An Analysis of Early Woodland Pottery from Southwest Michigan

James W. Cogswell
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AN ANALYSIS OF EARLY WOODLAND POTTERY
FROM SOUTHWEST MICHIGAN

by

James W. Cogswell

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Anthropology

Western Michigan University
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AN ANALYSIS OF EARLY WOODLAND POTTERY
FROM SOUTHWEST MICHIGAN

James W. Cogswell, M.A.
Western Michigan University, 1988

Significant amounts of Early Woodland pottery have been recovered from excavations in southwest Michigan. Radiocarbon and thermoluminescence assays date this pottery from 590 B.C. to A.D. 10. This pottery is analyzed in great detail, providing evidence for attributes heretofore unreported in the Great Lakes area. Selected vessel attributes are presented in a chronological framework, and potential trends in the regional development of Early Woodland pottery are discussed.
ACKNOWLEDGEMENTS

During the development of this thesis I have had the assistance of a great number of people. With this in mind, I would like to thank all of the people who have contributed to this effort, even if their names do not appear below.

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Financial support from the W.M.U. Graduate Research Fund enabled me to obtain thermoluminescence dates on several sherd samples.

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Caven Clark, more than any other person, introduced me to the real value of archaeology and has provided moral support throughout my anthropological career. He also deserves thanks.

James W. Cogswell
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CHAPTER I

INTRODUCTION

Research on Early Woodland pottery from southwest Michigan is beset with several difficulties. The amount of material is very small when compared to that of later periods. Furthermore, the pottery is generally extremely fragmented; many vessels are represented by only a few thumbnail-sized sherds. However, recent excavations by Western Michigan University under the direction of Elizabeth Garland have produced a relatively large amount of Early Woodland pottery from several sites in southwest Michigan. Dates ranging from 590 B.C. to A.D. 10 (Garland 1986) have been obtained from both radiocarbon and thermoluminescence assays.

Prior to these finds a significant geographical gap existed between the Marion Thick heartland of central Illinois and Indiana (Griffin 1952) and the Schultz Thick pottery of the Saginaw area (Fischer 1972; Munson 1982). There was a concomitant dearth of pottery types in southwest Michigan providing transition between the Early Woodland "Thick" wares and the Middle Woodland pottery types which have their earliest date at circa 10 B.C. from the Norton Mounds group in the Grand River valley (Flanders 1966:293-295). A tentative explanation for this ceramic hiatus was provided by Kingsley (1981:157) when he stated that "Early Woodland in Michigan was a short-term phenomenon." Kingsley (1981:166)
elsewhere states that Middle Woodland pottery was introduced by an incursion of Middle Woodland peoples from the south upon a culturally Late Archaic (aceramic) people. These statements were based upon the absence of Illinois-derived late Early Woodland ceramic phases in southwest Michigan at the time of his publication. The recent work directed by Garland (1984, 1986) at the Eidson site and the Elam site has substantially filled in the temporal gap in this area's Early Woodland sequence, but the absence of classical Illinois pottery types remains. The differentiation between external influences and indigenous developments in this pottery remains to be demonstrated. Given current knowledge of Early Woodland pottery in southwest Michigan, the primary objectives of this thesis are to describe the ceramics recovered from prominent Early Woodland sites in this area in as much detail as possible and to contribute to the definition of potential chronological trends and influences in selected attributes that may be relevant not only for this area but for the Marion Thick ceramic tradition throughout its distribution. To this end, the entire ceramic assemblage recovered from the 1980 and 1982 excavations of the Eidson site (20BE122), the 1981 and 1982 excavations of the Wymer (20BE132) and Rock Hearth (20BE306) sites, and the 1978 and 1983 excavations of the Elam site (20AE195) will be described and analyzed (Figure 1).

In the following discussion, sherds will be defined as being at least 1 cm³ and having at least 1 cm² of relatively intact and analyzable surface on both the interior and exterior. Fragments are all of those pottery pieces which do not meet these criteria.
1. Eidson (20BE122)
2. Wymer (20BE132)
3. Rock Hearth (20BE306)
4. Elam (20AE195)
5. Schultz (20SA2)
6. Bussinger (20SA194)

Figure 1. Michigan Sites Discussed in Text
The sherds grouped under a numbered vessel are those that can be physically joined together or are identical in all observable attributes. These vessels originate from rim sherds or the largest body sherds and my intensive effort to recombine sherds within a feature and then between features. The Vessel Type subgrouping is formed from sherds which cannot be physically joined to the numbered vessel and differ from the numbered vessel in one or more individual attributes, but remain predominantly similar to the numbered vessel.

All sherds and many of the fragments were analyzed and described using conventional methods. For purposes of clarity and comparability, several definitions and procedures merit full description. They are presented in the order that they will appear in the actual vessel descriptions.

Method of Manufacture refers to the most conservative reconstruction of the way in which the paste was formed prior to firing of the vessel. Coil break descriptions were made with the lower sherd juncture surface described first, followed by a description of the upper sherd juncture surface. Beveling refers to situations where the furthest extent of either the interior or the exterior portion of the coil juncture extends further toward the rim than does the opposite surface of this coil. Vertical sherd breaks (perpendicular to the rim) were also examined for cross-section juncture information.
Paste refers to both the plastic and aplastic fractions of the vessel, as mixed by the potter and discerned by the investigator upon visual inspection.

Temper refers to all particles which can be determined by the investigator to have been a conscious addition by the potter to the paste, as based upon visual inspection of the sherd. In the absence of any other information, angular particles were considered to be temper. The types of temper employed are based upon the rock and mineral descriptions provided by Press and Siever (1978). Amounts of temper were based upon unaided visual inspection of what was considered to be the most recent sherd break. The term sparse refers to the observation of less than 20% temper on the surface area of this surface break. The term moderate refers to the observation of between 20% and 50% of the surface of this break. Abundant refers to the observation of more than 50% of the sherd break surface being temper particles.

Color descriptions were always made under a combination of incandescent and fluorescent lighting, and usually with a background of natural lighting. Munsell Temperate Soil color descriptions were always employed in the color descriptions.

Firing descriptions rely heavily upon Shepard's (1968) work. Neither replicative experiments utilizing similar raw materials nor refiring of relevant Early Woodland sherds were felt to be practical in the context of this thesis research.

Surface Treatment refers to the final preparation of the vessel body surfaces prior to firing. Furthermore, this term was used only
for those final preparations which directly affected the form of the vessel or were employed during the formation of the vessel body. All sherd surfaces were analyzed by making a plasticene cast in order to make a positive impression of surface treatments and decorations. Replicative experiments were often performed to confirm the description of these attributes. Cordage descriptions are based upon Hurley (1979) and basketry descriptions are based upon Adovasio (1977).

The observation of cord thickness on a sherd or its impression is directly proportional to the depth to which the cord was originally impressed into a vessel surface. Shallow impressings will result in a thinner cord cross section than will a deeper impression. For this reason, only the most deeply impressed areas of the vessel surface were measured for cordage attributes. Even in situations where the vessel surface was described as being "shallowly impressed," there were always areas where a confident determination of cordage metrics could be made.

**Orifice Diameter** was calculated by placing the lip of the largest available rim sherd flat against a series of concentric circles drawn on rigid cardboard and determining the best possible fit of these circles against the innermost extension of the lip.

No single attribute could be used as a determining factor in deciding whether a given sherd had an Early Woodland affiliation, or whether it could be included within a given vessel category. Furthermore, every attempt was made to analyze each vessel and even each sherd without regard to the results from previously
analyzed material, or without anticipation of forthcoming material. As may well be anticipated, this had the effect of making each vessel or vessel type a unique and seemingly incomparable entity. However, an advantage of this method soon became apparent. Early Woodland potters used a variety of constructional techniques and surface treatments on a single vessel. For example, Eidson Vessel 4 exhibited smoothing, fabric marking, and basketry impressing on its interior surface. If a single attribute were the minimal unit of differentiation, there is a real possibility that this material would have been treated as three separate vessels, not one. After all, potters do not construct attributes or sherds, they construct whole pots. Any attempt to discern the functional, environmental, and cultural advantages which brought about the first use of ceramics in southwest Michigan by the Early Woodland peoples should predicate itself upon as complete a description and reconstruction of the vessels that were actually constructed as is analytically possible.
CHAPTER II

THE ELAM SITE POTTERY

The Elam site (20AE195) is located on a low terrace of the Kalamazoo River, about one kilometer downstream from the Allegan Dam. The site was first surveyed by a team of archaeologists from Western Michigan University in 1977. Permission was subsequently granted to conduct field school excavations under the direction of Elizabeth Garland during 1978 and 1983, which revealed several Late Woodland occupations and a substantially smaller but significant Early Woodland component. There are indications of a Late Archaic component as well.

The faunal and botanical remains from the 1978 field season were subjects of master's theses (Barr 1979; Parachini 1981); the chipped-stone material recovered from all three seasons were the subject of an undergraduate Honors College paper (Campbell 1984). Since the environmental setting and site history have been presented in previous studies, these topics will not be addressed here.

Early Woodland Feature Description

Early Woodland sherds were recovered from five Late Woodland features, and from four features which were determined to be Early Woodland in age. These may be described as follows:
Feature 27 was termed an Early Woodland "rock hearth" by Barr (1979). A great number of Early Woodland sherds from at least two vessels and 30 Late Woodland sherds were found in the single soil unit from this feature. Five turtle bone fragments (species unknown) comprise the only faunal remains. The Late Woodland sherds were confined to the upper 10 cm of this feature. No botanical remains were recovered, aside from moderate amounts of charcoal.

Feature 28, partially excavated in both 1978 and 1983, does not fit into Barr's typology. Two meters long, 1 m wide, and extending 80 cm below the plow zone, this feature consists of three fill episodes. Early Woodland sherds were bimodally distributed between the uppermost and lowermost soil units of this feature, and do not seem to be functionally related to the feature. Late Woodland sherds predominate in the uppermost fill zone, but occur sporadically in the other fill zones as well. Charcoal is present in moderate amounts throughout the feature, but only in the uppermost fill zone is there any likelihood of in situ burning. Debitage was scattered throughout all fill zones, but no tools were recovered. The function of this feature is unclear, but the lower fill zone is probably Early Woodland, and the upper fill zone is Late Woodland/Upper Mississippian in origin with mixed Early Woodland fill and material in it. Feature 28 is best interpreted as a trash pit, or at least a pit where cooking was not a primary function. There is little evidence for in situ burning, and no evidence for sustained burning. Fire-cracked rock (FCR) was very sparse and randomly distributed throughout the feature.
Feature 29 is an Early Woodland earth oven with abundant fire-cracked rock concentrated above the fuel zone (E. B. Garland, personal communication, August 1985). It has been C-14 dated to 2540 ± 65 B.P. (UGa-2630) or 590 B.C. (Garland 1986:52). No faunal or botanical materials other than wood charcoal were recovered. Eight Early Woodland sherds were found in the fuel zone of this feature.

Feature 47 is a small firepit occurring at a depth of 1.15 m beneath the surface and 5 cm below the bottom of the northern half of Feature 28. The high water table during field work prevented accurate and complete excavation, but three Early Woodland sherds were recovered from the fuel zone; the only cultural material found in this feature. Due to its stratigraphic placement below the Early Woodland level of Feature 28, and in the absence of any contrary evidence, an Early Woodland association is posited for this feature.

Early Woodland Pottery Description

The Elam site excavations recovered 381 Early Woodland sherds in 1978 and 1983. Three vessels and a possible fourth were partially reconstructed from these fragments. Their descriptions are presented below. The remaining sherds will be discussed following the vessel descriptions. This work expands and modifies the previous general description of some of this material by Garland (1986); vessel numbers are the same as employed in Garland's report.
Elam Vessel 1 Description

This vessel is represented by 43 sherds (total weight 551.0 g), including 13 rim sherds and one possible base fragment. The largest sherd (rim) is 5.5 cm high x 10 cm wide (weight 82.9 g). The total recovered rim arc length is 25 cm.

