ABSTRACT

The following paper presents data from the excavation and analysis of materials from the Griswold site (36Er62), a transitional late Middle Woodland–early Late Woodland site located in Millcreek Township, Pennsylvania. Multiple projects were conducted at the site prior to its destruction around 2011, though the content below primarily concerns excavations by William Engelbrecht and Edinboro University in the early 1970s. Using multiple lines of evidence, the authors present settlement and subsistence models for Griswold while also integrating the data into a broader discussion of the Middle to Late Woodland transition in the Northeast. Detailed ceramic and lithic analyses are presented. In doing so, the authors highlight issues associated with the temporal resolution of formal ceramic and lithic types. Additional contributions of this paper are the presentation of novel interpretations of the function of Jack’s Reef projectile points and the relationship between ceramic bossing and gripability.

HISTORY OF INVESTIGATION

In 1961 Frank Swartz discovered the Griswold site (36Er62) in Erie, Pennsylvania, while examining landscaping operations for a new home on Wolf Road (Figure 1). In 1962, the Eriez Chapter (No. 6) of the Society for Pennsylvania Archaeology under the direction of Frank Swartz and Neal Clark conducted excavations on the adjacent property belonging to the Griswold family. The materials from this excavation were then turned over to Stanley Lantz for study. In 1989, Lantz turned them over to the Carnegie Museum of Natural History (Carnegie Museum) in Pittsburgh.

William Engelbrecht learned of the site in 1971 from Frank Swartz who described the general location to him. Engelbrecht taught at Edinboro from 1971 - 1973, teaching three consecutive archaeological field schools during the summers of 1972 - 1974. Each field school lasted six weeks and approximately five weeks of each summer was devoted to the excavation of the Griswold site. This article describes the results of these excavations.

Engelbrecht chose the site for a field school excavation as the area seemed likely to become a housing development. Along with teaching archaeological techniques, a major objective was therefore the retrieval of archaeological information in case the site were destroyed. At the time, there had been a lack of systematic archaeological research in northwest Pennsylvania, so it was also hoped that these excavations would shed light on the prehistory of the region.

On visiting the site, Engelbrecht found a potsherd in the roots of a tree fall. Excavation began near the tree fall in 1972 and this area was subsequently designated the Primary Area (Figure 2). When Frank Swartz visited the site excavations shortly after the field school excavation started, he told Engelbrecht that where Edinboro was excavating was over 1/5th of a mile from the 1962 Eriez Chapter excavations. It was then realized that the site was greater in areal extent than had been realized. An objective of the 1972 and 1973 seasons therefore became defining the extent of the site.
Units were opened near the Eriez Chapter’s earlier excavation and this area was subsequently designated Area C. Area A consisted of two units that yielded little. Area B centered on a five foot square (Unit 47.5S 0W) placed randomly in the woods that yielded a large quantity of ceramics (N = 189
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sherds). Excavation of units immediately adjacent to this unit yielded little evidence of occupation. During the 1973 season, a series of regularly spaced units were opened between the Primary Area and Area C and work continued in Area C. In 1974, excavation occurred solely in Area C in hopes of recovering a portion of the settlement pattern. Future researchers should note that grid north on the map for Area C is more west than north.

In 1972, the general site area was covered in brush and small trees and considerable effort was spent in clearing areas prior to excavation. No plow scars were encountered, and Frank Swartz reported that the Griswold family had not farmed that area of the site. During the Edinboro excavations, the land owners were Harry E. Mueller and Herbert S. Sweny.

Employing shovels and trowels, the three Edinboro field schools excavated a total of 154 1.524 m² (5 ft²) units using arbitrary levels of 6.1 cm (0.2 ft); no power equipment was employed. All soil from these units was sifted using quarter inch mesh (6.35 mm). Flotation was used on a sample of soil from all features. Excavation in 1972 was hampered by rain associated with Hurricane Agnes, and minor vandalism of partially excavated units occurred during the 1972 and 1973 excavations.

In the early 1990s, Jude Kirkpatrick of Gannon University directed further excavations on the site with Stanley Lantz. These materials, like those from the 1962 excavation, were turned over to the Carnegie Museum. Most of the remaining site area including that of Edinboro’s excavations appears to have been destroyed in 2011 or shortly thereafter by the construction of a subdivision composed of North and South Wayside Drives.

ENVIRONMENTAL AND CULTURAL CONTEXT

Griswold is located on the Lake Erie Plain adjacent to an 18 m deep ravine at the bottom of which is Hagenlocker Run (also known as Wilkins Run or Wolf Run). Widmer and Webster (1981:3-78) mistakenly identify the site as at the mouth of Conneaut Creek in Ohio. A USGS topographic map from 1899 suggests Hagenlocker Run was once longer, extending under what is now the Erie Airport. Across the ravine to the south lay The Skyway site (36Er61), also known as the Outdoor Theater site, excavated by the Eriez Chapter in 1961 as a salvage operation and destroyed by construction activity in 1962. The Skyway site was the location of a drive-in theater and was estimated to cover an area 274 m by 183 m. The Skyway site and Griswold should probably be considered a single site bisected by Hagenlocker Run.

The Edinboro excavation was located approximately 1.2 km from the present shoreline of Lake Erie just south of the Lake Warren III strand line (Schooler 1974:Plate 1C). Erosion rates of the Lake Erie shoreline are variable, as are estimates of erosion over time, though it is clear that shoreline erosion has been extensive. Beckerman (1981:2-33) notes the greatest wave action on the Lake Erie shore between Sandusky and Erie. Jaouen (2016:159-161) suggests an erosion rate of 21 cm a year at the Ripley site (southwestern New York) for the last hundred years (12 m in 50 years) while Widmer and Webster (1981:3-79) cite an erosion rate of one to three feet per year for the New York and Pennsylvania shoreline. Erosion at Erie Bluffs State Park 8 km to the west averaged 52 cm per year between 1938 and 1975 (Wallace Roberts & Todd, LLC 2008:15). It is not known if the Griswold site extends to the present shoreline or even if some of the site was lost to erosion. A thousand years ago the shoreline would have been at least 457 m north of its current location, affording occupants of the site increased buffering from winds off the lake.

Eighteen-meter bluffs mark the shoreline by the site making direct access to the lake difficult. It is likely that this was the case when Griswold was occupied. However, from the site one can access Hagenlocker Run via a path down the gully and then follow this small stream to the lake. Bluffs are characteristic of the southeast Lake Erie shoreline and Widmer and Webster (1981) present a settlement model for the lake plain between Silver Creek (Chautauqua County, New York) and Mill Creek (Erie County, Pennsylvania) suggesting sites are often located near streams that provide access to the lake.

Griswold is also located approximately 10 km southwest from Presque Isle, a recurved sand spit which is migrating to the northeast due to longshore drift. Geologists are reluctant to postulate the rate of eastward movement of this sand spit as its movement is governed by complex variables, though O. E. Jennings (1930) suggested an eastward movement of 1.61 km every two hundred years. While the exact location of Presque Isle at different times in the past is not known, at some point in the last two thousand
years it would have been directly north of the site. Presque Isle has a high level of biodiversity and the Pennsylvania Department of Conservation and Natural Resources recognizes six ecological zones there in addition to Lake Erie. In 1819, an observer recorded cedar trees and cranberry bushes growing on Presque Isle (Beckerman 1981:2-49). The name “Cranberry Pond” on Presque Isle reflects the presence of this resource.

The soil on the site is classified as Conotton sandy loam and is moderately well drained, providing a relatively dry living area. This soil type is formed on terraces of former beach ridges and is classified as a gray-brown podzol. The natural fertility of this soil type tends to be low and it is subject to leaching of plant nutrients. However, the soil survey of Erie County, Pennsylvania states that this soil type warms quickly in the spring and that it is “…among the best soils of the lake plain for growing vegetables and fruits” (USDA 1960:65). The Soil Survey of Erie County Pennsylvania (USDA 1960) suggests that the native vegetation of the Conotton soil series was likely a chestnut-oak forest. This forest type would have provided nuts for human consumption and mast for animals. The area lies within the larger beech-maple-basswood forest zone that stretches along the Lake Erie Plain (Dyer 2006).

