 ft.²). During the remainder of the summer test pits 10 through 32 (207 ft.²) were dug by the author. These pits systematically covered the remainder of the ridge and were intended to delimit the site. A total of 2321 square feet, about 6.3% of the site, was excavated.

From the distribution of cultural debris and consideration of the terrain, the site boundaries can be fairly accurately set. Roughly, the site is in the form of an elongated oval with the 683 and 668 foot contour lines forming, respectively, the north and south edges. Connecting lines between these two contours on the east and west define the two sides (Map 2). This is an area of approximately 37,000 square feet or just under an acre.

Excavation squares were generally 10 x 10, 5 x 10, or 5 x 5 feet. In a few instances where extensions were necessary to recover features, units of appropriate size were dug. Test pits were 3 x 3 feet, except for test pits 2 and 3 which were 5 x 5 feet. Several other 5 x 5 units were started as test pits and were later enlarged to 10 x 10 squares.

Since the site is devoid of natural stratigraphy, the units were dug at arbitrary levels. During the 1968 excavations, digging was conducted in some instances by six-inch levels. In other cases, four-
Inch levels were used down to twelve inches, and six-inch levels below that. In the 1977 excavations, units were dug by three-inch levels.

The dirt was sifted through one-fourth inch screens and in a few cases, particularly with features, some sifting through one-eighth inch screen was utilized. The units were dug down until the final level was sterile or essentially sterile. The bulk of the cultural material was recovered above the one-foot level.

Samples of fill from features and samples for pollen analysis were collected during the 1968 excavations. These samples were processed by flotation as part of the present study. More extensive samples for flotation were collected during Dr. Cremin's 1977 excavations. Small samples were also taken by the writer for soil pH determination.

Radiocarbon Dates

Three radiocarbon dates were obtained for the Allegan Dam site from charcoal in Features 17, 19 and 28. All three features contained substantial amounts of ceramics and lithics (see Features). Feature 17 contained a mixture of grit and shell tempered pottery and gave a date of A.D. 1310±100 (Crane & Griffin 1972). Feature 19 was dated at A.D. 1210±100 (Crane & Griffin 1972). The pottery in this feature was exclusively shell tempered. Feature 28, containing exclusively grit tempered pottery, was dated at A.D. 1215±80 (UGa-2629).

Historic Material

Little historic material was recovered from the Allegan Dam site. All of the material was found at the upper levels and was of relatively recent deposition. As noted earlier, the remains of a barbed wire fence
were evident. This included pieces of barbed wire and staples found at various areas of the site. Other historic remains include several nails, two 22-caliber cartridge cases, one 22-caliber slug, two 16-gauge shotgun shell bases, some glass, and one piece of glazed china.
CHAPTER II
FEATURES

Twenty pit features, one burial, and a cluster of postmolds were uncovered at the Allegan Dam site (Map 3). Over half of the pit features were recognized 15-20 cm below the surface. Two were noted at 10 cm and the remainder at 25-30 cm below the surface. None of the features were intrusive into any other feature. Feature depths are given in cm below surface in all cases. Feature numbers 1-7 and 22-26 were assigned to features at another site excavated during the 1968 season.

Feature 8

Feature 8 was a circular, basin shaped pit encountered 20-25 cm below surface. It had a diameter of 76 cm and a depth of 72 cm. The fill was dark and the wall soil was reddish gray. Contents: charcoal, fire cracked rock, 5 grit and 23 shell tempered sherds, one point fragment, 26 pieces of debitage.

Feature 9

An ovate, 76 x 52 cm, conical shaped pit of 66 cm depth found 15 cm below the surface. The fill was dark gray. Contents: charcoal, 2 grit and 4 shell tempered sherds, 9 pieces of debitage.

Feature 10

A circular pit, 70 cm in diameter and 46 cm in depth found 10 cm below surface. The pit was probably basin shaped with dark gray fill. Contents: considerable charcoal and fire cracked rock, 30 grit and 5 shell tempered sherds, 2 utilized flakes, 30 pieces of debitage, 57
pieces of deer bone including a mandible fragment, 3 pieces of sturgeon bone.\(^1\)

Feature 11

A circular, conical shaped pit, 76 cm in diameter and 66 cm in depth, found at 15 cm below surface. The fill was dark. Contents: charcoal, some fire cracked rock, 10 grit and 9 shell tempered sherds, one triangular point, one scraper, one core, one miscellaneous tool, one utilized flake, 134 pieces of debitage. 2 fragments of beaver bone, 5 fragments of turtle shell.

Feature 12

A circular, probably basin shaped pit of 90 cm diameter and 40 cm depth noted at 20 cm below surface. The fill was dark gray. Contents: charcoal, fire cracked rock, one grit and one shell tempered sherd, one miscellaneous stone tool, 12 pieces of debitage, 4 pieces of charred nut.

Feature 13

This feature was a poorly defined small basin depression at 18 cm below surface. It had a diameter of about 46 cm and a depth of 31 cm. Contents: several pieces of river clam, 2 grit tempered sherds and 2 pieces of debitage.

Feature 14 (Plate I)

This large pit, first noted at 20 cm below surface, was roughly circular with a diameter of 122 cm and a depth of 91 cm. The walls had

\(^1\)All of the features contained some bone (see Faunal section). Noted here are only the more significant concentrations.
a slight slope toward the center and were of burned, consolidated sand. The bottom was rounded. The very dark fill became black near the bottom and had a "greasy" feel when rubbed between the fingers. Contents: charcoal, some fire cracked rock, 2 grit and 4 shell tempered sherds, 30 pieces of debitage, bone fragments of mammal, turtle and sturgeon, one piece of charred nut.

Feature 15

This pit was very similar to Feature 14. It was noted at 25 cm below surface and had a diameter of 91 cm and a depth of 101 cm. The walls were not consolidated as in Feature 14, but chunks of burned, consolidated sand were present in the fill. The lower fill was black with a "greasy" consistency. Contents: charcoal, some fire cracked rock, 14 grit and 16 shell tempered sherds, one point fragment, 49 pieces of debitage.

Feature 16

A small basin shaped shallow pit noted at 10 cm below surface. It was roughly circular with a diameter of 51 cm and a depth of 28 cm. The fill was dark gray. Contents: charcoal, fire cracked rock, 2 pieces of debitage, no pottery.

Feature 17

Feature 17 was very similar to Feature 14. It was noted at 20 cm below surface and had a diameter of 107 cm and a depth of 89 cm. The walls were of burned consolidated sand and the bottom of the fill was black and "greasy." Contents: charcoal, including some large pieces used for radiocarbon dating, 21 grit and 34 shell tempered sherds, one
side notched point, 2 point fragments, one drill, one scraper, 4 utilized flakes, 70 pieces ofdebitage, 8 pieces of sturgeon bone.

Feature 18

Feature 18 was very similar to Feature 14. It was a roughly circular pit, recognized at 28 cm below surface, with a diameter of 122 cm and a depth of 94 cm. It had consolidated, burned sand walls, and the black "greasy" lower fill. Contents: charcoal, fire cracked rock, 3 shell tempered sherds, one point fragment, 25 pieces of debitage.

Feature 19 (Plate II)

The dark soil of this pit was noted at 28 cm below surface but was not well defined until a depth of 41 cm was reached. It was basin shaped and had a diameter of about 85 cm and a depth of 56 cm. The pit was lined with 80 flattish, fire blackened rocks in a perfect circle at about 50 cm below surface. The fill was black as in Feature 14 but it lacked the "greasy" feel. Contents: much charcoal, some of which was used for radiocarbon dating, fire cracked rock, 116 shell tempered sherds, no grit pottery, one utilized flake, 40 pieces of debitage. Much pottery was also noted above the feature.

Feature 20

This was another large pit similar to Feature 14. It was noted at 30 cm below surface and had a diameter of 122 cm and a depth of 71 cm. It contained burned sand and a black "greasy" lower portion. Contents: much charcoal, fire cracked rock, 2 grit and 5 shell tempered sherds, one point fragment, one miscellaneous tool, one utilized flake, 87 pieces of debitage, 2 pieces of antler.
Feature 21

Feature 21 was a burial. It is described in detail below.

Feature 27

This was a poorly defined feature encountered at about 30 cm below surface. It was roughly circular, about 90 cm in diameter, and 90 cm deep. The fill was grayish black. Contents: charcoal, 5 grit and 2 shell tempered sherds, 17 pieces of debitage.

Feature 28

A roughly ovate pit, 107 x 76 cm and 66 cm deep. The fill was dark gray and contained some burned sand. It did not become black and "greasy" as in Feature 14. Contents: much charcoal, some used for radiocarbon dating, fire cracked rock, 95 grit tempered sherds, no shell tempered pottery, one point fragment, one utilized flake, 31 pieces of debitage.

Feature 29

A small pit noted at 20 cm below surface. It was roughly circular with a diameter of 60 cm and a depth of 45 cm. The fill was dark. Contents: fire cracked rock, 4 pieces of debitage.

Feature 30

Feature 30 consisted of two concentrations of rocks. At 20-25 cm below surface a roughly circular ring (53 cm in diameter) of 46 pieces of cracked rock was found. The rocks do not show evidence of having been fired. This portion of the feature appears to be similar
to what Binford et al. (1970:42) termed rock hearths. The pieces of cracked rock appear to have come from about five or six larger stones. Some of the pieces were fitted together to form a portion of what was probably a flat, anvil stone smoothed on one side. Inside the ring of rocks the soil was dark, suggesting the possible presence of a large postmold. The dark soil continued for 20 cm below the level of the rocks but then made an abrupt 90-degree turn into the wall of the square. It was probably a rodent burrow.

Below this concentration of rocks at 56-61 cm below surface and 15 cm to the north was a second rock concentration. It consisted of six fairly large cobbles, the largest being about 10 cm in length and 7 cm in thickness, six pieces of cracked rock, and one quartzite chopper (see lithics section). Three of the cobbles appear to have been used as hammer stones.

The contents of this feature consisted of one side notched point, one point fragment, 2 utilized flakes, and 218 pieces of chippage with a large proportion of heavy, irregular fragments. Charcoal and pottery were not present. The square (Z), particularly the north half associated with the feature, also had a heavy concentration of lithics: 3 triangular points, one point fragment, one scraper, 3 cores, 2 utilized flakes, and 591 pieces of debitage. From the heavy concentration of lithics in the feature and the immediate surrounding area, it appears that this section of the site may have been used as some sort of a lithic workshop.
Feature 31

This was a shallow basin-shaped pit noted at 17 cm below surface. It was roughly circular with a diameter of 107 cm and a depth of 45 cm. The fill was dark brown and much darker in the center.
Contents: charcoal, fire cracked rock, 37 grit and 15 shell tempered sherds, one corner notched point, 2 triangular points, one drill, 2 cores, 2 miscellaneous tools, 4 utilized flakes, 974 pieces of debitage.

Feature 32

This was a large pit, with sloping sides and a relatively flat bottom, noted at about 30 cm below surface. It was circular with a diameter of 137 cm and a depth of 91 cm. The fill was dark brown and became very dark near the bottom. A heavy concentration (over 60) of large stones (some 15-20 cm long and 10-13 cm thick) were found near the bottom. The stones show evidence of having been fired, but probably not in situ. Some limestone pieces, probably as a result of heating, were very soft with a chalky outer surface that could be easily rubbed off. They were first mistaken for chunks of clay. The concentration of charcoal was relatively light, most being recovered as small pieces from the flotation samples. Oxidized sand was not noted.
Contents: charcoal, some fire cracked rock, 22 grit and 37 shell tempered sherds, 6 triangular points, one point fragment, 2 scrapers, 548 pieces of debitage, one deer and 25 beaver bone fragments.

Feature 33

This was a roughly circular pit, with sloping sides and a
relatively flat bottom, noted at 27 cm below surface. It had a diameter
of 104 cm and a depth of 73 cm. The fill was dark gray and some oxi-
dized sand was noticed near the bottom. Contents: charcoal, fire
cracked rock, 88 grit and 4 shell tempered sherds, 120 pieces of debi-
tage, bone fragments of deer, beaver, turtle, sturgeon and fresh
water mussel.

Binford et al. (1970:42) suggest careful evaluation of features
with reference to: (1) form, (2) evidence regarding use such as
burned soil or other undisturbed primary contents, and (3) contents
of the fill deposited after use are important in determining feature
typologies. Four functionally different pit categories have been identi-
fied at Allegan Dam. These pits were apparently dug by the inhabitants
for a purpose—they were utilized for a period of time and, when their
original purpose was served, they were refilled, functioning as recep-
tacles for trash and debris.

Fire Pits

Fire pits are represented by Features 8, 10, 11, 28 and 33.
They show ample evidence of fire and generally contain much charcoal
and fire cracked rock. Their use was probably multi-purpose: heat,
cooking, drying, etc. These pits could also have functioned as shal-
low earth ovens (Binford et al. 1970:49).

Deep Storage Pits

Five features, 14, 15, 17, 18 and 20, appear to have functioned
as storage pits. Although evidence of fire was present, there is no
question that these pits are different from the fire pits. In form they are generally deeper with somewhat in-sloping walls and a round bottom. The most characteristic attributes of these pits, however, are the fire blackened, consolidated sand walls, and the "greasy" black fill near the bottom. This type of "greasy" fill was also noted at the Juntunen site (McPherron 1967:245).

The walls of these storage pits were roughly 2 to 5 cm thick. Some wall sections were found in situ while others were found as chunks of consolidated sand in the pit fill. Although still retaining their shape, the wall sections were rather crumbly and could be crushed by hand. The integrity of the walls in these pits is in striking contrast to the loose sand characteristic of the other pits and the site in general. This type of pit wall may also have been present at the Moccasin Bluff site (Bettarel & Smith 1973). The authors do not mention such walls, but in one of their storage pit drawings (Page 26, Figure 14, Pit 32b) they have labeled a section of the pit wall as "charred sand, black and very hard."

The persistent occurrence of consolidated sand wall sections in these storage pits suggests an intentional effort on the part of the pit builders to support the walls and avoid cave-ins so common in the sandy soil. In an attempt to elucidate the nature of the walls, some of the wall sections were crushed and extracted with organic solvents. If the pits had been lined with some kind of resin or other organic matter, it was hoped that some of the organic material might have been preserved and be solvent extractable. This was not the case. Extraction
failed to produce any appreciable amount of organic material.

The wall sections were also examined spectroscopically by Dr. D. Scott Aldrich of The Upjohn Company, Kalamazoo, Michigan. He concluded:

The residue consists of alpha-quartz grains held together by an inorganic clay matrix. Elementally, the powder in toto consists of Al-Si-K-Ca-Ti-Mn-Fe-Cu-Zn-As-Rb-Sr-Zr. This was established by Electron Microprobe and X-Ray Fluorescence analysis. Optical Microscopy and X-Ray Diffractometry identified the alpha-quartz and matrix. Also present are varying composition siliceous clays, micaceous rocks and unidentified agglomerates containing Mg-Al-Ci-Fe.

This analysis indicates a clay-like wall structure. After the pit was dug, the builders may have wetted the walls with a thin clay slurry. Subsequent firing may have set the clay matrix and given support to the wall. It is doubtful that the soil itself contains sufficient clay to form the clay matrix on being heated. The fire pits, for example, had considerable firing but did not have consolidated walls.

Hearths

Hearths are generally shallow pits and are usually basin shaped. The presence of fire is indicated by burned sand and charcoal, and generally a concentration of rock, usually fire cracked, is present. Hearths are represented by four pits: Features 12, 16, 19 and 31. Feature 19 (Plate II), though unusually deep, is lined with 80 rocks, and is very similar to a stone-lined hearth at Moccasin Bluff (Bettarel & Smith 1973:Plate 10).

Deep Earth Oven

Feature 32 was a large pit with a heavy concentration of fairly
large stones. The stones show considerable evidence of having been fired, but apparently not in situ. Charcoal was relatively light, most of it being recovered as small pieces from the soil flotation. Binford et al. (1970:42) have suggested that this type of pit may have been used as an oven with the stones being heated elsewhere and placed in the pit to provide the heat for cooking.

Unclassified Features

Features 9, 13, 21, 27, 29 and 30 are not included in the above classification. Some of the pits were not well-defined and lacked sufficient data for functional interpretation. Some may have been simply refuse pits. Feature 29 may have been a fire pit. Feature 30, as previously noted, may represent a lithic activity area, and Feature 21 was a burial.

Feature Distribution

The location of features indicates a random distribution of hearths but somewhat of a clustering of fire pits and storage pits. This apparent patterning should be regarded with caution since the number of units is small and they represent only the small area of the site that was intensively excavated. Nevertheless, it is suggestive of the existence of specialized activity areas. Four of the fire pits (Features 8, 10, 11 and 33) were located at the northeast corner of the excavated area in Squares B, F, O and AA. The fifth (Feature 28) was at the southern end of the excavation in Square S. The storage pits (Features 14, 15, 17, 18 and 20) were at the southwest portion of the excavation in Squares I, G, M and N.
Postmolds

A cluster of eight postmolds was uncovered in Square E at a depth of 20 cm below surface. They became apparent as medium gray sand against the lighter yellow sand background and were in an elongated arc pattern with a group of four at each end of the pattern. The distance between molds was 30-33 cm except for the center gap which was 91 cm. In diameter, the molds were about 8 cm and they had a depth of about 10 cm. Careful observation of the surrounding area did not show evidence of additional postmolds. The number and pattern of the postmolds is insufficient to support any suggestion of some kind of a substantial structure. It may possibly have been a temporary shelter or windbreak of the lean-to type.

Burial

Feature 21 was of a burial pit located in Square D at the top of the knoll at the north end of the site. The burial, located at a depth of 2.13 meters, was that of one individual in a semi-flexed position with no associated artifacts. Above the burial, from 1.9 meters to the surface, this square yielded a considerable amount of chipped stone: 78 pieces, including 2 corner notched points, 2 point fragments, one scraper, and 3 cores. Pottery was very sparse and included 2 shell and 2 grit tempered body sherds and one sherdlet.

The skeletal remains were analyzed with the aid of Mr. Larry M. Wyckoff, Western Michigan University. Dr. Robert I. Sundick of the Anthropology Department at Western Michigan University also reviewed the bones and resolved some minor uncertainties.
The bones were generally in a poor state of preservation. The assemblage consisted of the following:

a. Skull vault with fragment of right zygoma, missing most of the left side including all of the temporal; missing facial region except for maxilla fragment noted below; missing base of skull including most of the occipital.

b. Right half of maxilla, missing M3. Left maxilla teeth I2, C and one P. Left maxilla alveolar fragment.

c. Mandible, missing both I1 incisors and missing ascending ramus.

d. Fragment of left innominate containing sciatic notch and acetabulum.

e. Shaft of left tibia, distal end of left tibia, shaft of right tibia.

f. Left femur shaft and proximal end, fragment of left femur distal condyle, right femur shaft and distal end.

g. Left talus, left calcaneous, left first cuneiform, left navicular, left first metatarsal, proximal end of right first metatarsal. Shaft fragments of five metatarsals, second through the fifth; possibly four left and one right.

The individual appears to have been a 25-35 year old female. Sex is based on skull characteristics and size of bones. Age was determined by the complete and closed M3 roots, the somewhat open cranial sutures, and by molar attrition following Brothwell (1972:69).

The skull has a maximum cranial length of approximately 165 millimeters and has a non-metric variation in the presence of a right
mastoid ossicle. A slight variation, possibly pathogenic, is present in the head and neck of the left femur. The presence of some periodontal disease is evident and there is mild periostitis on the femur and tibia.
CHAPTER III
CERAMICS

Examination of the Allegan Dam ceramics discloses two major characteristics of the assemblage. One is the obvious use of two different tempering materials, grit and shell, and the second is the general lack of body decoration.

Grit and shell tempering reflect two distinct technologies recognized in the Upper Mississippi Valley and the Great Lakes area. The earlier technology, grit tempering, made its appearance with the first ceramics during the Early Woodland period and persisted into historic times. Shell tempering is generally associated with the prehistoric Mississippian cultures and shell tempered pottery is perhaps the single most important trait indicative of the emergence of Mississippian culture in the Upper Mississippi Valley. This tradition appeared in southwestern Michigan during the Late Woodland period, about A.D. 1000, and continued into the historic period.

Body decoration is minimal. The surface finish is predominantly cordmarked or smoothed-over cordmarking that usually extends all the way to the lip. Plain surfaces occur on almost 20% of the vessels. Only three vessels show any body decoration. The lack of decoration is also evident on the rim. With the exception of collars, only four vessels have decoration on the rim. Eight vessels have collars. The Allegan Dam potters expressed their decorative talents on the lip of the vessel.
Lip decoration is simple but is present in nearly half of the vessels, and eight more have the surface finish continued onto the lip.

Method of Analysis

The ceramic assemblage from the Allegan Dam site consists of 6240 pot sherds. These were initially divided into 3268 sherds and 2972 sherdlets according to size. Pieces larger than a dime were classified as sherds, whereas those smaller than a dime were placed in the sherdlet category. Two exceptions were made to the size-based classification. Pieces somewhat smaller than a dime but with a sufficiently well-defined surface to be of some diagnostic value were included with the sherds. Conversely, pieces larger than a dime but with the surface flaked off or so badly eroded as to be of questionable diagnostic value were relegated to the sherdlet category.

Except for the initial count and weight, the sherdlets were not further utilized in the analysis. The 3268 sherds, including 168 rim sherds, were first divided into 1604 grit tempered, 1521 shell tempered and 143 grit and shell tempered. They were then segregated as nearly as possible, into 44 individual vessels consisting of 157 rim sherds and 2767 body sherds. Attempts to reconstruct complete vessels or even substantial portions of vessels were unsuccessful. Consequently body shapes and base shapes are largely unknown or conjectural. Some errors, hopefully minimal, were no doubt made in assigning the body sherds to the various vessels. A number of these errors resulted from the nature of the material itself. Vessels were not made by the potters with assembly line uniformity. Variations in wall thickness,
color, and surface finish from one area to another in the same pot are not unusual. One large sherd, for example, varied in surface finish from lightly smoothed-over cordmarking to heavily smoothed to complete obliteration of the cordmarks. If the portion with the cordmarks removed had been broke off and stood by itself, it probably would have been classified as plain.

The ratio of rim sherds to vessels—3.6:1—is fairly high compared to the 46th Street (1.1:1) and Fennville (1.1:1) sites (Rogers 1972), the Spring Creek (1.1:1) site (Fitting 1968), and the Moccasin Bluff (1.3:1) site (Bettarel & Smith 1973). The 44 vessels, consisting of 21 grit tempered, 18 shell tempered and 5 grit and shell tempered, were individually described and are recorded in the Appendix.