Vessel 1 sherds were recovered from the 1978 excavation of 28S 18W and its eastern extension within the plow zone (one sherd from each), but the greatest number of sherds were found in the upper (16) and lower (25) levels of Feature 27. Two sherds were also found in fill zone E of Feature 28, approximately 125 cm below surface, and in close association with each other.

Method of Manufacture

Probably coiled construction. Junctures concavo-convex with a high exterior bevel up to interior. Juncture surfaces smoothed. Exterior surfaces poorly joined, leaving a "shingled" appearance. Two sherds indicate that coils were cordmarked on the exterior surface prior to joining, then cordmarked over the vessel's entire surface.

Paste

Temper: Crushed granodiorite. Particle sizes range from barely visible to 6 mm. Mean size 2.5 mm.

Texture: Compact and well mixed. Irregular transverse fracture. Paste is homogenous.
Color: Interior - Yellowish red (5 YR 5/6). Exterior - Yellowish red (5 YR 5/6). Core - Freshest breaks show no distinct core, only the same interior/exterior color. A body sherd sawn transversely showed a slight darkening from the exterior to the interior, indicating that the interior and the freshest natural breaks have been leached.

Firing

Oxidizing atmosphere on both interior and exterior. Very well fired. Possible leached-out fire clouds (10 YR 6/4) scattered over exterior.

Interior Surface Treatment

(Base) and Body: Smoothed. Very irregular surface with numerous fissures indicates that vessel was formed while paste was very watery.

Rim: Crudely cordmarked along entire surface in a zone extending from the lip to 3 to 4 cm below lip. Cordmarks trend obliquely up to left. Twist S z/z, 2 mm wide, 2 twists per centimeter.

Lip: Cordmarked radially around lip. Cordmarks are a continuation of interior or rim cordmarking, tool being "rolled" from interior up unto lip in a continuous motion in order to make the pattern. Cord-wrapped stick application.
Exterior Surface Treatment

(Base) and Body: Cordmarked. Depth of impression varies from deep to indistinct. Pattern is predominantly horizontal, trending to oblique up to left near and on rim. Twist S z/z, 1.6 mm diameter, 2 twists per centimeter. Probably cord-wrapped paddle application.

Rim: Cordmarked as on body. Small sections carelessly smoothed up to 1 cm below lip. Probably cord-wrapped paddle application.

Decoration

None observed.

Appendages

None recovered.

Form

Lip: Very irregular and uneven, but generally flat or slightly beveled up to exterior. Thickness varies from 4 to 9 mm. Mean 7 mm.

Rim: Excurred and thinned. Aperture angle 60°. Average thickness 1 cm below lip, 10 mm.

Orifice Diameter: 24 cm (based on 9 cm arc length).
Upper Body: Constricting at neck, approximately 2.5 cm below lip. Same thickness as body. Average thickness 13 mm.

Height: Unknown, but probably around 30 cm.

Vessel Shape: Curvature of available sherds suggests a globular vessel with an excurved rim and a slightly flattened hemispherical base.

Elam Vessel 2 Description

This vessel is represented by 12 sherds (total weight 387.0 g), including two near-rim sherds. The largest sherd (body) is 11 cm high x 9 cm wide. Vessel 2 sherds were recovered exclusively from the lower levels of Feature 29, at least 70 cm below the base of the plow zone. Charcoal from this feature was submitted for a radiocarbon analysis (UGa-2630) and resulted in a date of 2540 ± 65 B.P., or 590 B.C. (Garland 1986:52). This assay is believed to date this vessel as well.

Method of Manufacture


Paste

Temper: Crushed granodiorite. Particle sizes range from barely visible to 7 mm. Mean 3 mm.
Texture: Moderately compact. Very chalky feel. Pinhole-size voids observed on many breaks and surfaces suggests the incorporation of small amounts of fiber into the paste, resulting in a porous texture. Irregular transverse fracture. Paste is homogenous.

Color: Interior - Grayish brown (2.5 YR 5/2) and light brownish gray (2.5 YR 6/2). Black and brown organic char adhering to surface. Exterior - Light brownish gray (2.5 YR 6/2). Black and brown organic char adhering to surface. Core - Freshest breaks show a thick, very dark gray (2.5 YR 3/0) core which is generally equidistant from both surfaces.

Firing

Reducing or neutral on both interior and exterior. Vessel probably fired to low temperature due to surficial chalkiness.

Interior Surface Treatment

Cordmarked, direction horizontal or near horizontal. Twist Z s/s, 2.4 mm diameter, 1.5 twists per centimeter. Some overstamping at acute angles. Probably cord-wrapped paddle application.

Exterior Surface Treatment

Cordmarked, direction vertical or near vertical. Twist Z s/s, 2.4 mm diameter, 1.5 twists per centimeter. Some nearly perpendicular overstamping. Probably cord-wrapped paddle application.
Decoration

None observed.

Appendages

None recovered.

Form

Lip: Unknown.

Rim: Unknown; probably straight and slightly constricting.

Orifice Diameter: Unknown, but probably about 18 to 20 cm based on curvature of upper body sherds.

Body: Probably straight-sided and expanding. Thickness ranges from 10 mm to at least 22 mm.

Height: Unknown, but at least 25 to 30 cm.

Base: Unknown.

Vessel Shape: Unknown.

Additional Observations

The inferred presence of fiber inclusions in this vessel should not be construed as suggesting that this vessel was fiber tempered. The amount of fiber-derived voids is very small, comprising only about 2% of the volume of those sherds on which this attribute was
observed. The quantity of granitic temper, although relatively sparse, was probably sufficient to provide the necessary stiffening to the vessel body without the admixture of additional fiber temper. However, this inclusion of fiber appears to be a conscious decision on the part of the potter, and not merely a haphazard inclusion such as the squash seed reported by Ozker (1982:77), or the organically-derived voids observed in some of the Eidson vessels (see below). The voids observed are round, with no indication that they are grass blades incorporated into the paste during its mixing on a grassy surface. They appear to be fibers which were separated from the fleshy parts of the plant, and then incorporated into the paste of Vessel 2. A possible alternative hypothesis for this fiber inclusion is that the paste was mixed in the same area where fiber manufacture was undertaken.

Elam Vessel 3 Description

This vessel is represented by 153 sherds (total weight 1341.8 g), including 9 rim sherds (total arc length 14.0 cm). Approximately one third of the vessel was recovered including two thirds of the base. The largest sherd (rim) is 20 cm x 19 cm.

Sherds from Vessel 3 were found during the 1978 excavation of all levels of 28S 18W (15) and the plow zone of the east extension of this excavation unit (3). Three sherds were found in the upper levels of Feature 27, and another three sherds, indisputably from Vessel 3, were found in the lowest soil unit of Feature 28 (the same unit which produced the two Vessel 1 sherds). However, the
greatest number of sherds from this vessel were recovered from the northeast corner of 28S 16E (117). Vessel 3 sherds were also found in 26S 16E (18), 26S 18E (17), 26S 20E (17), 30S 20E (4), 28S 14E (2), the 1 x 2 m extension south of 28S 16E (2), and 26S 22E (1).

Method of Manufacture

Modified slab construction. Junctures concavo-convex and beveled up to exterior on base, evenly convexo-concave on rest of vessel. All juncture surfaces smoothed. Vessel constructed by forming a whole saucer-shaped basal plate, 17 cm in diameter and 5 cm high (Figure 2), and then applying rectanguloid, crescentic, and possibly circumferential slabs up to rim. Coil construction used to complete the vessel. Lowest body slab extends 9 cm up from base; next highest extends 6.5 cm high; remaining slabs gradually decrease in height. Juncture breaks common.

Paste

Temper: Crushed granodiorite. Moderate amounts. Particle sizes range from barely visible to 7 mm. Mean size 2 to 3 mm.

Texture: Coarse. Contorted and platy; suggests little kneading before construction. Irregular transverse fracture.

Color: Interior - Brown (10 YR 5/3) base; brownish yellow (10 YR 6/6) body; strong brown (7.5 YR 5/6) rim.

Exterior - Yellowish red (5 YR 5/6) and reddish yellow (7.5 YR 6/6).
Figure 2. Elam Vessel 3 Profile
Core - Freshest breaks show no distinct core, only gradations from interior to exterior colors. Exterior colors generally extend beyond the middle of the sherd.

**Firing**

Reducing or neutral atmosphere on interior, oxidizing atmosphere on exterior. Possible leached-out fire clouds on base and lower body.

**Interior Surface Treatment**

**Base:** Smoothed.

**Body:** Smoothed and cordmarked. When present, cordmarks trend slightly up to left. Twist S z/z, 1.4 mm diameter, 1.5 twists per centimeter. Method of application appears to be a combination of cord-wrapped stick and cord-wrapped paddle application. Small sections of smoothed areas were carelessly brushed with fibers, possibly a ball of grass.

**Rim:** The rim section, while heavily eroded, shows faint cord-marking and overstamping (or possibly fabric marking) in no discernible pattern. Metrics or method of application not determinable.

**Lip:** Smoothed.
Exterior Surface Treatment

Base: Apex of base smoothed. Upper area of basal plate vertically cordmarked. Twist S z/z, 2.0 mm diameter, 1.5 twists per centimeter. Cord-wrapped paddle application.

Body: Cordmarked over entire surface. Pattern trends vertically or slightly to left of vertical. Twist S z/z, 2.0 mm diameter, 1.5 twists per centimeter. Method of application probably a combination of cord-wrapped stick and cord-wrapped paddle application.

Rim: Cordmarked up to 5 mm below lip. Same cordage as on body, but exclusively trends up to left. Probably cord-wrapped paddle application.

Decoration

Interior: 5 mm below lip one or more loosely twisted cords were impressed roughly horizontally around the rim. Twist probably S z/z. Metrics indeterminable (Figure 3).

Exterior: 6 mm below lip a band of fine (0.8 mm wide and 0.6 mm deep, semicircular in cross section) roughly horizontal incisions were applied before the paste was leather hard (Figure 4).

Appendages

None recovered.
Figure 3. Elam Vessel 3 Rim Sherd Interior Corded Decoration
Figure 4. Elam Vessel 3 Rim Sherd Exterior Incised Decoration
Form

Lip: Unmodified rounded and smoothed. Uneven thickness and contour. Thickness ranges from 6 to 8 mm. Mean 7 mm.

Rim: Unmodified straight and constricted. Aperture angle 110°.

Thickness 1 cm Below Lip: 7 mm.

Orifice Diameter: 22 cm (based on 9.5 cm arc length).

Body: Curvilinear. Thickness tapers gradually.

Base: Hemispherical. Maximum thickness (at apex) 15 mm.

Height: 30 cm (estimated).

Vessel Shape: A slightly constricted and tapered vessel with a rounded base is indicated from the recovered sherds (Figure 2).

Additional Observations

In at least two areas on the interior of the body there are concentrations of roughly horizontal incisions apparently made to correct imperfections in the vessel before it was fired. One correction was made to mend an area which had split vertically after it had been joined to the base. The other was probably made to remove a piece of temper which protruded from the interior of the vessel. The corrective incisions were not deep, nor were they noticeably smoothed before firing.
Variable sherd color suggests that the base is less oxidized than the upper body and rim, and that possible fire clouds on this vessel occur predominantly on the lower body, indicating that when fired this vessel rested on its base. Another possible explanation for this pattern of variable areas of oxidation is that proximity to reducing areas of a cooking fire may have produced them during use, not manufacture. As yet, there is no known method for distinguishing between these two explanations.

The exterior of the basal plate exhibits numerous hairline cracks from shrinkage of the paste before the vessel was fired.