Climate data from the Erie airport just to the east of the site indicates an average growing season of 194 days, much greater than the Allegheny Plateau to the south with a growing season of only 119 days and far greater than the minimum of 120 frost-free days required for maize agriculture. On average, the last killing frost in the area occurs around April 30th. This is due to the ameliorating effect of Lake Erie on spring and fall temperatures. It is unlikely that climatic fluctuations over the last 2,000 years would have so shortened the frost free period that maize agriculture was not possible. In general, temperatures along the Lake Erie Plain tend to be cooler in summer by three degrees Fahrenheit and warmer in winter by five degrees (Beckerman 1981:2-35). The area along Lake Erie from Erie to Buffalo receives more rain and snow than average for the greater region (Beckerman 1981:2-35). During the Neo-Atlantic Climatic Episode between approximately A.D. 900 and 1200 conditions were generally warmer with greater precipitation (Bryson and Wendlund 1967).

Lake Erie was a rich fish habitat; its historic fishery producing more fish than all the other Great Lakes (Beckerman 1981:2-82). While the Western Basin of Lake Erie was more productive than the Central or Eastern Basin, the deeper Eastern Basin supported cold-water fish that were highly valued (Beckerman 1981:2-82). The Griswold site is adjacent to the moraine that divides the Eastern from the Central Basin. The most likely spring spawning fish in a small tributary to Lake Erie like Hagenlocker Run would have been suckers, redhorses, and bullhead catfishes, all of which can achieve fairly large sizes (Randall Snyder, Professor of Biology, SUNY/Buffalo State College, personal communication 2016). Fish that spawn in the fall like whitefish and lake trout do so offshore in deeper water (Cleland 1982:774). Fall spawning fish can achieve high concentrations requiring gill nets with netsinkers and floats to capture them.

Johnson et al. (1979:78-79) term the early Late Woodland sites along the Lake Erie Plain from Conneaut Creek eastward proto-Erie while Lantz (1989) refers to them as Lake Plain Iroquois. Few of these sites are well known. An unknown number have eroded into Lake Erie while others have likely been destroyed by construction projects (especially in the city of Erie) and gravel operations on former proglacial lake beach deposits. The Peacock site (Figure 1) near the mouth of Chautauqua Creek in New York is assumed to have been a fishing station and probably similar to Griswold (Johnson et al. 1979:79). Jack Schock (Professor Emeritus, Western Kentucky University, personal communication 1974) examined sherds from a private collection from Peacock and also ceramics from Edinboro's excavation at Griswold and thought the ceramics to be similar. The Reese site (36Er63) is located along the mouth of Twelve Mile Creek east of Erie along the lake plain. A surface collection and a two-meter square excavation from the Reese site yielded Princess Point ceramics (Johnson and Lantz n.d.). The Sommerheim Park site (36Er155), just east of Griswold, may have been a seasonal fishing station (Quinn 1999:38). Little is known about the Weigel site (36Er189), located to the west of Griswold along the same proglacial lake strandline. A small sample of sherds suggests it is contemporaneous with Griswold (Johnson and Lantz n.d.). Three sites at or near the mouth of Elk Creek in Pennsylvania (36Er53, 36Er160, and 36Er161) were likely also utilized during spawning runs (Quinn 1999:38). The Westfield site in New York is an earthwork to the southwest of Peacock and set back 2.4 km from the lake shore.
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near Chautauqua Creek. Netsinkers (Guthe 1958) and ceramics from this site suggest it dates slightly later than Griswold. The Sceiford site in Pennsylvania is 1.5 km south of the lake near the New York State line. It was excavated in 1987 and 1988 by the Carnegie Museum and appears to have at least two Late Woodland components (Johnson and Lantz n.d.). Stanley Lantz (personal communication 1988) places Sceiford slightly later than Griswold. Maize was recovered from Sceiford as well as netsinkers and evidence for structures (Jaouen 2016:31; Johnson and Lantz n.d.). The multi-component Eastwall site (33Ab40) at the mouth of Conneaut Creek in Ohio has similarities in both physical setting and material to Griswold (Johnson et al. 1979:79). The site appears to have been at least 100 m (north - south) by 275 m (east - west) and adjacent to a gully (Brose 1977; Brose et al. 1978). The recovery of 714 netsinkers from the Eastwall site suggest a focus on seine and/or gill nets. Fish were the most common faunal remain recovered from this site with sturgeon and drum (late summer and fall spawning fish) the most frequent species identified (Widmer and Webster 1981:3-73). Carbonized nut husks also point to a fall occupation (Brose et al. 1978:154).

ARTIFACT/FEATURE TYPES AND DISTRIBUTION

Ceramics

The distribution of excavated ceramics is depicted in Figure 3 as a kernel density map that was produced using the Spatial Analyst extension in ArcGIS (Environmental Systems Research Institute 2017). Ceramics were recovered from 89 percent (N=137) of test units, though the distribution is not uniform. Area C (Figure 4) has the highest sherd density and accounts for 85 percent (N=9,338) of the Griswold ceramic assemblage. The range for Area C is 544 sherds, with a minimum of 11 sherds (C45S 40W) and a maximum of 555 sherds (C30S 5W). Outside of Area C there are three loci that fall in the middle of the density spectrum: the Primary Area in the vicinity of Feature 1 (Figure 5), Area B, and Trench N from the Letter Test Pit Area.

Figure 3. Intrasite ceramic sherd distribution.
The ceramic vessel rather than the rim sherd is the unit of analysis in the following discussion. A total of 100 vessels was identified from the excavations. Some vessels are represented by a single or a few non-conjoined rim sherds, while other vessels are complete. Vessels have been assigned to traditional culture historical types for ease in comparison to reports in the existing literature. However, it is recognized that there are major problems using such types for an understanding of the past. At present, there is considerable overlap between type designations in northwest Pennsylvania. Also, two highly similar vessels in adjacent regions may be given different type names. In some cases, different attributes (tempering, presence/absence of a collar) are given hierarchical importance in defining a type that obscures ceramic similarities between areas.

In this analysis, we briefly define the criteria used for each type and reference similar ceramic types. The typology section is followed by a summation of selected attributes of the same vessels. In addition to the examples below, images of each vessel may be found under the Griswold project on the Digital Archaeological Record (tDAR) (Englebrecht 2016). These images were used in the analysis, though many sherds were also physically checked against these images. Vessel numbers (e.g., Vessel 15) in the ceramic figure captions reference the tDAR data. Vessel profiles are recorded in the tDAR listing, though the shape of the more fragmentary vessels was often not clear, and so profile shape is not tabulated.

**Carpenter Brook Cord-On-Cord** (N = 6 vessels, Figure 6)
“The diagnostic features of the type are corded-stick decorations upon the outflaring rim of a vessel which has been cord-malleated over the entire exterior surface” (Ritchie and MacNeish 1949:108).

**Clemson Island** (N = 13 vessels, Figure 7)
Clemson Island culture was first defined in the Susquehanna basin. The pottery is decorated with punctates and “cord marked decorations on the rim and neck” (Carr and Moeller 2015:183-186). Jack's Reef Corded Punctate, Castle Creek Punctate, Owasco Corded Horizontal, and Wickham Punctate (Ritchie and MacNeish 1949) overlap with these ceramics. A number of researchers including Rieth
(2002:149) have noted the stylistic similarity between Owasco and Clemson Island ceramics. The majority of sherds termed Clemson Island in this analysis have one or more rows of deep punctates on a cord-marked surface. We differentiate them here from Princess Point vessels for their lack of cord wrapped stick impressions.

**Glen Meyer Linear Stamped** (N = 3 vessels, Figure 7)

“The diagnostic feature of the pottery type is a single row of oblique or rarely, vertical linear stamped impressions directly below the lip. While the majority of the motifs appear to have been produced by linear stamping, a few cases of incising may be present” (Wright 1966:123).

**Glen Meyer Oblique** (N = 2 vessels, Figure 8)

“The diagnostic features of this pottery type are bands of parallel or opposed oblique lines of cord-wrapped stick impressed on the rim and neck of the vessel” (Wright 1966:114-115).
Figure 6. Griswold Rim Sherds. Number in brackets references tDAR vessel number: (A) Carpenter Brook Cord-On-Cord [91]; (B) Carpenter Brook Cord-On-Cord [92]; (C) Mahoning Collared [12]; (D) Goessens Oblique [96]; (E) Carpenter Brook Cord-On-Cord [53]; (F) Mahoning Collared [10a]; (G) Mahoning Collared [24]; (H) Mahoning Collared [10b]; (I) Goessens Punctate [56b].

