THE BORESMA SITE:

A MIDDLE WOODLAND BASECAMP IN THE THAMES RIVER VALLEY

By

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Abstract

In this report I discuss the excavation and analysis of the Boresma site (AfHi-121), a large Middle Woodland occupation located on the Thames River floodplain near Delaware Ontario. Rather than a spring/early summer macro-band fishing station, the Boresma site appears to have functioned as a base camp, occupied on and off throughout the year, providing the focal point for a local group's movements.

The location of the Boresma site along the proposed boundary between the Couture and Saugeen complexes also allows some observations concerning the utility of these large culture complex labels. At present, labels such as Saugeen have come to be used as rubrics for real sociopolitical groups. I suggest that they should be restricted to use as labels for areas where similar patterns of settlement and subsistence can be demonstrated. On this basis I present revised margins for the Saugeen complex, and propose a new term, the Middle Thames River complex, for the Middle Woodland occupations along the middle reaches of the Thames drainage.

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CHAPTER 1

Only along the southeast shore of Lake Huron is the nature of Middle Woodland occupation in Southwestern Ontario well understood. Recent excavation at the Boresma site (AfHi-121), a large Middle Woodland site located in the Thames River Valley in Middlesex County, presents the first major opportunity for unraveling chronological and settlement/subsistence problems for this poorly documented region. Being located on a purported archaeological frontier between the Saugeen and Western Basin Middle Woodland cultures (Wright and Anderson 1963; Finlayson, 1977; Timmins 1989), the site also provides an opportunity to address the nature of societal boundaries and material culture patterning in preagricultural societies.

In this report I approach these problems largely on the basis of my 1989 archaeological investigations at the Boresma site. Archaeologists have long recognized that there was a significant Middle Woodland presence along the Thames, but major research efforts in the southwestern part of the province have been confined to the Bruce Peninsula (Finlayson 1977; Wright and Anderson 1963). While recently there have been a number of salvage excavations at Middle Woodland occupations in the Thames drainage basin, only the Sibelius site (Fox 1982) and Butler's Woods (Timmins 1989) mitigations have been reported thoroughly, and comparative material is still very much at a premium.

The Southwestern Ontario Middle Woodland: Present Perspectives and Problems

Boundaries

The Middle Woodland occupations of southwestern Ontario have been divided into two major culture complexes. The Western Basin culture, or what more recently has been called the "Couture Complex" (Spence, Pihl, and Murphy, in press) occupies the extreme southwestern portion of the province, while it has been proposed that the Saugeen culture extends south from the Bruce Peninsula to the Lake Erie shore, and east to the Grand River valley. While there is some controversy as to whether sites in the Grand drainage are best designated Point Peninsula or Saugeen (Finlayson 1977; Stothers 1976; Stothers, Pratt, and Shane 1979), of concern to my research is the equally amorphous western Saugeen frontier.

When the Saugeen culture was first defined as an entity separate from Point Peninsula, the exact location and nature of its western boundary was poorly understood (Wright and Anderson 1963). On the basis of preliminary surveys conducted by Lee (1951,1952), Wright and Anderson assumed that there might be a boundary-like disjuncture in the material record somewhere west of London. The assignment of the western boundary of the Saugeen focus to the London area was admittedly provisional (Wright and Anderson 1963:50), based more on analytic convenience and a belief that culture complexes should have boundaries, than on any convincing archaeological data. While no new evidence has been brought forward, this hypothetical boundary has become further entrenched, with researchers describing Middle Woodland sites in this area as either "Western Basin" or "Saugeen" (See:

Fox 1982; Pihl 1983; Finlayson 1977; Timmins 1989).

Two problems are manifest in these attempts to assign culture complex labels. The first difficulty arises in relation to the small size of the ceramic samples from these sites. Even if it is assumed that there is a real boundary between the Saugeen and Couture complexes, when the Boresma site materials are excluded, the largest collection of ceramics from the middle Thames area is eight rimsherd vessels from the Brodie site; the Timber Drive site has been designated as Western Basin solely on the basis of one vessel (Pihl 1983).

The second, and even more serious problem is the acceptance of the Saugeen/Western Basin boundary prior to an empirical demonstration of a border-like discontinuity in the material record. Fieldwork in this area is in far too early a stage for archaeologists to take the existence of a boundary as anything but a problem for further investigation. To do otherwise inevitably leads to the formation of tautological research problems and conclusions.

If a boundary is assumed to exist, then a whole series of seemingly valid questions logically follow, including the cultural affiliation of groups on either side of the border, and the nature of interaction across the frontier. Because of the desire of archaeologists to have discrete units of comparison, pages of articles and monographs have been filled with "trait lists" designed to facilitate the identification of a site's cultural affiliation. When good diagnostics from one side of a boundary are encountered at archaeological sites on the other, archaeologists then have evidence with which to address the anthropologically interesting problems of societal interaction, trade, migrations, and even patterns of marriage. In the dust raised from chasing our tails in this fashion, we should be careful not to lose sight of the fact that "Saugeen",

"Couture", or "Western Basin", have yet to be proven anything other than analytic conveniences, and may bear little resemblance to prehistoric social or linguistic groups.

Spence, Pihl, and Murphy (in press) present the possibility that future research will demonstrate that "the mobility and high level of intermarriage characteristic of hunter/gatherer societies militate against clear cut borders". They expect that when more data have been collected, a series of "localized complexes" will emerge throughout the southwestern portion of the province, each similar in most respects to its immediate neighbors, but distinguishable from more distant complexes. The Boresma site excavations are particularly interesting in this regard because they have provided the first major artifact inventory from a supposed Middle Woodland frontier zone. Rather than falling clearly into either the Saugeen or Couture complex, the Boresma collection shares diagnostic forms from both areas, highly suggestive of a continuum of small culturally related groups, similar to the model presented by Spence, Pihl, and Murphy.

In an earlier summary, Spence, Finlayson, and Pihl (1978:115) state that Saugeen groups were "interacting relatively intensely with one another but less so with non-Saugeen people, which implies some form of alliance network may have existed". Because the area which has been defined as Saugeen encompasses a significant amount of environmental variation, researchers have expected that there will be material culture differences along different drainage systems and in distinct environmental zones (Finlayson 1977). However, the implication has been that these differences will be variations on a common recognizable Saugeen theme. While Spence, Pihl, and Murphy (in press) now present the model of a series of "localized complexes" spanning the southwestern portion of the

province, they also retain the larger culture complex labels, and treat Saugeen and Couture as if they had some kind of social or political reality.

While it is unlikely that the culture complex terms such as "Saugeen" will be banished from the literature, I argue that they can be misleading if not carefully applied. It may be more profitable to divorce these terms from their current usage and restrict them to the role of labels for areas with similar settlement and subsistence strategies. Problems of boundaries and the nature of interaction between real social units are critically important; however, it is first necessary for archaeologists to demonstrate the existence of these groups and their boundaries before tackling higher level problems of social group interaction. These issues are further discussed in Chapter Six, along with a comparison of the Boresma site diagnostics to the Donaldson and Thede materials (Finlayson 1977), and the limited collections available from the recently defined Couture complex.

Settlement and Subsistence

Middle Woodland settlement and subsistence patterns in southwestern Ontario have been constructed largely from excavations at the Donaldson, Thede, and Inverhuron-Lucas sites (Finlayson 1977). Finlayson has defined a three part seasonal round in which small communities of hunter-gatherers exploited floral and faunal resources within an ascribed territorial limit termed a "locality" (Finlayson 1977:612). He proposed a model, following Wright and Anderson (1963), in which spring/summer occupations were located at or near rapids to facilitate the exploitation of spring spawning fish runs. The abundance of food

supplies available in the spring "permitted an amalgamation of all families, within a particular locality, which had spent the winter months living in isolated camps" (Finlayson 1977:613).

Upon the completion of the fish runs, the macro-band fissioned into smaller micro-band segments to exploit locally available resources. It is suggested that part of this strategy included small lakeshore camps where angling and net fishing played an important role. The presence of butternuts and beechnuts at Inverhuron-Lucas, a small Lake Huron shoreline site, seems to indicate that these camps were occupied at least through the early fall months.

While Finlayson did not excavate a site with clear indication of winter habitation, he suggests that such sites probably are located inland away from the lake shore, and were occupied by single or small extended family groups. As Wright and Anderson point out (1963:57),"the carriers of the Saugeen Focus appear to have followed a way of life similar to the historic northern Algonkians".