As a further indication of a rolled cord-wrapped stick being used to treat the vessel surface, in at least two areas "bends" in contiguous cordmarks were observed on the exterior of the vessel body. There is no known alternative mechanism which would account for this feature. A rotational dragging of a cord-wrapped paddle, for example, would have produced a smearing of some of the cord-marks, but this was not observed.

A 22.4 g body sherd sample from the subsoil of the pottery concentration in the northeast corner of unit 28S 16E and indisputably from Vessel 3 was submitted to Alpha Analytic, Inc., for thermoluminescence dating. The date produced from this sample was 2010 B.P. ± 20% (Alpha-1540), or 60 B.C. Several months later a subsoil sample from approximately one meter to the southeast of this pottery concentration was submitted (Alpha-1922) which corrected this date to 90 B.C. and reduced the total error to 9%, or ±184 years.
The type of decoration found on the rim of this vessel is the first reported for Early Woodland pottery from southwest Michigan. Its closest analog in Michigan is Shiawassee Incised from the Saginaw Valley (Fischer 1972). Shiawassee Incised is not an explicitly defined pottery type but is included as a variant of Shiawassee Ware in the discussion of the Schultz site ceramics (Fischer 1972), and at the Bussinger site where Halsey (1976:160-166) provides the formal description of this ware. Halsey does not in fact list Shiawassee Incised in the Shiawassee Ware description (Halsey 1976:160), but does use the term in the caption for Figure 15. For these factors, direct comparisons between Elam Vessel 3 and Shiawassee Incised vessels are difficult to make.

Shiawassee Ware, though not firmly dated, is considered to be transitional between the Early and Middle Woodland periods in its currently known area of the Saginaw River basin. The date of 90 B.C. for Elam Vessel 3 would place it in this transitional period, but stylistically there are several important variances. The cord impressing on the rim interior of Elam Vessel 3 is not present on Shiawassee Incised. The incisions on the exterior rim of Elam Vessel 3 (Figure 4) are one third as wide (.8 mm vs. 2-4 mm) as those exhibited on Shiawassee Incised rim sherds from the Schultz site (Fischer 1972:Figure 36) or at the Bussinger site (Halsey 1976:161). The Shiawassee Incised incisions from both sites appear to have been made with a much more rounded tool than that which was used on Elam Vessel 3. The Elam Vessel 3 rim exterior incisions were applied over a cordmarked surface unlike the Shiawassee Incised
rim sherds from the Schultz site (Fischer 1972:Figures 36, 149) which were applied over a smoothed surface. The incisions on the Elam Vessel 3 rim exterior were applied in a much more haphazard fashion than those of the Shiawassee Incised rim sherd incisions at either the Schultz or the Bussinger sites (Fischer 1972:Figure 36; Halsey 1976:Figure 15). Furthermore, two of the six Shiawassee Incised vessels from the Bussinger site also exhibit punctation above the incised area, a trait clearly absent from Elam Vessel 3.

A possible fourth vessel is hypothesized from 14 small (total weight 56.7 g) body sherds from Feature 27, approximately 55 cm below surface in fill zone B, and one sherd from fill zone A, approximately 45 cm below surface. They appear to represent a hybrid between Vessels 1 and 3, and are sufficiently dissimilar from either to warrant a separate classification. Attributes in common with both Vessels 1 and 3 include horizontal cordmarking (S z/z twist, 1.6 mm diameter, 2 twists per centimeter). Attributes shared with Vessel 3 are a more pronounced darkening of paste towards the interior, and a curvature suggesting a more straight-sided vessel than that of Vessel 1. Possible leached-out fire clouds are present on the exterior of eight sherds. Attributes in common with Vessel 1 include fissured interior contours.

The remaining Early Woodland sherds from the Elam site were compared to the Elam vessels in order to assess their chronological affinity and the occupational dynamics of the site during the Early Woodland period. Without exception, these sherds were extremely
similar to Elam Vessel 3, despite their dispersed occurrence across the site (Figure 5).
Figure 5. Horizontal Density Distribution of Early Woodland Sherds From Excavation Units, and Early Woodland Features of the Elam Site
CHAPTER III

ELAM SITE EARLY WOODLAND CHRONOLOGICAL RECONSTRUCTION

Two dates have been derived for the Early Woodland occupation at the Elam site. The earliest date from Feature 29, 2540 ± 65 B.P. (UGa-2630) or circa 590 B.C., dates Elam Vessel 2. Based upon the singular occurrence of this vessel type, it is hypothesized that this occupation was both brief and limited. Despite the extreme depth of Feature 47, the sherds found within it were very similar to Vessels 1 and 3, and very dissimilar to Vessel 2. It is therefore hypothesized that this feature belongs to a later period than that represented by Vessel 2.

The main Early Woodland occupation of the Elam site is posited to have occurred circa 90 B.C., as indicated by the Elam Vessel 3 thermoluminescence date, which also indirectly dates Vessel 1 due to their co-occurrence in Features 27 and 28. This occupation is hypothesized to be a relatively intense and localized occupation around the 28S 18E area because of the concentration of Early Woodland sherds and features here. Due to the combined block and systematic test pit excavation strategies employed at the site, this is believed to be a real concentration rather than an observation possibly resulting from sampling error. The scattering of Vessel 3-like sherds around the site may be due to lateral disposition during this and subsequent occupational episodes and/or the possible
presence of additional, currently unknown Early Woodland activity loci where pottery similar to Vessels 1 and 3 (Figure 5) were utilized.
CHAPTER IV

EARLY WOODLAND POTTERY FROM BERRIEN COUNTY

Significant amounts of Early Woodland pottery were recovered during the excavation of the Eidson site (20BE122) in Berrien County during the US-31 Highway Mitigation Project (Figure 6). A few Early Woodland sherds were also recovered from the Wymer (20BE132) and Rock Hearth (20BE306) sites in the same project area. This pottery and its context have been described in the project reports (Garland and Clark 1981; Garland 1984) and in a recent article by Garland (1986) on the Early Woodland in Michigan. For the purposes of the present study all of the Early Woodland ceramics from US-31 project sites have been reanalyzed and the previous descriptions expanded or modified with respect to constructional attributes.

The Eidson Site

The Eidson site is located on a 20 acre bluff overlooking the St. Joseph River at an elevation of about 18 m above the floodplain. An old oxbow is situated some 40 m east of the site, while the present river channel lies about 550 m to the north.

Based upon surface surveys and subsequent excavations the site was divided into two main occupational areas, north and south, separated by a swale which exhibited a low density of cultural material. Without exception, Early Woodland pottery was found in
Figure 6. US-31 Project Sites on the St. Joseph River, Berrien County, Michigan

the northern area and is further concentrated into two subareas: along the north bluff edge and the east bluff edge (Garland 1986).

A total of 452 Early Woodland sherds and numerous fragments were recovered from the Eidson site north bluff area. Garland (1986:63) reported a minimal vessel count of nine, as represented by rim sherds. One additional vessel was identified from body sherds during this analysis of the Eidson pottery based on significant variances in technological attributes. Tabular data in this text add to the information provided by Garland (1984:Table 95) for all of the sherds under construction.

Eidson Vessel 1 Description

This vessel is represented by 120 sherds (204 pieces) including 2 rim sherds and approximately 120 fragments; total weight is 1339.3 g. The largest sherd (body) is 10.5 cm high x 8.5 cm wide (weight 105.9 g). The total recovered arc length is 7.2 cm. This vessel was recovered from Feature 10 in 1980 (Garland and Clark 1981:47-49) and from Feature 175 in 1982 (Garland 1984:718-719). It is quite possible that this vessel was broken during use in Feature 175 and then discarded in the immediately adjacent location that was initially called Feature 10 (Garland 1984:732).

Method of Manufacture

Paste

Temper: Crushed granite. Moderate amount. Particle sizes range from barely visible to 7 mm. Mean and mode 3-4 mm.

Texture: Very coarse. Contorted and platy; suggests very little kneading before construction.

Color: Interior - Pinkish gray (7.5 YR 6/2) slip. Black organic char on many areas.

Body - Strong brown (7.5 YR 5/6).

Exterior - Reddish yellow (7.5 YR 6/6) to light reddish brown (5 YR 6/3). Black organic char on several small areas, particularly the rim.

Core - Freshest breaks show a very thick black (10 YR 2/1) to very dark gray (7.5 YR 2/1) core. Core in general is closer to interior than exterior.

Firing

Probably oxidizing on exterior, reducing or neutral on interior. Well fired, since despite platiness of sherds and softness of exterior, paste is very hard. No fire clouds observed.

Interior Surface Treatment

Body: Slipped over smoothed. Slip is very thin (maximum 0.4 mm thick) and flakes off easily from the body.
Rim: Slipped over cordmarked. Cordmarks trend up to right from at least 5 cm below lip up to lip. Twist Z s/s, 1.9 mm diameter, 2.0 twists per centimeter. Method of application not determined.

Exterior Surface Treatment

Cordmarked over entire surface. No evidence of slip. Cordmarks probably trend slightly left of vertical with some oblique overstamping (difficult to orient body sherds accurately). Twist Z s/s, 2.0 mm diameter (one impression 1.5 mm diameter), twists per centimeter vary from 1.0, 1.5 and 2.0. Method of application not determined.

Decoration

None observed.

Appendages

None recovered.

Form

Lip: Unmodified flattened and smoothed. Thickness ranges from 8.3 to 10.0 mm. Mean 9.5 mm.

Rim: Bifacially thinned, straight and expanding. Aperture angle 75-80°. Average thickness 1 cm below lip, 10 mm. Rim thickness to 15 mm at 3.5-4.5 cm below lip.
Orifice Diameter: 34 cm (based on 7.2 mm arc length).

Body: Conical. Maximum thickness 19 mm.

Base: Unknown. Curvature of lower body sherds suggests a rounded base.

Height: Unknown.

Vessel Shape: Unknown, but curvature of available sherds suggests an unconstricted "flower pot" shape with a rounded bottom.

Additional Observations

Garland has hypothesized (1984:743) that appliqued strips were applied to the upper part of this vessel. Three sherds were used to demonstrate this hypothesis: one with an applique strip in place, one with the applique partially broken off, and one with the applique missing (Garland 1984:Plate 7:b, c, and d respectively). On all of these sherds the exterior surface surrounding the proposed appliques is heavily eroded and exfoliated, and on sherds (b) and (c) much of the breakage appears to have been along coil junctures. On none of these sherds is there an intact, external vessel surface near the proposed appliques so that an accurate measurement of applique protrusion can be made. Furthermore, the total thickness of the vessel body including the proposed applique of sherd (b) is 15 mm which is in line with the thickness of body sherds where the surfaces are intact. Figure 7 illustrates this point. The outline of sherd (a) is from a sherd with both surfaces intact. The sherd
Figure 7. Eidson Vessel 1 Body Sherd Profiles
outlines (b), (c), and (d) correspond to Garland's sherd examples. The arrows point to her hypothesized strip appliques. The major difference between all of these sherds lies in the relative absence of external sherd surface. This analysis suggests that Garland's observation of appliqued strips are instead due to breakage along coil breaks, exfoliation, and erosion of external sherd surfaces.

This vessel is believed to have a slipped interior surface treatment. The slip is very thin (0.4 mm), is of a different color than the vessel body (7.5 YR 6/2 vs. 7.5 YR 5/6), is composed exclusively of extremely fine particles, and is poorly joined to the vessel surface. It thus conforms in all respects to the definition provided by Shepard (1968:191-193) and Rye (1981:54) and does not conform to polishing as defined by either of these authors (Shepard 1968:191; Rye 1981:89-90). This attribute, if correct, would be a unique observance on Great Lakes area Woodland pottery to date.

Eidson Vessel 2 Description

This vessel is represented by 34 sherds (total weight 468.3 g), including 2 rim sherds (total arc length 10 cm). The largest sherd (rim) is 13.5 cm high x 8 cm wide (weight 138.3 g).