Goessens Oblique (N = 4 vessels, Figure 6)

“The diagnostic feature of this pottery type is a single row of cord-wrapped stick impressions occurring directly below the lip” (Wright 1966:129). This type overlaps with Owasco Corded Collar (Ritchie and MacNeish 1949). Kenneth Burkett has defined Fishbasket pottery along Redbank Creek (PA) some of which resemble Goessens Oblique (see Carr and Moeller 2015:174).
Goessens Punctate (N = 2 vessels, Figure 9)

“The diagnostic feature of this pottery type is the presence of one or more horizontal rows of circular, triangular, ovate, or rectangular punctates. Usually two or more rows of punctates are present, and in one instance horizontal incised lines were present below the punctates” (Wright 1966:124-125).

Mahoning Collared (N = 10 vessels, Figure 6, 10)

This type displays “...low added-on collars or rim strips. These collars are frequently decorated with a horizontal band of parallel or occasionally opposed, oblique cord wrapped paddle edge-stamped, linear-stamped, or incised impressions” (Johnson n.d.). This type overlaps with the Mead Island Collared type defined by Lantz (n.d.a) but unpublished.
Mead Island Filleted (N = 1 vessel, Figure 10)
This “...grit-tempered vessel type has narrow, weakly defined collars formed by the addition of a thin narrow rim strip or a thickened sub-lip formed by folding down the soft clay lip. This profile was embellished with a thin paddle edge impressed vertically and angled into the fillet below the lip” (Lantz n.d.a). Lantz notes its similarity to the Reeve Filleted type of the Whittlesey tradition (Brose 1994:70).

Niagara Collared (N = 2 vessels, Figures 10)
“The distinguishing features are the smooth surface and the undecorated short collar” (MacNeish 1952:26).

Ontario Oblique (N = 2 vessels, Figures 10)
“Bands of oblique lines either parallel or opposed on the neck and rim on globular-bodied vessels differentiate this type from others” (MacNeish 1952:18).

Owasco Corded Horizontal (N = 2 vessels, Figure 10)
"Horizontal cord-wrapped stick impressions, with or without oblique corded decoration above the main theme, on outflaring rims" (Ritchie and MacNeish 1949:111-112).
**Princess Point** (N = 14 vessels, Figure 11, 12)

The Princess Point complex in southwestern Ontario was defined by Stothers (1977). Fox (1990:177) defines Princess Point ceramics as having “collarless, everted rims.” “Bodies are heavily cord roughened, necks are often decorated with cord-wrapped stick horizontal lines over a corded surface, with an encircling row of circular exterior punctates. Rims are usually decorated on the exterior, lip and interior, often with cord-wrapped stick obliques (e.g. oblique lines)” (Fox 1990:177). The majority of sherds termed Princess Point in this analysis have deep punctates with cord wrapped stick impressions.

![Figure 11. Princess Point [58].](image1) ![Figure 12. Princess Point [63].](image2)

**Ripley Corded/Woodsman Corded** (N = 23 vessels, Figure 13)

In the authors’ view, the following types are similar enough in appearance to be considered one type:

Ripley Corded: “Grit tempered, cordmarked vessels with a globular body with either an outflaring mouth or a short collar distinguish this type from others” (MacNeish 1952:24-25).

Woodsman Corded: “The diagnostic feature of the pottery type is the exterior treatment of the rim which consists of cord malleation” (Wright 1966:121). Related types include Westfield Cord-Marked (Guthe 1958:55), Mahoning Cordmarked (Mayer-Oakes 1955:191-192), and Jack's Reef Corded (Ritchie and MacNeish 1949).

Sceiford Corded (a collared type) has been defined by Lantz for the Lake Erie Plain but the description has not been published. In this analysis, cord marked vessels with deep exterior or interior punctates are placed in the Clemson Island category.
“Paradoxically the most marked characteristic of this pottery …is the lack of distinctive features… its diagnostic features are its smoothness, total lack of decoration, and small-mouthed globular pot form” (MacNeish 1952:25-26). This is similar to Fairport Plain (Brose 1994:68) and Point Peninsula Plain and Canandaigua Plain (Ritchie and MacNeish 1949).

Stafford Stamped (N = 2 vessels, Figure 15)

“The diagnostic feature of the pottery type is the presence of the crescent stamp impressions” (Wright 1966:118-119).
Steamburg Oblique Channeled (N = 2 vessels, Figure 15)
This type was defined by Dragoo and Lantz (1971:45). Lantz (n.d.b) states that it “...is characterized by one to three channels impressed on medium to high molded collars. The smoothed surface above, below, and in the channels is often decorated with oblique impressions.”

Untyped (N = 5 vessels, Figure 16)
One untyped vessel is complete. It is small and poorly constructed. The portion near the rim appears to be smoothed, while the area near the base appears to be net impressed or impressed with a roug fabric. It resembles Ripley Plain (MacNeish 1952:25-26) or Fairport Plain (Brose 1994:68) but differs from both in that the entire surface is not smoothed. In discussing small cordmarked ceramic vessels of the Riviere au Vase phase of the Western Basin Late Woodland, Murphy and Ferris (1990:196) state: “Partially or completely smoothed over exterior rims and necks may first occur around A.D. 700.” We leave this vessel untyped at present.

The frequency of selected attributes among the 101 ceramic vessels is given below. All vessels appear to be grit tempered. Some of the vessels counted as having a plain exterior appear to have been initially cord marked and then the surface was smoothed. In cases where a vessel is represented by two or more rim sherds, the sherds may have slightly different attribute states. For example, one may have a relatively flat lip, while another may have a rounded lip. In such cases, the attribute of lip shape is tabulated below as “indeterminate.” This was also the case where the attribute could not be determined from available photographs used in the analysis.

Figure 16. Untyped [36].

Rim Exterior
Plain, N = 12
Cord Marked, N = 55
Cord Wrapped Stick Impressed, N = 46
Cord Marked and Cord Wrapped Stock, N = 13 (among the 54 cord marked and 46 cord wrapped stick impressed cited above)

Punctates
External, N = 14
Internal, N = 10 (with exterior bossing)
Cord marked and Punctated, N = 11 (among the cord marked and punctated vessels noted above)
Cord Wrapped Stick and Punctated, N = 7 (among the vessels noted above)
Cord Marked, Cord Wrapped Stick Impressed, and Punctated, \( N = 2 \)
Linear Stamped, \( N = 6 \)
Linear Stamped and Cord Wrapped Stick Impressed, \( N = 3 \)
Linear Stamped, Cord Wrapped Stick, and Cord Marked, \( N = 1 \)
Incised, \( N = 6 \)
Incised and Cord Wrapped Stick, \( N = 2 \)
Incised, Cord Wrapped Stick, Cord Marked, Punctated, \( N = 1 \)

Rim Interior
Plain, \( N = 81 \)
Cord Marked, \( N = 9 \)
Cord Wrapped Stick, \( N = 6 \)
Indeterminate, \( N = 4 \)

Lip Treatment
Plain, \( N = 22 \)
Cord Marked, \( N = 24 \)
Cord Wrapped Stick, \( N = 28 \)
Incision, \( N = 2 \)
Punctates, \( N = 4 \)
Stamped, \( N = 6 \)
Indeterminate, \( N = 14 \)

Lip Shape
Flat, \( N = 54 \)
Rounded, \( N = 28 \)
Thickened, \( N = 20 \)
Flat and Thickened, \( N = 6 \) (includes cases counted above)
Rounded and Thickened, \( N = 9 \) (includes cases counted above)
Indeterminate, \( N = 15 \)

Collar
Present, \( N = 31 \)
Absent, \( N = 64 \)
Indeterminate, \( N = 6 \)

Clay Pipes
Fragments representing a total of 18 clay pipes were recovered from Griswold, 17 of which were excavated from Area C (Figure 17). Images of these may be seen in the Griswold project on tDAR. There were seven stem fragments, 10 bowl fragments and one nearly complete pipe. All fragments were grit tempered. Eleven fragments had a smooth exterior, four had cord wrapped stick impressions, one had faint incisions on the lip, one had an incision and cord wrapped stick impressions, and one had punctates.

The nearly complete specimen had a smooth exterior with a plain short collar around the lip. It resembles a discrete chambered tubular pipe, having a wider smoking material chamber and a narrower pipe bore (Figure 18). However, its gentle curve suggested that it could be classified as an incipient obtuse angle pipe (Rutsch 1973:112).