One of the potential contributions of the Boresma site excavation is to help determine if there were differences in patterns of Middle Woodland settlement and resource exploitation in the more moderate southern portions of southwestern Ontario. The Donaldson, Thede, and Inverhuron-Lucas sites are located along the southern fringe of the Canadian biotic province, while the Boresma site is situated in the Carolinian (Cleland 1966:6). Whether or not one accepts the concepts of "biotic provinces" (Thaler and Plowright 1973), there is a shift in the availability of floral and faunal resources from south to north in southwestern Ontario. As Finlayson (1977:611) suggests, "one of the fascinating problems for future investigation will be to determine whether or not there are similar shifts in the settlement patterns of the Saugeen culture which correspond to

these changes in resource potential".

In this report I suggest that the Boresma site, like the Donaldson site, was oriented to an early spring occupation for harvesting spawning fish species; however, there is also evidence of continued late summer/fall occupation, along with winter habitation as well. While other aspects of the seasonal subsistence pattern along the Thames drainage are not well understood, I present the possibility that large riverine occupations like the Boresma site may have served as basecamps, occupied on and off throughout the year, acting as focal points for local group movements. This possibility is further explored in Chapter Five, after a presentation of the artifact data and the faunal analysis.

Chronology

Middle Woodland research in southwestern Ontario has been hampered by a lack of chronological control over stylistic change in both ceramics and lithics. Finlayson (1977), on the basis of radiocarbon dates from the Donaldson and Thede sites, suggests that the Middle Woodland period begins with the advent of pseudo-scallop shell ceramics circa 700 B.C., and lasts until A.D.800. The early origin of the Saugeen culture has struck many researchers as problematic and, as Mason (1981:269) points out, the Donaldson and Thede radiocarbon dates "are spread over a time range which is simply incompatible with the relative homogeneity of those manifestations and their indications of contemporaneity with related and much more tightly dated cultures elsewhere". Mason, along with Spence and Pihl (1984; see also Spence and Fox 1986), suggests that the early dates from Donaldson pertain to an Early Woodland component, represented by Vinette 1 sherds, Meadowood-like bifaces, and a

slate birdstone. These researchers prefer a later date of circa B.C.300 for the beginning of the Middle Woodland ceramic tradition.

In this report, when discussing the Middle Woodland occupation of southwestern Ontario, I refer to the period between 300 B.C. and A.D.700. The terminal date for the Middle Woodland period is equally amorphous, and depending on the criteria used, arguments can be made to include Princess Point and other related southwestern Ontario early Late Woodland cultures in the Middle Woodland sequence (Spence, Pihl and Murphy, in press).

Prior to excavations at the Boresma site, there was no secure method of differentiating early and late Middle Woodland assemblages in southwestern Ontario. Seriation of ceramics from the shallow soil horizons and pit features at the Donaldson and Thede sites has led Finlayson (1977:590) to suggest that pseudo-scallop shell ceramics dominate in the early part of sequence, gradually being replaced by dentate stamped wares. While this seriation makes good intuitive sense, in that the use of dentate stamping continues into the Early Late Woodland period in southwestern Ontario, it has yet to be anchored in a stratigraphic sequence or a series of consistent radiocarbon dates.

The Boresma site, with four radiocarbon dates in association with good samples of Middle Woodland artifacts, provides the first major opportunity to firm up our understanding of the ceramic and lithic typologies since the excavations of Donaldson and Thede twenty years ago. The radiocarbon dates and their implications for refining our understanding of the Middle Woodland chronological sequence are presented in Chapter Four.

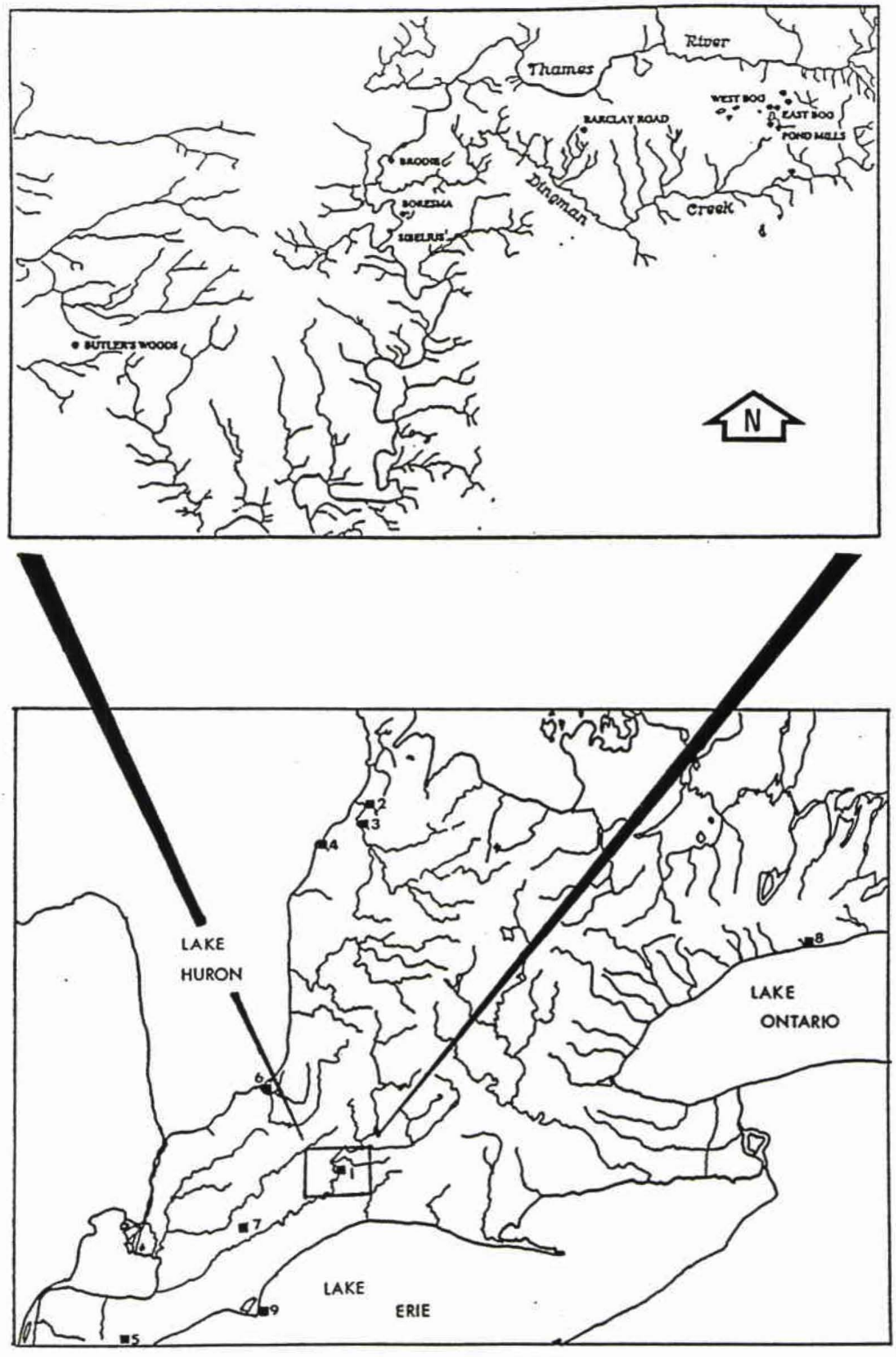
The Site: Location and Physiography

My attention was first drawn to the Boresma site by Mr. Frank Grey, who reported recovering ceramics and arrowheads from a field close to the Thames River while on a spring pickerel fishing expedition. Upon visiting the site I realized that it consisted of a large Middle Woodland occupation, and in April of 1988, with the gracious assistance of Dana Poulton and Christine Dodd, I returned to conduct a controlled surface pickup. Unfortunately, the site had been freshly plowed at the time of our reconnaissance and artifact visibility was poor; nevertheless, we determined that the site covered at least .45 hectares, with all artifacts encountered indicating a Middle Woodland occupation. On the basis of these initial results, and the realization that very little work had been conducted on Middle Woodland occupations along the Thames, I decided to return for further investigation the following field season. At this time I registered the site with the Ministry of Citizenship and Culture, and it was assigned the Borden Number AfHi-121.

The Boresma site is situated on a slight rise in the Thames River floodplain two meters above an abandoned channel. The modern Thames flows 175 meters west of the site; however, nineteenth century maps show the river in an old channel, which traversed the western edge of the site before turning sharply east, flowing back up the eastern margin of the occupation. The site was therefore situated at the top of a large U, with access to the river on either the east or west end.

Located in Middlesex county, Township of Delaware, Concession 'D', Lot 6, the site lies at an elevation of 690' a.s.l.. While the general flow of the Thames River is to the west, the Boresma site is situated along a 30 kilometer stretch

Figure 1: Southwestern Ontario Middle Woodland Sites Mentioned in the Text



1)Boresma, 2)Donaldson, 3)Thede, 4)Inverhuron-Lucas, 5)Rauch, 6)Burley, 7) Couture, 8)Short, 9) Point Aux Pins

which runs almost due south between Kilworth Heights and Middlemiss. The Lake Erie shore lies 34 kilometers south of the Boresma site, while Lake Huron, at Kettle Point, is 50 kilometers northwest.