Eidson Vessel 2 sherds were recovered from Features 129 and 151. Rejoining of sherds from both features proves that they are from the same vessel. Due to its presence within Feature 129, radiocarbon dated at 2190 ± 60 B.P. (Beta 5376) or 240 B.C. (Garland 1984:109), this vessel is presumed to date to this Early Woodland period.
Three body sherds from nearby Feature 382 are hypothesized to be Eidson Vessel Type 2, since they differ only in their smoothed interior surface treatment (Table 1).

**Method of Manufacture**

Probably coiled construction. Lower body coils 2 cm high, concavo-convex, and beveled up to exterior. Junctures smoothed. Coil creating the rim 8 cm high, concavo-convex, and beveled up to interior. Junctures infrequent.

**Paste**

**Temper:** Crushed granite. Sparse amounts. Particle sizes range from barely visible to 6 mm. Mean 2 mm.

**Texture:** Compact. Irregular transverse fracture. Paste is homogenous throughout.

**Color:** Interior - Brown (7.5 YR 5/4 and 10 YR 5/3), and very dark gray (10 YR 3/1).

Exterior - Brown (7.5 YR 5/4 and 10 YR 5/3).

Core - Freshest breaks show a thick black (7.5 YR 2/0) core equidistant from the interior and exterior surfaces.

**Firing**

Reducing or neutral atmosphere on interior and exterior surfaces. Well fired.
Table 1
Eidson Vessel Type 2 Summary

<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/Amount</th>
<th>Color Interior/Exterior/Core</th>
<th>Surface Treatment&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 129, F 151 (V 2)</td>
<td>granite/sparse</td>
<td>brown/</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>brown/ very dark brown</td>
<td></td>
</tr>
<tr>
<td>F 382</td>
<td>granite/sparse</td>
<td>brown/ smoothed</td>
<td>CM Z s/s</td>
</tr>
</tbody>
</table>

<sup>a</sup>CM = cordmark treatment, followed by cordage twist pattern.
**Interior Surface Treatment**

**Body:** Deeply cordmarked. Cordmarks applied by a cord-wrapped paddle in a randomly overlapping manner. Twist Z s/s, 2.0 mm diameter, 1.5 twists per centimeter.

**Rim:** Smoothed after cordmarked in a band up to 7 mm below lip.

**Lip:** Radially cordmarked. Metrics same as on body.

**Exterior Surface Treatment**

**Body:** Moderately deeply cordmarked. Cordmarks trend slightly left of vertical. Cordmarks increasingly carefully applied towards lip, approaching decorative quality on upper body and rim. Twist Z s/s, 1.0-2.7 mm diameter, 1.5 mm twists per centimeter. Cord-wrapped paddle application.

**Rim:** Smoothed after cordmarked in a band up to 1 cm below lip.

**Decoration**

None observed.

**Appendages**

None recovered.
Form

Lip: Unmodified flattened and beveled up to exterior. Uneven thickness and contour. Thickness 6 to 9 mm. Mean 7 mm.

Rim: Straight and constricted. Aperture angle 100°.

Average Thickness 1 cm Below Lip: 8 mm. Uniform thickness to shoulder.

Orifice Diameter: 30 cm (based on 8 cm arc length).

Shoulder: At 11 cm below lip thickness expands rapidly to 15 mm. Point of inflection at shoulder.

Body: Expanding and curvilinear. Maximum thickness 23 mm.

Base: Unknown.

Height: 35 cm (estimated).

Vessel Shape: Unknown.

Additional Observations

This vessel typifies the difficulty in discerning between firing and use-related fire clouds and differential weathering. The largest sherd exhibited a large, circular dark region which may have been termed a fire cloud but for the presence of equally-darkened matrix adhering to the surface of this feature. In addition, due to careful excavation of the feature, it was determined
that this area was covered by a large rock which prevented the original dark surface from leaching away.

**Eidson Vessel 3 Description**

This vessel is represented by 30 sherds (total weight 661.5 g), including 1 rim sherd (arc length 3.5 cm) and 1 lug orifice. The largest sherd (rim) is 8.5 cm high x 6.5 cm wide (weight 77.9 g). Eidson Vessel 3 sherds were recovered only from Feature 151. Feature 151 is believed to be contemporaneous with Feature 129, therefore a date of circa 240 B.C. is posited for this vessel.

**Method of Manufacture**

Two junctures observed; junctures smoothed, convexo-concave, and beveled up to interior.

**Paste**

**Temper:** Crushed granite in moderate amounts. Significant amounts of rounded hematite particles and lesser amounts of other rounded particles admixed. Particle sizes range from barely visible to 5 mm. Mean 2 mm. Small, organically-derived voids throughout paste.

**Texture:** Slightly chalky, crumbly, and compact. Irregular transverse fracture. Paste is homogenous.
Color:  Interior - Yellowish brown (10 YR 5/6) and yellow (10 YR 7/6).

Exterior - Reddish yellow (7.5 YR 6/6), yellow (10 YR 7/6), and dark grayish brown (10 YR 4/2).

Core - Freshest breaks show a thick, very dark gray (10 YR 3/1) core equidistant from the interior and exterior surfaces.

Firing

Oxidizing atmosphere on majority of the interior and exterior surfaces, reducing or neutral atmosphere on small areas of exterior. No fire clouds observed. Poorly fired.

Interior Surface Treatment

Body:  Deeply cordmarked. Cordmarks overlap randomly. Twist Z s/s, 2.0 mm diameter, 2 twists per centimeter. Upper body sherds lightly smoothed. Probably cord-wrapped paddle application.

Rim:  Smoothed in a band up to 13 mm down from lip.

Lip:  Smoothed.

Exterior Surface Treatment

Body:  Deeply cordmarked. Dominant cordmarks trend slightly up from horizontal, less distinct cordmarks trend slightly down from horizontal, forming a diamond pattern. On two sherds there is strong evidence that this is due to fabric impressions, but another sherd shows no intersecting pattern. Metrics for all cords: twist
Z s/s, 2.0 mm diameter, 1-1.5 twists per centimeter. Cord or possibly fabric wrapped paddle application.

Decoration

None observed.

Appendages

A sherd with a 3 cm diameter hole is unquestionably a lug orifice. The center of the lug is estimated to have been approximately 10-12 cm below lip.

Form

Lip: Flattened, beveled up to interior and thickened on exterior. Uneven thickness and contour. Thickness 9-11 mm. Mean 10 mm.

Rim: Straight and expanding. Aperture angle 85°. Thickness 1 cm below lip 10.5 mm.

Orifice Diameter: 28 cm (based on 3.5 cm arc length).

Body: Curvilinear. Thickness tapers gradually. Maximum thickness 29 mm.

Base: Unknown.

Height: Unknown.
**Vessel Shape:** An unrestricted jar with one or more ovoid riveted lugs.

**Eidson Vessel 4 Description**

This vessel is represented by 76 sherds (total weight 1323.7 g), including 3 rim sherds (total arc length 5 cm). The largest sherd (body) is 12 cm high x 10 cm wide (weight 254.4 g).

Eidson Vessel 4 sherds were recovered from Features 129 and 151. Feature 129 was dated to 240 B.C., and this is considered to date Vessel 4 as well. The paste and temper attributes of sherds from Feature 360 (one body sherd) and Feature 377 (4 body sherds and 14 fragments) are extremely similar to Vessel 4, so they are hypothesized to be contemporaneous with Eidson Vessel 4 and listed as Vessel Type 4, despite some differences in surface treatment, when observable (Table 2).

**Method of Manufacture**

Unknown. No junctures observed.

**Paste**

**Temper:** Crushed granodiorite. Abundant amount. Particle sizes range from barely visible to 6 mm. Mean 4 mm.

**Texture:** Coarse. Sherds are very fissured by cracks but otherwise compact. Irregular transverse fracture. Paste is homogeneous.
<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/ Amount</th>
<th>Color Interior/ Exterior/ Core</th>
<th>Surface Treatment&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 129, F 151 (V 4)</td>
<td>granodiorite/ abundant</td>
<td>reddish brown/ reddish brown/ none</td>
<td>smoothed &amp; FM: Z s/s Z s/s CM Z s/s</td>
</tr>
<tr>
<td>F 360</td>
<td>granodiorite/ abundant</td>
<td>light reddish brown/ reddish brown/ none</td>
<td>FM N/A CM N/A</td>
</tr>
<tr>
<td>F 377</td>
<td>granite/ abundant</td>
<td>reddish brown/ N/A/ black</td>
<td>CM Z s/s N/A</td>
</tr>
</tbody>
</table>

<sup>a</sup>CM = cordmark treatment, followed by cordage twist pattern; FM = fabric treatment, followed by warp and weft cordage twist patterns; N/A = not available on material for analysis.
Color: Interior - Reddish brown (5 YR 5/4) and red (2.5 YR 5/8) body. Reddish brown (5 YR 4/3) rim.

Exterior - Reddish brown (5 YR 5/4) body; reddish brown (5 YR 4/3) rim.

Core - Freshest breaks show no core, only interior and exterior colors.

Firing

Oxidizing atmosphere on both exterior and interior. Well fired. No fire clouds observed.

Interior Surface Treatment

Body: Mostly smoothed, small sections fabric impressed (four sherds) and basketry impressed (two sherds). Fabric data: warp and weft both twist Z s/s, 1.7 mm diameter, 1.5 twists per centimeter. Orientation of fabric to vessel indeterminable. Basketry data: warp made of reed or split wood, weft made of twisted cord (twist Z s/s, 2.4 mm diameter, 1 twist per centimeter). Close simple weave, 5 wefts per centimeter, 2 warps per centimeter. Warp is aligned horizontally with respect to the vessel axis. Basketry was very worn (Figure 8).

Rim: The larger rim sherd shows a smoothed band up to 12 cm below lip.

Lip: Cordmarked. Orientation and metrics indeterminant.
Figure 8. Eidson Vessel 4 Basal Sherd Interior Basketry Impression

**Exterior Surface Treatment**

**Body:** Deeply cordmarked with considerable overstamping. Twist Z s/s, 2.0 mm diameter, 1 twist per centimeter. Cord-wrapped paddle application.

**Upper Body:** Deeply cordmarked. Cordmarks trend slightly right of vertical. Twist Z s/s, 2.0 mm diameter, 1-1.5 twists per centimeter. Cord-wrapped paddle application.

**Rim:** Smoothed up to 1 cm below lip.
Decoration

None observed.

Appendages

None recovered.

Form

Lip: Unmodified flattened. Thickness range 7-8 mm. Mean 7.5 mm.

Rim: Outflaring. Thickness 1 cm from lip 9 mm. Aperture angle 80°.

Orifice Diameter: 32 cm (based on 4 cm arc length).

Body: Curvilinear and constricting. Thickness tapers gradually to maximum recovered thickness of 22.5 mm.

Base: Unknown.

Height: Unknown.

Vessel Shape: Unknown.

Additional Observations

This is the first observation of basketry impression on a Great Lakes area Early Woodland vessel, and indirectly the first recorded evidence for basket technology in the Great Lakes area. It is
tempting to suggest that a basket was used to shape or form the base of the vessel. Unfortunately, the majority of the Eidson Vessel 4 basal sherds are too eroded to make this determination. It is apparent from the two sherd impressions that a large section of basketry was utilized, and the quality of these impressions suggests that the basket was either carefully removed before firing, or allowed to burn off the vessel during firing.

This basketry impression could not be discerned from visual inspection of the actual sherds and would not have been discovered had not all sherd surfaces under consideration for this thesis been routinely analyzed by utilizing a plasticene cast. It is quite possible that other basketry impressions have been overlooked and subsumed under a cordmarking attribute. A re-examination of extant Early Woodland sherds from the Great Lakes area may prove worthwhile in identifying additional evidence of basketry impressions.