Remaining after the vessels had been separated were 11 rim sherds and 333 body sherds. These could not be assigned to any of the vessels and were divided into three categories; a probably grit tempered vessel, a probable shell tempered vessel, and a miscellaneous group. The probable grit tempered vessel consists of a homogeneous group of 48 grit tempered, smoothed surface body sherds. Probable shell tempered vessel consists of a group of 56 shell tempered, smoothed surface body sherds, including a large shoulder sherd. Although these two substantial groups of body sherds probably represent individual vessels distinct from the 44 recognized vessels, they are considered as probable vessels since no rim sherds could be associated with them. The miscellaneous category consists of 11 rim sherds and 229 body sherds. The rim sherds, 9 grit and 2 shell tempered, were either too small or too eroded to allow classification. The body sherds, 52 grit
and 177 shell tempered, were a heterogeneous group of sherds that could neither be placed with any vessels nor grouped in any other meaningful way. These groups are more fully described in the Appendix.

Surface Finish

Four basic surface finishes are represented: cordmarked, smoothed, fabric impressed and plain. Cordmarked and fabric impressed are unmodified finishes resulting from the application of a cordwrapped paddle or fabric against the wet clay. Generally the cordmarks are vertically oriented but in a few cases the orientation is at a slightly oblique angle to the vertical.

Smoothing of the cordmarks results in a smoothed surface. The smoothing may be light or it may be so severe as to cause a virtual removal of the cordmarks. Fitting (1965:35) and Rogers (1972:50) differentiated the degree of smoothing into smoothed-over and smoothed. But, as they point out, this subdivision is a continuum from the lightly to the severely smoothed states. The difficulty and subjectivity of differentiating the degree of smoothness precluded the inclusion of such subdivision in this report. Rather, any surface with evidence of having been cordmarked and subsequently smoothed, to any degree, is regarded as smoothed.

If the surface is not modified by cordmarking or fabric impressions, it is classified as plain. Plain surface vessels are those whose surfaces appear to have been left unmarked or, if originally corded, the marks have been completely removed and are no longer perceptible.
Included in this category is one vessel that might be what Fitting has called roughened. Fitting (1965:35) suggests roughening may be the result of washing the pot before firing and consequently leaving particles of temper protruding from the surface. Also included is one vessel that appears to have been very lightly brushed with some kind of fiber before firing. The interior surface of all the vessels is plain.

Table 1 shows the percent of surface finish in the vessel assemblage. Nearly three-quarters of the vessels are either cordmarked or smoothed. The remainder consist of fabric impressed (9.1%) and plain (18.2%).

Table 1

<table>
<thead>
<tr>
<th>Finish</th>
<th>No. of Vessels</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cordmarked</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
<td>Smoothed</td>
<td>22</td>
<td>50.0</td>
</tr>
<tr>
<td>Fabric Impressed</td>
<td>4</td>
<td>9.1</td>
</tr>
<tr>
<td>Plain</td>
<td>8</td>
<td>18.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The body surface finish generally continues on the rim. In no case is there a clear difference between the body and rim finishes. Two vessels have the surface of either the rim or body sherds eroded or flaked off and comparison of finishes is questionable. Occasionally the degree of smoothing appears to be somewhat different on the rim than on the body.
Temper and Paste

The Allegan Dam potters utilized grit and shell temper with essentially equal frequency. Of the total number of sherds, 49.1% are grit tempered, 46.5% are shell tempered, and 4.4% have a mixture of grit and shell temper. Inclusion of the grit and shell material into the shell category results in essentially a 50:50 mix of grit and shell tempered pottery. Approximately the same mix holds in the vessel count: 21 grit tempered, 18 shell tempered, 5 grit and shell tempered.

Grit temper consists of crushed granitic rock with the minerals quartz, feldspar, and some biotite (dark mica) being most conspicuous. No hornblende was noted. A number of pieces of granite, in various stages of disintegration, were found on the site. Some could be crumbled by merely rubbing with the fingers or squeezing in the palm of the hand. The size of grit temper varies from fine to coarse.

According to Fitting's scale (1965:12), fine temper has particles up to 1 mm in size, medium temper has particles up to 2 mm, and coarse temper is with particles over 2 mm. It should be noted that this classification does not attempt to isolate exclusive particle size categories. Rather, temper size is determined by the largest particles present and includes smaller particles. In actual situations, sherds are seldom found with temper particles falling within a graded size category. Generally temper includes particles of various sizes.

Most of the grit and shell plus grit tempered vessels from Allegan Dam have coarse temper (68%). In the remainder, the temper is medium (28%) and fine (4%). When analyzed on the basis of total sherds, these percentages change considerably and are very close to
the distribution found by Rogers at the 46th Street site. A substantial majority of the sherds, 90%, contain coarse temper. Medium temper is present in 9% and fine in 1%. At 46th Street the breakdown is coarse 88%, medium 9%, and fine 3% (Rogers 1972:51).

Shell tempered pottery from Allegan Dam is actually pottery without shell. The shell particles have been leached out of the sherds, leaving small pits. Of the total number of shell tempered sherds recovered, in only a half dozen was the presence of shell particles noted. The lack of shell is not only evident on the surface but also in the breaks, including fresh breaks made purposely. The acidic nature of the soil at the site (described in more detail in the faunal analysis) was probably an important factor leading to the decomposition of the shell.

Griffin (1966:285) has, in some instances, referred to shell tempered pottery with the shell leached out as "hole" tempered pottery. Throughout this report reference to shell tempered pottery denotes pottery that was initially tempered with shell but has since lost the shell particles. The shell tempered sherds were easily separated by their appearance; lack of visible temper, generally friable and laminar and usually pitted on both exterior and interior surfaces. The grit plus shell tempered sherds are much like the shell tempered sherds in appearance and are very sparsely tempered with grit.

Paste is sandy to silty clay of fairly uniform texture. The grit tempered sherds are predominately hard and well compacted, whereas the shell tempered sherds tend to be softer and friable with more laminar spalling.
Color, Hardness and Thickness

The color of the pottery ranges from gray and buff to reddish brown. Interior color is generally the same as the exterior with considerable variation in shades. The core is generally of the same coloration except for a number of vessels, particularly shell tempered, that have black cores. Color, as noted here, is meant to convey a general sense of coloration and is not meant to be precise. Because of the many and various factors, such as firing, usage and weathering, that can differentially affect the color of pottery, precision is difficult to attain and of questionable value. It was not unusual to find differences in coloration in the same vessel, particularly in vessels that were smoke blackened. Confronted with these difficulties, McPherron (1967:49) and Kingsley (1977:23) concluded that color was not a useful attribute for the establishment of pottery typology.

Hardness was determined according to Moh's hardness scale. Scratch tests were performed using gypsum for 2, calcite for 3 and fluorite for 4. The fingernail was used to represent 2.5. Hardness ranged from 2 to 3 except for one shell and grit tempered vessel that was 4.

Rim thickness averaged 6.8 mm with a range of 6 to 10 mm. Body sherds were slightly thinner, averaging 6.2 mm with a range of 4 to 9 mm. This measurement is stated to give a rough indication of thickness. The considerable variation of wall thickness within the same vessel makes a precise statement about vessel thickness unrealistic.
Rim Profile and Lip Shape

Nearly half of the vessels (47.7%) have everted rims (Figure 1). Seventeen vessels (38.6%) have straight rims and in six (13.6%), the rim profile could not be determined. Inverted rims were not noted. The grit tempered vessels have predominantly straight rims whereas the great majority of the shell tempered vessels have everted rims. This difference is further noted later in the comparison of grit and shell tempered pottery and may be seen in Figures 2 and 3.

Lips are mainly flat with 52% of the vessels showing this characteristic. Round lips occur in 30% of the vessels and in 18% the lips are beveled. The beveling is to the exterior in all vessels except one which is slightly beveled to the interior. Three of the vessels have the lips slightly thickened by a small fold on the outside.

Figure 1
Rim Profiles and Lip Shapes

<table>
<thead>
<tr>
<th>Rims</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td>Everted</td>
</tr>
<tr>
<td>Collared</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lips</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat</td>
<td>Beveled</td>
</tr>
<tr>
<td>Round</td>
<td>Thickened</td>
</tr>
</tbody>
</table>
Figure 2
Rim Profiles (Grit Tempered Pottery)

3 4 5 6 7 10 13
14 15 16 17 18 19
20 11 12 1 2

Interiors right
Vessel number below
Figure 3
Rim Profiles (Shell Tempered Pottery)

Interiors right
Vessel number below

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Rim Height and Diameter

Only half of the vessels have sufficiently large rim sherds, extending to the shoulder, to permit height measurement. Most rims are very short. With the exception of one grit-tempered vessel with a 6 cm high rim, heights were 4 cm or less. They averaged 2.8 cm with a range of 1.6 to 4 cm.

Rim diameters were determinable, with any degree of confidence, in 33 of the vessels and ranged from 6 to 50 cm with an average of 23.2 cm. In the remainder of the vessels the rim sherds were too small to measure but in a few cases an indication of very slight curvature suggested vessels of large diameter.

Collars

Eight vessels, all grit tempered, have collars. The term "collar" has been defined in various and conflicting ways. Dorothy (1978:33), after searching the relevant literature for an acceptable definition of collar, concluded that he was "as unsure of what constituted a collar as many of the other classifiers must be." In the Allegan Dam ceramics (and also at the 46th Street and Fennville sites) collars are of two varieties (Figure 1). One variety has a thickening or protuberance of the rim below the lip. The thickening is at least 1 cm below the lip and is quite shallow. The other variety has a continuous thickening of the rim from the lip to a distance of at least 1 cm below the lip. Three vessels have this variety of collar and it extends 2-3 cm below the lip. Not included as collars are the small folded-over lip exteriors (shown as thickened lip in Figure 1). These
folds are generally 0.5 cm or less and are formed by folding-over excess clay resulting from working (flattening or decorating) the lip. The width of this fold is generally variable and in one vessel it varied from 0 to 0.5 cm.

Whether the collars are the result of "folding-over" the top portion of the rim or from the application of additional clay is not clear in the Allegan Dam ceramics. Both varieties could be made by either folding-over or by appliqué. If the folded-over clay is left as such, a wide flat collar would result. Pressing-in the folded clay near the lip and at the lower edge would result in thickening below the lip. The same effect could be obtained by applying a flat strip of clay or by applying a cord of clay and working it into the rim. Questionable indications from fissures in some of the sherds suggest that flat collars are probably a result of folding-over. This might also be true of the thickened collars since the thickening is shallow and almost flush with the rim. In no case do the Allegan Dam ceramics show obvious appliqué collars such as those seen by Bettarel and Smith (1973:Plate 30) at the Moccasin Bluff site.

Neck Angle

For the lack of better terminology, neck angle is used to define the angle formed by projecting the rim and shoulder lines until they intersect as shown in the idealized drawing:
This is a measure of how sharply or gradually the rim curves away from the shoulder. Actually the neck is seldom angular, rather it is generally curvilinear, ranging from a sharp curve to a wide gentle curve. If the rim were to meet the shoulder at an angle, there essentially would be no neck.

The neck angle was measured by pressing a wire copy-cat against the neck of the vessel and transcribing the form onto a piece of paper. Rim and shoulder lines were then drawn and the angle was measured with a protractor. The accuracy of the measurement is, admittedly, not perfect, but it is sufficiently accurate to produce usable data. Two main problems were encountered in making these measurements. One is the condition of the material—sherds do not come out of the ground as large and regular as depicted in the idealized situation. Secondly, the lines drawn for the rim and shoulder are straight line representations of slightly curvilinear surfaces. The shoulder is almost always curved whereas the rim is mainly straight but sometimes curved. This situation allows subjective judgment in drawing the straight line representation and is prone to error. In spite of these difficulties, repeated measurements gave results that were within a 10° accuracy range.

This rim-shoulder relationship has been noted in the literature as "a sharp angle" or "a gentle curve" but does not appear to have been measured. In the Allegan Dam ceramics the attribute appeared to be of some importance in delineating differences between grit and shell tempered pottery and measurements were undertaken. Nineteen vessels had suitable rim-shoulder junctions for measurement. The range of
angle variation extends from a sharp, almost 90° angle to a wide 165° angle, with an average of 136°. Definite differences between grit and shell ceramics were noted and are more fully discussed later in the grit and shell tempered pottery comparison.

Rim and Body Decoration

Rim and body decoration is infrequent in the Allegan Dam ceramics. The great majority of the vessels are undecorated with surface finish extending all the way to the lip. Four vessels, all grit tempered, have rim decoration. One vessel (Vessel 10) has two horizontal rows of cordwrapped tool impressions below the lip. This vessel also has cordwrapped tool impressions on the interior of the rim, starting at the lip and running downward at a slight angle off the vertical. It is the only vessel in the assemblage with decoration in the interior. The second vessel (Vessel 11) has four horizontal rows of cordwrapped tool impressions below the lip. This vessel has a rim diameter of 6 cm and may be a "mini-pot." The third vessel (Vessel 7) has two horizontal rows of round punctates below the lip. In all of the above vessels the rim sherds are broken before they reach the shoulder area and the possible existence of additional rows of decoration cannot be ruled out. The fourth vessel (Vessel 9), represented by one small rim sherd, has two trailed\(^1\) lines running down from the lip at a slight angle to the left off the vertical.

Three vessels, two grit tempered and one shell tempered, have

---

\(^1\)The terms trail and trailing are used to differentiate these lines from incising. Trails are broader than they are deep and were apparently made by a blunt tool rather than the sharp instrument used in incising.
body decoration. One of the vessels is the trailed vessel mentioned above. The body sherds have randomly crosshatched trailing and incising. The other grit vessel (Vessel 9) has a horizontal row of linear punctates on a shoulder sherd. The shell tempered vessel (Vessel 44) has, on a shoulder sherd, three trailed chevrons, one below the other, with round punctates below and between the chevrons.

Lip Decoration

Lip decoration is present in nearly half of the vessels. Eight additional vessels have the cordmarking or fabric impressions of the surface finish continued onto the lip. The decoration consists of impressions made by a plain round tool (possibly a finger in one case) or by a cordwrapped tool. Two vessels have fine line incisions made by a sharp tool, possibly a flake. The impressions are generally on the top of the lip and transverse (oriented as the radius) to the lip. In three vessels they are on the exterior part of the lip and two vessels have the impressions more pronounced on the interior portion of the lip. On six vessels the impressions are not directly transverse to the lip but are at a slightly oblique angle either to the left or right off the transverse. In three vessels the impressions are quite pronounced, giving a scalloped effect.

Comparison of Grit and Shell Tempered Wares

In view of some general similarities and in order to avoid repetition and possible confusion, the Allegan Dam ceramics, both the grit and shell tempered, have been thus far treated as a unit with notation of differences where appropriate. A side-by-side comparison of these
differently tempered wares is now necessary to bring the similarities and differences into focus. Table 2 summarizes these relationships.

Entries in Table 2 are either the number of vessels having a specific attribute or, where measurements were taken, the numerical value of the measurement. The measurement is given as the average, followed by the range, followed (in parenthesis) by the number of vessels utilized in its determination. In many instances the number in parenthesis is less than the total number of vessels because all vessels were not always suitable for measuring a particular attribute.

The similarities and differences shown in the table should be regarded as tentative indications rather than as statistically valid conclusions. The small size of the sample makes firm conclusions unwarranted and statistical treatment of the data of questionable value.

For convenience and comparison, the table shows shell plus grit pottery as a separate column. In the discussion the shell plus grit pottery is normally included with the shell tempered pottery unless otherwise indicated. Inclusion of shell plus grit with the shell tempered pottery is not unusual. It is generally considered as part of the newer, more complex shell temper technology. In a recent article, Stimmel (1978) discusses some of the differences between grit and shell tempering and some of the advantages and difficulties of using shell.

**Surface Finish**

Both grit (67%) and shell (78%) wares are predominantly cord-marked and smoothed. Whereas the frequency of cordmarking and smoothing is about equal in the grit vessels, smoothing predominates in
Table 2
Comparison of Grit and Shell Tempered Wares

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Grit 21 Vessels</th>
<th>Shell 18 Vessels</th>
<th>Shell &amp; Grit 5 Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Finish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cordmarked</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Smoothed</td>
<td>6</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Fab. Impressed</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Plain</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buff</td>
<td>11</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Brown</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Body Decoration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decorated</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Undecorated</td>
<td>19</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Lip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decorated</td>
<td>10</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Round</td>
<td>5</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Flat</td>
<td>10</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Beveled</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Rim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decorated</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Straight</td>
<td>14</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Everted</td>
<td>5</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Collared</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Castellated</td>
<td>1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>3.0, 1.6–6 (8)</td>
<td>3.2, 2.3–3.5 (9)</td>
<td>2.4, 2–2.5 (5)</td>
</tr>
<tr>
<td>Diameter (cm)</td>
<td>20.1, 6–40 (15)</td>
<td>28.2, 12–50 (13)</td>
<td>19.2, 10–40 (5)</td>
</tr>
<tr>
<td>Neck Angle</td>
<td>155°, 150–165 (5)</td>
<td>127°, 93–140 (11)</td>
<td>140°, 135–145 (3)</td>
</tr>
<tr>
<td>Thickness (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rim</td>
<td>6.9, 6–10 (18)</td>
<td>6.9, 5–7 (14)</td>
<td>6, 6 (3)</td>
</tr>
<tr>
<td>Body</td>
<td>6.5, 4–9 (19)</td>
<td>5.9, 4–8 (15)</td>
<td>6.4, 6–7 (4)</td>
</tr>
<tr>
<td>Hardness</td>
<td>2.8, 2.5–3 (21)</td>
<td>2.4, 2–3 (18)</td>
<td>3, 2.5–4 (5)</td>
</tr>
</tbody>
</table>
the shell vessels. Four grit vessels are fabric impressed. The shell ware has no fabric impressed vessels. Plain vessels are present in both wares with a slightly greater number having shell tempering.

Color

As noted previously, color is not a precise attribute and the broad categories included in the table are intended to give only a general idea of coloration. Whereas the shell material tends to be predominantly of the lighter shades—buff and gray—the grit material is about equally divided between the light shades and browns. A further difference, not included in the table, is apparent in core coloration. Nine (39%) shell tempered vessels show black cores and only 2 (10%) of the grit tempered vessels have black cores.

Body Decoration

As previously noted, body decoration in both wares is minimal. Two grit (10%) and one of the shell (4%) tempered vessels are decorated on the body. If this observation is combined with the disparity in rim decoration noted below, a trend of more frequent decoration on the exterior of grit tempered vessels emerges.

Lip Attributes

A large proportion (78%) of the shell tempered vessels have round lips. About half of the grit tempered vessels are flat lipped. The other half is about equally divided between rounded and beveled lips. In both wares about half of the vessels have lip decoration. All of the shell plus grit tempered vessels have round, undecorated lips.
Rim Attributes

Rim decoration is present in four (19%) of the grit tempered vessels and completely missing from the shell ware. Rim profiles show a distinct difference between the grit and shell tempered ceramics. Of the grit tempered vessels, 67% have straight rims and 24% have everted rims, with the eversion generally slight. In contrast, 70% of the shell tempered vessels have everted rims and 13% have straight rims. The great majority of these vessels are sharply everted. Six vessels were not suitable for rim profile determination.

Collars and castellations show a clear difference between the two wares. Eight (38%) of the grit tempered vessels have collars whereas collars are absent in the shell tempered vessels. Seven (30%) of the shell tempered vessels are castellated and only one grit tempered vessel is castellated. This grit tempered vessel is somewhat unique in having both castellations and a collar. Such a combination was also seen by Bettarel and Smith (1973:56) in the Moccasin Bluff ceramics and Fitting (1965:154) in the Riviere Ware.

There appears to be no significant difference in the rim height of the two wares. A larger variation (1.6 cm to 6 cm) exists in the grit tempered ware. Rim diameters do show some difference. Shell tempered vessels are larger, averaging 28.2 cm in diameter, whereas the grit tempered vessels average 20.1 cm. In this trait the shell plus grit tempered vessels average about the same as the grit tempered vessels (19.2 cm).
Neck Angle

There is a definite difference between the two wares in the outward slant of the rim away from the neck. The grit tempered vessels have a longer, gently curved neck. The shell tempered vessels tend to have a shorter, much more angular neck. All of the grit tempered vessels have neck angles of 150° or wider. Neck angles of the shell tempered vessels are 140° or less with one vessel having almost a right angle (93°).

Thickness

Both the grit and shell tempered vessels are about the same thickness. The shell plus grit tempered vessels appear to average somewhat lower but this is minor and may be due to sampling error.

Hardness

All but one of the vessels are in the range of 2-3. One shell plus grit tempered vessel is 4. Within this range, the shell tempered material is somewhat softer, averaging 2.4 and being predominantly 2 (33%) and 2.5 (50%). The grit tempered vessels are harder, all being either 2.5 (29%) or 3 (71%) and averaging 2.8. The shell plus grit tempered material has an average hardness closer to the grit tempered vessels.

Ceramic Typology

Throughout this report, reference is made to two kinds of pottery. The two varieties have a number of differences, as they have some similarities, but the most obvious and definitive difference is in the tempering material—grit and shell. Consequently and for convenience, the pottery has been referred to as grit or shell tempered.
pottery, or simply as grit or shell ware. This usage does not imply that tempering is the sole difference between these wares. It is one of the major differences among a number of other dissimilarities.

The grit-shell differentiation was also useful in classifying the ceramics. For reasons discussed later, the shell tempered pottery is described as Allegan Dam Ware but is not formally typed. The large majority of the grit tempered pottery is typed as Allegan Ware. Although mindful of cultural considerations, the ware was typed largely in accord with Guth's concept that a type should be a ceramic group that embodies similar form styles, decorative styles, paste types, and surface finishes (1967:6). Comparison of the attributes and examination of the pottery leaves little doubt that the bulk of the grit tempered pottery is Allegan Ware. Of course, typing this pottery as Allegan Ware gives rise to some cultural implications that need to be addressed.

It has been stressed that an artifact is a representation of the culture that produced it. As Deetz put it, "The idea of the proper form of an object exists in the mind of the maker, and when this idea is expressed in tangible form in raw material, an artifact results" (1967:46). Accepting the concept that artifacts are the material results of culturally patterned behavior, it should be possible to formulate typologies with cultural meaning. Kingsley, basing his typology on the above principles, concludes that a ceramic type should represent a material manifestation of a particular sociocultural system at a particular point in time and space (1977:13).