The Thames River drains an area of 2200 square miles, second in southwestern Ontario only to the Grand River. From its source near Brodhagen to its embouchure with Lake St. Clair, the Thames is about 125 miles in length, and flows through two distinct physiographic regions. East of the city of London the two branches of the Thames cut through a series of deep glacial spillways, draining till plains and glacial moraines. The gradient on the Upper Thames is almost ten feet per mile, compared to the Lower Thames, where the gradient is two feet per mile (Chapman and Putnam 1984). West of London, the Thames Valley is more of its own making, wandering through the soft sediments of glacial Lake Warren. In many places in Delaware Township the valley is more than a kilometer wide, and the river is entrenched up to 25 meters below the old lake bed. Changes of river course are common along the Lower Thames, with many examples of abandoned channels (Chapman and Putnam 1984:94).

The Boresma site, 18 kilometers southwest of the forks of the Thames in London, is situated along the eastern edge of the Lower Thames drainage. The site lies on recent alluvial flats (Dreimanis 1964), on soils which are simply classified as bottomland (Anon 1931). Currently the site is subject to spring flooding which can quickly cover the former area of occupation with up to a meter of icy water. While the flow dynamics of the Thames would have been significantly different when the drainage basin was forested, sterile levels of silt in the midden deposits suggest that the site was also occasionally flooded during the period of its occupation.

Early forest survey conducted by Mahlon Burwell in the area of the site in the 1820's records that oak forest was dominant (Finlay 1977). Identification of charred wood from the Sibelius site, a Middle Woodland occupation located only one kilometer downstream from the Boresma site, suggests that oak was also dominant during the Middle Woodland period, with small amounts of elm, birch, maple, beech, and hickory also present in the collection (Fox 1982). Pihl (1978), on the basis of pollen analysis from cores from five different lakes in southcentral Ontario, suggests that the Middle Woodland period was one of climatic stability throughout southern Ontario, with an environmental regime similar in almost all regards to that of the present day.

2: BORESMA SITE EXCAVATIONS

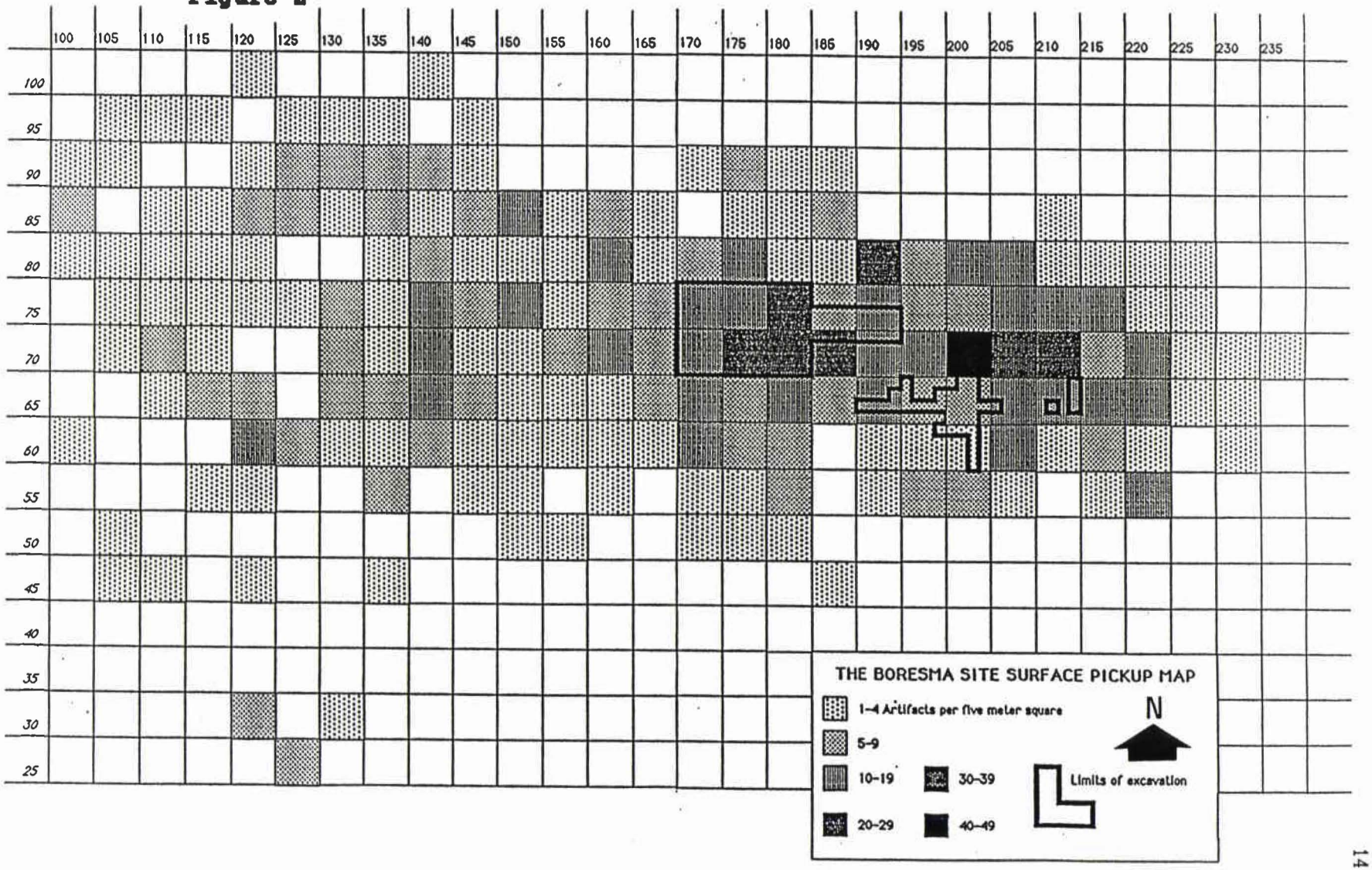
During the summer of 1989 I returned to the Boresma site for a ten week field season. In this chapter I discuss both the procedures and results of the 2070 person hours spent in the field. For nine weeks I was assisted by a crew of four, while during the remaining week two volunteers helped in backfilling the trenches. All artifacts were washed during a three week stretch of afternoons in which we waited for rain to improve the visibility of postmolds and subsurface features. In the end we were lucky, as the wet weather came with ten days remaining in the project, leaving just enough time for feature recording and excavation in ideal conditions.

The primary goals of the investigations were to: 1) to determine site limits, 2) recover as large a ceramic sample as possible, 3) collect materials for radiocarbon dating, and 4) open up an area in search of settlement pattern, in particular possible house structures. As the excavations unfolded we also recovered an excellent faunal sample and a large collection of diagnostic chipped lithics.

Site Area and Controlled Surface Pickup

The first two and a half days of the field season were spent conducting a controlled surface pickup to determine site limits and assist in the selection of areas of interest for excavation. While a surface pickup had been conducted the previous summer, the field had been plowed only hours before; artifact visibility was therefore poor, and I felt site limits were as yet unsatisfactorily delineated. When we conducted the second surface pickup, the field had been plowed, and rained on

Figure 2


100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25
THE BORESMA SITE SURFACE PICKUP MAP
1-4 Artifacts per five meter square
5-9
10-19
20-29
30-39
40-49
N
Limits of excavation

heavily several times, and artifact visibility was excellent.

From the first controlled surface pickup, conducted under less than ideal conditions, I produced a site area estimate of roughly .45 hectares. The second effort suggests that the Boresma site is slightly larger, covering an area of at least .57 hectares. The second surface pickup produced 391 pieces of lithic material including ten bifacially worked tools, 94 body sherds, and 73 faunal elements; 613 pieces of fire-cracked rock were also noted.

Oblong in shape, the site's long axis runs east/west for 140 metres along a two metre high sandy-silt rise. At its extreme western end the occupational scatter extends for 75 metres north/south; however, for the greater part of its length it is only 45 metres from side to side. Figure 2 illustrates the distribution of surface artifacts across the site, demonstrating that the majority of items were located on the eastern half of the occupation. Because the scheduled field season was only nine weeks in length, and the field in which the Boresma site lay was planted with corn, I decided to focus our efforts on this richer eastern end of the site. By following this strategy I hoped that we would maximize the chance of recovering a significant ceramic sample, and minimize the area of crop destroyed. During the surface pickup we also noted the presence of a few historic sherds on the western end of the site which helped to discourage our interest in this area. Later in the field season we placed one 1m test pit at the extreme western end of the site to test the nature of this disturbance, and recovered seven square headed nails, a small quantity of painted wood, one cord-wrapped stick sherd, and several pieces of corded ceramics. At this time a base of a Levanna point was noticed on the surface in square 100-90, five meters away. This suggests there may have been a historic structure in the area, along with the possibility of an

Early Late Woodland component.