Garland (1984:742) suggested that this vessel exhibited zoned punctation on a near-rim sherd. This analysis does not support her contention. Instead, it is suggested that these punctations result from the erosion of large rounded particles out of the vessel matrix. Magnified inspection of the breakage surfaces has revealed that they exhibit a constriction on the external surface over the maximum extension of the impression. A punctation should not exhibit any such constriction. This constriction, combined with the observation of similar rounded impressions on sherd breaks of this vessel below the rim area, is additional evidence against zoned punctation decoration being utilized on this vessel.
Eidson Vessel 5 Description

This vessel is represented by 15 sherds (total weight 176.9 g), including 1 rim sherd (arc length 3.5 cm) from Feature 142. The largest sherd (rim) is 7 cm high x 7.5 cm wide (weight 76.6 g). Surfaces are heavily eroded. The radiocarbon date for this vessel and vessel type was obtained from Feature 67, yielding an age of 2300 ± 90 B.P. (Beta 5375), or 350 B.C. (Garland 1984:109). Paste and temper similarities caused sherds from eight features to be considered Eidson Vessel Type 5 (Table 3).

Method of Manufacture

Unknown. No junctures observed.

Paste

Temper: Crushed granite. Impressions of rounded particles also present. Particle sizes range from barely visible to 9 mm. Moderate amount. Mean size 3 mm. Several thin (0.8 mm diameter) reed-like impressions observed on interior surface of rim sherd.

Texture: Slightly chalky and compact. Irregular transverse fracture. Paste is homogenous.

Color: Interior - Yellow (10 YR 7/6) rim; light gray (10 YR 7/2) body. Exterior - Yellow (10 YR 7/6) rim; brownish yellow (10 YR 6/6) and light yellowish brown (10 YR 6/4) body. Core - Freshest breaks show a very thick, very dark gray (10 YR 3/1) core
Table 3
Eidson Vessel Type 5 Summary

<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/ Amount</th>
<th>Color</th>
<th>Surface Treatment&lt;sup&gt;a&lt;/sup&gt;</th>
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<td></td>
<td>Interior/ Exterior/ Core</td>
<td>Body Interior</td>
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<td>F 142 (V 5)</td>
<td>granite/ moderate</td>
<td>yellow/ yellow/ dark gray</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td>F 11</td>
<td>granite/ very sparse</td>
<td>yellow/ yellow/ very dark gray</td>
<td>CM N/A</td>
</tr>
<tr>
<td>F 67</td>
<td>granite/ sparse</td>
<td>very pale brown/ very pale brown/ very dark gray</td>
<td>CM N/A</td>
</tr>
<tr>
<td>F 69</td>
<td>granite/ moderate</td>
<td>N/A/ light reddish brown/ dark gray</td>
<td>N/A</td>
</tr>
<tr>
<td>Feature (Vessel)</td>
<td>Temper/ Amount</td>
<td>Color Interior/ Exterior/ Core</td>
<td>Surface Treatment(^a)</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>--------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>F 177</td>
<td>granite/ sparse</td>
<td>pinkish gray/ light brown/ gray</td>
<td>CM N/A</td>
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<td></td>
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<td>CM Z s/s</td>
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<tr>
<td>F 179</td>
<td>granite/ sparse</td>
<td>N/A/ reddish yellow/ dark gray</td>
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<td>granite/ sparse</td>
<td>very pale brown/ dark gray</td>
<td>CM Z s/s</td>
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<td></td>
<td></td>
<td>CM Z s/s</td>
</tr>
<tr>
<td>F 370</td>
<td>granite/ sparse</td>
<td>pink/ dark gray/ none</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
Table 3—Continued

<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/Amount</th>
<th>Color</th>
<th>Surface Treatment&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Interior/Exterior/Core</td>
<td>Body Interior</td>
</tr>
<tr>
<td>F 371</td>
<td>granite/very sparse</td>
<td>yellow/yellow/dark gray</td>
<td>CM Z s/s</td>
</tr>
</tbody>
</table>

<sup>a</sup>CM = cordmark treatment, followed by cordage twist pattern; N/A = not available on material for analysis.
equidistant from interior and exterior surfaces. Well fired. No fire clouds observed.

**Interior Surface Treatment**

Cordmarked. Cordmarks horizontal. Twist Z s/s, 2.7 mm diameter, 2 twists per centimeter. Probably cord-wrapped paddle application.

**Lip:** Eroded, but probably smoothed.

**Exterior Surface Treatment**

Cordmarked. Cordmarks vertical. Twist Z s/s, 1.9 mm diameter, 2 twists per centimeter. Probably cord-wrapped paddle application.

**Form**

**Lip:** Beveled up to interior and slightly flattened. Thickness 7.5 mm.

**Rim:** Unmodified and slightly excurved. Aperture angle 80°. Thickness 1 cm below lip, 9 mm.

**Orifice Diameter:** 32 cm (based on 3.5 cm arc length).

**Body:** Slightly constricting. Thickness tapers gradually to maximum recovered thickness of 19 mm.

**Base:** Unknown.

**Height:** Unknown.
Eidson Vessel 6 Description

This vessel is represented by 43 sherds (total weight 271.0 g), including 1 rim sherd and 1 cylindrical lug fragment. The largest sherd (body) is 3 cm high x 7 cm wide (weight 41.1 g).

This vessel was represented by sherds found only in Feature 180. However, the sherds from Feature 9 were similar to those of Eidson Vessel 6. Their most significant difference is the high percentage of organically derived voids in the Feature 9 sherds. These Feature 9 sherds are therefore considered to be Vessel Type 6 (Table 4).

Method of Manufacture

Coiled construction. Coil height 1.5 times width. Junctures convexo-concave, smoothed, and common.

Paste

Temper: Crushed granite. Abundant amount. Small amount of rounded particles also present. Particle sizes range from barely visible to 6 mm. Mean and mode 3 mm.

Texture: Compact and very crumbly. Irregular transverse fracture. Paste is homogenous.

Color: Interior - Black (7.5 YR 2/0). Exterior - Strong brown (7.5 YR 5/8) and yellowish red (5 YR 5/8). Core - Freshest breaks show no core, only gradations between interior and exterior colors.
<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/Amount</th>
<th>Color Interior/Exterior/Core</th>
<th>Surface Treatment&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Interior/Exterior/Core</td>
<td>Body Interior</td>
<td>Body Exterior</td>
</tr>
<tr>
<td>F 180 (V 6)</td>
<td>granite/abundant</td>
<td>black/strong brown/none</td>
<td>CM Z s/s</td>
<td>CM N/A</td>
</tr>
<tr>
<td>F 9</td>
<td>granite/abundant</td>
<td>black/brown/none</td>
<td>smoothed</td>
<td>CM Z s/s</td>
</tr>
</tbody>
</table>

<sup>a</sup>CM = cordmark treatment, followed by cordage twist pattern; N/A = not available on material for analysis.
Firing

Oxidizing atmosphere on exterior, reducing or possibly neutral on interior. Well fired. No fire clouds observed.

Interior Surface Treatment

Lightly cordmarked. Cordmarks horizontal. Twists Z s/s, 1.8 mm diameter, 1.5 twists per centimeter. Cord-wrapped paddle application.

Lip: Smoothed.

Exterior Surface Treatment


Rim: Lightly cordmarked. Cordmarks vertical. Twist Z s/s, 1.4 mm diameter, 1.5 twists per centimeter. Method of application unknown.

Decoration

None observed.

Appendages

A single lug, slightly ovoid in cross section (26 mm x 20 mm) was recovered. The external face is completely eroded. Length of
fragment 30 mm. Thickness of vessel at point of insertion 17 mm.
Depth of insertion below lip unknown.

Form

Lip: Flattened. Thickness 8.5–9.0 mm.

Rim: Bifacially thickened and slightly constricting. Aperture angle 100°. Thickness 1 cm below lip, 8 mm.

Orifice Diameter: Unknown (1.8 cm arc length).

Body: Curvilinear. Maximum recovered thickness 17 mm.

Base: Unknown.

Height: Unknown.

Vessel Shape: Unknown.

Eidson Vessel 7 Description

Vessel 7 from Eidson is represented by 42 sherds (total weight 380.2 g), including 4 rim sherds (total arc length 8 cm) and 2 possible basal sherds. The largest sherd (body) 9 cm x 6 cm wide (weight 104.4 g). Surfaces are slightly eroded.

The sherds from this vessel were found in Feature 363. The sherds from Feature 60 are also considered to be affiliated with Eidson Vessel 7 and listed as Vessel Type 7 sherds, due to similarities in paste, temper, and fabric marking on the exterior on both vessels (Table 5).
Table 5
Eidson Vessel Type 7 Summary

<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/Amount</th>
<th>Color Interior/Exterior/Core</th>
<th>Surface Treatment$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Body Interior</td>
<td>Body Exterior</td>
</tr>
<tr>
<td>F 363 (V 7)</td>
<td>granite/sparse</td>
<td>yellowish brown/lt. yellowish brown/dark grayish brown</td>
<td>smoothed</td>
</tr>
<tr>
<td>F 60</td>
<td>granite/sparse</td>
<td>brownish yellow/yellow/gray</td>
<td>N/A</td>
</tr>
</tbody>
</table>

$^a$CM = cordmark treatment, followed by cordage twist pattern; FM = fabric treatment, followed by warp and weft cordage twist patterns; N/A = not available on material for analysis.
Method of Manufacture


Paste

Temper: Crushed granite. Sparse amount. Particle sizes range from barely visible to 6 mm. Mean 3 mm.

Texture: Slightly chalky and porous. Irregular transverse fracture. Paste is homogenous.

Exterior - Light yellowish brown (10 YR 6/4) and very pale brown (10 YR 7/4).
Core - Freshest breaks show a moderately thick dark grayish brown (10 YR 4/2) core equidistant from the interior and exterior surfaces. Basal sherds show no core, only gradations from interior to exterior surface colors.

Firing

Predominantly oxidizing atmosphere on interior with reducing atmosphere on base. Oxidizing atmosphere on exterior. Moderately well fired, less well fired at base. No fire clouds observed.
**Interior Surface Treatment**

Smoothed. Several body sherds show striated surfaces, such as would result from wiping with a ball of grass.

**Lip:** Smoothed.

**Exterior Surface Treatment**

**Base:** Deeply impressed with a loose and crudely woven fabric material. Orientation on vessel indeterminant. Warp - twist Z s/s, 3.0 mm diameter, 1.5 twists per centimeter. Weft - twist Z s/s, 1 mm diameter, 2 twists per centimeter.

**Body:** Fabric marked. Warp and weft - Z s/s, 1.4 mm diameter, 1 twist per centimeter. Fabric-wrapped paddle application.

**Rim:** Shallowly cordmarked. Cordmarks trend about 50° from horizontal. Metrics same as on body. Two rim sherds shallowly impressed with a loosely woven fabric, which was stretched transversely to create a diamond pattern. Warp - twist Z s/s, 1.5 mm diameter, 1 twist per centimeter. Weft - Z s/s, 1.4 mm diameter, 1.2 twists per centimeter. Fabric-wrapped paddle application.

**Decoration**

None observed.

**Appendages**

None recovered.
Form

Lip: Slightly flattened. Thickness 7 mm.

Rim: Slightly thinned on exterior, straight and expanding. Aperture angle 75°. One rim sherd slightly scalloped. Thickness 1 cm below lip, 10 mm.

Orifice Diameter: 30 cm (based on 2 cm arc length).

Body: Expanding curvilinear. Thickness tapers gradually.

Base: Curvilinear. Maximum recovered thickness 18 mm.

Height: Unknown, but from available sherds a maximum height of 20–25 cm is suggested.

Vessel Shape: Unknown.