If this definition of ceramic type is accepted in its narrower sense, i.e., that a particular group of people at a particular time
made the grit tempered pottery at the Allegan Dam site, then the designation of these ceramics as Allegan Ware raises cultural implications that are not intended. It would imply that the Allegan Ware makers were people of the Allegan Tradition and it would further imply that Allegan Dam is a two-component site; an occupation by the grit pottery makers and a second occupation by the shell pottery makers. It is argued later in this report that Allegan Dam is a single-component site.

If Allegan Dam is a single-component Upper Mississippi site, as suggested, how do we then reconcile the presence of Allegan Ware? Materially, the pottery presents no typological problem in view of the similarities to Allegan Ware. Culturally, the Ware can be accommodated by accepting a broader and more realistic view of the sociocultural system than the narrow definition presented above. Culture is not a static, rigidly bound entity. If such a unit exists, it is a rarity. Culture is a dynamic system, constantly changing and constantly being influenced by internal mechanisms and external stimuli. The situation at Allegan Dam appears to reflect this broader cultural view. It is argued in this report that Allegan Dam was an Upper Mississippi occupation but in no way is it suggested that it was an isolated cultural unit. To the contrary, the Allegan Dam inhabitants are viewed as participants in the general cultural milieu of the area and possibly reflect amalgamation of people.

Under these circumstances it is to be expected that the ceramic traits of the local Late Woodland culture and the Allegan Tradition would be incorporated into the Allegan Dam ceramics. Consequently, it is not surprising that the Allegan Dam potters made Allegan Ware. The
occupation represents a cultural unit that made Allegan Ware and in this sense Allegan Ware has a cultural meaning.

It might be still argued that typing these ceramics as Allegan Ware may be culturally misleading. The alternative appears worse. Based on Guthe's above-cited type concept, any other designation for this pottery would be a gross misrepresentation and lead to much confusion.

Allegan Ware

The vast majority of the Allegan Dam grit tempered pottery (21 vessels) falls within the classification Allegan Ware first defined by Rogers (1972) at the 46th Street and Fennville sites and later amplified by Kingsley (1977) at the Hacklander site and by Brashler (1978) in her analysis of southern lower Michigan ceramics. Kingsley's and Brashler's typology generally duplicates Roger's with considerable subdivision into variants and some modification of terminology. Brashler formulates only two types, decorated and undecorated, and all other designations are variants. Kingsley maintains the designation formulated by Rogers but modifies the type name by including the words decorated or undecorated. Both of these authors have sufficiently large samples to analyze statistically and provide the basis for the considerable number of variants. The Allegan Dam sample is relatively small and can best be treated following Rogers' original typology.

Since Allegan Ware has been formally described by Rogers, Kingsley and Brashler, a formal description is not included in this report. In summary, Allegan Ware has been defined by these investigators as being coarse and crumbly with a hardness of 2-3. The temper
is generally coarse and the color ranges from yellowish-brown to reddish brown. Surface finish is predominantly cordmarked and smoothed-over cordmarking. Few vessels are fabric impressed. The cordmarks are vertical or oblique and generally go up to the lip. Decoration is minimal and when it does occur it consists of punctates, tool impressions, or crosshatched incising over cordmarking. The decoration is usually in horizontal rows below the lip. Lip decoration is frequent and most often consists of cordwrapped tool impressions. Round tool and sharp impressions also occur. Cordwrapped paddle-flattened lips are also common. Interior decoration is very infrequent and when it does occur, it is in the form of tool impressions. Rims are normally straight but some are slightly everted and rarely slightly inverted. Lips are most often flat, but round, beveled and thickened lips are not uncommon. Collaring occurs on some vessels and castellations are infrequent. A brief description and classification of the Allegan Dam pottery follows and a full description of each vessel is included in the Appendix.

The majority of the Allegan Dam grit tempered vessels are cordmarked or smoothed up to the lip. The cordmarks are mainly vertical but oblique application is not unusual. Four vessels are fabric impressed and three are plain. Rim profiles are largely straight. Few examples show generally slight eversion. Rim and body decoration is minimal, and where it does occur, it is in the form of punctates or cordwrapped tool impressions. One vessel has cordwrapped tool impressions on the inside of the rim. The temper is normally coarse with a few vessels falling into the medium range and one having fine temper.

Lips are mainly round but flat and beveled lips are well represented.
Half of the vessels are decorated on the lip. Lip decoration is in the form of impressions made by a round smooth tool, a cord-wrapped tool, or is incising made by a sharp tool. The tool impressions are generally on the top of the lip and transverse to the lip. Some are obliquely across the lip and one vessel has the decoration on the exterior part of the lip. A few of the vessels have the surface cormarking or fabric impression continued onto the lip.

**Allegan Cordmarked** (Vessels 1, 2, Plate III)

This type is represented by two vessels with cordmarks up to the lip. The lips are flat and are decorated with cordwrapped tool impressions at a slightly oblique angle to the lip surface. The rims are everted.

**Allegan Smoothed** (Vessels 3–6, Plate IV)

This type is represented by four vessels that are also cord-marked but the cordmarks have been smoothed-over. The rims are straight. Two of the lips are flat, one with cordmarks and the other has oblique cordwrapped tool impressions. A third flat lip is slightly thickened on the outside and notched with a round tool. The fourth lip is slightly beveled to the outside and notched with a smooth tool on the exterior half of the lip.

**Allegan Punctate** (Vessels 7, 8, Plate V)

Two vessels, representative of this type, are decorated with punctates. One has two rows of round punctates on the rim. The other has one row of linear punctates on the shoulder.
Allegan Crosshatched (Vessel 9, Plate V)

One vessel, representing this type, is decorated over cordmarks on the body by random crosshatching. The crosshatching is mainly incising with some trailing. The rim has trails at a slightly oblique angle to the vertical.

Allegan Cord Impressed (Vessels 10, 11, Plate V)

This type is represented by two vessels having horizontal rows of cordwrapped tool impressions on the rim. One has cordwrapped tool impressions on the inside of the rim and is the only vessel in the assemblage with interior decoration. The other has a rim diameter of 6 cm and may be a miniature vessel.

Allegan Collared (Vessels 12-19, Plate VI)

Allegan Collared is a new name suggested by Kingsley and first employed by Brashler (1978:112, 372) to redefine the Allegan Ware formerly defined as Spring Creek Collared and Moccasin Bluff Collared. Brashler differentiated two ceramic traditions, Allegan and Spring Creek, in southwestern Michigan and contends retention of the name Spring Creek Collared for collared ceramics from the southwest area would erroneously imply that the southwest and northwest areas belong to the same ceramic tradition.

Rogers, in her typology of the 46th Street and Fennville ceramics, utilized the classification Spring Creek Collared first proposed by Fitting (1968:23). Likewise Kingsley (1977:83), in his report on the Hacklander ceramics, retains the name Spring Creek Collared because of precedence but maintains that it is "considered to be a type within the
category Allegan Ware." He considers the makers of this pottery to be more closely related, socially and culturally, to the makers of Allegan Ware than any other group.

The designation Allegan Collared is adopted here since the Allegan Dam collared ceramics are well within the Allegan Ware classification and have now been identified at a number of sites (Garland 1979:5) in this area. The Allegan Dam potters were probably as closely "related," socially and culturally, to the Allegan Ware makers as Kingsley suggested for the Hacklander potters.

Eight vessels represent this type. Four are cordmarked and four are fabric impressed. Rims are straight with one being slightly everted. One vessel has castellations. In five of the vessels, the collars are below the lip and are considerably flattened. In three vessels the collars start at the lip and continue down the rim for more than two centimeters. The four fabric impressed vessels represent the total fabric impressed component of the site, i.e., all fabric impressed vessels found are collared. Although Rogers' assemblage included fabric impressed sherds, she does not note any association between fabric impressed finish and collaring. Fitting includes fabric impressed vessels in his Spring Creek Collared classification and Kingsley included one collared, fabric impressed vessel in his Spring Creek Collared at Hacklander.

The collared and castellated vessel (Vessel 19) is somewhat unusual and possibly may not belong in this type. It was included because of precedence. Both Bettarel and Smith (1973) and Fitting (1965) include castellations in their collared categories.

One vessel (Vessel 16) is almost identical to a vessel found by
Rogers at the Fennville site and classified by her as Canton Ware. Re-examination of the two vessels and comparison with Fowler's (1955:219) description of Canton Ware cast some doubt on this classification. Reassessment of the data and recent discussions with Margaret Rogers Holman have resulted in agreement that the Canton Ware classification for the Fennville vessel was probably erroneous and should be abandoned. Both of the vessels are sufficiently similar in all essential aspects to other vessels in the assemblage to be included in Allegan Ware. Consequently this Allegan Dam vessel has been included in the type Allegan Collared.

Unclassified Vessels (Vessels 20, 21, Plate VII)

Two plain, grit tempered vessels have been left unclassified. They share many of the characteristics of Allegan Ware and are distinguished from Allegan Ware, as defined by Rogers, only on the basis of surface finish. These vessels show no evidence of cordmarks. One appears to have been lightly brushed and the other may have been roughened.

Rogers found four plain vessels at the 46th Street site and two at the Fennville site that she notes as being characteristic of Allegan Ware except for the surface finish. She also did not classify these vessels. If additional pottery of this kind continues to be found, it might be appropriate to extend the Allegan Ware definition to include a plain type.

Allegan Dam Ware

The terminology Allegan Dam Ware is used to describe the shell
tempered pottery from the Allegan Dam site. In view of the small size of the sample (23 vessels), the terminology is not used in a classificatory sense but only to designate the shell tempered ceramics at the site.

In many respects the Allegan Dam ware is similar to the Berrien ware described by Bettarel and Smith (1973) at the Moccasin Bluff site. Berrien ware may be considered a companion ware. Because of the similarities and a desire to avoid unnecessary proliferation of ceramic designations, the Berrien ware designation was considered for the Allegan Dam shell tempered pottery. However, it was not adopted due to dissimilarities that appear sufficient to justify a different designation. For example, Berrien ware is largely a plain ware whereas the Allegan Dam shell tempered pottery is predominantly cordmarked or smoothed. Berrien ware is not classified by surface finish and an exact count was not possible, but more than 57% of the vessels are plain; only 22% of the Allegan Dam shell tempered vessels are plain. Secondly, Berrien ware has appendages (8% of the vessels). Included are one loop handle, one strap handle, and two lug handles. This is not a large number, but it is significant when compared to no handles in the Allegan Dam pottery. Thirdly, there is a relatively large percentage (30%) of castellated vessels in the Allegan Dam shell tempered assemblage; there is none in the Berrien ware.

Although Allegan Dam ware and Berrien ware are similar, they appear dissimilar, as ware groups, to other Upper Mississippi shell wares. The pottery appears to represent a blending of Woodland grit tempered ceramics and Upper Mississippi shell tempered pottery.
Future research, as more shell tempered material becomes available, might well lead to the typological classification of a distinct ware for these ceramics. In this regard, a combined analysis and comparison of the Allegan Dam, Moccasin Bluff, and the shell tempered ceramics from the more recently excavated Schwerdt and Elam sites may be worthwhile.

Bettarel and Smith divide their Berrien ware into five groups, one of which is a miscellaneous group. The four main groups are based primarily on what they term shoulder development (1973:66–68). This apparently refers to how sharply the rim slants away from the shoulder. The Berrien ware grouping was not utilized for the Allegan Dam shell tempered ware. Although Bettarel and Smith's shoulder development might be related to what has been called neck angle in the Allegan Dam ceramics, their subjective designations of "well developed shoulder," "developed shoulder," and "sloping shoulder" are difficult to interpret. Secondly, if the Allegan Dam pottery were to be grouped according to the neck angle, much of the assemblage would be forced into a miscellaneous category since the neck angle could not be determined in a number of vessels. Thirdly, and possibly most important, grouping by shoulder development or neck angle would complicate comparison with other ceramics. In most reports the ceramics are grouped primarily by surface finish and decoration. Consequently, the Allegan Dam pottery is grouped primarily according to surface finish. The assemblage consists of 23 vessels, all of which are shell tempered with five having, in addition, a small amount of grit temper.
**Group 1: Cordmarked (Vessels 22, 23, Plate VIII)**

This group consists of two cordmarked vessels with the cordmarks oriented vertically and continuing to the lip. One is gray and the other light brown. The interiors are grayish and the cores are gray and black. Both have neck angles of 140°. One of the vessels has a slightly tapered rim and the other a slightly everted rim. Rim height and diameter were measureable in one vessel and are 2.3 cm and approximately 30 cm. Both vessels have round lips with cordwrapped tool impressions. One has the impressions slanted toward the inside. Thickness of rim and body sherds is 0.6-0.7 cm in both vessels and hardness is 2.5 in one and 3 in the other. This group corresponds to Berrien Ware Group 5c.

**Group 2: Smoothed (Vessels 24-31, Plate IX)**

This is a group of eight vessels with smoothed cordmarking. The cordmarks are generally vertical and in most instances severely smoothed. The color is mainly buff and gray with two vessels reddish brown and three vessels have black cores. Neck angles, measureable in four vessels, range from 110° to 135°. Rims are everted (4), slightly everted (2), and straight (1). One of the rims is tapered to the lip. Rim heights and rim diameters, measureable in five vessels, range from 2.5-4 cm and 20-50 cm respectively. Five vessels have round lips, two are flat and one is beveled. The lips in five of the vessels are decorated: two with cordwrapped tool impressions, two with smooth round tool or finger impressions, and one with fine line incising. Thickness of rim and body sherds is 0.5-0.7 cm and hardness is mainly 2 and 2.5
with one vessel having a hardness of 3. One vessel has some coarse grit temper. This group of vessels is similar to vessels in Berrien Ware Groups 2 and 4.

**Group 3: Plain** (Vessels 32-36, Plate X)

This group of five vessels has plain surface finish. Three of the vessels are buff colored and the other two are reddish brown. The core in most of the sherds of three vessels is black. The neck angle of one vessel is $93^\circ$ and of another $140^\circ$. Four vessels have everted rims and one is straight. In three cases where rim height was measureable it was 2.2-3 cm. Rim diameter, measureable in four vessels, ranges from 12 to 40 cm. Three vessels have round lips, one is flat, and one is beveled. Two have cordwrapped tool impressions on the lip and one has round tool impressions. Rim thickness ranges from 0.4-0.7 cm and hardness averages 2.4. Two vessels have some grit temper, one medium and the other coarse. This group of vessels corresponds quite well to vessels in Berrien Ware Groups 1, 3 and 4 but the rims are somewhat shorter than the range given for the Berrien ware.

**Group 4: Castellated** (Vessels 37-43, Plates XI and XII)

This group of seven vessels is castellated and have smoothed vertical cordmarks. Castellations are generally well developed with peaks ranging from 5-7 cm apart and 0.2-0.6 cm in depth. Neck angles range from $125^\circ$ - $140^\circ$ with one vessel, containing some grit temper, having a neck angle of $145^\circ$. Rim heights (to the peak of the castellations) vary from 2 to 3.5 cm and rim diameters range from 10 - 26 cm. All vessels have round lips. Three of the vessels have undecorated lips, three have...
cordmarks on the lip and one has cordwrapped tool impressions on the exterior part of the lip. Thickness ranges 5-7 cm and hardness is mainly 2.5 with one vessel being 2 and two vessels with some grit temper being 3 and 4. One vessel (Vessel 41) has a slight indentation on the rim that appears as a somewhat large, shallow punctate and could have possibly resulted from the loss of a lug. Closer examination of the sherd dismissed this possibility as highly unlikely.

The castellated vessels do not have their counterparts in the Berrien ware. Although castellated rims were found on Moccasin Bluff, they were grit tempered. None of the shell tempered material showed any castellations.

**Group 5: Decorated** (Vessel 44, Plate X)

This group is represented by one unusual vessel with decoration on the shoulder. It is the only example of decoration (except for lip decoration) present in the shell tempered pottery. This vessel consists of three small rim sherds, one large shoulder sherd with decoration, and 31 other body sherds. The vessel is gray in color on both surfaces and core. Surface finish is smoothed vertical cordmarking. The rim is straight, of unknown height, and has a thickness of 0.5 cm and a hardness of 3. The lip is round and undecorated.

The decoration on the shoulder sherd consists of three trailed chevrons, one below the other. Below and between the chevrons are rows of round punctates. The chevrons are approximately 0.8 cm apart and have 0.4 cm wide trails. The punctates are 0.4 cm in diameter and approximately 0.7 cm apart center to center.
Ceramic Relationships and Chronology

Allegan Ware

Brashler (1978:372) has delimited the geographical range of Allegan Ware as southwestern Michigan, probably confined to the Kalamazoo River drainage and possibly as far south as the St. Joseph River. The ware was first defined by Rogers at the 46th Street and Fennville sites. Subsequently it was found by Kingsley at Hacklander and, accepting Brashler's reclassification of some of the Moccasin Bluff Ware as Allegan Ware, at the Moccasin Bluff site.

Rogers (1972:97) considers Allegan Ware to be a companion ceramic series to Wayne Ware (Fitting, 1965:158). Brashler (1978:373) sees clear relationships between Allegan Ware and Wayne and Spring Creek Wares. Allegan Cordmarked was found at the 46th Street and Fennville sites (Rogers 1972) and corresponds to the Allegan Undecorated Cordmarked and Allegan Decorated Lip at the Hacklander site (Kingsley 1977). It is related to Wayne Cordmarked at the Spring Creek site (Fitting 1968:24) and to Moccasin Bluff Cordmarked at the Moccasin Bluff site (Bettarel & Smith 1973:51).

Allegan Smoothed was also found at 46th Street and Fennville and corresponds to Allegan Undecorated Smooth at Hacklander. It is related to Moccasin Bluff Cordmarked, Group 6. Allegan Punctate was found at the 46th Street and Fennville sites and corresponds to Allegan Decorated, variant Allegan Punctate, at Hacklander. Allegan Crosshatched is represented at the Fennville site and Allegan Cord-impressed at the 46th Street site. Allegan Collared has been found at the 46th Street and Fennville sites and is related to Spring Creek Collared at Spring Creek and Hacklander and to Moccasin Bluff.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Collared at Moccasin Bluff.

Temporally, Allegan Ware was being made from early Late Woodland, about A.D. 600, to at least the end of the 13th Century. Kingsley has recorded the earliest radiocarbon date of A.D. 690±110 for this ware at Hacklander. The 46th Street site was dated at A.D. 1040±100 and A.D. 1140±100. Dates of A.D. 1215±60 and A.D. 1310±100 were obtained at Allegan Dam from features containing Allegan Ware pottery. The Spring Creek site, containing pottery related to Allegan Ware, has been dated at A.D. 950±75 (Crane & Griffin 1958:1119). Most of the Moccasin Bluff Ware has been dated at about A.D. 1060 to A.D. 1210 (Bettarel & Smith 1973:114).

Allegan Dam Ware

Allegan Dam was the first site excavated in the Kalamazoo River drainage to yield shell tempered pottery. More recently two other sites, Elam, about one-half mile above the Allegan Dam site, and Schwerdt, about 10 miles downstream, have produced shell tempered pottery that on preliminary examination appears similar to the Allegan Dam ware. To the south, Berrien Ware from the Moccasin Bluff site on the St. Joseph River shows marked similarities to the Allegan Dam material. Farther south and west, similarities exist with the Fisher and Huber ceramics from the Fifield and Griesmer sites in the Kankakee Valley in northern Indiana and the Fisher, Huber, and other sites in northeastern Illinois.

As previously noted, Allegan Dam Ware has its greatest similarity with Berrien Ware. Bettarel and Smith have related the Berrien Ware,
Groups 4 and 5, to Fisher Ware and to the similar Fifield pottery. They state "Berrien ware Groups 1, 2, 3 are good examples of Huber ware" (1973:115).

The outstanding characteristic of Fisher ware is the elaborate decoration around the shoulder of the vessels. J. B. Griffin describes the most common motifs as being

three or four incised\(^1\) lines, festooned around the vessel, with convex side down, chevrons formed and used similarly, or two or more parallel lines forming bands that run perpendicular to or at a slight angle to the rim. Rows of round or oblong punctates made with an instrument similar to that used to form the lines often appear between the lines of the festoons and vertical bands. [The pottery is generally cordmarked but] many pieces have been partly or almost entirely smoothed over. This gives rise to the suspicion that possibly the sherds with smooth surface were first paddled and later smoothed (1966:275).

Appendages such as strap handles, loop handles, and lugs are common in Fisher ware.

Faulkner summarizes the predominant characteristics of the Huber ceramics as follows:

Although cordmarked pottery occurs, the predominant surface treatment is smoothing. Strap handles are typical and the usual decoration consists of fine to wide trailed elements and occasional punctates arranged in rectilinear patterns on the shoulder (1972:164).

The main difference between the Fisher and Huber appear to be twofold. Whereas the Fisher ware is mainly cordmarked with curvilinear decorations, the Huber ware is predominantly smooth with rectilinear decorations.

It is obvious from the above general descriptions that the Allegan

\(^1\)These are wide, trailed lines. Griffin does not differentiate between incising and trailing.
Dam ware and probably the Berrien ware, as complete ware groups, cannot be considered as either Fisher or Huber wares. The Allegan Dam ware is predominantly cordmarked or smoothed and is devoid, except for one vessel, of body decoration. With the exception of a very questionable indication on one vessel, appendages are absent. However, both Fisher and Huber wares, in addition to the dominant characteristics noted, encompass types that are similar to the Allegan Dam material.

Fenner (1963:55), at the Plum Island site in northeastern Illinois, identified, in addition to the decorated Fisher Trailed, two undecorated types, Fisher Plain and Fisher Cordmarked. Fisher Plain consists of plain, smoothed body sherds with no decoration and Fisher Cordmarked has smoothed-over cordmarked or cordmarked body with no decoration. Faulkner (1972:192-193), at the Griesmer site, identified two Huber types with undecorated bodies. Huber plain has the exterior surface smoothed, dull and never polished, and the only decoration that occurs is on the lip. Huber Cordmarked has cordmarks on the surface that have been partially smoothed-over. The rim is smoothed and the only decoration occurs on the lip and handles.