The Midden Excavations

When the Boresma site excavations began the crew held out some hope that buried cultural material might lie protected beneath layers of silt deposited during spring flooding. During the 1972 test excavations of the Brodie site, a large Middle Woodland/Late Archaic occupation located two kilometers upriver from the Boresma site, buried midden deposits had been encountered. We suspected that the Boresma site, because of its similar floodplain location, might have been subject to the same types of post-depositional processes. Nevertheless, we were still quite surprised when on the first day our initial test squares sank ever more deeply into a stratified refuse deposit over one meter in depth. As the field season unfolded we spent close to four weeks excavating in this refuse-filled depression, before moving slightly northwest, in search of other types of settlement pattern data.

A Note on Recording Procedures

For the purpose of recording artifact and feature locations, the site area was divided in a primary grid of 5m squares. The permanent datum is located in a small cluster of trees at the northwest corner of the site, five meters from the break in slope leading down to the old river channel. This point was arbitrarily designated 100-100, and from it all numerical references to locations on the site can be ascertained. The first number in the sequence refers to the east/west axis, and the second to the north/south coordinate. Each 5m square is

identified from its southwest coordinate.

The 5m squares are divided into twenty-five 1m units, or "sub-squares". Sub-square number one (SS-1) is always located in the southwest corner of a 5m unit, with the numbering proceeding to the right, along the bottom of the square. Sub-square number six is located directly above SS-1, with the remainder of the square numbered in the same pattern.

The Midden

The midden area is located in what was a natural bowl-like depression along the southeastern edge of the site. It extends for at least 21 meters east/west, and is 9.5 meters wide at the point of our primary north/south trench. It is definitely larger than these measurements indicate, as we located its western terminus in 190-65-SS-8; however, at the easternmost point of our excavations, 210-65-SS-1, the midden showed no indication of ending. While it is now impossible to see the depression in which the midden sits due to silt deposition, the controlled surface pickup indicates that the site limit is only 15 to 20 meters east of this point. Therefore, it seems probable the midden is no more than 30-35 meters long, covering 175-225 square meters. Of this area, we excavated 38 one meter units, or somewhere between 17% and 22% of the midden.

The midden stratigraphy consists of six main levels, each bearing various amounts of cultural material. These levels and their contents are described below. The chronological implications of the artifacts recovered from the midden are discussed in Chapter Four.

Level 1

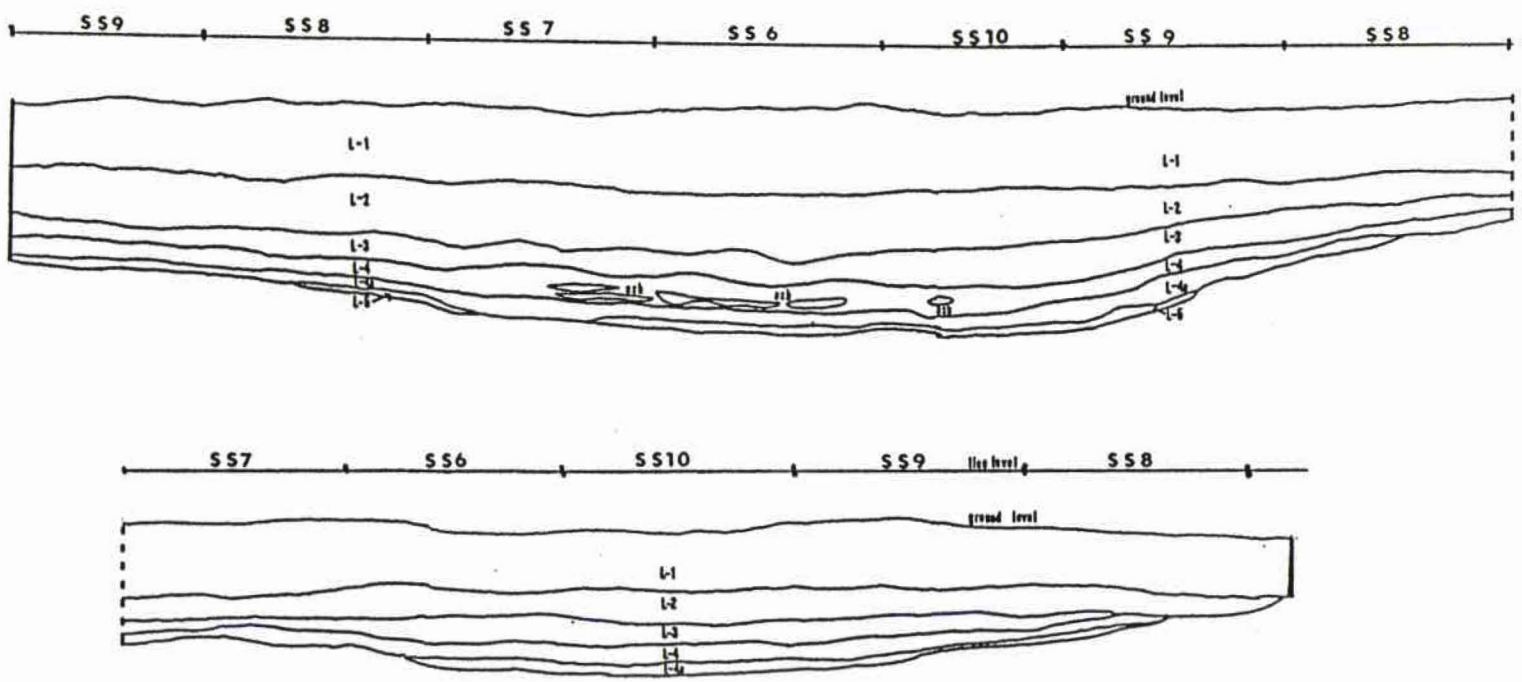
The first level of the midden proved to be very artifact poor. This top stratum consists of a rich grey silt which has accumulated largely in the 150 years since major clearance of forests began with the arrival of European settlement. The few pieces of chipping detritus and micro-sherds which we did recover can probably be attributed to plow dispersal from the surrounding shallower areas of the site, or from rodent activity. In the heart of the midden this silt cap was up to 34cm in depth.

Level 2

Level 2 consists of a thick dark brown to black band of very organically rich soil which I believe represents a period of humic soil accumulation which developed largely after the abandonment of the site. In the central area of the midden this level is up to 25cm thick. This soil development probably occurred all over the occupational area; however, it was capped and preserved from the plow only in the midden depression. The site was clearly still in use when this level was first being formed, as at the very base of level 2 in square 205-65-SS-15, we discovered a thin ash lens flecked with charcoal and chipping detritus. Scattered throughout the remainder of the stratum, we screened 226 fragments of fire-cracked rock, 980 pieces of chipping detritus, 2052 faunal elements, 16 bifacially worked tools, and 179 analyzable pieces of ceramics.

Figure 3

MIDDEN: SOUTH PROFILE 200-65-SS9 - 190-65-SS8



Level 3

The soil in level 3 is a clearly distinguishable sandy-brown color, resembling in color and texture the sterile layers of silt upon which the midden deposits rest. Originally, on the basis of the color and texture of this soil, I thought the entire strata may have been water deposited (Wilson 1989). Further analysis demonstrates that this is clearly not the case, as there is good evidence of in situ occupational debris. In square 200-65-SS-2, we partially uncovered the remains of a well preserved hearth, consisting of a circular 42 by 40 centimeter stain of fire-reddened soil overlain by a 4cm layer of fine ash. Extending out from this hearth for one meter is a thin organic stain, one to two centimeters in depth. Regrettably, I missed this stain in the excavation process, noticing it only during profiling. A reexamination of photos from the midden leads me to suspect that level 3 may actually consist of three separate strata: two water deposited sterile zones, separated by a thin and often discontinuous occupational stratum associated with the hearth. The hearth must have been buried almost immediately, as its ash lens was perfectly preserved, which would be unlikely if it had remained uncovered for any length of time.

The remainder of level 3, while producing no other evidence of occupation such as hearths or features, did produce 664 fragments of fire-cracked rock, 1,517 pieces of chipping detritus, 5,811 faunal elements, 12 bifacially worked tools and 431 analyzable sherds. Level 3 reached a maximum thickness of 17cm at the center of the midden deposits.