Eidson Vessel 8 Description

This vessel is represented by one rim sherd, 4.0 cm high x 3.5 cm wide (weight 15.5 g), with a maximum thickness of 10 mm. Eidson Vessel 8 was recovered from Feature 384A. Similar sherds recovered from Feature 398, radiocarbon dated to 1940 ± 70 B.P. (Beta 6153), or A.D. 10, are interpreted to date Eidson Vessel 8 due to their overall similarity and are considered to be Vessel Type 8 as well (Table 6).
Table 6
Eidson Vessel Type 8 Summary

<table>
<thead>
<tr>
<th>Feature (Vessel)</th>
<th>Temper/ Amount</th>
<th>Color</th>
<th>Surface Treatment&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Interior/ Exterior/ Core</td>
<td>Body Interior</td>
</tr>
<tr>
<td>F 384 (V 8)</td>
<td>granite/ sparse</td>
<td>reddish brown/ reddish yellow/ dark gray</td>
<td>smoothed</td>
</tr>
<tr>
<td>F 398</td>
<td>granite/ sparse</td>
<td>yellowish brown/ brown/ dark gray</td>
<td>smoothed &amp; CM Z s/s</td>
</tr>
</tbody>
</table>

<sup>a</sup>CM = cordmark treatment, followed by cordage twist pattern.
Method of Manufacture

Unknown.

Paste

Temper: Crushed granite, sparse amount. High frequency of rounded particles. Particle sizes range from barely visible to 5.5 mm. Mean 1 mm.

Texture: Compact and chalky. Irregular transverse fracture. Paste is homogenous.


Firing

Possibly oxidizing on exterior; interior indeterminable. Moderately well fired.

Interior Surface Treatment

Rim: Smoothed.

Lip: Probably smoothed.

Exterior Surface Treatment

Rim: Possibly vertically brushed or combed; 3 mm between marks applied to 7 mm below lip when paste was leather hard.
Near-Rim: Faintly cordmarked. Twist Z s/s, 1.5 mm diameter, 2 twists per centimeter. Method of application unknown.

Form

Lip: Unmodified flattened. Thickness 8 mm.

Rim: Vertical. Aperture angle 90°. Thickness 1 cm below lip, 9 mm.

Orifice Diameter: 22-26 cm (based upon 3.5 cm arc length).

Neck: Constricting.

No other data available.

Eidson Vessel 9 Description

This vessel is represented by one rim sherd, 1.8 cm high x 2.5 cm wide and weighing 6.0 g. Maximum thickness is 10.0 mm. The Vessel 9 sherd was recovered from the plow zone in excavation unit N554 W82. No other sherds were recovered from the site which are considered to be like the Vessel 9 sherd.

Method of Manufacture

Unknown.

Paste

Temper: Sand with extremely sparse amount of crushed granite. Particle sizes range from barely visible to 3.1 mm. Mean 0.7 mm.


Firing

Reducing or neutral on interior and exterior. Moderately well fired.

Interior Surface Treatment

Rim: Smoothed.

Lip: Sparsely cordmarked. Cordmarks trend radially around lip at various angles. Twist Z s/s, 1.5 mm diameter, 2 twists per centimeter. Method of application unknown.

Exterior Surface Treatment

Not determinable (eroded).

Form

Lip: Unmodified flattened. Thickness 10 mm.

Rim: Straight and slightly constricting. Aperture angle 95°. Average thickness 1 cm below lip, 10 mm.
Orifice Diameter: Not determinable (based upon 1.7 cm arc length).

No other data available.

Eidson Vessel 10 Description

This vessel is represented by four body sherds (total weight 27.8 g), the largest of which is 4.0 cm high x 4.5 cm wide (weight 19.1 g), and with a maximum recovered thickness of 13.8 mm. Sherds from this vessel were recovered exclusively from Feature 332. One body sherd from Feature 343 is potentially affiliated with Vessel 10 because it also has basaltic temper, but its interior and exterior surfaces are too eroded to determine stylistic affiliates.

Method of Manufacture


Paste

Temper: Crushed basalt. Sand noticeably present. Moderate amount. Particle size ranges from barely visible to 7 mm. Mean 3 mm.


Core - Thick light gray (5 YR 6/1), equidistant from interior and exterior.

Firing

Possibly oxidizing on exterior; interior indeterminable.

Surface Treatment

Smoothed interior; indeterminable exterior.

No other data available.

Early Woodland pottery was also recovered from 12 features and 11 locations in plow zone excavations or surface locations at the Eidson site, based primarily on maximum temper size and sherd thickness (Garland 1984:Table 95). These sherds could not be assigned to any of the above, nor could any new vessels or vessel types be derived from these sherds, due to their small size and their relative lack of observable attributes.

Eidson Site Early Woodland Chronological Reconstruction

Three radiocarbon dates were obtained for the Early Woodland occupation at the Eidson site. The earliest date, 350 B.C., was obtained from Feature 67 which contained sherds very similar to Vessel 5. Vessel 5 sherds differ significantly from Vessel 7 sherds only in the presence of interior cordmarking, and that Vessel 7 was cordmarked on the exterior. Therefore, 350 B.C. is considered to date all of the sherds which are similar to these vessels.
The second date, 240 B.C., dates Vessels 2, 3, and 4. The feature from which this date was obtained was a relatively large firepit. The sherds were solidly bedded within the feature matrix, and there is no evidence to suggest their subsequent introduction into the feature. The similarity of sherds found in other features to the Vessel 2 and 4 types strongly supports the conclusion that they date from this time period as well.

The final date, A.D. 10, indirectly dates Eidson Vessel 8, due to the similarity to sherds found in the dated Feature 398. There is a possibility that at least some of the residual, untyped sherds from the Eidson site mentioned above are contemporaneous with Vessel 8, but the small size of most of these sherds and their relative lack of observable attributes precludes any definitive placement.

Based upon these three dates and the geographical distribution of diagnostic sherds on the site, two hypotheses are suggested for the Eidson site Early Woodland occupation. First, it is suggested that the dates 350 B.C. ± 90 and 240 B.C. ± 60 represent a real hiatus in the occupation sequence, despite the fact that the dates overlap at one sigma. The distribution of Vessels 5 and 7 and Vessel Types 5 and 7, and Vessels 2, 3, and 4 and Vessel Types 2, 3, and 4 are mutually exclusive over the site (Figure 9). No features contained sherds from both Vessels 2, 3, and 4, or their types and sherds from Vessels 5 and 7, or their types.

Secondly, if the above hypothesis is correct, then the recovered ceramics suggest that the major Eidson site Early
Figure 9. Horizontal Distribution of Eidson Site Features Containing Vessels 2, 3, 4, and Type Sherds, and Features Containing Vessels 5, 7, and Type Sherds.
Woodland occupation occurred at approximately 350 B.C. The strong similarity of all sherds within Vessel Type 5 and the congruence of paste and temper attributes with Vessel Type 7 are considered to be indicative of contemporaneity. The Vessel Types 5 and 7 are widely dispersed on the north bluff of the Eidson site, with a relative concentration in the N500 W70 area. Based on this, a diffuse occupation by single family groups during this time is suggested.

Circa 240 B.C. a most confusing series of events occurred, as evidenced by the ceramic remains. Vessel Types 2, 3, and 4, while extremely dissimilar, are linked by co-occurrence in a dated feature (129) and by a relatively tight clustering on the northeast bluff of the site (Figure 9). Before the reporting of this complex, Early Woodland pottery at other sites has usually been very uniform within a given occupation. If these three vessel types are in fact contemporaneous, then there is no question that disparate influences were at work to produce this situation. Attributes such as the presence of lugs (e.g., Fischer 1972; Shane 1967), fabric marking (Helmen 1950), as well as the general interior-exterior cordmarking common to almost all Marion-Schultz Thick vessels, can be found in the literature, but the entire constellation of attributes appears to be unique to each of the Eidson Vessel Types 2, 3, and 4. No currently known Early Woodland ceramic types in the upper Great Lakes area would seem to serve as the requisite influence for all three of these vessels found at the Eidson site, particularly at the proposed point in time.
It is possible that these three vessel types may have served very different functions within the same cultural context, thus accounting for their very different morphologies and technical attributes. There is no faunal or botanical evidence to support or contradict this suggestion at the Eidson site (Garland 1984:723), a plight common to many Early Woodland sites.

A possible alternative explanation is that the same occupational group was experimenting with different raw material sources and different methods of construction. These experiments may or may not have been initiated with different functions in mind, but it is currently impossible to determine if this was the case.

An additional and, frankly, dubious possibility to account for the co-occurrence of these three vessel types is that the northeast bluff of the Eidson site was a meeting place for two or more groups of Early Woodland potters who stayed together long enough for their ceramics to be deposited in the same feature. There is, however, no direct or circumstantial evidence for this supposition.

Vessel 8 and Vessel 8 type sherds from Feature 398 are from the northeast bluff area of the Eidson site. Given their sparse representation, it is difficult to reconstruct an occupational scenario for circa A.D. 10 based on ceramic material.

The Wymer Site

The Wymer site (20BE132) is situated in the St. Joseph River floodplain approximately 200 m north of the Eidson site. It occupies two knoils; here designated East Knoll and West Knoll.
The West Knoll, previously excavated by Andrews University and tested in 1978 by Garland (Garland and Mangold 1980), has produced evidence of an Upper Mississippian occupation lying just outside of the US-31 Mitigation project; hence it was not the subject of further testing by the US-31 project. The East Knoll, however, was extensively excavated, resulting in the recovery of a multicomponent occupation extending from the Early Archaic to the Late Woodland periods, as substantiated by lithic typologies and radiocarbon dates (Garland 1984:470-533). The third of three geological trenches dug in 1981 uncovered a buried occupation layer on the eastern margin of the West Knoll containing Early Woodland and Late Woodland ceramics. A 2 m x 2 m excavation (6N 38E) abutting the south end of this trench was also undertaken, resulting in the recovery of additional Early Woodland sherds. All of the Early Woodland sherds (total of six) were resolved into vessels, and are described below.

**Wymer Vessel 1 Description**

This vessel is represented by one near-rim sherd, 65 mm x 65 mm in size (weight 51.4 g), and 9-11 mm thick. The largest sherd was recovered from the south profile of the geological trench. The other two sherds were recovered from Level 5 of the 6N 38E excavation.

**Method of Manufacture**

Unknown; no junctures observed.
Paste

Temper: Crushed granite, high percentage of orthoclase. Sparse amount. Particle sizes range from barely visible to 6.5 mm. Mean 2 mm.

Texture: Compact and smooth. Slightly porous; partially due to cylindrical organic voids. Irregular transverse fracture. Paste is homogenous.

Color: Interior - Dark gray (5 YR 4/1) and reddish gray (5 YR 5/2). Exterior - Reddish brown (5 YR 5/3). Core - Dark gray (5 YR 4/1) equidistant from interior and exterior surfaces.

Firing

Probably reducing or neutral on interior and exterior surfaces. Well fired. No fire clouds observed.

Interior Surface Treatment

Impressed with the edge of cord-wrapped paddle. Application trends up to left. Paddle appears to be concave, resulting in a crescentic application of cordmarks. Deeply cordmarked. Twist Z s/s, 1.9 mm diameter, 1.25 twists per centimeter.

Exterior Surface Treatment

Cord-wrapped paddle impressed. Cordmarks deep and trend vertically. Twist Z s/s, 1.9 mm diameter, 1.25 twists per centimeter.
Form

The sherd is slightly excurved towards lip.

No other data available.

Additional Observations

Overall, this vessel is extremely similar to Eidson Vessel 2; so similar that an (unsuccessful) attempt was made to physically join this sherd with those of the Eidson vessel. In support of this similarity, Garland (1984:536) states that "it is sufficiently similar to Eidson Vessel 2 that it could have been made by the same potter."

Wymer Vessel 2 Description

This vessel is represented by three small body sherds (total weight 5.4 g), the largest of which is a body sherd 20 mm x 14 mm (3.45 g), with an average thickness of 12.5 mm. These sherds were recovered from Zone C of the geological trench.