Bettarel and Smith related the Berrien ware to both Fisher and Huber wares. Although Allegan Dam ware has similarities with both of these wares, because of temporal considerations and the prevalence of cordmarking, a closer relationship to the Fisher ware appears more likely. Allegan Dam ware Groups 1, 2 and 3 are similar to Fisher Plain and Fisher Cordmarked and to Huber Plain and Huber Cordmarked. The one body decorated vessel (Group 5) is similar to Fisher Trailed. The
decorations are very much like the Fifield Trailed vessel illustrated by Faulkner (1972:128) and the Fisher Trailed examples illustrated by Langford (1927:Plate XII,d), J. B. Griffin (1966:Plate CXXXVI, 19) and J. W. Griffin (1946:Plate I, 21,26). Faulkner's proposed type Fifield Trailed was based on Fisher sherds from the Fifield and Griesmer sites. The main difference between Fisher Trailed and Fifield Trailed appears to be the predominance of curvilinear motifs on the former and rectilinear motifs on the latter. The shoulder sherd of the Allegan Dam vessel is of such size as to be limited to the chevrons and punctates. Whether the vessel might have had trails, either curvilinear or rectilinear, on either side of the chevrons cannot be ascertained. This decorated vessel appears so out of place in the assemblage that it could be easily considered as an import. Alternatively, if the Allegan Dam potters were making other Fisher-like pottery, they could have also made this vessel.

The presence of castellations (Group 4) in the Allegan Dam shell ware is unusual and difficult to relate to other Upper Mississippi ceramics. In the various reports perused, including Griffin's (1966) and Faulkner's (1972) extensive reviews of Upper Mississippi pottery, castellations are either absent in these ceramics or of insufficient importance to be highlighted. On the other hand, castellations appear to be a significant attribute of the Late Woodland grit tempered ceramics. In Michigan they are well represented at the Juntunen site in the Straits of Mackinac area (McPherron 1967), the Riviere au Vase and other southeastern sites (Fitting 1965), and to a lesser degree at the nearby Moccasin Bluff and Hacklander sites. The castellated pottery at Allegan
Dam may represent the adoption of this trait by the Upper Mississippians from the Woodland cultures.

The relationship of the Fisher phase to Upper Mississippi Oneota has been generally accepted since J. B. Griffin and McKern recognized the similarities in the 1940's. McKern states:

In Illinois, the cultural order represented in the middle level of the Fisher burial mounds closely corresponds to that of the Oneota Aspect, and offers particularly interesting resemblances to features of the Grand River Focus, the immediately apparent differences consisting for the most part of secondary pottery traits (1945:169).

Griffin opines:

It is evident that when a full analysis of the Fisher Focus is made and when it is compared with the various foci of Oneota as now recognized, it will be classed as a unit of the Oneota Aspect, although in a different relationship than exists between Orr and Lake Winnebago (1966:283).

J. W. Griffin, who investigated the Upper Mississippi occupation at the Fisher site, does not disagree with these authorities but is reluctant to assign Fisher to Oneota. He states:

The present writer agrees that the relationship between the two is closer than that of Fisher and Fort Ancient but hesitates, particularly in light of the condition of the Fisher Trait list, to definitely assign the Fisher materials, beyond their identification as Upper Mississippian [and their assignment] is left as an open question (1946:139).

Huber and Oneota relationships appear to be more secure. Faulkner does not hesitate in stating:

The Huber culture found in the Chicago area and lower Kankakee Valley can be considered "classic" Oneota, a late horizon that has already been defined principally by ceramic attributes (1972:164).

J. B. Griffin is more definite in the placement of Huber than he was about Fisher:
In spite of the small amount of excavation carried on at this site there can be but little hesitation in recognizing that the Huber Component is part of the Oneota Aspect. It is indeed closer in pottery form and decoration to the Orr and Winnebago foci than is the Grand River Focus, and it is also closer to Oneota than the relationship indicated in the suggested placement of the Fisher Focus in the Oneota Aspect (1966:286).

The Allegan Dam shell ceramics were radiocarbon dated at 1210±100 and 1310±100. The early date came from a feature containing shell pottery solely, the later date from a feature containing a mixture of shell and grit sherds. At Moccasin Bluff a number of radiocarbon dates were obtained ranging from A.D. 1060 to A.D. 1640 (1060±110, 1090±110, 1150±110, 1210±110, and 1590±100, 1640±100) (Crane & Griffin 1970). The earlier dates are suggested as relating to the Fisher-like material whereas the later dates are associated with Huber-like ceramics.

No radiocarbon dates are available for the Fisher and Huber ceramics from the type sites. Fisher pottery has been radiocarbon dated at the Lawrence site in Whiteside County, Illinois. The dates run from A.D. 1160 to A.D. 1270 (1160±110, 1170±110, 1260±110) (Crane & Griffin 1966). More recently, Faulkner (1972:53) has extended the upper end of the Fisher time span with a radiocarbon date of 1530±130 at the Griesmer site.

Huber ceramics are generally considered a late horizon since they have been usually associated with historic artifacts. Huber pottery is centered in the Chicago area and is known from the Huber site (Griffin 1966:284-286), the Anker site (Bluhm & Liss 1961), the Oak Forest site (Bluhm & Fenner 1961) and the late historic Palos site (Munson & Munson 1969). The beginnings of the Huber tradition is
not well defined. Faulkner (1972:53) has obtained the earliest radiocarbon date of 1520±130 at the Griesmer site.

It is inviting to speculate that the Allegan Dam radiocarbon dates might represent a still earlier date for the Huber ceramics if, indeed, the Allegan Dam shell material is Huber ware. A much more critical side-by-side comparison of the pottery would be necessary before such an assumption can be anything but speculation. Regardless of the Huber dating, the chronological position of the Allegan Dam ware appears to be near the beginning of the Upper Mississippi shell tempered pottery tradition.
CHAPTER IV
LITHICS

A detailed analysis of the lithic assemblage from Allegan Dam is being made by Mr. John Meszaros and will be included in his M.A. Thesis to be submitted to the Department of Anthropology, Western Michigan University. The assemblage was examined and artifact counts were made by the author and, in view of the upcoming Meszaros report, only a preliminary account is included in this site report.

The stone tool assemblage of the Allegan Dam site includes a great variety of chipped stone tools and some ground stone tools as well. A total of 16,754 pieces of chipped stone weighing over two kilograms (Table 3) and 19 other stone tools were recovered.

Chipped Stone Artifacts

Chipped stone tools were generally made from chert of varying quality and a wide range of colors and textures. A small amount of quartzite was also used. Most of the chert appears to be locally derived from glacial pebbles and cobbles. There are no known exposures of chert-bearing rock in southwestern Michigan (Ellis 1960), but chert is found scattered in glacial deposits, stream beds, and as beach cobbles along Lake Michigan. Sorensen (1978:22) estimates that 95% of the chert material excavated at the Hacklander site is from the Deer Lick Creek source near South Haven in Van Buren County. The Allegan Dam knappers were probably utilizing the same or similar sources for their supplies. A small percentage of the chert may have come from distant sources. Some pieces are, by visual comparison,
Table 3

Chipped Stone

<table>
<thead>
<tr>
<th>Unit</th>
<th>Proj. Points</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stemmed</td>
<td>Side notched</td>
<td>Corner notched</td>
<td>Triangular</td>
<td>Drills</td>
<td>Scrapers</td>
<td>Cores</td>
<td>Miscellaneous tools</td>
<td>Utilized flakes</td>
<td>Debitage</td>
<td>Total count</td>
<td>Total weight (gm)</td>
</tr>
<tr>
<td>Sq. A</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>449</td>
<td>468</td>
<td>396.8</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>986</td>
<td>1018</td>
<td>732.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>824</td>
<td>845</td>
<td>454.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>339</td>
<td>348</td>
<td>171.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D ext</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>339</td>
<td>348</td>
<td>171.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1344</td>
<td>621</td>
<td>935.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>559</td>
<td>577</td>
<td>370.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>282</td>
<td>298</td>
<td>274.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>306</td>
<td>320</td>
<td>286.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>370</td>
<td>385</td>
<td>592.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>370</td>
<td>385</td>
<td>592.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>638</td>
<td>649</td>
<td>563.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>365</td>
<td>379</td>
<td>349.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>224</td>
<td>235</td>
<td>328.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>125</td>
<td>136</td>
<td>91.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>59</td>
<td>61</td>
<td>85.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>614</td>
<td>623</td>
<td>278.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1721</td>
<td>1744</td>
<td>1001.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>547</td>
<td>557</td>
<td>367.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>360</td>
<td>363</td>
<td>114.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>1</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>1542</td>
<td>1562</td>
<td>922.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>428</td>
<td>435</td>
<td>206.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AA</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BB</td>
<td>2</td>
<td>49</td>
<td>51</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.P.2</td>
<td>2</td>
<td>49</td>
<td>51</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.P.3</td>
<td>2</td>
<td>67</td>
<td>70</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Proj. Points</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stemmed</td>
<td>Side notched</td>
<td>Corner notched</td>
<td>Triangular</td>
<td>Drills</td>
<td>Scrapers</td>
<td>Cores</td>
<td>Miscellaneous tools</td>
<td>Utilized flakes</td>
<td>Debitage</td>
<td>Total count</td>
<td>Total weight (gm)</td>
</tr>
<tr>
<td>T.P.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surf.</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>3</td>
<td>21</td>
<td>79</td>
<td>44</td>
<td>15</td>
<td>38</td>
<td>34</td>
<td>11</td>
<td>112</td>
<td>13916</td>
<td>14275</td>
</tr>
<tr>
<td>Feat.</td>
<td>8</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table 3 (continued)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Proj. Points</th>
<th>Stemmed</th>
<th>Side notched</th>
<th>Corner notched</th>
<th>Triangular</th>
<th>Drills</th>
<th>Scrapers</th>
<th>Cores</th>
<th>Miscellaneous tools</th>
<th>Utilized flakes</th>
<th>Debitage</th>
<th>Total count</th>
<th>Total weight (gm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>134</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>87</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>218</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>974</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>548</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>120</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>120</td>
</tr>
<tr>
<td>Sub</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2428</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2479</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1509.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16344</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16754</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12429.0</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
very similar to Bayport chert from eastern Michigan and to Flint Ridge and Upper Mercer cherts from central and southern Ohio. The presence of these cherts at Allegan Dam was recently confirmed by neutron activation analysis (Luedtke 1978:428).

**Projectile Points**

A total of 170 projectile points, including fragments, were recovered. Of this total, 117 points are complete or sufficiently complete to be classified as 88 triangular, 22 corner notched, 5 side notched, and 2 stemmed. The remainder consists of 53 point fragments, generally broken distal and proximal ends, that could not be classified into any of these categories. Eight of the fragments are obviously parts of non-triangular point bases. However, these basal fragments could not be related to the specific categories above and were left unclassified.

**Triangular (Plate XIII)**

The points in this class (88) form by far the largest category and vary greatly in size and workmanship. Based on classified points and the 8 unclassified basal fragments, triangular points constitute slightly over 70% of the total.

Dimensionally, most of the triangular points cluster around a mean of 3 cm in length and 1.5 in width at the base. A few are larger, one of the largest being 6.2 cm in length and 2.5 cm in width, and a considerable number are smaller, with one of the smallest having a length of 1.5 cm and a width of 1.2 cm. The workmanship is generally good. A few examples show excellent workmanship but a few others are poorly made, with only slight modification of the flake blank.
The predominant form is that of an isosceles triangle. Less than 5%, usually the smaller points, approach the shape of an equilateral triangle. Bases are mostly straight but examples with slightly concave and slightly convex bases are also present. The same is true of blade edges; most are straight but there are also a few examples of slightly excurvate and incurvate edges.

As a class, these points are of the type referred to as Madison points (Ritchie 1961:33). The Madison points are smaller than the Levanna points (Ritchie 1961:31), are more isosceles shaped, and tend to have bases with less concavity than the Levanna points.

The high percentage of triangular points found at Allegan Dam is not unexpected. Triangular points, particularly of the Madison type, are characteristic of Upper Mississippi occupations. Table 4 lists several sites, including Allegan Dam, and the percentage of triangular points found at the sites. Also included in the Table are data published by Barbara Luedtke (1978:5-10). Luedtke surveyed the point assemblages from 34 dated (A.D. 800 to A.D. 1400) Late Woodland sites in Michigan and found a general increase in triangular points with time. The percentage of these points averaged 55.5% for the whole period and 65.5% for the time span of A.D. 1000 to A.D. 1400.

Of the sites listed in Table 4, Anker (Bluhm & Liss 1961) and Oak Forest (Bluhm & Fenner 1961) are late Upper Mississippi occupations. Griesmer (Faulkner 1972) and Moccasin Bluff (Bettarel & Smith 1973) have earlier components in addition to the Upper Mississippi occupations. The 46th Street site (Rogers 1972) and the Hacklander
Table 4
Percent Triangular Points

<table>
<thead>
<tr>
<th>Site</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegan Dam</td>
<td>70</td>
</tr>
<tr>
<td>Oak Forest</td>
<td>96</td>
</tr>
<tr>
<td>Anker</td>
<td>94</td>
</tr>
<tr>
<td>Moccasin Bluff</td>
<td>85</td>
</tr>
<tr>
<td>Griesmer</td>
<td>78</td>
</tr>
<tr>
<td>Late Woodland Sites (A.D. 1000-1400)</td>
<td>65.5</td>
</tr>
<tr>
<td>46th Street</td>
<td>24</td>
</tr>
<tr>
<td>Hacklander</td>
<td>23</td>
</tr>
</tbody>
</table>

site (Sorensen 1978) are primarily Late Woodland occupations. As shown in the Table, the percentage of triangular points at Allegan Dam approaches those found for the Upper Mississippi sites. Although it is only moderately higher than the average found by Luedtke for Late Woodland sites, it is in sharp contrast to the low percentage of triangular points found at the nearby 46th Street and Hacklander sites.

Corner Notched (Plate XIII)

The next largest group of points (22) are of the corner notched type. The notches angle slightly upward from the corners leaving the base somewhat smaller than the shoulder. Blades are triangular (isosceles shaped), biconvex, with the edges generally excurvate. The bases are generally convex but straight bases are also present. Most of these points appear to be well made with considerable variation in size. The largest has an overall length of 4.8 cm and a width at the...
shoulder of 2.5 cm; the smallest is 3.5 cm long and 2.2 cm wide.

Side Notched (Plate XIII)

Five points constitute this group. The notches are perpendicular to the point axis leaving the base about the same width as the shoulder. Blades are triangular; four are isosceles in form and one equilateral. Three are biconvex and two are plano-convex. The largest point has an overall length of 5.2 cm and is quite narrow with a shoulder width of 2.0 cm. With the exception of the smallest point, these points are poorly made. The smallest is a very well made plano-convex point with fine serrations on both edges of the triangular (equilateral) blade. The overall length of this point is 1.7 cm. The base is somewhat wider than the shoulder and has a width of 1.7 cm.

Stemmed (Plate XIII)

Only two partial points constitute this group. One has a straight stem and one has an expanding stem. Both are poorly made. The expanding stem point is plano-convex and large, with an estimated overall length of 6.5 cm and a width of 3.5 cm at the widest part of what appears to be an ovate blade.

Cores

Thirty-seven cores were recovered from the site. These include: 1) pebble cores showing various degrees of primary flaking and still retaining some of the smooth, rounded cortex, 2) block cores described by Binford and Papworth (1963:83) that have no natural cortex remaining and are characterized by irregular shapes caused by multidirectional
detachment of flakes, and 3) exhausted core nuclei too small to provide additional useable flakes. The cores are mainly chert but some quartzite is also present.

**Drills** (Plate XIV)

Seventeen drills, most of them complete or essentially complete, were recovered. The majority are of the elongated variety with long, narrow bits and with only one end tapered into a point. Three of the drills have expanding bases. One of the bases is side notched with shallow notches.

**Scrapers** (Plate XIV)

The 42 scrapers encompass bifacial and unifacial tools with working edges lateral and/or transverse to the longitudinal axis of the tool. An unusually large number of scrapers exhibit hafting elements. Six such scrapers are present and are probably the result of broken points having been reworked into scrapers. Rogers (1972:64) and Sorensen (1978:40-41) noted only one scraper with a hafting element at each of the 46th Street and Hacklander sites.

**Miscellaneous Tools**

Sixteen miscellaneous tools consist primarily of knives and preforms. Knives can be distinguished from preforms by their finished look and their generally ovate or roughly triangular form and biconvex cross section.

One unusual tool included in this category is a quartzite core tool (Plate XV) with the appearance of a "classic" chopper. This is
a large tool (weight 793g), approximately 15 cm long and 6-8 cm thick. Decortication flakes have been removed and one end has been further sharpened into an edge 4 cm in width.

**Utilized Flakes**

A total of 128 flakes appear to have been utilized. They have nicked or jagged edge damage that is not due to retouch but appears to be the result of usage.

**Debitage**

Debitage (16,344 pieces) encompasses the general wastage resulting from any stone tool industry. It consists of decortication flakes, trimming flakes, thinning, sharpening and resharpening flakes, and the general shatter debris of angular and irregular pieces of stone. It includes small and large pieces of various shapes including a number of long slender flakes with ridged dorsal surface generally termed blades.

**Other Stone Artifacts**

A few pecked, ground, and polished stone artifacts were found at the site. Included are a small adze (Plate XV) with one end chipped off, and some rubbing and abrading stones. A number of broken pieces of what appears to have been a large flat stone with one surface smoothed were found. Several of the pieces were put together but were insufficient to define the size and shape of the stone. It appears to have been some kind of a grinding platform possibly as large as 6 x 12 inches. A number of hammerstones with battering marks on the
ends and edges were recovered.

Fire-cracked rock was scattered throughout the site. During the 1968 excavation it was noted but the pieces were not counted or weighed. The 1977 excavation produced 498 pieces of fire-cracked rock weighing nearly 27 kilograms.
CHAPTER V

FAUNAL REMAINS

The majority of the Allegan Dam faunal remains were analyzed by Terrance J. Martin, Michigan State University and this section is based on his report submitted to the Department of Anthropology, Western Michigan University (1978). Mr. Martin's report was altered to conform with this report and his tables were changed to remove a questionable unit which is not in the Allegan Dam site and to add new faunal data. Also, information on soil pH has been added. The new faunal data were derived from bone remains recently recovered from light fractions of flotation samples. These fractions were not separated when Mr. Martin wrote his report. Analysis of the new material was done by the author with the aid of Mr. Michael J. Higgins and Mr. Kenneth Barr, Western Michigan University. Most of the bone remains from the light fractions were very small and were classed as unidentified bone. A few fragments of sturgeon and turtle were identified. The new data resulted in a considerable increase in the fragment count, particularly of unidentified bone, but scarcely modified the total weight. Mr. Martin's analysis and conclusions, in essence, were not significantly altered.

The Allegan Dam site yielded a total of 5757 fragments of bone and shell weighing 684.1 grams. Well over 90% of the bone is calcined and only 6.3% (45.9 by weight) could be identified more specifically than the class level. Over 32% (78 by weight) of the fragments are mammal, 143 pieces of which were identified as white-tailed deer (Odocoileus virginianus). A minimum of two individual deer are
represented by the presence of two left distal humeri elements. The majority of deer remains consist of two fragmentary antlers and broken molar fragments. One of the antlers appears to have been shed. Neither antler shows any indication of usage as a tool. Thirty-one fragments of at least six molars from beaver (Castor canadensis) were obtained from Features 11, 15 and 32 and associated Squares I and O. One right proximal ulna fragment of a squirrel (Sciurus niger or carolinensis) was found in the flotation sample from Feature 33 in Square AA. The only other identified mammal element is a distal end of a right humerus of an intrusive woodchuck (Marmota monax) recovered from Square Q.

Reptiles are represented by 173 elements, 3.01% (5.82 by weight) of all animal remains. Of these, 161 are carapace and plastron fragments of an unidentified species of turtle. Based on the thickness and morphology of the small fragments, most are probably elements of map turtle (Craptemys geographica). Spiny soft shell turtle (Trionyx spinifer) is represented by 12 carapace and plastron fragments. Fish makes up 3.52% (5.61 by weight) of all animal remains with 172 of the 203 elements being small fragments of dermal plates from lake sturgeon (Acipenser fulvescens). One bowfin (Amia calva) vertebra fragment was recovered from Square W. Seventeen pieces of freshwater mussel shell are too fragmentary to make a more specific identification. These were recovered in Squares B and J and associated Feature 13.

Viewed as one assemblage, animal remains are extremely sparse at the Allegan Dam site. In terms of animal remains per square foot of excavated area expressed by weight in grams, the greatest concentrations...
occur in Square G (0.947 g per ft²), M (0.824), F (0.745), and J (0.512). One possible explanation for this scarcity, as well as the poor condition of the remains, might be attributed to soil conditions that are detrimental to preservation. Secondly, disposal of refuse may have been in a location away from the main area of occupation. A third reason might be related to food preparation techniques such as the extraction of bone grease in the preparation of foods such as pemmican and sagimate. In general, the animal remains from the Allegan Dam site are reminiscent of those from the northern area of the Hacklander site (Martin 1976), both in terms of calcination and species composition.

Soil acidity at the Allegan Dam site is relatively high. The site was soil sampled (43 samples) both laterally and vertically and the pH of the samples determined according to the procedures utilized at the Hacklander site (Spero 1976). As can be seen in Table 5, of the four sites in this area that were tested, Allegan Dam is the most acidic.

Table 5

<table>
<thead>
<tr>
<th>Site</th>
<th>pH Average</th>
<th>pH Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegan Dam</td>
<td>5.0</td>
<td>3.9-6.3</td>
</tr>
<tr>
<td>Hacklander</td>
<td>5.6</td>
<td>4.1-7.0</td>
</tr>
<tr>
<td>Elam</td>
<td>5.8</td>
<td>5.1-6.3</td>
</tr>
<tr>
<td>Schwerdt</td>
<td>6.3</td>
<td>5.5-7.0</td>
</tr>
</tbody>
</table>
The relationship of soil acidity, as expressed by pH and bone preservation is not clearly understood. It is reasonable to expect that the generally alkaline nature of bone would be adversely affected by acidic conditions. A detailed intersite analysis of pH and bone preservation has not been made, but the general impression gained from bone recoveries at the four sites tends to support this view. Preservation appears to be poor at Allegan Dam and Hacklander but excellent at Schwerdt. The late date of Schwerdt (A.D. 1450) may also be a factor. Bone preservation and bone recoveries are subject to many factors. Some are physical, as soil conditions, and some are cultural, as the obvious example of the quantity and type of bone deposited on a site by the inhabitants. Until all these factors are better understood and correlated, the exact role played by soil acidity on the preservation of bone remains conjectural.

A warm weather occupation for the Allegan Dam site is suggested by the faunal assemblage. Harkness and Dymond (1961:36-37) state that spawning of sturgeon takes place in late May and early June, depending on water temperature. Sturgeon, aquatic turtle (Cohn 1937: 41, 191), and freshwater mussel are all species most susceptible to spring and/or summer seasons of exploitation. However, Late Woodland occupations of the site during other times of the year cannot be excluded on the basis of the animal remains.