Level 4

Beneath level 3 lay the stratum from which the bulk of the

artifacts on the site were recovered. Level 4 is comprised almost in its entirety of rich brown organic soil and occupational debris. A total of 1240 pieces of fire-cracked rock were recovered, along with 2,122 fragments of chipping detritus, 796 analyzable sherds, 17 bifacially worked tools, and 25,507 faunal elements.

Level 4 also served as something more than strictly a refuse disposal area, as scattered throughout we uncovered five well preserved hearths, indicated by areas of fire-reddened soil covered by ash lenses. The exact function of these hearths is unclear, but it is possible they may have served in some type of processing activity such as firing ceramics or drying fish. It is interesting that while 1,240 pieces of fire-cracked rock were recovered from level 4, none was found in association with a hearth. Interestingly, Finlayson (1977:253) also notes the presence of hearth features in the refuse disposal area at the Middle Woodland Donaldson site on the Bruce Peninsula. Table 1 presents the locations and metrics for the level 4 hearth features. The length and width measurements indicate the extent of the fire-reddened soil.

Level 4a

While microscopic analysis of soil samples from level 4a have not yet been conducted, on the basis of color and texture similarities between soil from this level and the fluvial soils beneath level 5, I provisionally suggest that level 4a was deposited during a period of flooding. Much of the cultural material from this level was recovered from the interface with level 4. It seems very likely that many of these artifacts were introduced by compaction from the rich level 4 deposits. This seems especially true of the 2,550 faunal elements which we

recovered. Without exception, all level 4a squares with high concentrations of bone were located under the most dense bone deposits in level 4. Level 4a also contained five bifacially worked tools, 256 pieces of chipping detritus, 49 fragments of fire-cracked rock, and 128 analyzable sherds.

Table 1: Level 4 Hearth Location and Dimension Data

	Location	Depth(cm)*	Length(cm)	Width(cm)
1	210-65-SS-1	50	46	46
2	210-65-SS-11	47	34	34
3	210-65-SS-6	46	42	20+
4	195-65-SS-16	39	26	26
5	200-65-SS-7	81	48	36

* Below Surface

Level 5

Level 5, the lowest level in the midden which contains cultural material, is a thin, often discontinuous band of organically and artifact rich soil. It is in all respects except thickness, similar to level 4, including the presence of hearth features and large quantities of faunal material.

The three hearths which were located were all in the extreme eastern end of the excavations. Surrounding these hearths were five widely spaced posts, which may indicate the presence of some type of structure, perhaps a drying rack. Once again there was no fire-cracked rock in direct association with the hearths, although 65 pieces were recovered scattered throughout the remainder of the level.

Level 5 also produced 4,929 faunal elements, two bifacially worked tools, and 143 analyzable pieces of ceramics.

Table 2: Level Five Hearth Location and Dimension Data

	Location	Depth(cm)*	Length(cm)	Width(cm)
1	210-65-SS-11	60	40	40
2	210-65-SS-6	63	85	38
3	210-65-SS-1	63	80+	76

*Below Surface

Level 5 rests upon a layer of sandy-brown silt which ranges between eight and ten centimeters in depth. This level, which we did not assign a number, contained no artifacts or other indications of occupation and appears to have been water deposited. It rests upon a 10 cm thick dark brown organically rich level which may represent a humic layer buried by flood activity. This level was also devoid of occupational debris. In the areas where we probed even deeper, we found yet another layer of sterile silt, apparently quite thick, and we stopped our investigation forty centimeters beneath the surface of this layer.

The Occupational Area

The four weeks spent excavating in the refuse filled depression proved very productive in terms of ceramics and

faunal material; however, we still had failed to meet one of the primary project goals, the uncovering of pit features and potential house structures. To this end we shifted the focus of the investigation northwest of the midden, where we hoped to locate the source of the rich garbage deposits. By the end of the project we managed to clear a total of 226 square meters in addition to the midden excavations. One five meter square was opened up directly north of the midden (Area B, see Figure 4), while a larger area of 201 square meters was excavated ten meters northwest of the western end of the midden (Area A, see Figure 4). All of the plowzone was sifted through 1/4 inch sand screen.

This area of the site proved to be much shallower than the midden, with a 30 centimeter plowzone overlying a sandy-silt base. This yellowish soil provided good contrast for the identification of subsurface soil discolorations, and we uncovered a total of 66 features and 364 posts. The locations of the features and posts are mapped in Figures 4, while the metric data for the features are presented in Table 3.

Of the 66 features, twenty proved to be sterile rodent disturbances, nine were sterile treefalls, ten documented the presence of a historic fence-line which ran the length of the excavations, eleven proved to be prehistoric hearths, and ten were pit features dug by the prehistoric inhabitants of the site. The excavations also uncovered four treefalls or natural depressions which had served as refuse disposal areas, and two rodent disturbances with occupational debris. All of the features and posts were recorded by triangulation from the 5m grid posts, and flotation samples were taken from each of the pit features and one of the refuse-filled depressions.

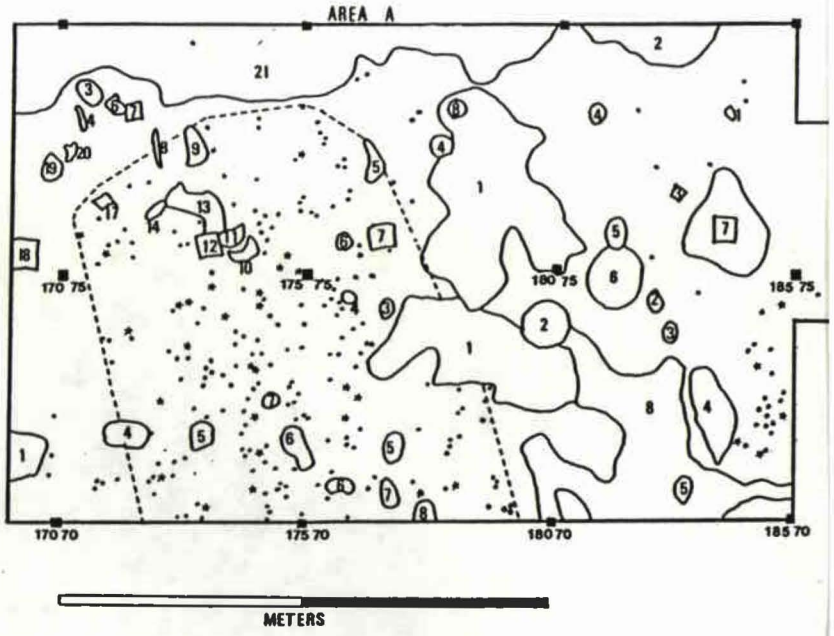


Figure 4: The Boresma Site Settlement I

Table 3: Feature Metric and Non-Metric Data

170-70

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	86	66+	-	Sterile Treefall
4	81	56	27	Pit
5	48	30	-	Rodent
6	100	66	-	Rodent
7	33	30	-	Rodent

170-75

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
3	50	35	-	Rodent
4	65	10	-	Rodent
6	50	50	-	Rodent
7	35	35	-	Historic Post
8	85	9	-	Rodent
9	85	40	-	Rodent
10	63	31	-	Rodent
11	60	40	18	Refuse Filled Rodent Disturbance
12	59	41	-	Historic Post
13	120	60		Refuse Filled Rodent Disturbance
14	31	18	-	Rodent
15	35	30	-	Rodent
16	29	16	-	Rodent
17	48	33	-	Historic Post
18	66	50	-	Historic Post
19	50	45	-	Rodent
20	18	18	-	Rodent
21	1080	150+	-	Unknown-Possibly Treefalls

175-70

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	410	200	-	Sterile Treefall
2	103	99	63	Pit-77 Fire-Cracked Rock
3	44	34	-	Hearth
4	30	28	-	Rodent
5	60	50	-	Hearth
6	60	30	-	Rodent
7	55	31	-	Rodent
8	33+	33	-	Hearth

175-75

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	426	260	21	Refuse Filled Treefall
3	50	40	-	Historic Post
4	32	32	27	Pit
5	80	29	-	Rodent
6	33	30	-	Hearth
7	66	60	-	Historic post
8	25	28	15	Pit

Table 3: Continued

180-70

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
2	33	33	-	Rodent
3	46	30	-	Hearth
4	200	78	-	Treefall
5	43	14+	-	Hearth
6	50	32	-	Hearth
7	29	16	-	Hearth
8	550	335	-	3 SterileTreefalls

180-75

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	16	15	-	Rodent
2	270	69+	-	Unknown
4	42	41	7	Pit
5	69	52	9	Pit
6	138	120	52	Pit-17 Fire-Cracked Rock
7	50	50	-	HistoricPost
8	192	162	42	Refuse FilledTreefall

185-75

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	50	39	-	HistoricPost
2	216	192	18	Refuse FilledTreefall
3	133	98	-	SterileTreefall

190-75

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	50	35	-	HistoricPost
3	45	40	-	HistoricPost
4	190+	99	39	Pit
5	200+	115	-	Treefall
6	128	70	11	Pit
7	31	20	-	Rodent
8	71	69	10	Pit

200-70

Feature#	Length(cm)	Width(cm)	Depth(cm)	Comments
1	100	100	-	Treefall
2	40	30	-	Hearth
3	41	33	-	Hearth
4	41	42	-	Hearth

Hearths

All that remained of the eleven hearth features was a dull orange patch of oxidized soil. Unlike the well preserved midden hearths, any sign of an ash or charcoal cap above these features had been obliterated by plowing. The hearths averaged 36cm in length, and 31cm in width.