Method of Manufacture

Unknown.

Paste

Temper: Crushed granite. Abundant amount. Particle sizes range from barely visible to 5 mm. Mean 3 mm.

Color: Interior - Dark reddish gray (5 YR 4/2). Exterior - Reddish yellow (5 YR 6/6). Core - None, only continuation of interior color to the exterior color.

Firing

Probably reducing or neutral on interior; oxidizing on exterior.

Surface Treatment

Interior probably smoothed. Exterior probably cordmarked; metrics and orientation indeterminant.

No other data available.

Additional Observations

This vessel is most like Eidson Vessel 6, due to similarities in paste, color, and surface treatment.

Wymer Vessel 3 Description

This vessel is represented by one body sherd and one fragment (total weight 16.5 g). Metrics of this sherd are 38 mm x 30 mm, with a weight of 16.4 g and an average thickness of 14.4 mm. This sherd was recovered from Level 2 of the 6N 38E excavation unit.
Method of Manufacture

Unknown; no junctures observed.

Paste

Temper: Crushed granodiorite; muscovite and hornblende noticeably present. Moderate amount. Particle sizes range from barely visible to 5 mm diameter. Mean 3 mm.

Texture: Coarse and platy; laminar voids common, suggesting overfiring. Irregular transverse fracture.

Color: Interior - Reddish yellow (7.5 YR 6/6). Exterior - Reddish yellow (7.5 YR 6/6). Core - Very thin brown (7.5 YR 5/2), nearer to exterior.

Firing

Possibly oxidizing on interior and exterior surfaces. Well fired, possibly overfired.

Surface Treatment

Interior smoothed. Exterior cordmarked, possibly horizontal; twist S z/z, 2.0 mm diameter, 1-1.5 twists per centimeter. Method of application unknown.

No other data available.
Additional Observations

This vessel is very unlike any of the Eidson vessels or sherds and is more like Elam Vessels 1 and 3, as reflected in temper, texture, color, and exterior cordmarking utilizing $S_z/z$ twist.

Wymer Site Early Woodland Chronological Reconstruction

Given the circumstances of the recovery of these sherds, a reconstruction of the occupational history of the Wymer site during Early Woodland times cannot be offered in anything more than the most general of terms.

The extreme similarity between Wymer Vessel 1 and Eidson Vessel 2 strongly suggests contemporaneity and interaction between these sites at about 240 B.C., based on the dates for Eidson Vessel 2 in Feature 129.

There is another possible ceramic association between the Wymer and Eidson sites due to the similarity between the three sherds of Wymer Vessel 2 and Eidson Vessel 6. Since neither of these vessels is dated and the Wymer vessel is so poorly represented, further inferences must await future excavations in the Wymer Vessel 2 area.

The Wymer Vessel 3 remains pose a most interesting anomaly. If the tentative association between this vessel and Elam Vessels 1 and 3 is correct, then it dates an additional occupation of the Wymer site to circa 90 B.C. and suggests a potential cultural affiliation between these two sites which is not represented.
ceramically at the Eidson site. It must be realized that these hypotheses are at present based upon only one sherd from Wymer. Combined with the potential for a sealed Early Woodland layer in southwest Michigan (Garland 1984:536), this finding supports the need for further investigations of the Wymer site buried cultural strata.

The Rock Hearth Site

Of the 100 sherds found at the Rock Hearth site (20BE307), only two were found to be potentially Early Woodland in origin (Garland 1984:400, 404). Two additional Early Woodland sherds were found in Locus D near the site (Garland 1984:404). All of these were surface finds, and no features from the site are believed to have Early Woodland placement. Given the recurrent flooding of the Rock Hearth site and vicinity by the St. Joseph River and the concomitant erosion and redeposition of cultural materials on the floodplain, it is virtually impossible at present to establish the original location of these sherds. These sherds are very small, the largest being 3 cm x 2.6 cm, and all were body sherds. Three sherds were cordmarked on both the interior and exterior surfaces; the fourth has an eroded interior with cordmarking on the exterior. Twist and metrical observations on all cordmarked surfaces were indeterminable. Their temper, thickness, and surface treatment indicate their placement within the classically-defined Marion Thick type. Furthermore, there is no evidence that these sherds are not from the Early Woodland. They are noticeably different from the
other Rock Hearth sherds which can be confidently placed in later cultural periods (Garland 1984:407-408).

However, the small size of these sherds, combined with the lack of stratigraphic context precludes the placement of these sherds within the Early Woodland relative to the other Early Woodland pottery in southwest Michigan. Further excavations in the Rock Hearth site and its environs will hopefully provide more information on this Early Woodland manifestation.
CHAPTER V

DEVELOPMENT OF EARLY WOODLAND POTTERY IN SOUTHWEST MICHIGAN

Now that the recovered Early Woodland pottery from the Elam, Eidson, and Wymer sites has been described in a uniform manner and ceramic chronologies have been derived for each site wherever possible, the relevant data will be compared between sites to see if there are any trends in this area over the approximately 600 years that this pottery was utilized. Data from the Schultz site (20SA2) (Fischer 1972; Ozker 1982) are also included where applicable, because this is the only other site in southern Michigan where significant amounts of Early Woodland pottery have been recovered from a dated context.

Vessel Metrics

Of the metrical attributes listed in Table 7, the orifice diameter shows the most variation. This measurement ranges from 18 cm to 38 cm given the limitations of the available rim sherd arc lengths on which this measurement can be taken. While the mean orifice diameter is 28 cm, there appears to be a trend among the dated vessels. The earlier vessels (Elam Vessel 2 and Schultz Thick) have a smaller orifice diameter (mean 21.5 cm) which widens to a mean of 30.4 cm during the intermediate dates of 350 B.C. and 240 B.C. at Eidson. The latter part of the Early
<table>
<thead>
<tr>
<th>Date</th>
<th>Vessel or Feature</th>
<th>Orifice Diameter&lt;sup&gt;a&lt;/sup&gt; (Arc Length)</th>
<th>Height&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.D. 10 ± 70</td>
<td>Eidson F 398</td>
<td>22-26 cm (3.5 cm)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson V 8</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>90 B.C. ± 9%</td>
<td>Elam V 3</td>
<td>22 cm (9.5 cm)</td>
<td>30 cm</td>
</tr>
<tr>
<td></td>
<td>Elam V 1</td>
<td>24 cm (9.0 cm)</td>
<td>30 cm</td>
</tr>
<tr>
<td>240 B.C. ± 60</td>
<td>Eidson V 2</td>
<td>30 cm (8.0 cm)</td>
<td>35 cm</td>
</tr>
<tr>
<td></td>
<td>Eidson F 382</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Wymer V 1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson V 3</td>
<td>28 cm (3.5 cm)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson V 4</td>
<td>32 cm (4.0 cm)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 360</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 377</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>350 B.C. ± 90</td>
<td>Eidson F 67</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson V 5</td>
<td>32 cm (3.5 cm)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 11</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 69</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 177</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 179</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 357</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Woodland period, from 90 B.C. to A.D. 10, exhibits a constricting of the orifice to a mean of 23.3 cm.

The total height of these vessels is difficult to derive due to their fragmentary nature, but a modal height of 30 cm regardless of age can be derived from the available material. The exception is Eidson Vessel 7, which has a height of about 7 cm below the norm.

Volumetric measurements of those vessels for which height and orifice diameter are known indicate a chronological trend which parallels that of the orifice diameter. The vessel volumes were calculated as if they were a cylinder: $V = \pi r^2 \times \text{height}$ (Moise and Downs 1967), which while given the uncertainties of vessel measurements and their reconstructions, would be at least a first
approximation of their actual volumes. From a volume of 8.8 liters for Elam Vessel 2, the maximum volume is attained by Eidson Vessel 2 (21.2 liters) which tapers down to a value of 12.5 liters for Elam Vessels 1 and 3.

One observation can be made of this volumetric measurement. Based upon personal experimentation (Cogswell 1982), these Early Woodland vessels would be highly unsuitable for use as a container for stone boiling. For a consistent heat source, a volume of heated stones roughly equal to the material to be cooked must be employed. For an average size container of 14.2 liters (derived from Table 7), this would mean that only 7.1 liters could be cooked, not including wastage from introducing and removing stones from the pot. This would be an extremely inefficient method of cooking, particularly when considering the effort of making the pot in the first place.

Vessel Surface Treatment

The paradigmatic statement that Marion Thick-like vessels are cordmarked on the interior and exterior must be qualified when they are more closely examined. For example, Helmen's (1950:4) original description of Marion Thick states that "the interior of the vessels received two types of treatment: cord or fabric marking and smoothing." Fischer (1972:273) states that while the entire interior of Schultz Thick vessels were cordmarked, the cordmarking was consciously smoothed over with varying degrees of success. This same situation occurs in southwest Michigan. While the predominant
interior surface treatment is cordmarking (Table 8), a significant number were smoothed on at least a portion of this surface. One vessel (Eidson Vessel 4) exhibits fabric marking and basketry marking on its interior as well. Thus, while the presence of interior cordmarking on exterior-cordmarked sherds indicates placement within the Early Woodland period, the absence of interior cordmarking on an otherwise Early Woodland sherd should not be considered ipso facto evidence for excluding them from this period, particularly when sherd size or the sample size is small.

Of the cordmarked interior sherds, only three, Elam Vessels 1 and 3 and Wymer Vessel 2, exhibit S z/z twist. The remainder of twist patterns regardless of age are Z s/s.

Concerning the common observation that cordmarking on Early Woodland vessel interiors is predominantly horizontal, there is a practical explanation for this. If the cords were wrapped across a firm paddle, stick, or hand, it is likely that the length of the entire implement would exceed the internal diameter of the vessel during any given stage of construction. The implement would have had to have been introduced through the vessel mouth and thus prevent cord impression orientation in any other way than in a roughly horizontal direction. Interior horizontal cordmarking should probably be seen as a constructional limitation and not a culturally-defined trait.

The exteriors of Early Woodland vessels from southwest Michigan conform more closely to the cordmarked exterior attribute for Marion Thick than do their interiors, with one exception (Table 8).
<table>
<thead>
<tr>
<th>Date</th>
<th>Vessel or Feature</th>
<th>Interior(^a)</th>
<th>Exterior(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.D. 10 ± 70</td>
<td>Eidson F 398</td>
<td>Smoothed/</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM Z s/s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eidson V 8</td>
<td>Smoothed</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td>90 B.C. ± 9%</td>
<td>Elam V 3</td>
<td>Smoothed/</td>
<td>CM S z/z</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM S z/z</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elam V 1</td>
<td>Smoothed</td>
<td>CM S z/z</td>
</tr>
<tr>
<td>240 B.C. ± 60</td>
<td>Eidson V 2</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoothed</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Wymer V 1</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson V 3</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson V 4</td>
<td>Smoothed/</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FM: Z s/s</td>
<td>Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson F 360</td>
<td>CM N/A</td>
<td>CM N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 377</td>
<td>CM Z s/s</td>
<td>N/A</td>
</tr>
<tr>
<td>350 B.C. ± 90</td>
<td>Eidson F 67</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson V 5</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson F 11</td>
<td>CM N/A</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson F 69</td>
<td>N/A</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson 177</td>
<td>CM N/A</td>
<td>CM Z s/s</td>
</tr>
</tbody>
</table>
Table 8—Continued

<table>
<thead>
<tr>
<th>Date</th>
<th>Vessel or Feature</th>
<th>Interior&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Exterior&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>350 B.C. ± 90</td>
<td>Eidson F 179</td>
<td>N/A</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson F 357</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson F 370</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson F 371</td>
<td>CM Z s/s</td>
<td>CM N/A</td>
</tr>
<tr>
<td></td>
<td>Eidson V 7</td>
<td>Smoothed</td>
<td>FM: Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Z s/s</td>
</tr>
<tr>
<td></td>
<td>Eidson F 60</td>
<td>N/A</td>
<td>FM: Z s/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Z s/s</td>
</tr>
<tr>
<td>530 B.C. ± 90</td>
<td>Schultz&lt;sup&gt;b&lt;/sup&gt;</td>
<td>CM N/A</td>
<td>CM N/A</td>
</tr>
<tr>
<td>540 B.C. ± 130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>590 B.C. ± 65</td>
<td>Elam V 2</td>
<td>CM Z s/s</td>
<td>CM Z s/s</td>
</tr>
</tbody>
</table>

<sup>a</sup> CM = cordmarked treatment, followed by cordage twist pattern; FM = fabric marked treatment, followed by warp and weft twist patterns; N/A = not available on material for analysis.