Tables 6, 7 and 8 contain detailed information of the faunal analysis. Table 6 lists the animal remains by excavation units. In each case the weight in grams is given immediately beneath the fragment count. Table 7 is a listing of the species composition by frequency
counts, weights of fragments and percentage for each. Table 8 lists the identified anatomical elements for each species.
Table 6
Animal Bone Distribution

<table>
<thead>
<tr>
<th>Unit</th>
<th>Deer</th>
<th>Beaver</th>
<th>Woodchuck</th>
<th>Squirrel</th>
<th>Unidentified mammal</th>
<th>Spiny soft shell turtle</th>
<th>Unidentified turtle</th>
<th>Sturgeon</th>
<th>Bowfin</th>
<th>Unidentified fish</th>
<th>Freshwater mussel</th>
<th>Unidentified bone</th>
<th>Unit totals (13)</th>
<th>Fragments per ft² by weight (14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Squares</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>2.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>.023</td>
</tr>
<tr>
<td>B</td>
<td>1.8</td>
<td>2</td>
<td></td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>.028</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>1.2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>.016</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>6</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>.031</td>
</tr>
<tr>
<td>D ext.</td>
<td>1.1</td>
<td>1.8</td>
<td></td>
<td>.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.1</td>
<td>.108</td>
</tr>
<tr>
<td>E</td>
<td>10</td>
<td>2.4</td>
<td></td>
<td>2</td>
<td>.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>.205</td>
</tr>
<tr>
<td>F</td>
<td>56</td>
<td>2.4</td>
<td></td>
<td>17</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>113</td>
<td>.745</td>
</tr>
</tbody>
</table>
Table 6 (Continued)

<table>
<thead>
<tr>
<th>Unit</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
<th>(13)</th>
<th>(14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>3</td>
<td>194</td>
<td>12</td>
<td>2</td>
<td>2</td>
<td>213</td>
<td>94.7</td>
<td>.947</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32.5</td>
<td>57.6</td>
<td>3.4</td>
<td>.2</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>18</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>9.5</td>
<td>.095</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.4</td>
<td>1.1</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>44</td>
<td>17</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>82</td>
<td>.194</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.3</td>
<td>9.6</td>
<td>3.8</td>
<td>1.9</td>
<td>1.5</td>
<td>2.3</td>
<td>19.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>84</td>
<td>2</td>
<td>7</td>
<td>8</td>
<td>101</td>
<td>51.2</td>
<td>.512</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24.6</td>
<td>.3</td>
<td>1.3</td>
<td>25.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>2</td>
<td></td>
<td>1</td>
<td>.5</td>
<td>3</td>
<td>1.0</td>
<td>.040</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>37</td>
<td>5</td>
<td>15</td>
<td>3</td>
<td>62</td>
<td></td>
<td>.824</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.0</td>
<td>1.9</td>
<td>4.5</td>
<td>1.5</td>
<td>.7</td>
<td>20.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>7</td>
<td></td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>13</td>
<td>2.5</td>
<td>.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td></td>
<td>.1</td>
<td>.5</td>
<td>.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>2</td>
<td></td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>9</td>
<td>3.6</td>
<td>.240</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.4</td>
<td></td>
<td>1.9</td>
<td>.9</td>
<td>.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>1</td>
<td>8</td>
<td></td>
<td>1</td>
<td></td>
<td>10</td>
<td>13.1</td>
<td>.131</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td>8.8</td>
<td></td>
<td>.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>1</td>
<td>15</td>
<td></td>
<td>6</td>
<td>1</td>
<td>19</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>13.8</td>
<td></td>
<td>.8</td>
<td>.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6 (Continued)

<table>
<thead>
<tr>
<th>Unit</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
<th>(13)</th>
<th>(14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>2</td>
<td>1.9</td>
<td>4</td>
<td>.5</td>
<td>.6</td>
<td>6</td>
<td>2.4</td>
<td>.024</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>8</td>
<td>2.4</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>9</td>
<td>.034</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>438</td>
<td>7</td>
<td>24</td>
<td>26</td>
<td>8</td>
<td>9</td>
<td>512</td>
<td>.318</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>29</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>48</td>
<td>2.3</td>
<td>10.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>25</td>
<td>7.6</td>
<td>14</td>
<td>1</td>
<td>2</td>
<td>42</td>
<td>6</td>
<td>.222</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>6</td>
<td>2.2</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>2.2</td>
<td>.056</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>24</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>2.9</td>
<td>12</td>
<td>48</td>
<td>.135</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>18</td>
<td>2</td>
<td>.8</td>
<td>.6</td>
<td></td>
<td>1</td>
<td>24</td>
<td>.120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BB</td>
<td>5</td>
<td>.3</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>7</td>
<td>.256</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>2.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
<td>(10)</td>
<td>(11)</td>
<td>(12)</td>
<td>(13)</td>
<td>(14)</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.2</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>.5</td>
<td>.3</td>
<td>.1</td>
<td></td>
<td></td>
<td>.8</td>
<td>.089</td>
</tr>
<tr>
<td>Fea. 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.1</td>
</tr>
<tr>
<td>10</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>47.8</td>
<td></td>
<td></td>
<td></td>
<td>.4</td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.1</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.4</td>
<td>.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.5</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.3</td>
<td>.1</td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.9</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
<td>12.8</td>
<td>12.8</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28</td>
<td>8</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47</td>
<td>93</td>
<td>.2</td>
</tr>
</tbody>
</table>

Table 6 (Continued)
<table>
<thead>
<tr>
<th>Unit</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
<th>(13)</th>
<th>(14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fea.15</td>
<td>1</td>
<td>.3</td>
<td>3</td>
<td>1</td>
<td>.7</td>
<td>7</td>
<td>.1</td>
<td>12</td>
<td>.2</td>
<td>.1</td>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>.1</td>
<td>2</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>.1</td>
<td>7</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>6</td>
<td>15</td>
<td>17</td>
<td>3</td>
<td>4.0</td>
<td>1.5</td>
<td>1.5</td>
<td>1.4</td>
<td>10.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>.3</td>
<td>3</td>
<td>2</td>
<td>.4</td>
<td>.4</td>
<td>4.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>.1</td>
<td>3</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>4.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>.1</td>
<td>3</td>
<td>3.3</td>
<td>3.3</td>
<td>22.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>1.5</td>
<td>.2</td>
<td>1.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>.1</td>
<td>2</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>2.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>1.7</td>
<td>.1</td>
<td>.1</td>
<td>134</td>
<td>143</td>
<td>.3</td>
<td>.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>352</td>
<td>12</td>
<td>7</td>
<td>.5</td>
<td>697</td>
<td>1069</td>
<td>.5</td>
<td>8.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6 (Continued)

<table>
<thead>
<tr>
<th>Unit</th>
<th>(11)</th>
<th>(12)</th>
<th>(13)</th>
<th>(14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fea.32</td>
<td>1.3</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Unknown</td>
<td>1.3</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Prov.</td>
<td>1.3</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>343.2</td>
<td>343.2</td>
<td>343.2</td>
<td>343.2</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
<table>
<thead>
<tr>
<th>Table 7</th>
<th>Fragments</th>
<th>Percentage</th>
<th>Weight (g)</th>
<th>Percentage</th>
<th>MNI</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-tailed deer <em>Odocoileus virginianus</em></td>
<td>143</td>
<td>2.48</td>
<td>264.9</td>
<td>38.72</td>
<td>2</td>
</tr>
<tr>
<td>Beaver <em>Castor canadensis</em></td>
<td>31</td>
<td>.53</td>
<td>7.5</td>
<td>1.09</td>
<td>1</td>
</tr>
<tr>
<td>Woodchuck <em>Marmota monax</em> (recent)</td>
<td>1</td>
<td>.02</td>
<td>3.0</td>
<td>.43</td>
<td>1</td>
</tr>
<tr>
<td>Squirrel <em>Sciurus sp.</em></td>
<td>1</td>
<td>.02</td>
<td>.2</td>
<td>.03</td>
<td>1</td>
</tr>
<tr>
<td>Unidentified mammal</td>
<td>1697</td>
<td>29.48</td>
<td>261.5</td>
<td>38.23</td>
<td>-</td>
</tr>
<tr>
<td>Spiny soft shell turtle <em>Trionyx spinifer</em></td>
<td>12</td>
<td>.21</td>
<td>3.1</td>
<td>.45</td>
<td>1</td>
</tr>
<tr>
<td>Unidentified turtle</td>
<td>161</td>
<td>2.80</td>
<td>36.7</td>
<td>5.36</td>
<td>-</td>
</tr>
<tr>
<td>Sturgeon <em>Acipenser fulvescens</em></td>
<td>172</td>
<td>2.30</td>
<td>29.0</td>
<td>4.24</td>
<td>?</td>
</tr>
<tr>
<td>Bowfin <em>Amia calva</em></td>
<td>1</td>
<td>.02</td>
<td>.4</td>
<td>.06</td>
<td>1</td>
</tr>
<tr>
<td>Unidentified fish</td>
<td>30</td>
<td>.52</td>
<td>9.0</td>
<td>1.31</td>
<td>-</td>
</tr>
<tr>
<td>Unidentified freshwater mussel</td>
<td>17</td>
<td>.50</td>
<td>39.3</td>
<td>5.74</td>
<td>?</td>
</tr>
<tr>
<td>Unidentified bone</td>
<td>3491</td>
<td>60.64</td>
<td>29.5</td>
<td>4.31</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>5757</td>
<td>684.1</td>
<td>78.51</td>
<td>5.82</td>
<td>7+</td>
</tr>
</tbody>
</table>

- Mammal 1873 32.55 537.1 78.51
- Reptile (turtle) 173 3.01 39.8 5.82
- Fish 203 3.52 38.4 5.61
- Pelecypod (mussel) 17 .23 39.3 5.74
- Unidentified bone 3491 60.63 29.5 4.31
Table 8

Identified Animal Remains

<table>
<thead>
<tr>
<th>Species</th>
<th>Identified Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-tailed deer</td>
<td>2 phalanx fragments, 2 metapodial fragments, 3 mandible fragments, 39 molar</td>
</tr>
<tr>
<td></td>
<td>fragments, 28 unidentified longbone fragments, 1 right calcaneus fragment, 1</td>
</tr>
<tr>
<td></td>
<td>left distal humerus, 1 left distal humerus (5 fragments), 2 antler fragments</td>
</tr>
<tr>
<td>Beaver</td>
<td>circa 6 molars (28 fragments)</td>
</tr>
<tr>
<td>Woodchuck</td>
<td>1 right distal humerus</td>
</tr>
<tr>
<td>Squirrel</td>
<td>1 right proximal ulna</td>
</tr>
<tr>
<td>Spiny soft shell turtle</td>
<td>12 carapace and plastron fragments</td>
</tr>
<tr>
<td>Unidentified turtle</td>
<td>161 carapace and plastron fragments</td>
</tr>
<tr>
<td>Sturgeon</td>
<td>172 bony plate fragments from the skull and/or dermal scales</td>
</tr>
<tr>
<td>Bowfin</td>
<td>1 vertebra fragment</td>
</tr>
</tbody>
</table>
CHAPTER VI
FLORAL REMAINS

During the 1968 excavation at Allegan Dam, a number of nut shell fragments were recovered. Most of these were found in features and were charred. The type of nut was not identified in the record and these fragments are presently unavailable for identification. An acorn shell fragment was found at the 8-12 inch level in Square E. Numerous uncharred butternut shell fragments were noted during the 1977 excavation. All of these were near the surface except for one fragment that was found at the 12-15 inch level in Square U.

Floral remains were also recovered from flotation samples. During the 1968 excavation, 26 soil samples, mainly feature fill, were collected. The samples were small and totaled 23.6 liters. These samples were processed in the laboratory by spray-washing through two metal pails with screen bottoms of 1/8 inch mesh and 1/16 inch mesh respectively. The larger particles were thus isolated, leaving a water slurry of finer particles that was collected in a third pail with a solid bottom. The water slurry was decanted through a fine mesh fisherman's minnow net that retained the small, floating particles. All three fractions, collected in the 1/8 mesh pail, the 1/16 mesh pail, and the fine mesh net were dried and the plant material was manually separated under a low power magnifying lamp.

More extensive flotation was conducted in the field during the 1977 excavation. Some of the fill from Feature 30 and essentially the entire contents of Features 31, 32, and 33 were floated. A total of
636 liters of soil was floated in the Kalamazoo River according to the "tub" method described by Struever (1968). The light fraction material was skimmed with a fine mesh fisherman's minnow net and was dried in the laboratory. For ease of manipulation, the dried material was passed through a multi-screen sieve and was separated into four different size particle fractions. All of these fractions were manually processed under the low power magnifying lamp to separate the plant material.

No attempt was made at this stage to identify seeds or other plant remains. To be on the safe side, all material that remotely resembled seeds or nut fragments were isolated (obvious rootlets were not included). It was felt that a cleaner separation could be made under the microscope during the seed identification process.

In the above discussion, emphasis has been placed on the isolation of plant material. It should be noted that flotation also proved useful in isolating other materials. From both the light and heavy fractions, considerable amounts of small fragments of charcoal, bone, chippage, and pottery were recovered.

The plant materials isolated under the low power magnifying lamp were sent to C. W. Cowan at the University of Michigan for identification.\(^1\) Mr. Cowan's report is included below with some minor editing. It was edited to conform with the format of this report and to remove some introductory material concerning the nature of the site and the samples. Both of these topics have been adequately treated elsewhere in this thesis. In addition, Mr. Cowan's report includes an addendum

\(^1\)Funds for plant material identification were provided by a Western Michigan University Graduate Student Research Fund award.
covering two samples that were analyzed after the original report was written. These two samples had not been separated when the original sample submission was made and were submitted later.

Carbonized plant remains from Allegan Dam are rather limited and conclusions as to subsistence and seasonality must remain tentative. Nevertheless, the identified material, nut shell fragments and seeds point to late summer and fall activity. As noted later, the plant remains, along with the faunal remains, suggest a warm weather occupation.

University of Michigan Museum of Anthropology
Ethnobotanical Laboratory Report
No. 524

Plant Remains from the Allegan Dam Site
Allegan County, Michigan

by

C. Wesley Cowan

Analytical Techniques

All materials submitted to the University of Michigan Ethnobotanical Laboratory were examined with the aid of a binocular microscope with magnifications ranging from 10 to 30X. When plant remains were noted, they were identified utilizing various identification manuals and modern comparative materials on file at the Ethnobotanical Laboratory. Although small slivers of wood charcoal were present in several samples, all were too small to allow for identification.

Results

Unfortunately, the majority of the samples submitted to the
Ethnobotanical Laboratory did not contain plant remains. Most were found to be dominated by insect droppings, small fungal (?) nodules, and quartz grains. Samples from eight proveniences did contain plant materials, but with the exception of samples from Feature 33, and the 0-4" level of unit Q, all plant remains were uncarbonized and presumed to be of a recent origin. A single carbonized seed of pokeberry (Phytolacca americana) and a carbonized seed of blackberry (Rubus sp.) constitute the entire sample of carbonized seeds from the site. It should be emphasized, however, that the prehistoric nature of these two seeds cannot be confirmed. Since both were recovered from deposits quite close to the original ground surface of the site, it is highly possible that they represent seeds burned accidentally by a forest fire.

Reproductive structures of uncarbonized, and hence modern plants, suggest that the site may have at one time been cleared and open. Seeds of sumac (Rhus sp.), blackberry (Rubus sp.), carpetweed (Mollugo verticillata), pigweed (Amaranthus sp.), pokeweed (Phytolacca americana), and a member of the genus Paspalum are typical plants of disturbed, or open habitats. The grass seeds lend some strength to Spero's hypothesis concerning the presence of a pasture at the site in former times.

Other modern materials noted included a seed of some species of cherry or plum (Prunus sp.), and a badly decayed acorn (Quercus sp.). Both of these plants may be growing on the site today. All data concerning the materials recovered from the site are summarized in Tables 9 and 10.
Addendum

The two new samples submitted to the Laboratory were collected from Feature 32, and consisted of light fraction materials collected during flotation of sediments from the north and south halves of the feature.

In contrast to the majority of the previously submitted samples, both samples from Feature 32 contained prehistoric plant remains. Small fungal (?) nodules were, however, the dominant component of both.

The sample from the north half of the feature contained two carbonized shell fragments of black walnut (Juglans nigra), three fragments of carbonized sap or resin, and approximately 19 unidentifiable seed (?) and/or fruit fragments. All of these latter materials are highly fragmentary and heat distorted, and despite a concerted effort, could not be identified even to a generic level.

The sample from the south half of the feature contained three black walnut fragments, two hickory shell (Carya sp.) fragments, and a fragment from the interstitial area of an unidentified nut (possibly hickory). In addition to the nut fragments, two carbonized suma (Rhus sp.) seeds, a carbonized bedstraw (Galium sp.) seed, and three carbonized, but unidentified grass (Graminae sp.) caryopses were noted. Two uncarbonized, and probably modern, sedge (Carex sp.) or rush (Cyperus sp.) seeds were also identified.
Table 9

Materials Identified from Non-feature Contexts

<table>
<thead>
<tr>
<th>Unit</th>
<th>Genus/species</th>
<th>charcoal</th>
<th>nodules</th>
<th>fecal pellets</th>
<th>quartz grains</th>
<th>insect fragments</th>
<th>other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surface</td>
<td>Prunus sp.</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>tree buds</td>
</tr>
<tr>
<td></td>
<td>Paspalum sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4&quot;</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8&quot;</td>
<td>Paspalum sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carex sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-12&quot;</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>Pinus needle</td>
</tr>
<tr>
<td>18-24&quot;</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Square F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surface</td>
<td>Rubus sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tree buds, burned sap</td>
</tr>
<tr>
<td></td>
<td>Phytolacca americana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Composite flower</td>
</tr>
<tr>
<td></td>
<td>Quercus sp. (acorn)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paspalum sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mollugo verticillata</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4&quot;</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8&quot;</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Square Q</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surface</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4&quot;</td>
<td>Rubus sp.*</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8&quot;</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-12&quot;</td>
<td>Paspalum sp.</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*denotes carbonized seed
<table>
<thead>
<tr>
<th>Unit</th>
<th>Genus/species</th>
<th>charcoal</th>
<th>nodules</th>
<th>fecal pellets</th>
<th>quartz grains</th>
<th>insect fragments</th>
<th>other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fea. 8</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 10</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>rootlets</td>
</tr>
<tr>
<td>Fea. 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fea. 14</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fea. 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fea. 17</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fea. 18</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 19</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fea. 30</td>
<td>Rhus sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amaranthus sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mollugo verticillata</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paspalum sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 32</td>
<td>Rhus sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amaranthus sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paspalum sp.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 33</td>
<td>Phytolacca americana*</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*denotes carbonized seed
CHAPTER VII
DISTRIBUTION OF POTTERY AND CHIPPED STONE

As noted in earlier sections of this report, a total of 6240 pieces of pottery, including sherds and sherdlets, and 16,754 pieces of chipped stone, including tools, flakes and debitage, were recovered at the Allegan Dam site. Intrasite distribution of this cultural debris is recorded in Tables 11 and 12 and graphically shown in Graphs 1 through 6. Both lateral and vertical aspects of the distribution were examined. Laterally the distribution is expressed in pieces of pottery or chipped stone per square foot rather than per cubic foot. Since all units were excavated to sterile or essentially sterile levels, use of area rather than volume is a simple and satisfactory mode of expressing lateral distribution.