Pit Features

Of the ten pit features, all but one are roughly circular in shape with basin shaped profiles. The exception, feature 4 in square 190-75, was only partly exposed, but appears to have been irregular in both plan view and profile. Only three of the pit features exceeded fifty centimeters in depth, with F-6 in 180-75, and F-2 in 175-70 containing 17 and 77 pieces of fire-cracked rock respectively. This may indicate that these large circular features functioned as roasting pits; however, the fire-cracked rock was not found in layers or lenses, but intermixed in the feature fill with pieces of lithic, ceramic, and faunal detritus, suggesting a secondary deposition. The shallower pit features gave no clear evidence of their original function, although most were at least partially filled with occupational refuse.

Refuse Filled Depressions

The three refuse-filled treefalls and two refuse-filled rodent disturbances provided the bulk of the cultural material recovered from the features. The large treefalls were quite shallow, with the deepest extending 42cm beneath the plow zone. All other treefalls and rodent disturbances on the site were

cross sectioned and if shallow, were removed to check for evidence of hidden posts or cultural features.

Postmolds

During the excavations we uncovered a confusing array of 364 posts. All of these postmolds were cross-sectioned and depths and diameters were recorded. Figures 5 and 6 present the distribution of post sizes and depths. The site's inhabitants obviously preferred saplings between five to eight centimeters in diameter for construction purposes, as 85.5% of the posts fell within this range. It is interesting to note that 48 possible support posts larger than 9 cm in diameter were recorded. The average post depth was only 14.0cm; however, these 48 averaged 21.2 cm in depth.

In the southwestern end of the excavation in squares 170-70, 175-70, 170-75, and 175-75 (See Figure 4), we partially uncovered a nine by five meter cluster of posts with its longitudinal axis oriented northwest/southeast. The arrangement of posts is far from clear; however, it is possible that it represents the remains of a structure subject to multiple phases of rebuilding. Four hearths are also present in this area, two located directly in the post cluster (170-70-F-5; 175-70-F-5), and two located along the northeastern edge (175-70-F-3;175-75-F-6). When the distribution of chipping detritus recovered from the plowzone was plotted (Figure 7), the area of the post cluster was found to be ringed with a zone of high flake density. Lennox (1986) has identified a similar

Figure 5

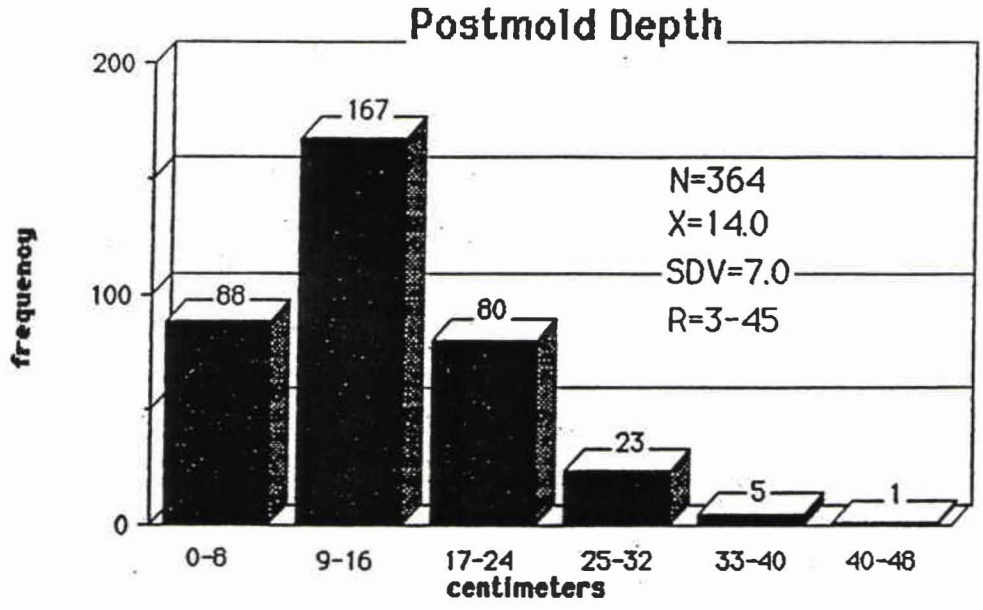


Figure 6

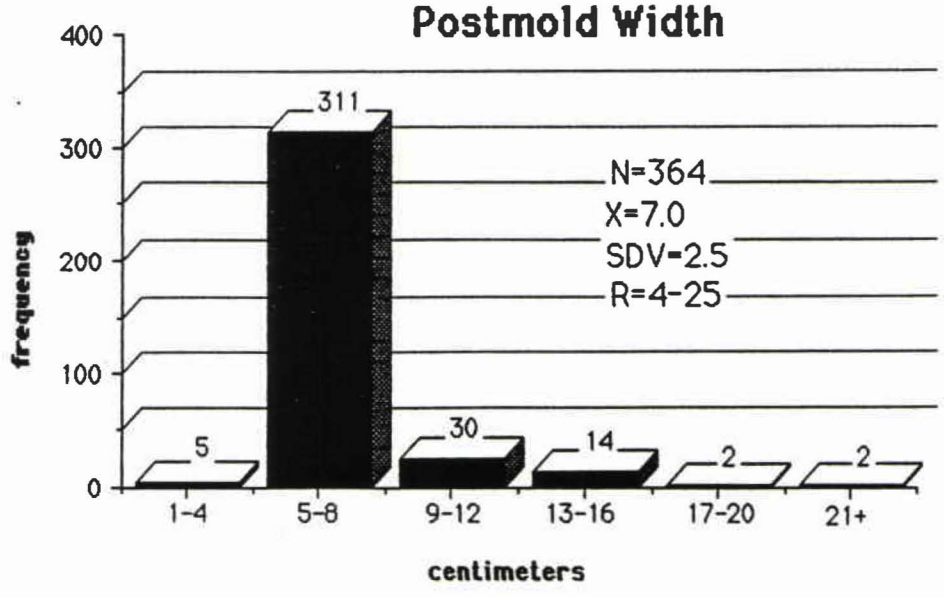
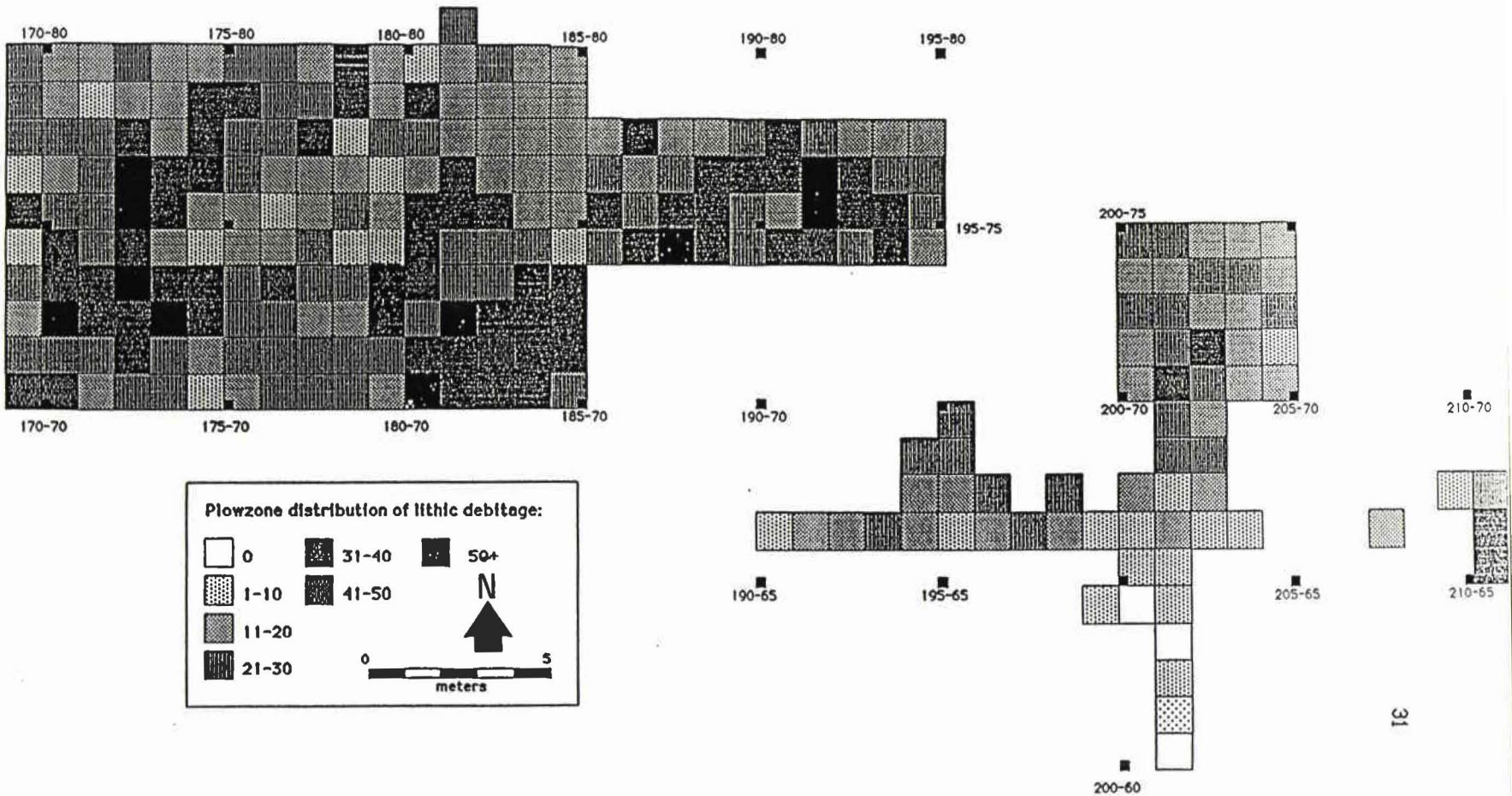