One pipe stem is a clay tube with a bulbous shape. It has a smooth exterior and the pipe bore is near an edge, rather than being centered. Since it is not a complete, it cannot be determined if it is a discrete chambered clay tube or an obtuse angled pipe. Two other pipe stems look like simple clay tubes at first glance, but the nature of the breaks in both suggests that they were obtuse angle pipes. Another pipe stem with exterior cord marked stick impressions has a cone shape, but not enough is present to determine the type (Figure 18). In three cases the bore can be observed. Two are smooth and one bears the impression of cordage.
Seven of the pipe bowls are plain. Three pipe bowls may be classified as ring bowls, one having three horizontal rows of cord wrapped stick impressions, one having two rows of horizontal cord wrapped stick impressions and a horizontal incised line, and the third having two horizontal rows of punctates. Brose (1994:111-113) notes pipe bowls with two rows of horizontal punctates are common around Lake Erie, beginning in the early Late Woodland. Finally, one bowl fragment has cord wrapped stick
impressions with no discernable pattern. The lips on 10 pipe bowls were observable. Eight of these were unmarked, while one had faint vertical incisions and one had vertical cord wrapped stick impressions.

Lithics

While sherd counts were tabulated in the field, the authors suspect that much of the lithic debitage has remained unprocessed as only 4,049 pieces have been recorded. Based on a visual inspection of the debitage curated at Edinboro University, it would appear that lithic debitage is currently underrepresented. Nonetheless, the debitage kernel density map (Figure 19) is similar to the distribution of ceramics at the site-level, though there are some notable intra-area differences. All conclusions regarding the debitage assemblage should be taken as tentative. As with the ceramics, Area C had the highest debitage density and accounts for 72 percent (N = 2,906) of the debitage assemblage (Figure 20). Outside of Area C there are two loci that fall in the middle of the intensity spectrum – test pit 170N 5W (N = 73) and Trench N (N = 118). In contrast to sherd density, Area B and the Primary Area (Figure 21) have significantly less debitage.

Figure 19. Intrasite debitage distribution.

In terms of formal stone tools, there are 23 Levanna points, three Raccoon Side Notched points, two Madison points, and the base and mid-section of a Chesser Notched point (Figure 22). Additionally, five point base fragments were classified as triangular, and two non-diagnostic point tip fragments were recovered. Twenty-one drills were also identified. Biface metric attribute data can be found in Table 1. Multiple preforms and scrapers were also recovered from Griswold, but these have yet to be analyzed and tabulated.

The Chesser Notched projectile point type (Figure 23) “…is a side notched to expanding stemmed form with wide notch openings” (Justice 1987:213). It is particularly common in central and southern Ohio, eastern Kentucky, western Pennsylvania, and western New York (Justice 1987:214).

The Raccoon Notched points are part of the Jack’s Reef cluster of points (Justice 1987:219-220). These are considered diagnostic of the early Late Woodland in the Midwest and are generally considered
Figure 20. Area C debitage distribution.

Figure 21. Primary Area debitage distribution.
to be arrow points that represent the introduction of the bow and arrow. Lantz (1989:6) notes that Raccoon points tend to be smaller than Jack’s Reef points. Both are similar in shape to Port Maitland points (Justice 1987:220; Lantz 1989:6). Fogelman (1988:187) notes that Port Maitland points tend to be smaller than Raccoon points.

Levanna points are unnotched triangular points, generally with concave bases and equilateral shape. Most range in size between 3.2 and 4.5 cm in length (Ritchie 1971:31-32). Madison points are also unnotched triangular points, but they are thinner and shorter than Levanna points, averaging approximately one inch in length. The majority are isosceles in shape (Ritchie 1971:33-34). Both Levanna and Madison points are considered to be arrow points.

The drills (Figure 24) fall into three general types: Raccoon Triangular Base drill (N = 10); T-Base drill (N = 6); and Bulbous or Raccoon Ovoid Base drill (N = 5) (Fox 1990:175; Lantz 1989:20-22). The T-Base drills appear roughly equivalent to Lantz’s Raccoon Rectangular Base drills. The Triangular Base drills were likely reworked Levanna points while most of the T-based drills were likely reworked Raccoon Notched/Jack’s Reef points.

No netsinkers were recovered, though some were recovered from the adjacent Skyway site. The presence of a possible net impressed pot implies the presence of nets. The absence of netsinkers at Griswold is puzzling. Perhaps it is because the area excavated was over half a mile inland from the present shoreline. Nets and netsinkers were likely kept closer to the shore.

Two stone maskettes were recovered (Figures 25, 26). Both are schematic rather than finely detailed. One represents a smiling face and the other a face in profile. The mouth on the “smiling” maskette (catalog number 32) appears to be natural and may have suggested a face, to which eyes were added. Similarly, the shape of the stone (catalog number 31) may have suggested the profile of a face, to which an eye was added on either side. George Hamell (personal communication 2016) suggests that these objects might be examples of pareidolia, the human tendency to recognize faces or other patterning in an otherwise naturally produced object. The edges of both objects are smooth, suggesting they are
Table 1. Biface metric attribute data.

<table>
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<th>Cat#</th>
<th>Provenience</th>
<th>Type</th>
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<th>Length/mm</th>
<th>Width/mm</th>
<th>Thick/mm</th>
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<td>Chesser Notched</td>
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401/394  C50S 5E L4/C45S 5E L4  Levanna  6.19  39.38  36.93  5.29
Missing  Unknown  Madison  2.88  34.3  22.82  4.37

Figure 23. From left to right: Chesser Notched, two Raccoon Notched, and two Levanna projectile points.

Figure 24. Griswold drill assemblage.
unmodified. In all cases the holes for the eyes are smooth with no evidence of drilling, so it is possible that they represent spots of differential erosion, perhaps of a fossil crinoid stem. However, the placement of the eyes in the appropriate positions argues against this.

Both well-made and crude maskettes have been found in Pennsylvania and surrounding areas. A well-made stone maskette was recovered from the Vanatta site (30Ca46) near Steamburg, NY, in a hearth within a rectangular house and dating to ca. A.D. 900 - 1000 (Stanley Lantz, personal communication 2016). Two stone maskettes are pictured in back issues of the Pennsylvania Archaeologist, one with likely Clemson Island affinity (ca. A.D. 750 - 1250) (Garrahan 1988:66) and one with little information given (Eisert 1984:80). A clay effigy head with shell inlay eyes from the Ebert Springs site (36FR367) in Franklin County was also reported (Powell 2010:73-77). Ritchie (1965:254) describes maskettes on Hunter’s Home phase sites in New York (ca. A.D. 750 - 1000).

In New Jersey where Algonkian peoples lived, maskettes may represent Mesingw, the Living Solid Face, Masked Being, or Keeper of the Game or a way to tap into the Great Spirit, Kishelemukong (Lenik 2002:210-211). In Iroquoian areas, they may have been representative of Iroquois False Face masks (Fenton 1987:69; Edward Lenik, personal communication 2016) or more specifically the mythical stone giant Ganusquah, the founder of the Society of Faces (Gramly 1999). We are unlikely to ever know the specific meaning of the Griswold maskettes, but it seems reasonable that characteristics of both stones when found suggested faces. These faces were likely then enhanced, imbuing them with further power (orenda).

The greater part of a two-hole slate gorget was recovered from Level 1 of C35S 5E (Figure 27). Each hole was drilled from both sides, resulting in holes that are biconical. While signs of wear are sometimes visible in gorget holes, they are not observable in this specimen. The break incorporates one of the holes. It is not known whether this specimen broke from usage, accidental damage, or was deliberately snapped (“killed”). At the Pig Point site (Adena) in Maryland, slate gorgets appear to have been deliberately “killed,” being represented by 27 pieces and numerous small fragments (Melton and Luckenbach 2013). Melton and Luckenbach (2013) note that incising of gorget fragments after the gorget broke may have been an additional stage in the ritual “killing” process. There is a large flake missing from one side of the gorget from Griswold and what may be a pot lid on the opposite side. This suggests
that the gorget may have been burned. There are also some short, faint, random incisions with some cross-hatching. These occur both on the original surface and on the fractured and pot lid surfaces, suggesting they postdate other damage to the gorget. Whether these incisions were deliberate or the result of post-depositional damage remains uncertain. While many functions have been advanced for two hole gorgets, their use remains unknown.

A thin, circular stone disk 42 mm in diameter with a thickness of 7 mm and weighing 6 g. was recovered from C45S 5W, Level 1 (Figures 28). This appears similar to circular ceramic pieces that are common on Iroquois sites (Williamson 1990:229) and that appear with the Jack’s Reef horizon in Illinois (Evans and Fortier 2013:212). These are commonly believed to be used as gaming pieces. Culin (1975:113) illustrates Seneca bone dice that were blacked on one side that are also reminiscent of this stone disk.