Vertically, the depth is divided into four levels, 0-6, 6-12, 12-18 and below 18 inches. An increment smaller than six inches would have been preferred but the multiplicity of levels used in digging the site made the six-inch levels the most suitable. As earlier noted, during the 1968 excavations, units were dug in six-inch levels or in four-inch levels down to 12 inches and then by six-inch levels. Three-inch levels were used during the 1977 excavations. Of the various levels used, the 4-8 inch level did not fit directly into the six-inch depths utilized in the analysis. This was resolved by apportioning half of the contents of the 4-8 inch level to the 0-6 inch depth and the other half to the 6-12 inch depth. The apportionment may have introduced some error but this is probably minor and of little consequence to the overall results.
### Table 11

Lateral Distribution of Pottery and Chipped Stone

<table>
<thead>
<tr>
<th>Unit</th>
<th>Area ft²</th>
<th>Grit Sherds</th>
<th>Grit Conc. ft²</th>
<th>Shell Sherds</th>
<th>Shell Conc. ft²</th>
<th>Sherd-Lets</th>
<th>Total Pottery Pieces</th>
<th>Total Pottery Conc. ft²</th>
<th>Chipped Pieces</th>
<th>Chipped Conc. ft²</th>
<th>Stone Pieces</th>
<th>Stone Conc. ft²</th>
<th>Total Pottery &amp; Stone Pieces</th>
<th>Total Pottery &amp; Stone Conc. ft²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sq. A</td>
<td>100</td>
<td>29</td>
<td>.29</td>
<td>34</td>
<td>.34</td>
<td>60</td>
<td>123</td>
<td>1.2</td>
<td>468</td>
<td>4.7</td>
<td>591</td>
<td>5.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>100</td>
<td>55</td>
<td>.55</td>
<td>101</td>
<td>1.01</td>
<td>232</td>
<td>388</td>
<td>3.9</td>
<td>1018</td>
<td>10.2</td>
<td>1406</td>
<td>14.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>100</td>
<td>23</td>
<td>.23</td>
<td>54</td>
<td>.54</td>
<td>62</td>
<td>139</td>
<td>1.4</td>
<td>845</td>
<td>8.5</td>
<td>984</td>
<td>9.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>100</td>
<td>2</td>
<td>.02</td>
<td>2</td>
<td>.02</td>
<td>1</td>
<td>5</td>
<td>.05</td>
<td>758</td>
<td>7.6</td>
<td>763</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D ext.</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.04</td>
<td>0</td>
<td>1</td>
<td>.04</td>
<td>348</td>
<td>13.9</td>
<td>349</td>
<td>14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>100</td>
<td>30</td>
<td>.30</td>
<td>43</td>
<td>.43</td>
<td>82</td>
<td>155</td>
<td>1.6</td>
<td>561</td>
<td>5.6</td>
<td>712</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>80</td>
<td>36</td>
<td>.45</td>
<td>35</td>
<td>.44</td>
<td>39</td>
<td>110</td>
<td>1.4</td>
<td>577</td>
<td>7.2</td>
<td>687</td>
<td>8.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>100</td>
<td>22</td>
<td>.22</td>
<td>38</td>
<td>.38</td>
<td>39</td>
<td>99</td>
<td>1.0</td>
<td>206</td>
<td>2.1</td>
<td>305</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>100</td>
<td>30</td>
<td>.30</td>
<td>29</td>
<td>.29</td>
<td>73</td>
<td>132</td>
<td>1.3</td>
<td>298</td>
<td>3.0</td>
<td>430</td>
<td>4.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>100</td>
<td>66</td>
<td>.66</td>
<td>53</td>
<td>.53</td>
<td>117</td>
<td>236</td>
<td>2.4</td>
<td>320</td>
<td>3.2</td>
<td>556</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>100</td>
<td>149</td>
<td>1.49</td>
<td>46</td>
<td>.46</td>
<td>143</td>
<td>338</td>
<td>3.4</td>
<td>385</td>
<td>3.9</td>
<td>723</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>185</td>
<td>10.27</td>
<td>329</td>
<td>514</td>
<td>28.6</td>
<td>36</td>
<td>2.0</td>
<td>550</td>
<td>30.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>25</td>
<td>11</td>
<td>.44</td>
<td>1</td>
<td>.04</td>
<td>8</td>
<td>20</td>
<td>.8</td>
<td>48</td>
<td>1.9</td>
<td>68</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>25</td>
<td>14</td>
<td>.56</td>
<td>12</td>
<td>.48</td>
<td>15</td>
<td>41</td>
<td>1.6</td>
<td>57</td>
<td>2.3</td>
<td>98</td>
<td>3.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>25</td>
<td>23</td>
<td>.92</td>
<td>10</td>
<td>.40</td>
<td>23</td>
<td>56</td>
<td>2.2</td>
<td>125</td>
<td>5.0</td>
<td>181</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>15</td>
<td>8</td>
<td>.53</td>
<td>14</td>
<td>.93</td>
<td>23</td>
<td>45</td>
<td>3.0</td>
<td>180</td>
<td>12.0</td>
<td>225</td>
<td>15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>100</td>
<td>18</td>
<td>.18</td>
<td>59</td>
<td>.59</td>
<td>22</td>
<td>99</td>
<td>1.0</td>
<td>649</td>
<td>6.5</td>
<td>748</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>100</td>
<td>20</td>
<td>.20</td>
<td>84</td>
<td>.84</td>
<td>74</td>
<td>178</td>
<td>1.8</td>
<td>379</td>
<td>3.8</td>
<td>557</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>100</td>
<td>22</td>
<td>.22</td>
<td>71</td>
<td>.71</td>
<td>54</td>
<td>147</td>
<td>1.5</td>
<td>235</td>
<td>2.4</td>
<td>382</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>100</td>
<td>7</td>
<td>.07</td>
<td>65</td>
<td>.65</td>
<td>74</td>
<td>146</td>
<td>1.5</td>
<td>136</td>
<td>1.4</td>
<td>282</td>
<td>2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>87</td>
<td>1.38</td>
<td>204</td>
<td>291</td>
<td>4.6</td>
<td>61</td>
<td>1.0</td>
<td>352</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>100</td>
<td>14</td>
<td>.14</td>
<td>1</td>
<td>.01</td>
<td>9</td>
<td>24</td>
<td>.2</td>
<td>623</td>
<td>6.2</td>
<td>647</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>100</td>
<td>103</td>
<td>1.03</td>
<td>141</td>
<td>1.41</td>
<td>187</td>
<td>431</td>
<td>4.3</td>
<td>1744</td>
<td>17.4</td>
<td>2175</td>
<td>21.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>50</td>
<td>54</td>
<td>1.08</td>
<td>34</td>
<td>.68</td>
<td>71</td>
<td>159</td>
<td>3.2</td>
<td>557</td>
<td>11.1</td>
<td>716</td>
<td>14.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table I1 (Continued)

<p>| Unit | Area (ft²) | Grit Sherd (ft²) | Grit Conc. | Shell Sherd (ft²) | Shell Conc. | Shell Sherdlets | Total Sherdlets | Total Pottery Pieces | Total Pottery Conc. (ft²) | Chipped Stone Pieces | Chipped Stone Conc. (ft²) | Total Pottery &amp; Stone Pieces | Total Pottery &amp; Stone Conc. (ft²) |
|------|------------|-----------------|------------|-----------------|------------|----------------|-----------------|---------------------|---------------------|------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|
| X    | 39         | 17              | .44        | 18              | .46        |                | 25              | 60                  | 14.5                | 433                   | 9.3                    | 423                    | 10.8                       |                        |
| Y    | 100        | 322             | 3.22       | 77              | .77        |                | 302             | 701                 | 7.0                 | 1562                  | 15.6                   | 2263                    | 22.6                       |                        |
| Z    | 50         | 9               | .18        | 34              | .68        |                | 98              | 91                  | 1.8                 | 692                   | 12.0                   | 696                    | 13.8                       |                        |
| Sq. AA | 24       | 144             | 6.00       | 7               | .29        |                | 110             | 261                 | 10.9                | 435                   | 18.1                   | 696                    | 29.0                       |                        |
| BB   | 25         | 6               | .24        | 7               | .28        |                | 9               | 22                  | .9                  | 93                    | 3.7                    | 115                    | 4.6                        |                        |
| TP   |            |                 |            |                 |            |                |                 |                     |                     |                        |                        |                        |                            |                        |
| 2    | 25         | 0               | 0          | 5               | .20        |                | 2               | 7                   | .3                  | 51                    | 2.0                    | 58                     | 2.3                        |                        |
| 3    | 25         | 7               | .28        | 2               | .08        |                | 1               | 10                  | .4                  | 70                    | 2.8                    | 80                     | 3.2                        |                        |
| 10   | 9          | 0               | 0          | 2               | .22        |                | 0               | 2                   | .2                  | 9                     | 1.0                    | 11                     | 1.2                        |                        |
| 11   | 9          | 0               | 0          | 0               | 1          |                | 1               | 1                   | .1                  | 4                     | .4                     | 5                      | .6                        |                        |
| 12   | 9          | 0               | 0          | 8               | .89        |                | 0               | 8                   | .9                  | 3                     | .3                     | 11                     | 1.2                        |                        |
| 13   | 9          | 0               | 0          | 1               | .11        |                | 2               | 3                   | .3                  | 3                     | 1.3                    | 3                      | .3                        |                        |
| 14   | 9          | 3               | .33        | 4               | .44        |                | 2               | 9                   | 1.0                 | 27                    | 3.0                    | 36                     | 4.0                        |                        |
| 15   | 9          | 0               | 0          | 0               | 1          |                | 0               | 0                   | 0                   | 1                     | .1                     | 1                      | 1.1                        |                        |
| 16   | 9          | 6               | .67        | 2               | .22        |                | 18              | 26                  | 2.9                 | 67                    | 7.4                    | 93                     | 10.3                       |                        |
| 17   | 9          | 4               | .44        | 6               | .67        |                | 3               | 13                  | 1.4                 | 7                     | .8                     | 20                     | 2.2                        |                        |
| 18   | 9          | 0               | 0          | 0               | 0          |                | 0               | 0                   | 0                   | 11                    | 1.2                    | 11                     | 1.2                        |                        |
| 19   | 9          | 0               | 0          | 0               | 0          |                | 2               | 2                   | .2                  | 0                     | 0                      | 2                      | .2                        |                        |
| 20   | 9          | 0               | 0          | 0               | 0          |                | 0               | 0                   | 0                   | 61                    | 6.8                    | 61                     | 6.8                        |                        |
| 21   | 9          | 0               | 0          | 0               | 0          |                | 0               | 0                   | 0                   | 61                    | 6.8                    | 61                     | 6.8                        |                        |
| 22   | 9          | 0               | 0          | 0               | 0          |                | 0               | 0                   | 0                   | 61                    | 6.8                    | 61                     | 6.8                        |                        |
| 23   | 9          | 0               | 0          | 0               | 0          |                | 0               | 0                   | 0                   | 0                     | 0                      | 0                      | 0                          |                        |
| 24   | 9          | 2               | .22        | 1               | .11        |                | 4               | 7                   | .8                  | 6                     | .7                     | 13                     | 1.4                        |                        |
| 25   | 9          | 5               | .56        | 1               | .11        |                | 13              | 19                  | 2.1                 | 134                   | 14.9                   | 153                    | 17.0                       |                        |
| 26   | 9          | 0               | 0          | 0               | 0          |                | 3               | 3                   | .3                  | 23                    | 2.6                    | 26                     | 2.9                        |                        |
| 27   | 9          | 0               | 0          | 0               | 0          |                | 0               | 0                   | 0                   | 0                     | 0                      | 0                      | 0                          |                        |</p>
<table>
<thead>
<tr>
<th>Unit</th>
<th>Area ft²</th>
<th>Grit Shards</th>
<th>Grit Conc. ft²</th>
<th>Shell Shards</th>
<th>Shell Conc. ft²</th>
<th>Sherd-lets</th>
<th>Total Pieces</th>
<th>Total Conc. ft²</th>
<th>Chipped Stone Pieces</th>
<th>Chipped Stone Conc. ft²</th>
<th>Total Pottery &amp; Stone Pieces</th>
<th>Total Conc. ft²</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0.6</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>29</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0.3</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>30</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TP</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>9</td>
<td>1</td>
<td>.11</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>.2</td>
<td>11</td>
<td>1.2</td>
<td>13</td>
<td>1.4</td>
</tr>
<tr>
<td>Total</td>
<td>2321</td>
<td>1262</td>
<td>.54</td>
<td>1375</td>
<td>.59</td>
<td>2492</td>
<td>5129</td>
<td>2.2</td>
<td>14244</td>
<td>6.1</td>
<td>19373</td>
<td>8.3</td>
</tr>
<tr>
<td>Fea. 8</td>
<td>8</td>
<td>5</td>
<td>23</td>
<td>8</td>
<td>36</td>
<td>27</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>9</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>5</td>
<td>8</td>
<td>43</td>
<td>32</td>
<td>139</td>
<td>162</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>9</td>
<td>4</td>
<td>23</td>
<td>139</td>
<td>13</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>30</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>14</td>
<td>16</td>
<td>14</td>
<td>44</td>
<td>50</td>
<td>94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>21</td>
<td>34</td>
<td>15</td>
<td>70</td>
<td>79</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>26</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>0</td>
<td>116</td>
<td>165</td>
<td>281</td>
<td>41</td>
<td>322</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>5</td>
<td>12</td>
<td>19</td>
<td>90</td>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>17</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Area ft²</td>
<td>Grit Sherds ft²</td>
<td>Conc. Shell Sherds ft²</td>
<td>Shredlets ft²</td>
<td>Total Pottery Pieces</td>
<td>Conc. ft²</td>
<td>Chipped Stone Pieces</td>
<td>Conc. ft²</td>
<td>Total Pottery &amp; Stone Pieces</td>
<td>Conc. ft²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>-----------------</td>
<td>------------------------</td>
<td>---------------</td>
<td>----------------------</td>
<td>-----------</td>
<td>----------------------</td>
<td>-----------</td>
<td>--------------------------</td>
<td>-----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fea. 28</td>
<td>95</td>
<td>34</td>
<td>129</td>
<td>33</td>
<td>162</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>222</td>
<td>222</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>37</td>
<td>31</td>
<td>83</td>
<td>986</td>
<td>1069</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>22</td>
<td>70</td>
<td>129</td>
<td>557</td>
<td>686</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>88</td>
<td>110</td>
<td>202</td>
<td>120</td>
<td>322</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>336</td>
<td>476</td>
<td>1090</td>
<td>2479</td>
<td>3569</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surf.</td>
<td>6</td>
<td>4</td>
<td>21</td>
<td>31</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>1604</td>
<td>2972</td>
<td>6240</td>
<td>16754</td>
<td>22994</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Features were excluded in determining distribution, both laterally and vertically. Features are obvious depth intrusion. They may also be considered as intrusions in a lateral sense since they represent isolated pockets of cultural activity in an otherwise general lateral scatter of cultural debris. Further, features were, in most instances, found below the level at which the peak recovery of pottery and chipped stone occurred. Consequently the features were not included in the lateral and vertical distribution but are treated independently.

Lateral Distribution

Graph 1 shows the distribution of the combined pottery and chipped stone over the site and the limits of the site. The squares and test pits are directionally arranged on the graph. The arrangement starts with Square S at the southern end and proceeds back and forth across the site in a northerly direction to Test Pits 30 and 31 at the northern end. In order to fit all of the data on one graph, some of the smaller squares were combined with adjacent units. These units were generally similar in content and the combination causes little if any distortion in the overall distribution.

It is obvious from the graph that the biggest concentration is at the southern part of the site, particularly around Squares V, B, Z, and O, AA, Y, BB. Farther to the north, the concentration drops somewhat and then picks up again at the southern slope of the knoll (Test Pits 21, 22 and 25) and on the knoll (Squares D and D-Ext.). It can also be seen that the test pits which are sterile or essentially sterile are generally located at the periphery of the site, confirming
Graph 1

Lateral distribution of Combined Pottery and Chipped Stone

Concentration (Pieces/ft²)
the general outline of the site described in the Introduction of this report.

The overall ratio of chipped stone to pottery at the site is about 2.7 (16,754 pieces of chipped stone divided by 6,240 pieces of pottery equals 2.68). Pottery and chipped stone are both generally scattered throughout the site but the ratio is quite variable from unit to unit as shown in Graph 2. Notable differences exist in several areas. In the area of Squares W, V, B, and Z chipped stone is in much greater concentration than pottery. This area includes Feature 30 (in Square Z) which was earlier noted as probably representing a lithic activity area. Likewise the northern part of the site, Test Pits 21, 22, 23 and Squares D, D-Ext. is heavy in lithics with little pottery. A high concentration of pottery, with virtually no chipped stone, is present in Squares K and T. Also Squares Y and BB, and O and AA have a high ratio of pottery. Both of these areas of high pottery concentration are associated with features that contained considerable pottery. Feature 19 is located in Square K and Feature 33 in Squares Y and AA.

The distribution of grit and shell tempered pottery is shown in Graph 3. In this graph and in Graphs 4 and 5, where comparisons of grit and shell pottery are made, only sherd counts were utilized. Sherdlets were excluded since they were not classified by temper. (For sherd and sherdlet definitions see Ceramics section).

Glaring differences in concentration are apparent in Graph 3. Squares K and T contain shell pottery exclusively and Squares Y and BB, and O and AA have predominantly grit pottery. As noted above, those areas are associated with Features 19 and 33, respectively, that
Graph 2
Distribution of Pottery and Chipped Stone

Concentration (pieces/ft²)

Squares and Test Pits

0-A
X
U
C
E
B-Z
A
H
G
I-I
J
M
N
S
show similar grit-shell pottery distributions (see Graph 4).

Graph 4 shows the grit and shell tempered pottery distribution in the features. The most pronounced differences are in Feature 28 which contains grit pottery exclusively, Feature 19 that has exclusively shell pottery, and Feature 33 which contains predominantly grit pottery. Feature 28 is located on the south end of the main excavation area, Feature 19 about center and to the left, and Feature 33 in the northern tier of squares.

The most plausible explanation for this differential pottery distribution would seem to be a chance breaking or discarding of a particular pottery vessel in the feature. This appears likely in Features 28 and 33—two fire pits. The ceramic content of Feature 28 consists predominantly of Vessel No. 17, an Allegan Collared vessel. Likewise Vessel No. 19, another Allegan Collared vessel, came primarily from Feature 33 and the associated Squares AA and Y. However, Feature 19 appears to have been the repository for three vessels. Vessels Nos. 24, 25, and 33, all Allegan Dam shell ware, came principally from Feature 19 and Squares K and T. Discarding three shell tempered vessels by chance in Feature 19 seems unlikely. Rather, it appears that Feature 19, a hearth, was utilized mainly by people who used shell tempered pottery.

Vertical Distribution

Vertical distribution of cultural debris may indicate a temporal difference in the deposition of the debris. Grit tempered and shell tempered pottery are two distinctly different ceramic wares and it was
Graph 4
Distribution of Grit and Shell Tempered Sherds in Features

- grit
- shell
of considerable interest to determine whether or not a difference existed in their vertical distribution. As shown in Table 12 and the histogram (Graph 5), there is indeed a difference in the distribution. The 0-6 inch level contains considerably more shell sherds than grit sherds, whereas in the 6-12 inch level the grit sherds outnumber the shell sherds. This difference is not due to random distribution but is statistically highly significant. A chi square test using a 2 x 2 contingency table (Thomas 1976:272) gave a probability factor of $p < .001$. Levels 12-18 and below 18 inches contained relatively minor amounts of pottery and were not statistically considered.

Table 12
Vertical Distribution of Sherds and Projectile Points

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Sherds</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grit</td>
<td>Shell</td>
</tr>
<tr>
<td>0 - 6</td>
<td>481</td>
<td>735</td>
</tr>
<tr>
<td>6 - 12</td>
<td>693</td>
<td>563</td>
</tr>
<tr>
<td>12 - 18</td>
<td>89</td>
<td>69</td>
</tr>
<tr>
<td>Below 18</td>
<td>5</td>
<td>19</td>
</tr>
</tbody>
</table>

Based on this order of distribution a conclusion that the grit pottery was temporally earlier than the shell pottery would seem justified. But such conclusion would be in variance with that suggested by the radiocarbon dates. Feature 19, containing shell pottery exclusively, gave a radiocarbon date of A.D. 1210±100. This is almost identical to the date of A.D. 1215±60 obtained from Feature 28 which contained...
exclusively grit pottery. Feature 17 had a mixture of grit and shell sherds and was dated at A.D. 1310±100. Integration of the distribution data and radiocarbon results suggests that grit and shell pottery were both made throughout the period of occupation of the site and that shell pottery assumed a more prominent role with the passage of time.

The increase in shell pottery during this early period of Upper Mississippi influence in the Lower Kalamazoo River Basin is not unexpected. In alluding to this change in Illinois, Griffin (1946:130) states, "the temper would then change from grit to shell in keeping with the broad change we identify in Illinois with the change from Woodland to Mississippi." Although not evident at the Allegan Dam site, at some Upper Mississippi sites grit pottery becomes dominant again at a later period. At a number of these sites in northeastern Illinois the Upper Mississippi pottery is overwhelmingly grit tempered Langford ware. Only small amounts of shell tempered Fisher ware occur (Bettarel & Smith 1973:117). The change is well documented at the Fisher site (J. W. Griffin 1946; J. B. Griffin 1966:279), where the earlier Fisher ware is gradually replaced by Langford ware. By late prehistoric and early protohistoric times, Langford is the predominant pottery at the Fisher site. This change may be reflected in the Kalamazoo River Valley by the Upper Mississippi Schwerdt site (Cremin 1977) which has been dated at about A.D. 1450 and yielded predominantly grit pottery. The temper mix for 31 vessels at Schwerdt is 81% grit and 19% shell, and 89% grit and 11% shell for body sherds (Paul W. McAllister, personal communication).
Graph 5
Vertical Distribution of Grit and Shell Tempered Sherds

Number of Sherds

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Grit</th>
<th>Total</th>
<th>Shell</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 18</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Graph 6

Vertical Distribution of Projectile Points

Number of Points

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>0-6</th>
<th>6-12</th>
<th>12-18</th>
<th>Below 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filled bars</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open bars</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

trIangular    total  non-trIangular
Graph 6 is a histogram of the depth distribution of triangular and non-triangular points. Luedtke (1978) found a change in projectile point form through time during the Late Woodland period in Michigan. This change is a shift from stemmed points to triangular points. Although such change is indicated at the Allegan Dam site, the data are insufficient to be conclusive. As can be seen from the histogram there is a greater proportion of triangular points at the 0–6 inch level than at the 6–12 inch level. A 2 x 2 contingency table chi square test showed this difference to be statistically insignificant (p > .10). The 12–18 and below 18 inch levels are too sparse to be of any consequence.
Who were the Allegan Dam inhabitants? Where did they come from? In what cultural milieu were they participants? These are most intriguing questions and difficult to answer, not only at Allegan Dam but in any archaeological research. However, it has been rightly said that it is the duty of the archaeologist to interpret his or her data and attempt to elucidate the culture whose remains are being studied. Though the data available are almost always less than conclusive, there is generally sufficient information from which at least a partial and tentative picture might be derived.

The Allegan Dam site, occupied during the 13th Century A.D., appears to represent a transitional phase between the local Late Woodland culture and the emerging Upper Mississippi culture. The phase may reflect an amalgamation of people or the crossing of cultural traits from one group to another. This site and the Schwerdt and Elam sites, all in the lower Kalamazoo River Valley, represent the northward expansion of the Upper Mississippi culture along the eastern side of lower Lake Michigan. In terms of Cleland's (1966) biotic provinces, the Kalamazoo River Basin is at the northern fringes of the Carolinian province and borders the Carolinian-Canadian transition zone. Based on forest composition, Garland (1979:1) places this area in the transition zone. The agricultural potential of this zone is limited and becomes even less attractive farther north.

One fact that became apparent early in the excavations at
Allegan Dam was the presence of two different ceramic technologies, the use of grit and shell tempering materials. This immediately gave rise to questions regarding the component nature of the site. Is it a single component of a two-component site? A component, first defined by McKern (1939:308) and later amplified by Willey and Phillips (1958:21) is summarized by Ritchie as "a single expression of culture at a site which, if but once inhabited, is a single component site, and if occupied by two or more different groups, a multicomponent site" (1969: xxviii). Whether Allegan Dam is a single or a two-component site remains questionable. A single component occupation appears more likely but a two-component situation is not ruled out.

Based solely on the ceramics and lacking natural stratigraphy, one might be led to suspect a two-component occupancy; possibly an early occupation by Late Woodland inhabitants who made grit tempered pottery and a later occupation by the shell tempered pottery makers, the Upper Mississippians. Certainly, the presence of both grit tempered Allegan Ware and shell tempered Upper Mississippi pottery, in essentially equal amounts, would indicate two components. Whether the site was first occupied by Allegan Tradition people and later by the Upper Mississippians is not clear. As noted earlier, the depthwise distribution of grit and shell tempered pottery shows a higher concentration of grit tempered sherds at the 6-12 inch level and a higher concentration of shell tempered sherds at the 0-6 inch level. This might suggest an earlier occupation by the grit tempered pottery makers, but, as discussed later, the difference can also be explained by a change in ceramic technology to an increase in the use of shell temper.