Figure 7: The Plowzone Distribution of Lithic Debitage



pattern of lithic distribution on plow disturbed Late Archaic sites in southwestern Ontario, and has tentatively suggested the clean interior areas may be house floors. This explanation seems reasonable for the Boresma site pattern, with lithic reduction perhaps taking place outside the structure area, or if inside, then the debris may have occasionally been swept to the edges.

There is also a partially uncovered concentration of posts in square 190-75, and three hearths in association with a group of posts in square 200-70. It seems likely that if a larger area of the site had been cleared we would have uncovered several more post clusters.

Settlement Pattern Interpretations

The post and feature distribution at the Boresma site is consistent with a site occupied off and on over a long period of time. Pits and posts are common, but clear patterns of structures do not emerge. Finlayson (1977) has identified a similar pattern at the Middle Woodland Donaldson site, and has also noted the inherent difficulty in sorting out activity areas on sites which have been occupied repeatedly over several centuries.

While no clearly defined structures are present, I suggest that the post cluster out-lined in Figure 4, may represent the remains of a structure subject to many phases of rebuilding and repair. The presence of two hearths directly within this post concentration may indicate that there were internal hearths, which would be consistent with a cold weather occupation. It also seems there was a conscious effort on the part of the site's inhabitants to keep this particular area of the site clear of debris, such as lithic debitage, which is also consistent with the interpretation of this post cluster as a

possible house feature.

Faunal Analysis

The entire screened sample of 45,669 faunal elements was analyzed by Rosemary Prevec (Prevec 1990). Of these elements, 44,957 could be identified to class, of which 14,564 (32.4%) could be classified to order or lower taxa. This section of the report summarizes the results of the faunal analysis and discusses the implications for site function and seasonality. In general, the faunal sample was very well preserved, although the long bones of the large mammals, especially deer, had been shattered at the time of deposition, with none complete, and few fragments longer than 60 centimeters.

Fish

The 29,743 elements of fish bone recovered from the Boresma site accounted for 65% of the entire faunal sample. Of the 10,084 elements which could be further identified, seventy percent consisted of walleye or sauger (Stizostedion). While it is difficult to distinguish between the bones of walleye and sauger, these elements all matched well with walleye reference specimens, and many were quite large which also suggests walleye, as they grow larger than sauger. The second most highly represented fish species, at 26.7%, was the white or longnose sucker (Catostomas). Present in small quantities were sturgeon, northern pike, large and/or smallmouth bass, channel catfish, brown bullhead, burbot, and drum.

Table 4: Fish Species

SPECIES		TOTAL# OF ELEMENTS	%IDENTIFIED
Sturgeon	Acipenser fulvescens	117	1.16
Northern Pike	Esox lucius	32	0.32
Pike or Muskellunge	Esox sp.	21	0.21
White or Longnose Sucker	Catostomas sp.	2,688	26.65
Brown Bullhead	Ictalurus nebulosus	3	0.03
Channel Catfish	Ictalurus punctatus	4	0.04
Burbot	Lota lota	5	0.05
Bass sp.	Micropterus sp.	96	0.95
Walleye or Sauger	Stizostedion sp.	7,102	70.43
Drum	Aplodinotus grunniens	16	0.16
Total Identified Fish		10,084	100.00
Unidentified Fish		19,659	
TOTAL FISH		29,743	

Mammals

The 13,654 elements of mammal bone made up the second largest part of the collection (29.9%). Of this number 2,927 were assignable to taxa, with white-tailed deer comprising 80.2% of all identified mammal bone. Prevec believes that almost all of the unidentified mammal bone probably belonged to white-tailed deer as well.

Also present in significant numbers at the Boresma site were beaver(9.4%), muskrat (3.4%), woodchuck (2.7%), and raccoon (1.3%). The possibility exists that at least some of the elements of the woodchuck, chipmunk, and <u>leporidae</u> species are intrusive; however, one of the woodchuck bones was burnt, suggesting it was part of the original deposit.

Table 5: Mammal Species

SPECIES		TOTAL# OF ELEMENTS	%IDENTIFIED
Snowshoe Hare	Lepus americanus	3	0.10
Hare or Rabbit	Leporidae sp.	2	0.07
Chipmunk	Tamias striatus	4	0.14
Woodchuck	Marmota monax	78	2.67
Grey Squirrel	Sciurus carolinensis	13	0.44
Beaver	Castor canadensis	274	9.36
Muskrat	Ondatra zibethicus	99	3.36
Porcupine	Erethizon dorsatum	2	0.07
Wolf	Canis lupis	9	0.31
Domestic dog	Canis familiaris	4	0.14
Dog or Wolf	Canis sp	3	0.10
Black Bear	Ursus americanus	23	0.79
Raccoon	Procyon lotor	37	1.26
Marten	Martes americana	3	0.10
Fisher	Martes pennanti	1	0.03
Ermine	Mustela erminea	1	0.03
Skunk	Mephitus mephitus	1	0.03
Otter	Lontra canadensis	21	0.72
Bobcat	Lynx rufas	2	0.07
White-Tailed Deer	Odocoileus virginianus	2,347	80.19
Total Identified Mammal		2,927	100.00
Unidentified Mammal sp.		10,727	
TOTAL MAMMAL		13,654	

Reptiles

All of the 987 elements in the reptilian collection could be identified below class. Snapping turtle comprised 40.2% of the collection, while the painted turtle was a close second at 35.3%. The rate of recovery of reptilians is summarized in Table 6.

Table 6: Reptile Species

SPECIES		TOTAL# OF ELEMENTS	%IDENTIFIED
Snapping Turtle	Chelydra serpentina	396	40.2
Eastern Spiny	Trionyx spiniferus	12	1.2
Soft-shell Turtle	Spiniferus	12	1.2
Painted Turtle	Chrysemys picta	348	35.3
Blanding's Turtle	Emydoidea blandinga	18	1.8
Pond Turtle	Emydidae	85	8.6
Turtle sp.	Testudines sp.	128	12.9
TOTAL REPTILE		987	100.00

Clams

A total of 409 clam fragments from four different species were recovered from the Boresma site. Only two of the clams were complete, as almost all had their ventral ends broken off. Prevec suggests that they had been rapped sharply to break off the end and pried open in order to remove the meat before cooking. She has noted a similar pattern at the Middle Woodland Schoonertown site on the Nottawasaga River near Georgian Bay (Prevec 1988). Table 7 summarizes the recovery of clam species.

Table 7: Clam Species

SPECIES	TOTAL# OF ELEMENTS	%IDENTIFIED
Actinonaias carinata	24	5.9
Elliptio dilatatus	95	23.2
Amblema plicata	1	0.3
Lampsilis radiata siliquoidea	21	5.1
Unionidae sp.	268	65.5
TOTAL	409	100.00

Amphibians

A total of 136 amphibian elements were recovered. None of the bones were burnt and there is a possibility that they might be intrusive.