Fauna and Flora

There was little bone recovered. While fish bone would be expected, it is often poorly preserved. The soil was acidic, the pH ranging from 5.2 - 5.6.

Flotation of soil samples from features resulted in the recovery of carbonized seeds. During the early 1970s, John Paxon of the Biology Department at Edinboro examined these and identified the following genera: *Galium* (bedstraw), *Vitus* (grape), *Prunus* (cherry) and *Rhus* (sumac). He also identified one possible example of *Crataegus* (hawthorne). All these plants have medicinal properties and *Rhus* and *Galium* additionally have use as dyes (Herrick 1995; Rudy Fecteau, Archaeobotanical Consultant, R. D. Fecteau and Associates, personal communication 2016). The fruits of these plants are eatable and ripen between mid-summer and fall arguing for an occupation during this period. The shoots and young leaves of *Vitis*, *Rhus*, and *Galium* can be eaten as can the young leaves of *Crataegus*. The inner bark of *Rhus* and *Prunus serotina* was sometimes smoked with tobacco. The cherry bark was said to improve the flavor (Rutsch 1973:31-32; Yarnell 1964:153). Both *Rhus* and *Crataegus* grow well in disturbed areas. Rossen (1992:196-197) suggests that *Rhus* may have been protected or even cultivated.
Features

No human remains were encountered at any of the excavations at Griswold, nor was any feature recognized as a possible grave. This is similar to the situation to the east and north where burials within habitation areas are uncommon on proto-Allegheny Iroquois sites and on Early Ontario Iroquoian villages in southwestern Ontario (Howard et al. 2008:34).

Johnson and Lantz (n.d.) report that the Gannon University field school recovered an 18 m long portion of a stockade along the northwest corner of the site associated with a ca. A.D. 13th century component (later Early Ontario Iroquois stage). The Eriez chapter uncovered post molds of a 9.2 m section of a longhouse wall. The precise spatial and temporal relationship between these two features and the Edinboro excavations is unknown.

The Edinboro excavations revealed scattered post molds, but they do not appear to reflect a house or palisade. Eight post molds form a J-shaped pattern in C15S 20W. Three post molds adjacent to Feature 5, two post molds adjacent to Feature 11, and two adjacent to Feature 9 might reflect part of a covering structure or fence for these features, but the lack of additional post molds renders this a very tentative suggestion. Twelve pits were recorded, but one deep, straight sided pit in C60S 10E and C60S 15E was found to have modern glass in the bottom and is not considered further here. The locations of post molds and pits are shown in Figures 6 and 7.

Two pits, Feature 1 and Feature 7, were recovered from the Primary area. Feature 1 (45S 5W, 50S 5W, 47.5S 0W) was 3 ft. x 7.5 ft. with a depth of 1.7 ft. East wall profiles of 45S 5W and 50S 5W indicate a gently sloping bowl-shaped profile. The feature contained a large number of sherds including a Glen Meyer Linear Stamped rim sherd and a vessel classified as Ripley Plain represented by 17 rim sherds. There was also a pipe stem with parallel cord wrapped stick impressions. Notes indicate a large quantity of fire-altered rock. The upper levels of the units containing Feature 1 yielded a nutting stone (cat. no. 164), a stone effigy face (cat. no. 31), a carbonized sumac seed, and many potsherds. The ceramic types of Glen Meyer Linear Stamped and Ripley Plain suggest this feature was filled in later rather than earlier in the site’s occupation.

Feature 7 (60S 5W, 65S 5W) was 3.7 ft. (N - S) and extended an unknown distance to the west into unexcavated units. The excavated portion was shallow with a depth of approximately .6 ft. Sherds representing a vessel of Ripley Plain were recovered from this feature (3 and 4 conjoined sherds respectively). As with Feature 1, the Ripley Plain vessel suggests a later, rather than earlier date for this feature.

Nine features were excavated in Area C. Feature 2 (C45S 0W) measured 2.5 ft. by 2 ft. A profile was not drawn, but eight arbitrary levels were excavated in the feature area, implying a minimum depth of 1.4 ft. A drill was recovered from Level 3 and a pipe stem (cat. no. 115) with a smooth exterior was recovered from Level 6.

Feature 2a (45S 5E, 50S 5E, 45S 10E, 50S 10E) measured 6 ft. by 3.7 ft. with a depth of 2 ft. It appeared in the profile of the east wall of C45S 5E as a straight-sided feature, but in the south wall profile of the same unit it appeared as more shallow and with a gently sloping side. This unit was recorded as Feature 2 in the 1974 notes, but is changed here to avoid confusion with Feature 2 (above, C45S 0W) excavated in 1973. Feature 2a contained a large quantity of material including three Levanna points, three point fragments, three drills, a pipe stem fragment (cat. no. 406), and a charred grape seed. It was excavated in arbitrary levels. Two radiocarbon dates were secured from Level 4 of this feature. A number of cord-wrapped stick impressed sherds were also recovered from Level 4. A two-hole gorget was found in Level 1 of C45S 5E and was possibly also associated with this feature. A rim sherd typed as Stafford Stamped and a Mahoning Collared vessel represented by two separate rim sherds were associated this feature. A sherd of Ripley Cord Marked was recovered from Level 4 of C50S 5E and likely came from this feature, since it covered three-fourths of the unit. A rim sherd of Clemson Island came from Level 4 of 45S 10E and may be associated with this feature as well. The ceramics and radiocarbon dates suggest an earlier rather than later date.

Feature 4 (C60S 5E, C65S 5E, C60S 10E, C65S 10E) measured 4 ft. by 3 ft. with a minimum depth of 2 ft. The west wall profile of C65S 10E indicates a basin-shaped feature with four separate dark bands of soil separated by lighter yellow sand, suggesting the pit was stratified. Two Levanna points and a drill
were recovered from the feature. Levels 1 and 2 of the four units yielded three Levanna points, a Madison point, and two drills. These artifacts were possibly associated with Feature 4. These units also contained numerous potsherds. Level 4 of 65S 10E contained a smooth pipe bowl fragment and a rim sherd typed as Clemson Island.

Feature 5 (C5S 10W, C10S 10W, C10S 5W) was 4 ft. wide by at least 6 ft. in width with a depth of 1.3 ft. F5 extended into C5S 5W which was not excavated. It was basin-shaped in profile (W to E). It contained many sherds including a Niagara Collared rim and a fragment of a smooth pipe bowl. This feature was likely filled in later in the occupation.

Feature 6 (C30S 10W, C35S 10W, C30S 5W, C35S 5W) measured 4.5 ft. by 3 ft. with a depth of 1.9 ft. Profiled in the east and south walls of C30S 10W it appeared as a dark, irregular lens of soil. This feature contained many sherds though no rim sherds, much chert debris, and charcoal.

Feature 8 (C20S 10W) was a small pit 1 ft. by 1 ft. with a depth of 1.7 ft. It was u-shaped in cross section (NE to SW).

Feature 9 (C25S 10W, C25S 5W) measured 3.3 ft. by 2 ft. and was 1 ft. in depth. Profiled south to north at a depth of .28 ft. it was bowl shaped with a rounded bottom. This feature contained a drill, much chert debris, and numerous sherds. A vessel represented by 24 sherds was typed as Ripley/Woodsman Corded. A rim sherd classified as Princess Point was also recovered from this feature.

Feature 11 (C10S 5W) measured 3 ft. by 3 ft. with a minimum depth of .6 ft. The unit record refers to this as a possible feature characterized by darker soil that was sandier than the surrounding rocky soil.

Feature 17 (C45S 5W) measured 2 ft. by 2 ft. The depth was not recorded. It contained a Glen Meyer Oblique ceramic vessel, numerous rim sherds representing a Ripley Corded vessel, and a rim sherd representing a Carpenter Brook Cord-on-Cord vessel. A pipe bowl fragment (cat. no. 116) with two horizontal rows of punctates was also recovered.

Artifact and Feature Distribution Summary

In the Primary Area, as one moves closer to the ravine, the amount of material drops off. No hillside midden or palisade was found along the edge of the ravine.

Area C produced the most material and was near the area where the Eriez Chapter dug in 1962. According to Frank Swartz, the Eriez Chapter also excavated an area roughly between Areas B and C and turned up little. All 10 drills were from Area C as were 13 of the 14 Levanna points or point fragments. Seventeen out of 18 pipe fragments were also from Area C, the other pipe fragment being found in Feature 1 in the Primary Area. Area C had the highest densities of sherds and debitage, but the intra-area distribution of these artifact types differed. The highest density of ceramics was in the vicinity of Feature 9 in the western portion of Area C, while the highest density of debitage was encountered in the northeastern section near Feature 2a (cf. Figures 6, 41). Whether this offset indicates functionally different areas or gaps in the data remains to be determined.