The component question is further complicated by the nature of
the excavations at Allegan Dam. Only about 6% of the site was excavated and, although the whole site was tested, the main excavation was concentrated at the southern end of the site. It is possible that a clearer definition of components might lie in a portion of the site that was not as thoroughly investigated. For example, test pits indicate a fairly high concentration of chipped stone near the north end of the site. Both grit and shell tempered pottery are also present but the amounts are limited and pottery relationships cannot be determined with any degree of confidence. Excavation of this area might present a somewhat different picture than the one resulting from the work at the southern end of the site.

Although a two-component occupation cannot be ruled out, the available evidence suggests to the author the conclusion that the site is single component. The site shows no obvious evidence of a break in occupation. Even the pottery, though differing in temper, has many similarities such as surface finish, lip decoration, and lack of body decoration. There appears to be no abrupt change from grit pottery to shell pottery. As noted earlier, radiocarbon dates indicate that both grit and shell pottery are being made throughout the period of occupation. An increase in the proportion of shell pottery from the lower to the higher excavation levels is evident, but this difference does not appear as an abrupt change. Rather, it seems to be a gradual swing in favor of shell pottery over grit pottery.

Further evidence of a single occupation is gained from examination of the pit features. If the features were the result of two successive occupations, some intrusion of later pits into the earlier pits would
be expected. In no case was there evidence of intrusion. Each pit feature was a discrete entity without disturbance from other features.

As noted earlier, the presence of both grit and shell tempered pottery at Upper Mississippi sites is not unusual and it is generally accepted that both types of pottery were produced by the same culture. The best documented example is the Fisher site. J. W. Griffin (1946) treats the Upper Mississippi occupation at the Fisher site as a single component. Although he detects three periods of occupation, he feels that these are re-occupations by the same people after short abandonments. During the Upper Mississippi occupation both shell and grit tempered pottery was being made by the occupants. There is a gradual change from predominantly shell tempered Fisher ware to almost exclusively grit tempered Langford ware.

Change is also evident at Allegan Dam but the change is in the opposite direction—shell to grit tempered pottery at Fisher and grit to shell tempered pottery at Allegan Dam. Considering the time frame of the two sites, Allegan Dam appears to be coeval with the very early Fisher. A change from grit to shell is not unexpected at this early period. The change from shell to grit at Fisher and at other Upper Mississippi sites takes place at a later date.

As at Fisher, the occupation at Allegan Dam reflects a culture continuum and culture change. For about 100 years the site was occupied by the same culture. During this period many changes not discernible in the archaeological record most certainly took place. One aspect, a change in pottery technology, is reflected in the ceramic remains. The use of shell as tempering material became more prevalent
during the occupation and vessel form shifted to vessels with more pronounced rim eversion.

The nature of the Allegan Dam remains do not permit a refined analysis of social organization, but some generalizations can be made. Among aboriginal groups, it has been generally accepted that ceramics were made by women and chipped stone implements were made and used by men. Fitting (1968:69) suggests that the relative frequencies of these artifacts may reflect the ratio of women to men at a particular site. The ratio of ceramic vessels to chipped stone tools at Allegan Dam is .16. This is below the 2 - .2 range suggested by Fitting (1969:366) as representing a balanced sexual composition. Lower ratios indicate higher percentage of males and thus male activity. Sites with very low ratios may represent male hunting camps.

While the absolute validity of the proposed sex ratio might be questioned, it is useful in intersite comparisons. It appears that at Allegan Dam activities involving stone tools were of greater importance than at Moccasin Bluff where a ratio of two vessels to each stone tool was obtained (Bettarel & Smith 1973:122). The differences are even more pronounced between Allegan Dam and the Spring Creek and Riviere au Vase sites (Fitting 1968:69-70). At the 46th Street site a balanced male-female composition is indicated by a ratio of .26 (Rogers 1972:71). These comparisons, while not entirely conclusive, do suggest differences in site function and activities.

Importance of male activity is further substantiated by the ratio of debitage to finished tools. At Moccasin Bluff a ratio of 4.7 flakes for every tool was noted (Bettarel & Smith 1973:121). This rather low
ratio might imply that a fair amount of the flint knapping was done elsewhere. A similar situation was noted by Fitting at the Spring Creek and Riviere au Vase sites (1968:71; 1965:47). At Allegan Dam the ratio is 58 pieces of debitage to each finished tool, indicating substantial knapping activity at the site. The ratio at 46th Street appears to be slightly higher.

The subsistence economy of the Allegan Dam population was based on hunting, fishing, and gathering. Some agriculture may have been practiced on nearby river flats but such evidence was not recovered. A variety of animals were hunted, deer being the most important. Aquatic resources were also utilized. Use of turtle, mussel and fish, particularly sturgeon, is evident in the remains. The paucity of floral remains leaves this aspect of the economy somewhat cloudy. Nuts and berries appear to have been gathered. Remains of butternut, charred black walnut and hickory, and other unidentified charred nut fragments were recovered. Also, carbonized seeds of blackberry, pokeberry, sumac, and bedstraw were recovered.

A category of stone tools particularly prominent at Allegan Dam are projectile points. They constitute 60% of all tools. More than half of the points are triangular and this variety comprises 31% of all tools. The points were certainly used as arrow or spear heads for hunting game and may have been used to point shafts for spearing fish.

The relative importance of hunting and fishing is difficult to assess from the sparse faunal remains. The predominance of mammal remains suggests a higher reliance on hunting. This is further substantiated by the ratio of bifacial to unifacial tools. Fitting (1969)
notes that a relatively low ratio of bifacial to unifacial tools occurs at fishing sites. As an example he cites Taggart's (1967) comparison of the Late Archaic Feeheley and Schmidt sites. At Feeheley, where fishing is considered to have been the major subsistence activity, the ratio was 1.36 whereas at Schmidt, where hunting was the major activity, a ratio of 3.15 was obtained. At Allegan Dam the ratio of bifacial to unifacial tools is 9 to 1 (John Meszaros, personal communication).

Both the faunal and floral remains suggest a warm weather occupation but they do not rule out winter occupation. Sturgeon, turtles, and mussels were most likely taken in late spring and summer, whereas the nuts and berries would have been collected during late summer and fall. The mammal remains were of such nature as to be of little value in determining seasonality.

The lack of evidence for agriculture may seem incongruous with an Upper Mississippi occupation but this is not uncommon, particularly at sites marginal for dependable agriculture. Mason, commenting on a similar situation on the Door Peninsula in Wisconsin, wonders why after approximately 1500 years of residence, the Woodland cultures on the peninsula were seemingly so suddenly and completely replaced by a Mississippi culture when there is no evidence, particularly locally, of a technologically superior adaptation to the environment on the part of the newcomers (1966:193-194).

Griffin (1960:27) has postulated a relatively cold period from about A.D. 1200 to 1700 with an associated reduction in the reliability of agriculture. He suggests that these worsening conditions affected the Middle Mississippi groups who had moved to the northern
Mississippi Valley and caused the cultural differentiation which resulted in the Oneota tradition with a mixed agriculture and hunting-gathering economy. In contrast, Hall (1962:109) notes that some Oneota occupations predate the cold period and certain Middle Mississippi occupations in Wisconsin. Cleland (1966:82-83) suggests development of the Oneota economy took place about A.D. 1100 in areas marginal for dependable agriculture as a result of climatic changes and adaptation to distinctive ecological zones.

The Allegan Dam occupation represents a phase of the emerging Upper Mississippi culture in areas suboptimal for agriculture. The inhabitants adapted to the local conditions with a diffuse economy (Cleland 1976) based on hunting, fishing and gathering, with little if any agriculture. According to Willey and Phillips' (1958:22) definition of phase, this occupation might be termed the Allegan Dam Phase which may be related to the Moccasin Bluff Phase that Bettarel & Smith (1973:153) place at about A.D. 1050 to 1300 at the Moccasin Bluff site. At Moccasin Bluff this phase is marked by the appearance of Moccasin Bluff Impressed Exterior Lip sherds and some Fisher-Fifield related shell tempered, cordmarked pottery. A later phase, Berrien Phase, at about A.D. 1400 to 1600, is ceramically marked by the appearance of the Berrien-Huber shell tempered, plain surfaced pottery along with a continuation of the earlier grit tempered pottery.

According to Fitting's definition (1969:366), the Allegan Dam site was not an intensive occupation, having a ratio of only .016 ceramic vessels per square foot of excavation. It was occupied, probably intermittently, for a period of about 100 years by a population.
of mixed sexual composition. The inhabitants were most probably representative of the Upper Mississippi culture. It is doubtful that these people were local Late Woodland residents who developed Upper Mississippi traits, particularly shell tempered pottery, through acculturation from contact with Upper Mississippian to the south. Shell tempered pottery appears to be well established at the site from the earliest date and represents about half of all the pottery found.

At Moccasin Bluff, a site of considerable time depth ranging from Archaic to about A.D. 1600, Bettarel and Smith see the emergence of the Upper Mississippi character as a Fisher-Huber influence on the indigenous Late Woodland population. Allegan Dam appears somewhat different and suggests a movement of upper Mississippians into the area. It is more like the situation Faulkner notes in norther Indiana. He states:

Thus far the evidence indicates that the Fisher culture moved into the Kankakee Valley from Illinois as a distinct entity, either displacing the resident Late Woodland groups or in some instances amalgamating with them (1972:158).

If the northward movement of Upper Mississippians caused a displacement at Allegan Dam, the displacement was probably friendly and contact with the local population was maintained. This is evidenced by the Late Woodland pottery attributes that are incorporated into the shell pottery. The crossing-over of pottery traits appears to be of such significance as to suggest an amalgamation of the incoming people with the local residents. Although grit pottery continues to be made, shell tempering assumes greater importance. Along with the greater emphasis on shell tempering, the shell pottery shows a number of Late
Woodland traits, particularly the marked use of cordmarking and castellation and little body decoration.

A final consideration that cannot be ignored is the number of similarities between Allegan Dam and Moccasin Bluff. These are most pronounced in the ceramics; the potters at both sites were making some rather similar pottery. Some types of Allegan Ware were made at both sites as was some of the shell ware. It is possible that the Allegan Dam site served as a warm weather camp for groups from Moccasin Bluff at a stage when the Moccasin Bluff residents were well acculturated with Upper Mississippi traits. Although evidence for permanent structures was not found at Moccasin Bluff, Cleland’s analysis of some of the faunal material from the site led him to postulate that the site was occupied on a year-round basis (1966:79).

As an alternative to the above view, the pottery similarities, along with some important dissimilarities noted earlier, could also argue that Allegan Dam was not a camp for groups from Moccasin Bluff. Ceramic dissimilarities between the two sites could have resulted from independent development, while the similarities were derived from a common outside influence. The common influence appears to have been the Upper Mississippi culture that affected both Moccasin Bluff and Allegan Dam.
REFERENCES

Bettarel, Robert L. and Smith, Hale G.

Binford, Lewis R. and Papworth, Mark L.


Bluhm, Elaine A. and Fenner, Florida J.

Bluhm, Elaine A. and Liss, Allen

Brashler, Janet B.

Brothwell, D. R.

Cahn, A. R.

Cleland, Charles E.


Crane, H. R. and Griffin, James B.

123
Crane, H. R. and Griffin, James B.

Cremin, William M.

Deetz, James

Dorothy, Lawrence G.

Ellis, Holmes H.

Faulkner, Charles H.

Fenner, Gloria J.

Fitting, James E.

Fowler, Melvin L.
Garland, Elizabeth B.

Griffin, James B.

Griffin, John W.

Guthe, Carl E.

Harkness, W. J. K. and Dymond, J. R.

Kingsley, Robert G.

Langford, George

Luedtke, Barbara E.
1978 Lithic Material Distribution and Interaction Patterns During the Late Woodland Period in Michigan. University Microfilms International, Ann Arbor.

Martin, Terrance J.
Martin, Terrance J.  

Mason, Ronald J.  

McKern, Will C.  

McPherron, Alan  

Munson, Cheryl A. and Munson, Patrick J.  

Ritchie, William A.  

Rogers, Margaret B.  

Sorensen, Jerrel H.  

Spero, George B.  

Stimmel, Carole  
Struever, Stuart

Taggart, David W.

Thomas, David H.

Willey, Gordon R. and Phillips, Phillip
APPENDIX

VESSEL DESCRIPTION
VESSEL 1

Type: Allegan Cordmarked.

No. of Sherds: Rim: 2(23.9g). Body: 95(235.9g).


Paste: Hard, compact.

Temper: Grit, coarse, and mainly feldspar and quartz with some mica.


Thickness: Rim: 0.7cm. Body: 0.6-0.7cm.

Hardness: 3


Lip: Flat, with cordwrapped tool impression at an oblique angle to the lip surface. Impressions are 0.5cm. apart center to center and about 0.2cm. wide.

Rim Diameter: 18cm.

Rim Height: Unknown, greater than 4.2cm.


Rim and Lip Drawing (actual size):
VESSEL 2

Type: Allegan Cordmarked.

No. of Sherds: Rim: 3(10.0g). Body: 54(108.1g).


Paste: Hard, compact.

Temper: Grit, coarse, large particles of feldspar and quartz.


Thickness: Rim: 0.6cm. Body: 0.7cm.

Hardness: 3


Lip: Flat, with cordwrapped tool impressions at a slight angle to lip surface. Impressions are roughly 0.6cm apart center to center and 0.3cm wide.

Rim Diameter: Approximately 22cm.

Rim Height: Unknown, greater than 2.8cm.


Rim and Lip Drawing (actual size):
VESSEL 3

Type: Allegan Smoothed.

No. of Sherds: Rim: 4(29.6g). Body: 171(647.9g).


Paste: Fairly hard, very gritty.

Temper: Grit, coarse, mainly feldspar and quartz.


Thickness: Rim: 0.8cm. Body: 0.7cm.

Hardness: 2.5


Lip: Flat, with cordwrapped tool impressions applied at an angle to lip surface. Impressions are 0.5 cm. apart center to center and 0.3 cm. wide.

Rim Diameter: Approximately 24cm.

Rim Height: Unknown, greater than 3.6cm.


Rim and Lip Drawing (actual size):
VESSEL 4

Type: Allegan Smoothed.

No. of Sherds: Rim: 1(9.8g). Body: 11(17.2g).

Provenience: Rim sherds: 1-R. Body sherds: 3-R.

Paste: Hard, compact.

Temper: Grit, fine.


Thickness: Rim: 0.6cm. Body: unknown.

Hardness: 2.5


Lip: Slightly beveled to exterior, with notches applied with a smooth tool on exterior half of lip. Notches are roughly 0.7cm. apart center to center and 0.3cm. wide.

Rim Diameter: Approximately 36cm.

Rim Height: Unknown, greater than 3.6cm.


Base: unknown.

Rim and Lip Drawing (actual size):

[Image of rim and lip drawing]
VESSEL 5

Type: Allegan Smoothed.

No. of Sherds: Rim: 1(3.6g). Body: 33(69.9g).

Provenience: Rim sherds: 1-B. Body sherds: 4-B, 4-F, remainder scattered.

Paste: Hard, well compacted.

Temper: Grit, medium, mainly feldspar with some mica.


Thickness: Rim: 0.6cm. Body: variable, 0.4-0.6cm.

Hardness: 2.5


Lip: Flat and slightly thickened to the outside. The exterior edge of the lip is notched with a round tool. Notches are deep (0.3cm), 0.7cm apart center to center, and 0.2cm wide.

Rim Diameter: Unknown, large.

Rim Height: Unknown, greater than 2.3cm.


Rim and Lip Drawing (actual size): 

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Type: Allegan Smoothed.
No. of Sherds: Rim: 2 (23.3g). Body: 13 (19.0g).
Paste: Hard, well compacted.
Temper: Grit, medium, mainly feldspar and quartz.
Thickness: Rim: 0.7cm. Body: 0.8cm.
Hardness: 2.5
Lip: Flat and cordmarked. Cordmarking is random as if done by a flat cordwrapped tool. Distinct tool impressions are not evident.
Rim Diameter: 24cm.
Rim Height: 2.5cm.

Rim and Lip Drawing (actual size):
VESSEL 7

Type: Allegan Punctate.

No. of Sherds: Rim: 1(9.1g). Body: 74(238.6g).


Paste: Coarse, friable.

Temper: Grit, coarse, mainly feldspar and quartz.


Thickness: 1.0cm. Body: 0.8cm.

Hardness: 3

Surface Finish: Rim: vertically cordmarked with one horizontal row of round punctates 2.2cm below lip. A second, partial row, is at 2.7cm at the broken edge of the sherd. Since the sherd is broken at this point, the existence of additional rows cannot be ruled out. Punctates are about 0.2cm in diameter and 0.5-0.8cm apart. Body: cordmarked, with possibly some slight smoothing on some sherds. Interior surface: smooth.

Lip: Flat, with sharp incisions transverse to lip. Incisions are 0.6cm apart and were possibly made with a stone flake.

Rim Diameter: Unknown, large.

Rim Height: Unknown, greater than 2.9cm.


Rim and Lip Drawing (actual size):
VESSEL 8

Type: Allegan Punctate.

No. of Sherds: Rim: 1(6.7g). Body: 25(63.2g).


Paste: Coarse, friable.

Temper: Grit, medium, mainly feldspar and quartz.


Thickness: Rim: eroded, about 0.8cm. Body: 0.6-0.7cm.

Hardness: 2.5

Surface Finish: Rim: cordmarked. Body: smoothed-over cordmarking. A shoulder piece has a row of linear punctates. The punctates are 0.4cm long, about 0.1cm wide, and 0.5 cm apart. Interior surface: smooth, eroded.

Lip: Badly eroded, probably round. Lip area too small to determine if decorated or not.

Rim Diameter: Unknown.

Rim Height: Unknown, greater than 2.2cm.


Rim, Lip and Shoulder Drawing (actual size):

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
VESSEL 9

Type: Allegan Crosshatched.

No. of Sherds: Rim: 1(1.2g). Body: 17(41.4g).


Paste: Hard, well compacted.

Temper: Grit, coarse, mainly feldspar and quartz.


Thickness: Rim: 0.5cm. Body: 0.5cm.

Hardness: 2.5

Surface Finish: Rim: cordmarked with two trailing lines at an oblique angle off the vertical. Body: cordmarked with incising and trailing. Some sherds have fine line incising at an oblique angle to the cordmarks. Some sherds have trailing lines. One sherd is incised with a trailing line crossing obliquely. In this vessel the trailing lines are 1.5-2.5mm in width. Interior surface: smooth.

Lip: Flat, with cordwrapped tool impressions on the inside edge of lip. Impressions are roughly 0.8cm apart center to center and 0.2cm wide.

Rim Diameter: Unknown.

Rim Height: Unknown, greater than 1.6cm.


Rim, Lip and Body Sherd Drawing (actual size):
VESSEL 10

Type: Allegan Cord Impressed.

No. of Sherds: Rim: 2(8.8g). Body: 77(182.0g).


Paste: Hard, compact.

Temper: Grit, coarse, feldspar and quartz.


Thickness: Rim: 0.6cm. Body: 0.8cm.

Hardness: 3

Surface Finish: Rim: exterior is well smoothed-over cordmarking with two horizontal rows of cordwrapped tool impressions at 1.1cm and 1.7cm below lip. The interior of the rim has cordwrapped tool impressions at a slight angle off the vertical. The impressions are 0.6cm apart and extend 0.9cm down from the lip. Body: well smoothed-over cordmarking. Three sherds have a row of cordwrapped tool impressions similar to those on the rim. They could be part of the rim, lacking lip portion. Interior surface: smooth.

Lip: Round, undecorated.

Rim Diameter: 10cm.

Rim Height: Unknown, greater than 2.5cm.


Rim and Lip Drawing (actual size):
VESSEL 11

Type: Allegan Cord Impressed.

No. of Sherds: Rim: 3(9.0g). Body: 10(14.8g).


Paste: Hard, compact.

Temper: Grit, coarse, sparsely tempered.


Thickness: Rim: 0.6cm. Body: unknown.

Hardness: 3

Surface Finish: Rim: smooth, with four horizontal rows of corded tool impressions. Rows are at 0.9, 1.6, 2.0 and 2.6cm below lip. Since the sherd is broken at this point, the existence of additional rows cannot be ruled out. Body: uncertain, probably smooth. One of the sherds has one row of linear corded tool impressions similar to the rim sherds. May be part of the rim lacking the lip portion. Interior surface: smooth.

Lip: Slightly beveled to the exterior, with cordwrapped tool impression transverse to lip. Impressions roughly 0.4 cm apart center to center and 0.2cm wide.

Rim Diameter: 6cm.

Rim Height: Unknown, greater than 3.0cm.


Rim and Lip Drawing (actual size):
VESSEL 12

Type: Allegan Collared.

No. of Sherds: Rim: 3(16.1g). Body: 165(552.6g).


Paste: Hard, laminated in appearance.

Temper: Grit, coarse, mainly feldspar and quartz.


Thickness: Rim: 0.7cm. Body: 0.7cm.

Hardness: 3


Rim Diameter: 20cm.

Rim Height: 1.6cm.


Rim and Lip Drawing (actual size):
VESSEL 13

Type: Allegan Collared.
No. of Sherds: Rim: 4(21.1g). Body: 166(389.8g).
Paste: Hard, compact.
Temper: Grit, coarse, mainly feldspar and quartz.
Thickness: Rim: 0.6cm. Body: 0.9cm.
Hardness: 3
Lip: Round, no decoration.
Rim Diameter: unknown.
Rim Height: 2.5cm.

Rim and Lip Drawing (actual size):
VESSEL 14

Type: Allegan Collared.

No. of Sherds: Rim: 3(22.2g). Body: 90(230.5g).


Paste: Hard, compact.

Temper: Grit, coarse, mainly feldspar and quartz.


Thickness: Rim: 0.8cm. Body: 0.7cm.

Hardness: 3


Lip: Thickened, slightly beveled to the exterior, fabric impressed.

Rim Diameter: 14cm.

Rim Height: 1.6cm.


Rim and Lip Drawing (actual size):
VESSEL 15

Type: Allegan Collared.

No. of Sherds: Rim: 1(16.1g). Body: 28(61.3g).


Paste: Hard, compact.

Temper: Grit, coarse, mainly feldspar and quartz with possibly some mica.


Thickness: Rim: 0.8cm. Body: 0.6cm.

Hardness: 3


Lip: Beveled to the exterior, fabric impressed.

Rim Diameter: 14cm.

Rim Height: 3.2cm.


Rim and Lip Drawing (actual size):

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
VESSEL 16

Type: Allegan Collared.

No. of Sherds: Rim: 4(52.0g). Body: 39(155.0g).


Paste: Hard, compact.