<sup>b</sup> From Fischer (1972:273).

The Eidson Vessel 7 and the Vessel Type 7 sherds exhibit fabric marking. There appear to be no chronological trends in either interior or exterior surface treatments in southwest Michigan Early Woodland pottery as exhibited by the presently available materials.
Vessel Decoration

Decorative attributes are rare on southern Michigan Early Woodland pottery, an absence which is common to this form of pottery throughout its range. Their presence or absence, however, may have bearing not only on chronological analyses but also on the social dynamics within the occupying group at any given time.

Although technically considered to be a mere surface treatment, the cordmarking on the rim and upper body of Eidson Vessel 2 (circa 240 B.C.) and Wymer Vessel 1 are unique in southern Michigan for the care and quality in which the cordmarks were impressed. This is considered to be an incipient form of decoration, particularly when comparisons suggest more laxness in efforts at cordmarking from both earlier and later time periods.

Elam Vessel 3 (circa 90 B.C.) exhibits internal horizontal cord impressing and external horizontal incisions. Though faint and confined to a narrow band about the rim, the internal cord impressions have no known constructional or functional reason for their presence and must therefore be a decorative embellishment. Its closest analog is with Shiawassee Incised, but on the Shiawassee type the incised area is larger and the incisions are more carefully placed and patterned (Halsey 1976:161, Fig. 15). Furthermore, Shiawassee Incised has no internal decoration. While Halsey (1976:167) considers Shiawassee Incised to be related to transitional pottery from Illinois, which it closely resembles, Elam Vessel 3 is not believed to have a direct relationship to
Shiawassee Incised due to the different nature of its decoration. Thus there are believed to be no decorative trends in southern Michigan Early Woodland pottery as it is currently known.

There are no decorative motifs observed on the Eidson Vessel 8 and Vessel 8 type pottery dated to circa A.D. 10. There is only one rim sherd and possibly one near-rim sherd in this group, a sample size too small for purposes of deriving any conclusions.

Lugs

Ovoid, riveted lugs in southern Michigan have been reported for the Eidson site Vessels 3 and 6 (Garland 1984:745), and Norton Mound M (Griffin, Flanders, and Titterington 1970:169), Schultz site (Fischer 1972:273), and Fletcher site (Ozker 1982:169) vessels. Strip lugs have been reported from Schultz (Fischer 1972:273), 20LP98 (Lovis 1979), and appliqued strips from the Eidson site (Garland 1984:743).

Based on direct examination, riveted lugs on Eidson Vessels 3 and 6 appear to have been inserted near the rim, when the vessel form was essentially complete and before the external surface treatment was applied. All of the lug apertures and the surfaces in direct contact with the aperture were smoothed and therefore poorly joined. This may explain why lugs have rarely been recovered still attached to the vessel body.
Unfortunately, most of the vessels analyzed in this thesis are too fragmentary to derive a conclusive statement on the manufacture of these vessels or to assess any chronological trends. Some tentative hypotheses can be discerned from the existing material. Elam Vessel 3 provides the most detailed information on the construction of Early Woodland vessels from southern Michigan. This vessel clearly shows the use of a basal plate. There are also indications that Eidson Vessel 4 was constructed using a basal plate. If true, this would extend this observation back to circa 240 B.C., because there is no evidence for coil or slab construction on its basal sherds.

Elam Vessel 3 differs from most other reported Woodland pottery in the predominant use of slabs instead of coils to construct the vessel body. Given the small size of most of the other Early Woodland sherds, evidence for this slab construction may have been obliterated. This is an attribute which should be looked for when sherds of sufficient size are recovered.
CHAPTER VI

CONCLUDING REMARKS

Early Woodland pottery from the Elam, Eidson, and Wymer sites in southwest Michigan has been described and compared within and between sites. These descriptions were made so that they could be compared to Early Woodland pottery from other areas. As presented in the introductory remarks, the major intent of this thesis was to utilize a more detailed description of this pottery in the hopes that more discrimination between temporal and geographic ceramic groups could be made. This discrimination has been accomplished utilizing the ceramic material and supportive dating processes. In addition to providing a more refined reconstruction of the ceramic history in question, this detailed analysis discovered attributes, such as basketry impressions and the method of cord application, which may otherwise not have been found.

Based upon the material from these sites, there appear to be no indigenous formal or stylistic trends in Early Woodland ceramics in southwest Michigan. There were no observed direct links with established pottery types from either the Marion Thick heartland or from the Saginaw area. The overall impression resulting from this intensive analysis of these vessels and related sherds strongly suggests that the potters in southwest Michigan during the period from circa 600 B.C. to A.D. 10 were aware of the ceramic developments in
other areas but developed a conservative and selective orientation toward incorporation of the attributes from other areas into their own pottery.

Attempts to physically recombine similar sherds from different features within individual sites met with mixed results. At the Elam site, this effort created strong links between Features 27 and 28, and between Vessels 1 and 3. However, recombination was unsuccessful at the Eidson site. Despite my best efforts, the only successful recombinations involved sherds from the same feature. Erosion of sherd surfaces due to soil acidity, postdepositional physical erosion, and other factors are potential reasons why recombinations at the Eidson site were unsuccessful. Additionally, this may reflect a real difference between sherds and thereby the vessels from which they originated. It is beyond the scope of this thesis to decide between these alternatives.

Based primarily upon comparison of ceramics from the Eidson and Schultz sites, Garland (1986:67-68) posited seven attributes which she considered to be significant with respect to differentiating late Early Woodland pottery from earlier manifestations. They are summarized below.

1. Basal Configuration: a trend toward more rounded bases.
2. Coil Breaks: trend toward better bonding between coils and toward flatter junctures.
3. Exterior Surface Treatment: trend toward finer and more regular cordmarking, utilizing thinner cords and shallower impressing.
4. Interior Surface Treatment: trend away from entire vessel cordmarking.

5. Decoration: trend toward refined cordmarking on upper exterior surfaces and zoned punctation.

6. Temper: trend toward white grit and use of sand.

Following this listing, Garland states five traits which may further differentiate early from late Early Woodland pottery, with late pottery exhibiting: (1) rounded bases; (2) finer cordmarking on even, well-finished surfaces; (3) smoothed interiors as a minor variant; (4) slightly excursive rims; (5) punctate decoration.

While all of these traits have been observed on Early Woodland pottery in the Midwest, and most have been observed within the study area, the analysis herein reported indicates that these traits can be further refined for the ceramics of the southern Michigan area. There is also strong evidence that the technological dictates of the clay and temper employed significantly affected the outcome of several vessels in question. The contributions of this thesis to Garland's attribute list are presented below.

The basal configuration of all southwest Michigan vessels exhibited rounding to a greater or lesser extent when this attribute could be observed, regardless of age. The earliest recovered vessel from southwest Michigan, Elam Vessel 2, had no sherds which could be considered to be a basal sherd, but some of the lower body sherds suggested a consciously flattened base. At the later end of the period, Elam Vessel 1 exhibits the most flattened of all bases, but this is probably due to postmanufacture slumping of a very wet
vessel. Therefore, this analysis supports Garland's contention that rounded bases are a feature of later Early Woodland pottery.

This analysis can neither support nor negate Garland's hypothesized trend in coil breakage patterns over time. Trends in coil bonding are extremely difficult to measure, since this bonding is generally measured in its failure rather than its success. All coil junctures observed for this thesis were unmodified and smooth regardless of the age of the vessel or the placement of the break on the vessel: rim break, body break, or basal break. It is difficult to assess Garland's criterion for flattening of junctures over time since the curvature of the vessel, the thickness of the coil and its method of application, and the technological dictates of the paste employed would also have to be considered before discussing the cultural and chronological development of coil breakage patterns. For example, coil breaks on all of the analyzed vessels were most angled at basal junctures and were most even toward the rim junctures. A discussion of the relative flattening of coil junctures over time will have to await future analysis of this specific question.

This analysis supports Garland's observation of trends in exterior and interior surface treatment. At present, however, some surface treatment patterns appear to be site specific rather than part of a large chronological trend. Elam Vessels 1 and 3 were the only analyzed vessels which exhibited a rolled cord-wrapped stick impression. Eidson vessels from an earlier time exhibited fabric marking and basketry impressions, traits not observed at other
sites. Within each site there does appear to be an overall trend toward increased complexity of surface treatments and the method of their application during the middle and late portions of the south-west Michigan Early Woodland sequence.

Lip shape does not appear to have any chronological significance; this observation is in line with Garland's hypothesis for this attribute, but rim shape at present does not seem to follow the trend which she indicated. As examples, Elam Vessel 1 exhibited an excursive rim, but the contemporaneous Elam Vessel 3 had a constricting rim profile. At the Eidson site, Vessel 2 exhibited a straight and constricting rim profile; the contemporaneous Vessel 3 had a straight and expanding profile, and Vessel 4 had an excursive rim. Eidson Vessel 5 had an excursive rim while the probably contemporaneous Vessel 7 had a straight and expanding rim shape. These differences may possibly be due to differing functions within a given occupation.

Decorative attributes may well prove to be a major factor in supporting a late placement within the southern Michigan Early Woodland continuum, but at present for somewhat different reasons than Garland outlined. Re-analysis of the Eidson Vessel 4 sherds did not provide evidence for zoned punctation; these voids are instead believed to have been due to the erosion of rounded particles from the sherd surfaces. I strongly concur with Garland's assessment of the exceptional cordmarking on Eidson Vessel 2 as having a decorative intent. The Wymer Vessel 1 cordmarking should also be included in this assessment. Elam Vessel 3 (circa 90 B.C.)
exhibited the first clear-cut evidence for incised decoration from this region. Therefore, this study independently confirms Garland's hypothesis of decoration being a late Early Woodland attribute.

Comparative variations in temper are one of the least analyzed attributes of Early Woodland pottery. At present only tentative contributions to Garland's hypotheses on this subject can be added by this work. At the Elam site, granodiorite was used by both early and late potters, while at the Eidson and Wymer sites, granite was preferred regardless of temporal placement. This again suggests a site specific rather than a cultural preference, but the limited number of vessels at the Elam site may make the above observation coincidental. Sand was observed in all analyzed vessels and sherds in varying amounts. Given Fischer's (1972:273) observation of a sandy clay paste in the Schultz material, there is considerable evidence contradicting the presence of sand in Early Woodland pastes as being an indicator of late placement. I suspect that sand was a component of the raw clay which was not eliminated by the potter during the formation of the paste; whether this is the case or whether sand was added in addition to that which was already present in the raw clay remains an area deserving of further work.

Much has been said of Early Woodland pottery being crude or merely adequate for the immediate purpose (cf. Ozker 1982:78). Given the variability in forms and surface treatments exhibited in southern Michigan, an alternative explanation is that these potters were exploring the possibilities of their craft. The hypothesized seasonality of their way of life dictated that new and untested raw
materials be employed at virtually every pottery-making location. Each relocation also brought the potential for new ceramic styles and methods of manufacture being introduced from nearby cultural groups. Therefore, it is equally possible that the Early Woodland use of pottery could be interpreted as a dynamic, explorative period in the prehistory of this area.
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