Material was occasionally encountered in the intermediate area between the Primary Area and Area C, though it was extremely light, suggesting that the Primary Area and Area C constituted two distinct loci of occupation. Stanley Lantz who observed the Eriez Chapter excavations in the 1960s, Edinboro’s excavation in the early 1970s and Gannon’s excavation in the early 1990s believes that there were three artifact loci within the Griswold site (Johnson and Lantz n.d.). Since the entire site was not systematically tested, the possibility remains that additional loci existed.

Traditional ceramic types found together in features were as follows:

- Feature 1: Glen Meyer Linear Stamped and Ripley Plain
- Feature 2a: Clemson Island, Mahoning Collared, Ripley Cord Marked, Stafford Stamped
- Feature 9: Princess Point, Ripley Corded
- Feature 17: Carpenter Brook Cord-on-Cord, Glen Meyer Oblique, Ripley Corded

Traditional ceramic types that were associated with one another within a unit at depths greater than half a foot (Level 4 or greater) were as follows:
The Griswold Site

C20S 0W: Clemson Island (3 vessels, L8, L13, and depth of 3.3 ft.), Niagara Collared, depth of 3.3 ft., Princess Point, depth of 3.3 ft., Ripley Corded, L6
C20S 5E: Carpenter Brook Cord-on-Cord, L.10; Princess Point, L15
C25S 0W: Mahoning Collared, L.11, L.16, depth 3.8 ft.; Ripley Corded (3 vessels, L.11 and L.16, L.16, and L.16); Ripley Plain (2 vessels, L.14, L.16)
C50S 0W: Clemson Island, L4; Princess Point, L4

While it is possible that some of the above associations were the result of mixing, the simplest explanation is that the deposition of these ceramics was roughly contemporaneous.

CHRONOLOGY

Table 2 contains data pertaining to the five radiocarbon dates obtained from Griswold. Two of the dates resulted from the Edinboro excavations and were obtained from charcoal samples taken from Feature 2a (C45S 5E and C50S 5E) at a depth of between 18 - 24 cm. The charcoal was picked up with tweezers and stored in aluminum foil in which it remained until being submitted for dating. The samples were associated with cord wrapped stick impressed body sherds and produced dates consistent with a Middle Woodland occupation. Excavations by the Eriez Chapter produced the remaining three samples which were submitted by Gannon University (Johnson and Lantz n.d.). The dates indicate an occupation spanning the beginning to middle of the Late Woodland.

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<td>0.989</td>
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¹CALIB Radio Carbon Calibration Program Ver. 7.1 (Stuiver et al. 2017)
Unfortunately, the ceramics from the adjacent Skyway site have been lost. Stanley Lantz (personal communication 2016) described the pottery as similar to that found on Griswold. John Witthoft described it as early Late Woodland. Witthoft’s five major categories were: Mahoning Cord Marked, Mahoning Ware with Owascoid decorative motifs, Owascoid, Clemson Island Fabric Impressed, and Ripley-like forms with punctates.

Both the ceramic vessels and pipes from Edinboro’s excavations suggest occupation spanning the late Middle Woodland through the early Late Woodland, though it should be noted that the timing of these temporal periods varies depending on location (Gartley et al. 2016; McConaughy 2015). For the Erie Plain of northwest Pennsylvania, Johnson and Lantz (n.d.) date the Middle to Late Woodland transition to ca. A.D. 800 - 1000 and equate it with the Princess Point horizon. In Ontario, ceramics classified as Princess Point may date ca. A.D. 500 - 1000 (Smith and Crawford 1997:23-24). Cord impressed, deeply punctated Princess Point ceramics are broadly similar to those of the Clemson Island culture in Pennsylvania ca. A.D. 750 - 1250 (Raber 2014:3), though James Herbstritt (personal communication 2016) would end Clemson Island by around A.D. 1050 - 1075 and Rieth (2002:136) dates Clemson Island as between A.D. 700 and 1300. Ceramics classified as related to the early Ontario Iroquoian Glen Meyer culture in Ontario may date ca. A.D.900/1000 – 1300 and are broadly contemporaneous with the Owasco culture in New York. As has been noted by a number of researchers, the sequence of archaeological taxa in Ontario, New York, and Pennsylvania divide what may be more accurately viewed as a continuum.

Chesser Notched, Raccoon Notched (Jack’s Reef cluster), Levanna, and Madison point types were recovered from Griswold, but there is insufficient data from the site to address their temporal relationship. In the past, most would have argued for a sequential appearance of these forms with Chesser Notched as the earliest, followed by Jack’s Reef, Levanna, and then Madison points. According to Prufer and Shane (1970:84) Chesser Notched points appear around A.D. 300 during the terminal Middle Woodland but are most common during the early Late Woodland. McConauhgy (2013:34, 2015:31) dates Raccoon Notched points to A.D. 500 - 830. Rieth (2013:91) notes that current research in New York dates Jack’s Reef/Raccoon Notched points from the first to the tenth centuries A.D., though the greatest number of points date A.D. 600 – 900. Levanna points appear around A.D. 700 and become common after A.D. 900, being gradually replaced by Madison points around A.D. 1350 (Ritchie 1971:31).

Dates for the time span of these point types overlap, and this is reinforced by evidence from many sites in the Northeast, Midwest, and Mid-Atlantic where these different point types and others are found together. Jack’s Reef points are found in association with Fox Creek and Steubenville Lanceolate dart points as well as Levanna arrow points in New York (Rieth 2013:94, 99). George (1992:70) notes the association of Chesser Notched and Raccoon Notched in Pennsylvania and Lantz (1989:58) notes the association of Chesser Notched and triangular points in West Virginia. In the 2013 Archaeology of Eastern North America dealing with Jack’s Reef points, authors note the co-occurrence of Jack’s Reef/Raccoon Notched points with other points, especially triangular arrow points (see for example, Lowery 2013:6; McConaughy 2013:43). Gartley et al. (2016:13) note the regular association of Jack’s Reef Corner Notched and Side Notched with Levanna triangular points in eastern Ohio and western Pennsylvania. Therefore, the occurrence of various point types is not as reliable a temporal indicator as was once thought. Chesser Notched, Jack’s Reef (including Raccoon Notched) and Levanna points overlap and do not replace one another in a rigid temporal sequence (Rieth 2013:96).

Maskettes appear in the archaeological record in the Northeast toward the end of the Middle Woodland and beginning of the Late Woodland (Fenton 1987:69; Lenik 2002:101; Redmond 2013:115). However, many ornamental ground stone objects like gorgets decrease during the Late Woodland (Fox 1990:172). The presence of two stone maskettes and a gorget would not be out of place temporally in a site transitional between the Middle and Late Woodland.

DISCUSSION

Johnson and Lantz (n.d.) note the similarity of ceramics from Late Woodland sites along the Lake Erie Plain to those of Wright's (1966) Ontario Iroquois tradition. They describe both Griswold and the adjacent Skyway site as "...multi-component with ... early Princess Point ceramics and classic Glen Meyer
ceramics." They classify the 208 rim sherds from the Eriez Chapter excavations in the early 1960s as 40 percent Princess Point and 13 percent as a variety of Early Ontario Iroquois types, including Glen Meyer Necked, Glen Meyer Linear Stamped, Goessens Punctate, Ontario Oblique, Stafford Stamped, and Glen Meyer Oblique. They classify 44 percent as Woodsman Corded. While this is an Early Ontario Iroquois type, they suggest the presence of interior punctates with exterior bosses on several indicate a Middle-Late Woodland transition for these vessels.

Our typological attributions for the Edinboro material are broadly similar to those of Johnson and Lantz, though we used more typological categories and defined some categories in a slightly different manner. In our analysis rims with punctates and cord marked surface are classified as Clemson Island rather than Woodsman Corded, while rims with corded surfaces without punctates are classified as Ripley-Woodsman Corded. Clemson Island was not a category Johnson and Lantz considered but if the 13 percent of vessels we classified as Clemson Island is added to the 14 percent we classified as Princess Point we have 27 percent versus their 40 percent. Fifteen percent of our types are considered to be Early Ontario Iroquois as compared to their 13 percent. We classified 23 percent as Ripley–Woodsman Corded compared with their 44 percent for Woodsman Corded. If we add Carpenter Brook Cord-on-Cord (6 percent) and Owasco Corded Horizontal (2 percent) to our Ripley–Woodsman Corded figure, we have 31 percent. Other minority types which we identified include Mahoning Collared (10 percent) and Ripley Plain (7 percent). Twelve percent of the vessels from the Edinboro excavations exhibited the attribute of a smoothed or plain exterior.