Temper: Grit, coarse, large coarse particles (up to 4mm) of feldspar and some black mica occasionally protrude on exterior.


Thickness: Rim: 0.8cm. Body: 0.6cm.

Hardness: 3

Surface Finish: Rim: medium to fine cordmarking applied at a slightly oblique angle. Body: medium to fine cordmarked. The manner of application or type of cord used gives appearance of loosely woven fabric. Interior surface: smooth.

Lip: Cordwrapped tool impressions applied at slight angle to flattened lip. Impressions roughly 0.7cm apart center to center and 0.5cm wide. Notching of lip results in a slightly overhanging scallop on exterior of lip.

Rim Diameter: 24cm.

Rim Height: Unknown, greater than 3.3cm.


Rim and Lip Drawing (actual size):
VESSEL 17

Type: Allegan Collared.

No. of Sherds: Rim: 11(63.3g). Body: 126(387.8g).


Paste: Very friable, crumbles easily.

Temper: Grit, coarse, feldspar and quartz.


Thickness: Rim: 0.6cm. Body: 0.5-0.7cm.

Hardness: 3


Lip: Fabric impressed, slightly beveled to the exterior.

Rim Diameter: 14cm.

Rim Height: 3.5cm.


Rim and Lip Drawing (actual size): 

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
**VESSEL 18**

| Type: | Allegan Collared. |
| No. of Sherds: | Rim: 4(26.5g). Body: 7(18.8g). |
| Provenience: | Rim sherds: All-I. Body sherds: All-I. |
| Paste: | Hard, compact. |
| Temper: | Grit, medium, mainly feldspar and quartz. |
| Thickness: | Rim: variable, 0.5cm at lip to 0.8 where collar is thickest. Body: 0.8cm. |
| Hardness: | 3 |
| Lip: | Round, slightly thickened by folding to the outside, no decoration. |
| Rim Diameter: | Approximately 40cm. |
| Rim Height: | 2.7cm. |

Rim and Lip Drawing (actual size):
VESSEL 19

Type: Allegan Collared

No. of Sherds: Rim: 6(18.8g). Body: 191(686.3g).


Paste: Hard, compact.

Temper: Grit, coarse, mainly feldspar and quartz.


Thickness: Rim: 0.5cm at lip to 0.8cm at thickest part of collar. Body: 0.6-0.8cm.

Hardness: 3


Lip: Flat, Probably has cordmarking but surface too eroded to be certain.

Rim Diameter: 10cm.

Rim Height: Unknown, greater than 2.7cm.


Rim and Lip Drawing (actual size):
VESSEL 20

Type: Unclassified.

No. of Sherds: Rim: 1(3.4g). Body: 18(21.8g).


Paste: Hard, compact.

Temper: Grit, coarse, mainly feldspar.


Thickness: Rim: 0.6cm. Body: 0.6cm.

Hardness: 3


Lip: Slightly beveled to the interior with notches applied with round tool. Notches are 0.7cm apart center to center, fairly deep (0.2cm) and 0.3cm wide.

Rim Diameter: Unknown, large.

Rim Height: Unknown, greater than 1.8cm.


Rim and Lip Drawing (actual size):
VESSEL 21

Type: Unclassified
No. of Sherds: Rim: 10 (90.8 g). Body: 17 (125.1 g).
Provenience: Rim sherds: 2-TP14, 2-F10, 1-F11, 1-E, 1-F, 1-H, 1-Q,
Paste: Very hard, well compacted.
Temper: Grit, medium, mainly feldspar and quartz.
Core: mostly black.
Thickness: Rim: tapered, from 1.3 cm near neck to 0.7 cm at lip.
Body: 0.6 cm.
Hardness 3
Lip: Round, slightly thinned, undecorated.
Rim Diameter: 26 cm.
Rim Height: 6 cm.
Form: Rim: slightly everted with gradual tapering from neck to lip.

Rim and Lip Drawing (actual size):

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
VESSEL 22

Type: Untyped Allegan Dam ware. Group I: Cordmarked.

No. of sherds: Rim: 7(3.1g). Body: 126(231.9g).

Provenience: Rim sherd s: 7-V. Body: 84-V, remainder scattered.

Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim: tapered, 0.7cm near neck to 0.5cm at lip. Body: 0.7cm.

Hardness: 2.5


Lip: Round, with small cordwrapped tool impressions transverse to lip surface. Impressions are roughly 1.2cm apart center to center and 0.5cm wide.

Rim Diameter: Unknown.

Rim Height: Unknown, greater than 2.4cm.


Rim and Lip Drawing (actual size):
VESSEL 23

Type: Untyped Allegan Dam ware. Group 1: Cordmarked.

No. of Sherds: Rim: 2(10.1g). Body: 25(54.5g).

Provenience: Rim sherds: 2-Q. Body sherds: variable, mainly Q.

Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim: 0.6cm. Body: 0.6cm.

Hardness: 3


Lip: Round, with round tool impressions slanted toward the inside of the lip. Impressions are 0.4cm wide and of unknown distance apart.

Rim Diameter: Estimated at about 30cm.

Rim Height: 2.3cm.


Rim and Lip Drawing (actual size):
**VESSEL 24**

**Type:** Untyped Allegan Dam ware. Group 2: Smoothed.

**No. of Sherds:** Rim: 9 (17.4g). Body: 164 (485.5g). Some of the body sherds may belong to Vessel 23. The two vessels are very much alike.

**Provenience:** Rim sherds: 6-K, 2-F19, 1-T. Body sherds: variable, predominantly K and F19. Also T and others.

**Paste:** Friable, laminated in appearance.

**Temper:** Shell.

**Color:** Exterior: buff. Interior: buff. Core: mostly black, some buff.

**Thickness:** Rim: 0.5cm. Body: variable, 0.4-0.7cm.

**Hardness:** 2

**Surface Finish:** Rim: severely smoothed-over cordmarking with considerable pitting. Body: same as rim. Interior surface: smooth, pitted.

**Lip:** Round and somewhat thinned to the outside by a small fold. Cordwrapped tool impressions transverse to lip. Impressions are 1.5-2.0cm apart center to center, 0.9cm wide, and give a slight scalloped effect to rim. Very similar to Vessels 23 and 26.

**Rim Diameter:** Large vessel. Diameter greater than 36cm.

**Rim Height:** Unknown, greater than 2.3cm.


**Rim and Lip Drawing (actual size):**
Type: Untyped Allegan Dam ware. Group 2: Smoothed.

No. of Sherds: Rim: 3(12.5g). Body: 36(115.7g).


Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim: 0.6cm. Body: 0.4-0.6cm.

Hardness: 2.5


Lip: Beveled to the exterior. Round tool or finger impressions on surface roughly 1cm apart center to center and 0.6 cm wide.

Rim Diameter: 20 cm.

Rim Height: 2.8cm.


Rim and Lip Drawing (actual size):
VESSEL 26

Type: Untyped Allegan Dam ware. Group 2: Smoothed.

No. of Sherds: Rim: 4(40.9g). Body: 178(521.8g).


Paste: Friable, laminated in appearance.

Temper: Shell.


Hardness: 2.5

Thickness: Rim: 0.7cm. Body: 0.6cm.


Lip: Flat with cordwrapped tool impressions at an angle to lip surface. Impressions are roughly 2.5cm apart center to center and 1.4cm wide. Impressions are very similar to Vessels 24 and 33 and give a scalloped effect to the rim.

Rim Diameter: 42cm.

Rim Height: 4cm.

Form: Rim: everted. Neck: angular rim-shoulder junction. Neck angle 110°. Body: unknown, probably round. This is a large vessel. Approximate body diameter, estimated from several sherds glued together, is over 65cm. Base: unknown, probably round.

Rim and Lip Drawing (actual size):
### VESSEL 27

<table>
<thead>
<tr>
<th>Type</th>
<th>Untyped Allegan Dam ware. Group 2: Smoothed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Sherds</td>
<td>Rim: 2(12.2g). Body: 23(91.9g).</td>
</tr>
<tr>
<td>Provenience</td>
<td>Rim sherds: 2-R. Body sherds: variable, mainly R and S.</td>
</tr>
<tr>
<td>Paste</td>
<td>Hard, laminated in appearance, considerable cleavage along laminations.</td>
</tr>
<tr>
<td>Temper</td>
<td>Shell.</td>
</tr>
<tr>
<td>Thickness</td>
<td>Rim: tapered from 1cm near neck to 0.6cm at lip. Body: 0.7cm.</td>
</tr>
<tr>
<td>Hardness</td>
<td>2</td>
</tr>
<tr>
<td>Lip</td>
<td>Round, with finger or smooth tool impressions. Impressions are roughly 1.5cm apart center to center and 0.6cm wide.</td>
</tr>
<tr>
<td>Rim Diameter</td>
<td>Large vessel. Diameter estimated at about 50cm.</td>
</tr>
<tr>
<td>Rim Height</td>
<td>3cm.</td>
</tr>
</tbody>
</table>

Rim and Lip Drawing (actual size):

![Rim and Lip Drawing](image-url)
VESSEL 28

<table>
<thead>
<tr>
<th>Type</th>
<th>Untyped Allegan Dam ware. Group 2: Smoothed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Sherds</td>
<td>Rim: 1(10.6g). Body: 41(87.5g).</td>
</tr>
<tr>
<td>Paste</td>
<td>Hard, compact, laminated in appearance.</td>
</tr>
<tr>
<td>Temper</td>
<td>Shell.</td>
</tr>
<tr>
<td>Thickness</td>
<td>Rim: 0.6cm. Body: 0.4-0.6cm.</td>
</tr>
<tr>
<td>Hardness</td>
<td>2</td>
</tr>
<tr>
<td>Lip</td>
<td>Flat, undecorated.</td>
</tr>
<tr>
<td>Rim Diameter</td>
<td>Approximately 38cm.</td>
</tr>
<tr>
<td>Rim Height</td>
<td>3cm.</td>
</tr>
</tbody>
</table>

Rim and Lip Drawing (actual size):
VESSEL 29

Type: Untyped Allegan Dam ware. Group 2: Smoothed.
No. of Sherds: Rim: 1(3.2g). Body: 5(5.5g).
Provenience: Rim sherds: 1-I. Body sherds: all B.
Paste: Friable, laminated in appearance.
Temper: Shell.
Thickness: Rim: 0.6cm. Body: unknown.
Hardness: 2.5
Surface Finish: Probably smoothed-over cordmarking. Sherds are considerably eroded. Interior surface: smooth, pitted.
Lip: Round with fine line incisions perpendicular to lip. Incisions are very close to each other and are made by a sharp tool, possibly a stone flake.
Rim Diameter: Unknown, probably between 20 and 40cm.
Rim Height: Unknown, greater than 2.8cm.

Rim and Lip Drawing (actual size):
VESSEL 30

Type: Untyped Allegan Dam ware. Group 2: Smoothed.

No. of Sherds: Rim: 2(11.6g). Body: 12(17.8g).


Paste: Friable, laminated in appearance.

Temper: Shell


Thickness: Rim: 0.7cm. Body: 0.5-0.6cm.

Hardness: 3


Lip: Round, undecorated.

Rim Diameter: Unknown

Rim Height: Unknown, greater than 2.5cm.


Rim and Lip Drawing (actual size):
Type: Untyped Allegan Dam ware. Group 2: Smoothed.

No. of Sherds: Rim: 1(8.2g). Body: 4(13.3g).


Paste: Hard, laminated in appearance.

Temper: Grit and shell. The grit temper is coarse feldspar.


Thickness: Rim: tapered from 0.6cm near neck to 0.3cm at lip. Body: 0.7cm.

Hardness: 2.5


Lip: Round, undecorated.

Rim Diameter: 24cm.

Rim Height: 2.5cm.

Form: Rim: straight, tapered down from the neck to the lip, and possibly castellated with shallow castellations. Neck: unknown. Body: unknown. Base: unknown. This vessel is very similar in surface treatment to Vessel 43, probably a larger version.

Rim and Lip Drawing (actual size):
Type: Untyped Allegan Dam ware. Group 3: Plain.

No. of Sherds: Rim: 1(1.6). Body: 10(28.9g).


Paste: Friable, laminated.

Temper: Shell.


Thickness: Rim: 0.4cm. Body: 0.4-0.5cm.

Hardness: 2.5


Lip: Flat. Smooth round tool impressions transverse to the lip surface. Impressions are 0.2cm wide to 0.5 cm apart.

Rim Diameter: Unknown, large.

Rim Height: Unknown, greater than 1.3cm.


Rim and Lip Drawing (actual size):
VESSEL 33

Type: Untyped Allegan Dam ware. Group 3: Plain.

No. of Sherds: Rim: 4(23.0g). Body: 303(1032.1g). Some of the body sherds may belong to Vessel 24. The two vessels are alike.


Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim: 0.7cm. Body: 0.7cm with slight variation.

Hardness: 2


Lip: Round, with cordwrapped tool impressions transverse to lip surface. Impressions are 2cm apart center to center, 0.7cm wide and give a slight scalloped effect to the rim. Very similar to Vessels 24 and 26.

Rim Diameter: Approximately 28cm.

Rim Height: Unknown, greater than 3cm.


Rim and Lip Drawing (actual size):
VESSEL 34

Type: Untyped Allegan Dam ware. Group 3: Plain.

No. of Sherds: Rim: 6(32.0g). Body: 36(101.1g).


Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim: 0.7cm. Body: 0.5-0.8cm.

Hardness: 2


Lip: Slightly beveled to the exterior, undecorated.

Rim Diameter: 34cm.

Rim Height: 2.2cm.


Rim and Lip Drawing (actual size):
VESSEL 35

Type: Untyped Allegan Dam ware. Group 3: Plain.
No. of Sherds: Rim: 4(7.6g). Body: 3(7.3g).
Paste: Friable, laminated in appearance.
Temper: Grit and shell. The grit is medium feldspar.
Thickness: Rim: 0.6cm. Body: unknown.
Hardness: 3
Lip: Round, undecorated.
Rim Diameter: Large, approximately 40cm.
Rim Height: 2.5cm.

Rim and Lip Drawing (actual size):

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
**VESSEL 36**

| Type: | Untyped Allegan Dam ware. Group 3: Plain. |
| No. of Sherds: | Rim: 1(6.8g). Body: 3(8.2g). |
| Paste: | Friable, laminated in appearance. |
| Temper: | Grit and shell. The grit is coarse feldspar. |
| Thickness: | Rim: 0.6cm. Body: 0.6cm. |
| Hardness: | 2.5 |
| Lip: | Round, with cordwrapped tool impressions transverse to lip surface. Impressions are 0.5cm apart center to center and 0.2 to 0.3cm wide. |
| Rim Diameter: | 12cm. |
| Rim Height: | 2.3cm. |

**Rim and Lip Drawing (actual size):**

![Rim and Lip Drawing](image-url)
VESSEL 37

Type: Untyped Allegan Dam ware. Group 4: Castellated.
No. of Sherds: Rim: 2(73.9g). Body: 69(365.2g).
Paste: Friable, laminated in appearance.
Temper: Shell.
Thickness: Rim: 0.7cm. Body: 0.6cm.
Hardness: 2.5
Lip: Round, with rim cordmarks continuing on lip surface.
Rim Diameter: 16cm.
Rim Height: 2.5cm at castellation peak.

Rim and Lip Drawing (actual size):

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
**VESSEL 38**

**Type:** Untyped Allegan Dam ware. Group 4: Castellated.

**No. of Sherds:** Rim: 2 (40.7g). Body: 40 (88.5g).


**Paste:** Friable, laminated in appearance.

**Temper:** Shell.

**Color:** Exterior: buff, rim and some body sherds smoke blackened. Interior: buff. Core: black.

**Thickness:** Rim: 0.6cm. Body: 0.6cm.

**Hardness:** 2.5

**Surface Finish:** Rim: smoothed-over coarse vertical cordmarking with pitting. Body: well smoothed-over coarse cordmarking with pitting. Interior surface: smooth, pitted.

**Lip:** Round, with some indications of rim cordmarks continuing on lip surface (lip cordmarks not as clear as in Vessel 37).

**Rim Diameter:** 16cm.

**Rim Height:** 2.3cm at castellation peak.


Rim and Lip Drawing (actual size):

[Drawing of rim and lip]
Type: Untyped Allegan Dam ware. Group 4: Castellated.
No. of Sherds: Rim: 17(69.8g). Body: 78(318.6g).
Paste: Friable, laminated in appearance.
Temper: Shell.
Color: Exterior: buff. Interior: buff, with a few sherds almost yellow. Core: mostly black, some buff and gray.
Thickness: Rim: 0.5-0.6cm. Body: 0.6cm.
Hardness: 2.5
Surface Finish: Rim: smoothed-over vertical coarse cordmarking resulting in a finish that is almost shiny. Body: same as rim. Interior surface: smooth, pitted.
Lip: Round, undecorated.
Rim Diameter: 26cm.
Rim Height: Variable, 3-3.5cm at castellation peaks.

Rim and Lip Drawing (actual size):
VESSEL 40

Type: Untyped Allegan Dam ware. Group 4: Castellated.

No. of Sherds: Rim: 2(15.5g). Body: 11(14.9g).


Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim 0.6cm. Body: unknown.

Hardness: 2


Lip: Round, with rim cordmarks continuing on lip surface.

Rim Diameter: 24cm.

Rim Height: Unknown, greater than 3.5cm.


Rim and Lip Drawing (actual size):
VESSEL 41

Type: Untyped Allegan Dam ware. Group 4: Castellated.

No. of Sherds: Rim: 3(14.6g). Body: 26(42.6g).


Paste: Friable, laminated in appearance.

Temper: Shell.


Thickness: Rim: 0.6cm. Body: 0.6cm.

Hardness: 2.5


Lip: Round, undecorated.

Rim Diameter: 12cm.

Rim Height: 3cm.


Rim and Lip Drawing (actual size):
Type: Untyped Allegan Dam ware. Group 4: Castellated.

No. of Sherds: Rim: 9(30.1g). Body: 88(238.1g).


Paste: Hard, compact.

Temper: Grit and shell. The grit is coarse feldspar.


Thickness: Rim: 0.6cm. Body: 0.6cm.

Hardness: 4


Lip: Round, with cordwrapped tool impressions on the exterior part of the lip at a slightly oblique angle to lip surface. Impressions are roughly 0.6cm apart center to center and 0.3cm wide.

Rim Diameter: 10cm.

Rim Height: 2.5cm.


Rim and Lip Drawing (actual size):
VESSEL 43

Type: Untyped Allegan Dam ware. Group 4: Castellated.
No. of Sherds: Rim: 3(39.3g). Body: 27(76.2g).
Paste: Hard, compact, laminated in appearance.
Temper: Grit and shell. The grit is medium feldspar.
Thickness: Rim: tapered, from 0.7cm near neck to 0.2cm at lip. Body: 0.6-0.7cm.
Hardness: 3
Lip: Round, undecorated.
Rim Diameter: 10cm.
Rim Height: 2cm.
Form: Rim: everted, with gradual tapering from neck to lip and with shallow castellation. Castellations approximately 5cm apart and 0.2cm deep. Neck: sharply curved rim-shoulder junction. Neck angle 135°. Body: probably round or conoidal. Base: probably round or conoidal.

Rim and Lip Drawing (actual size):
Type: Untyped Allegan Dam ware. Group 5: Decorated.

No. of Sherds: Rim: 3(7.0g). Body: 32(85.3g).

Provenience: Rim sherds: 2-Q, 1-E. Body sherds: variable, mainly K, P, Q, R.

Paste: Hard, laminated in appearance.

Temper: Shell.


Thickness: Rim: 0.5cm. Body: 0.4-0.5cm.

Hardness: 3

Surface Finish: Rim: smoothed-over vertical cordmarking. Body: smoothed-over cordmarking. Interior surface: smooth. On what appears to be a shoulder piece, there are three trailed chevrons with round punctates below the trails. The trailed lines are approximately 0.8cm apart and 0.4cm wide. The punctates are 0.4cm in diameter and approximately 0.7cm apart.

Lip: Round, undecorated.

Rim Diameter: Unknown.

Rim Height: Unknown, greater than 2cm.


Rim, Lip and Shoulder Drawing (actual size):
Probable Grit Tempered Vessel

This probable vessel consists of a homogeneous group of body sherds that probably represents one vessel. No rims could be associated with the body sherds and consequently the sherds were classed as a probable vessel.

The group contains 48 (245.3g) grit tempered (coarse, mainly feldspar and quartz) shreds of roughly 0.7cm thickness. The sherds have a buff-colored exterior and a grayish interior and core. Exterior finish is well smoothed-over cordmarking, resulting in an almost polished appearance.

Probable Shell Tempered Vessel

This group of body sherds is also homogeneous and probably represents one vessel. Since no rims could be associated with these sherds, they were classed as a probable vessel.

The group consists of 56 (223.1g) shell tempered sherds of roughly 0.9cm thickness. The sherds have buff-colored exteriors and interiors, and the core is black. Surface finish is smoothed-over cordmarking. One sherd is a large (21.2g) shoulder sherd.

Miscellaneous Sherds

This is a heterogeneous group of sherds that could not be fitted into any vessel category. The group consists of the following:

1. Two small, badly eroded, shell tempered rim sherds.

2. Nine grit tempered rim sherds that are either too small or too eroded to be of diagnostic value.

3. One hundred seventy-seven shell tempered body sherds. Included are one small sherd with two small punctures and three large shoulder sherds. One shoulder sherd has a portion of what appears to be a drilled hole.
4. Fifty-two grit tempered body sherds. Included are two small sherds that appear to be from the same vessel and are distinguished by a wide (0.5cm) trail on the interior surface.
Plate I. Storage Pit. Feature 14.

Plate II. Hearth. Feature 19.
Plate III. Allegan Cordmarked.

Plate IV. Allegan Smoothed.
Plate V. A. Allegan Punctate.
B. Allegan Crosshatched.
C. Allegan Cord Impressed.
Plate VI. Allegan Collared.
Plate VII. Unclassified Vessels 20 and 21.
Plate VIII. Allegan Dam Ware. Group 1, Cordmarked.
Plate IX. Allegan Dam Ware. Group 2, Smoothed.
Plate X. Allegan Dam Ware.
A. Group 3, Plain.
B. Group 5, Decorated.
Plate XI. Allegan Dam Ware. Group 4, Castellated.
Plate XII. Allegan Dam Ware. Group 4, Castellated.
Plate XIII. Projectile Points.
A. Triangular.
B. Corner Notched.
C. Side Notched.
D. Stemmed.
Plate XIV. A. Drills.  
B. Scrapers.
Plate XV. A. Chopper.
B. Adze.