Boulanger and Hudson (2012) argue that vessels with smooth exteriors have poorer gripability than ceramics with textured surfaces. Eighty-four percent of the vessels from the Edinboro excavations at Griswold have textured surfaces (cord marked, cord wrapped stick impressed, or punctated). The remaining vessels are either plain or have only incising. While 81 percent of vessel interiors are plain, 19 percent have textured surfaces near the lip. This interior texturing also could have served to increase gripability. Fourteen percent of the vessels have external punctates with internal bossing while 10 percent of vessels have internal punctates with external bosses. We suggest that bossing provides additional gripability. Whether deep punctates contributed to structural weakness of the vessel could be determined through experimental archaeology.

We see the cord impressed, cord marked, and punctated ceramics at Griswold as broadly similar to ceramics from surrounding areas including the Hunter’s Home, Clemson Island, Princess Point, Owasco, and Glen Meyer archaeological constructs. Cord-decorated ceramics form a broad horizon in the late first millennium from the Northeast through the eastern Midwest and lower Great Lakes (Gartley et al. 2016). Lantz (n.d.b) has noted the temporal overlap of Glen Meyer ceramic types with Princess Point style pottery on sites of the Upper Allegheny dating between A. D. 1000 - 1100 (early Vanatta phase sites of the Allegheny Erie tradition). However, Bill Fox (personal communication 2016) examined photos of rim sherds from Edinboro's excavations and noted greater similarities to ceramics from the western end of Lake Erie than the north shore.

McConaughy (2015:36) notes that few smoking pipes have been recovered from Late Woodland sites in western Pennsylvania, a characteristic of Princess Point sites in Ontario as well (Keenlyside 1978:118-119). The recovery of pipe fragments representing 18 specimens at Griswold is an anomaly that remains to be explained.

Chesser Notched points were likely dart points, whereas the Raccoon Notched/Jack’s Reef, Levanna, and Madison points were likely arrow points (Seeman 1992; Shott 1993). Shott (1993) argues that hunting with a bow and arrow is not necessarily more efficient than hunting with an atlatl and suggests that the reason for the adoption of the bow and arrow remains to be determined. Seeman (1992:42) suggests the increased maintenance costs and production challenges that come with bow and arrow use are reasons for the gradual adoption of the bow and arrow and a temporal overlap of dart points and arrow points. Evans and Fortier (2013:195) suggest that both the atlatl and the bow and arrow were used together for up to 250 years in Illinois.

While the greater weight of dart points and their shaft give these points greater penetrating power, the greater range, accuracy, and speed with which the bow and arrow delivered the stone arrow point to its target gave the latter an advantage in warfare. There was an evolution of progressively smaller and
lighter bifaces in Eastern North America as exemplified by the shift from Levanna to Madison points (Engelbrecht 2015; Engelbrecht and Jamieson 2016:88). Madison points are narrower and thinner than Levanna points; the narrower angle of the point tip aided penetration and the reduced width rendered them more likely to pass through the ribs of the target (Beber et al. 2017). The length to width ratio and thinness makes Madison points more likely than Levanna points to shatter within an enemy, increasing their ultimate lethality (Engelbrecht 2015).

There was a sequential development from side and corner notched arrow points to equilateral triangular Levanna points (Halsey and Brashler 2013:157; Redmond 2013:113). Since earlier dart points were generally notched to facilitate hafting, it is reasonable to expect that early arrow points would also be notched. While Jack’s Reef points likely appeared before Levanna points, Levanna and Jack’s Reef points occur together on many sites across a broad area, suggesting contemporaneity of both arrow point styles. The distribution and temporal occurrence of these Jack’s Reef points form a horizon, initially described by Seeman (1992). Where Jack’s Reef points are found with Levanna and other points, they tend to be in the minority.

The co-occurrence of Jack’s Reef with Levanna points suggests that Jack’s Reef points were used for a specialized function (McConaughy 2013:43) though a specific function has not been suggested. Engelbrecht (2014) argues that unnotched triangular points have the advantage of detaching from the arrow shaft once embedded in the target, making it easier to recover the shaft when hunting and more difficult for an enemy to extract the arrow. Jack’s Reef/Raccoon Notched points were unlikely to have detached from an arrow shaft or fore shaft since the notches are assumed to have been used in securing the arrow point to the shaft or fore shaft. We ask in what situation this would have been advantageous and hypothesize that bow hunting of fish, beaver, muskrat, sea mammals, or waterfowl were such situations. Cleland (1982:773-774) argues that during the Middle Woodland, larger fish were more often harpooned than speared. The detachable harpoon head had a line attached, resulting in greater success in recovering the fish. We argue that bow hunting of fish using a line attached to the shaft or fore shaft would have provided greater success than the use of harpoons.

Numerous groups in North America shot fish with a bow and arrow (Rostlund 1952:191, 298). Captain John Smith (1624:31-32) noted that native peoples made frequent use of their bow and arrows for fishing, hunting, and war and that a line was attached to the arrows shot at fish in rivers. In the 1670s, Jacques Bruyas observed the Mohawk taking fish in an enclosure using spears, arrows and clubs (Beauchamp 1895:220). In the Southeast, DuPratz observed Natchez bow hunting of fish (Swanton 1911:58-59). Hudson (1976:284) describes the method of “impaling them with arrows with lines attached to wooden floats which kept the fish from escaping and which exhausted them.” On Cape Cod, the Mashpee bow hunted or clubbed fish; fish were attracted to a pine torch fastened to the prow of their sea-going dugout (Prince 1907:495). By the early Contact period, notched arrow points were absent from much of the Northeast (Christenson 1997) so points of bone or antler may have been used in bow hunting fish instead. These do not sink the way stone points do (Ellis 1997).

As noted above, Volume 41 of the Archaeology of Eastern North America contains numerous references to Jack’s Reef/Raccoon Notched points recovered from sites near water or wetlands. Keenlyside (1978) notes numerous Jack’s Reef points at the 11H8a site on Point Pelee (Lake Erie) where both fish and waterfowl were likely important resources. Both Goodby (2013) and Lowery (2013) describe a distinct coastal Jack’s Reef adaptation. The type site for Jack’s Reef points is located near shallows on the Seneca River in New York where eels and salmon spawn (Rieth 2013:93). A side notched point related to the Jack’s Reef type from the Puncheon Run site along the St. Jones River in Delaware tested positive for gizzard shad antiserum (LeeDecker et al. 2005a:261, 2005b:291; Puseman and Cummings 2005:J-4), suggesting it was used for shooting shad, though its possible use in the processing of shad cannot be ruled out. Since the results of blood antiserum analyses have been criticized in a number of journals, these results should be regarded as suggestive rather than conclusive. Nonetheless, we suggest bow hunting of spawning fish in Hagenlocker Run using Raccoon Notched arrow points was a possibility. Distributional studies of points of the Jack’s Reef cluster with respect to fishing locations should be undertaken along with residue analysis. If notched arrow points were used for shooting fish, it is not known whether or not they were used along with harpoons. Unilaterally barbed bone and antler
harpoons with line holes persisted into the Contact period (Jamieson 2016). An examination of the spatial and temporal distribution of notched arrow points versus harpoons might prove instructive.

Cleland (1982) describes the development of the inland shore fishery in the northern Great Lakes. While Lake Erie is the southermmost of the Great Lakes, we propose that his description provides a model for understanding occupation of the Griswold site. During the Archaic, people camped near the shores of the Great Lakes to take advantage of spring spawning runs. This was a time of year when game lacked significant stores of fat, critical for a healthy diet. Many plant foods are unavailable in the early spring. Large fish like sturgeon were likely speared. Seine net technology developed during the first millennium B.C. leading to more efficient harvesting of fish, though requiring group labor in manufacturing the seine net and moving it through the water. This more efficient fishing method and need for group cooperation led to the appearance of small, warm season villages during the Middle Woodland in the northern Great Lakes.

By ca. A.D. 800, the abundance of whitefish and lake trout in sites along the northern Great Lakes indicates the harvesting of these fall spawning fish that gather in offshore shoals. These fish could have been exploited by use of a gill net, deeply submerged and kept vertical by means of netsinkers and floats. These fish are typically taken in late fall after the onset of freezing weather, the most productive period lasting from two weeks to a month. Fall spawning occurred during a narrower window than spring spawning and storms would have further narrowed the time at which this offshore fishery could operate. Cleland (1982) notes that whitefish and lake trout are nutritionally superior to most spring spawning species. While going after spring spawning fish is a low risk activity, venturing out on the Great Lakes in the late fall entails both greater risk and greater potential returns. It is likely that men did the actual fishing, but cooperation between women in processing the catch by smoking and then freezing it for storage would have been critical. In the northern Great Lakes, Late Woodland sites along the shores increase in size and duration.

The large number of drills recovered from the site (N = 21) is anomalous. As many have observed, stone tool shape does not always equate with function. However, following Lewenstein (1987), it seems likely that tools described as drills generally had a perforating function, though secondary functions of scraping, graving, and cutting cannot be ruled out without further study. Drills could have been used in manufacturing a variety of objects, from two-hole gorgets such as the one recovered from Griswold to bark canoes. For bark canoes, if a single large bark sheet were not available, bark sheets would need to have been pierced with an awl or drill and then sewn together and sealed with pitch (Vennum n.d.). Drills could also have been used to make line holes in harpoons or point foreshafts.

While evidence of maize phytoliths in the Northeast is as early as 400 - 200 B.C. (Gates St-Pierre and Thompson 2015; Hart 2011:102) and maize at Meadowcroft in southwest Pennsylvania is dated to the fourth century B.C. (Adovasio et al. 1977:81) maize does not appear to have played a significant role in the diet this early. Physical remains of maize were recovered on the floodplain of the Grand River in Ontario on Princess Point sites dating to the early sixth century A.D. (Smith and Crawford 1997). In Pennsylvania maize has been recovered from early Clemson Island sites, ca. A.D. 800, though the maize itself has not been dated (Hart and Sidell 1996:15-17; McConaughy 2013:39). In northeastern Ohio, maize is rarely recovered from Jack’s Reef horizon sites of the 9th and 10th centuries A.D. and isotopic analysis of human skeletal material suggests that there was little consumption of maize (Redmond 2013:137). However, strontium analysis of human skeletal material from a tenth century ossuary in the middle Susquehanna River indicates that maize constituted approximately 50 percent of the diet (Jim Herbstritt, personal communication 2016).

After approximately A.D. 900, the warmer and wetter conditions of the Neo-Atlantic Climatic Episode facilitated the intensification of horticulture in the Northeast. Between approximately A.D. 850 and 1050 numerous Clemson Island habitations occur along the West Branch of the Susquehanna River suggesting farming (Jim Herbstritt, personal communication 2016). Early and Middle Iroquoians in southern Ontario evidence a strong preference for sandy soils for their base camps (Williamson 1990:306; Wright 1966:24), perhaps reflecting the increased importance of horticulture at this time. On the Lake Erie Plain, maize was recovered from the Eastwall site in a context dating ca. A.D. 1000 - 1280 (Brose et al. 1978) and the Sceiford site in Pennsylvania, ca. A.D. 900 – 1100 (Engelbrecht and Sullivan 1996:20).
Like Eastwall, Sceiford, and Early and Middle Ontario Iroquoian sites to the north, Griswold was located on sandy soil. While evidence of maize horticulture would be expected at Griswold, it has not yet been recovered.

Widmer and Webster (1981) developed a predictive model for site locations on the Lake Erie Plain between Silver Creek in Chautauqua County, New York and Mill Creek in Erie County, Pennsylvania. The location of Griswold conforms to the typical site location predicted by their model. The site is on a stream which has down cut through the lake bluff providing access to the lake shore. The soil, Conotton sandy loam, is suitable for nut trees as well as horticulture.

After the beginning of the second millennium A.D., there is a general trend for populations in western Pennsylvania and areas to the west and northeast to move away from good fishing locations and canoe transportation routes to upland fortified settlements (Carr and Moeller 2015:175; Dincauze and Hasenstab 1989:79; Hasenstab 1996; Stothers and Abel 2002:88-89; Tuck 1978:325-326). The apparent lack of occupation at Griswold after the thirteenth century fits this pattern. It is not until the late sixteenth and seventeenth centuries with the occupation of the Ripley site in southwestern New York and the 28th Street site in Erie that Iroquoian style villages are found on the lake plain.

SUMMARY

The radiocarbon dates from Griswold span roughly a millennium, from the third to the thirteenth centuries A.D. The diversity of ceramic vessels and projectile point types support the idea that the site was multi-component. Occupation was distributed over a wide area with the Edinboro excavations focusing on a concentration of material in Area C. Material from this area yielded artifacts characteristic of both the Middle and Late Woodland with no clear stratigraphic separation. It is increasingly realized that many ceramic and projectile point types were in use for longer time spans than previously realized, so it is possible that there was temporal overlap between earlier and later types at Griswold. The majority of material was found within 6 inches of the surface, so it is also possible that reoccupation led to mixing of occupational debris.

Ceramics from any site offer a unique combination of attributes and types. The ceramics from Griswold also exhibit broad similarities with those from other areas. Earlier ceramics bear resemblance to Princess Point and Clemson Island. Later ceramics are reminiscent of the Glen Meyer branch of the Ontario Iroquois Tradition and the Owasco of New York. The Chesser Notched, Jack’s Reef/Raccoon Notched, Levanna, and Madison projectile points found at Griswold are commonly found over a wide area of the Midwest and Northeast. Drawing on the gendered division of labor among the Iroquois as a model (Sagard 1968), similarities in female-manufactured ceramics and male-manufactured projectile points and pipes to those in other areas imply both mobility and inter-group contact for both males and females. Following Howard et al. (2008:49-50), this pattern reflects an interaction sphere rather than a taxonomic unit equating with a geographically defined culture.

Seasonal fluctuations in group size appears to have been a common pattern for Middle Woodland and early Late Woodland settlements in the Northeast. Group composition may also have changed from year to year which could have facilitated the spread of pottery and point styles as well as technological innovations over a broad region. It is believed that families came together in the late winter or early spring to form multifamily groups, especially along waterways or lakes. In some areas, families would have remained together during the summer and fall before dispersing in winter (Knapp 2009:101). The discovery of different ceramic styles in features at Griswold may reflect differing backgrounds of members of the social group. The ethnohistoric literature suggests that smoking was both a social and political activity among peoples in the Northeast (Springer 1981) and the many pipe remains at Griswold may reflect behavior fostering group cohesion.

Lake Erie provides a natural transportation route facilitating canoe movement along the lake shore. Historically, the Lake Shore Path followed the south shore of Lake Erie (Wallace 1965:85-88), providing a parallel land route. In the eighteenth century, the Presque Isle portage of 13 miles from the mouth of Mill Creek in Erie to French Creek in Waterford was part of a strategic north-south route (Wallace 1965:140; Kolb 1981:4-26). The location of the seventeenth century 28th Street site in Erie along this portage seems more than coincidence, implying a pre-eighteenth century use of this route. Presque Isle
The Griswold Site was farther to the west when Griswold was occupied. It is therefore possible that an earlier western variant of the Presque Isle portage was in use when Griswold was occupied. Along with the Lake Shore Path and a parallel canoe route, these routes would have facilitated inter-group contact.

In addition to the data presented, we present a model for change over time in the occupation of the Griswold site. Following Cleland (1982), we expect the earliest components at Griswold to be those of people who took advantage of spring spawning on Hagenlocker Run. We hypothesize that after the introduction of the bow and arrow some of these fish were taken by bow hunters with Jack's Reef/Raccoon Notched tipped arrows. After the development of gill net technology ca. A.D. 800, we expect people in larger settlements at Griswold harvested fall spawning fish. As maize farming became more important, we would expect spring through fall occupation, or possibly year round occupation of the site by at least some families. With increasingly sophisticated fishing techniques and greater reliance on stored crops, native peoples had the potential to remain at the Griswold site for longer periods. However, changes in regional interaction around the thirteenth century A.D. saw the abandonment of most long term Lake Plain settlements in favor of fortified inland locations. While no net sinkers or faunal remains were recovered from Edinboro’s excavation at Griswold and the floral remains recovered were limited, the available data fit the above model.

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DATA AVAILABILITY STATEMENT
All data and records are curated in the Anthropology Laboratory at Edinboro University, Edinboro, Pennsylvania. Images of artifacts and records have been uploaded to the Digital Archaeological Record (tDAR) under the Griswold Project, tDAR id 426773.

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