Table 8: Amphibian Species

SPECIES		TOTAL#OF ELEMENTS	%IDENTIFIED
American Toad	Bufo americanus	42	30.9
Frog sp.	Rana sp.	21	15.4
Frog or Toad	Anura sp.	73	53.7
TOTAL		136	100.00

Birds

Avian bones made up the smallest portion of the faunal collection, as only 28 elements were recovered. The giant Canada goose, wild turkey, barred owl, duck, hawk, and grouse were all present. Table 9 summarizes these data.

Table 9: Avian Species

SPECIES		TOTAL#OF ELEMENTS	%IDENTIFIED
Giant Canada Goose	Branta canadensis maxima	2	9.5
Goose sp.	Anserinae sp.	2	9.5
Duck sp.	Anatidae sp.	10	47.6
Wild Turkey	Meleagris gallopavo	2	9.5
Grouse sp.	Tetraonidae sp.	1	4.8
Hawk sp.	Accipitridae sp.	3	14.8
Barred Owl	Strix varia	1	4.8
Total Identified		21	100.00
Unidentified Avian sp.		7	
TOTAL		28	

Table 10: Faunal Findings by Zoological Class

Class	Frequency	%Total
Fish	29,743	65.13
Mammalia	13,654	29.90
Reptilia	987	2.16
Clams	408	0.89
Amphibia	136	0.30
Aves	28	0.06
Class Uncertain	712	1.56
TOTAL	45,669	100.00

Discussion

A minimum number of 817 individuals were found at the Boresma site (Table 11). Of the mammals, the white-tailed deer (MIN=15) would have supplied by far the greatest portion of the meat, followed by bear (MIN=2), beaver (MIN=4), raccoon (MIN=4), woodchuck (MIN=6), and muskrat (MIN=5). With all body portions of the deer present, and all long bones broken, it appears that the deer were consumed at the Boresma site, not just processed for consumption at another locale.

Fish also provided a significant portion of the Boresma diet. A minimum number of 573 walleye or sauger were identified, along with at least 83 suckers. Prevec notes that there are many more head bones of fish present in the screened collection than ribs or vertebrae. This may indicate that some fish were being

smoked or dried for later use, and only their heads, removed in the cleaning process, are represented in the midden debris. This suggestion will remain tentative until after the analysis of the flotation material, as many of the smaller fish elements may be represented there. It is also possible that ribs and vertebrae were being consumed, if not by humans, then possibly by dogs.

It is interesting that net sinkers are not common at the Boresma site even though fish remains dominate the faunal assemblage (N=4). We also did not recover any toggling head harpoons or copper fish hooks, both of which have been documented on other Middle Woodland sites in Ontario (Finlayson 1977). While it is impossible to say if there were rapids adjacent to the Boresma site as the channel is now abandoned, the Thames is quite shallow in the Delaware area, and the spring spawning runs may have been harvested with a weir. It is also possible that the majority of the net-sinkers were not being transported back onto the habitation area and that netting was a primary method of fish harvesting. Dip-netting, which has been documented ethnographically in the upper Great Lakes area (Cleland 1982:763) may also have been practiced at the Boresma site.

Seasonality

There are definite indications in the faunal collection of the seasons in which the Boresma site was occupied. The large numbers of walleye or sauger elements provide solid proof of early spring residency. Walleye are early spawners, moving up the river during March and April (Scott and Crossman 1973:100). Following spawning, these fish return to Lake St. Clair, leaving only small numbers of sauger in the river during the summer months. April/May occupancy of the site can be similarly

Inferred from the high percentage of sucker bones in the collection, since this fish spawns at this time of year. Sturgeon, pike, and channel catfish are also spring spawners, although they are present in only small numbers in the collection.

There are not many elements of summer spawning fish, and it is possible that the brown bullhead, drum, and bass, were caught incidentally along with the spring spawners. It is also possible that exploitation of fish resources during the summer months may not have been as important to the site's occupants, with only small numbers harvested in order to supplement a more diversified diet.

A good sign of early summer occupation at the site is the large number of bones from four different species of turtle. Turtles are most easily caught at this time of year, when they venture on land to lay their eggs. Other indications of a warm season occupation include clams, which are available only when the river is ice free, along with the frogs and toads, which are active during the warm summer months. Similarly, chipmunk and woodchuck are in a state of semi-hibernation for most of the time between September and March, and bear are dormant from late fall until April (Banfield,1981). The presence of two immature bird wing bones also indicates a late spring or early summer occupation at the Boresma site.

Table 11: Minimum Number of Individuals

Species	Minimum #	Determining Element
Sturgeon	1	Present
Pike and Esox sp.	7	Left Dentary
Catostomus sp.	83	Right Dentary
Brown Bullhead	1	Present
Channel Catfish	1	Present
Burbot	1	Present

Con't

Table 11: Continued

Bass sp.	12	Right Quadrate
Walleye or Sauger	573	Right Dentary
Drum	1	Present
Snowshoe Hare	1	Present
Chipmunk	3	Right Mandible
Woodchuck	6	Lower Left Incisor
Grey Squirrel	2	Right Humerus
Beaver	4	Right Ulna
Muskrat	5	Left Calcaneous
Porcupine	1	Present
Wolf	1	Present
Dog	1	Present
Fox sp.	1	Present
Black Bear	2	Right Metatarsal 4
Raccoon	4	Lower Right Molar 1
Marten	1	Present
Fisher	1	Present
Ermine	1	Present
Skunk	1	Present
River Otter	3	Left Mandible
Bobcat	1	Present
Deer	15	Right Tarsal 2+3
Spiny Soft Shell Turtle	1	Present
Snapping Turtle	4	Right Humerus
Painted Turtle	8	Entoplastron
Blanding's Turtle	2	Left Marginal 9
Amblema plicata	1	Present
Actinonaias carinata	12	Left Pseudocardinal tooth
Elliptio dilatatus	9	Right " "
Lampsilis radiata	11	Right " "
Unionidae sp.	7	Right or left Pseudocardinal
American Toad	7	Right Illium
Frog sp.	9	Right Illium
Anura sp.	1	Right Illium
Giant Canada Goose	1	Present
Duck sp.	2	Left Tibiotarsal
Wild Turkey	1	Present
Grouse	1	Present
Hawk sp	1	Present
Barred Owl	1	Present
Avian sp.	2	Right Coracoid
TOTAL	817	

Evidence for other seasons of occupation can be determined by aging mammal elements. One immature beaver foot bone was very small, indicating an age of less than six months, and was probably taken during the summer or early autumn. Even better evidence comes from two deer skulls which had recently lost their antlers. Deer usually drop their antlers following mating in December and regrowth begins by early spring. The exception to this pattern are young unmated bucks, which retain their antlers into late winter (Smith and Verkruysse,1983). The presence of two deer skulls with antlers recently fallen, points convincingly to an occupational presence during the early winter months of December, January, and February.

In summary, the Boresma site faunal sample is extremely diversified, providing good evidence of at least limited occupation over much of the year. I suspect that the site, rather than serving as a specialized extractive camp for spring fishing and/or fall deer hunting, is a base camp, the focal point for a small group's movements through their "locality". The site was probably not occupied year round. Rather, it seems to have been the central point from which the local group would depart to harvest other resources. This point is returned to in greater detail in Chapter Six, after a presentation of the artifact assemblage recovered from the site.

3: The Boresma Artifacts

The Boresma site proved to be extremely productive in terms of artifacts, especially ceramics and chipped lithics. In this chapter I provide a description of all classes of artifacts encountered during the investigations. A discussion of the chronological implications of the artifacts recovered from the midden levels is presented in the following chapter, along with the associated radiocarbon dates.

Ceramics

The Boresma ceramic sample is the largest yet from a Middle Woodland site on the Thames drainage; a total of 165 rimsherd vessels were recovered. For the purposes of ceramic analysis, I adopted a modified version of Finlayson's (1977) system of attribute analysis developed for the Donaldson and Thede collections. One of my primary concerns was to insure comparability of the Boresma data with the Donaldson and Thede materials; however, as Finlayson has carefully documented, attempts to deal with Middle Woodland ceramics on typological terms have generally resulted in a proliferation of noncomparable data (Finlayson 1977:66-70). Because of this, I felt that an attribute approach would best serve to make the Boresma ceramic data accessible for future researchers.

My major modifications of Finlayson's approach involved trimming out variables which were originally coded, but not utilized. In the end, I coded each of the Boresma vessels for twenty attributes (See Appendix 1). For the attributes of rim profile and design sequence the original number values assigned

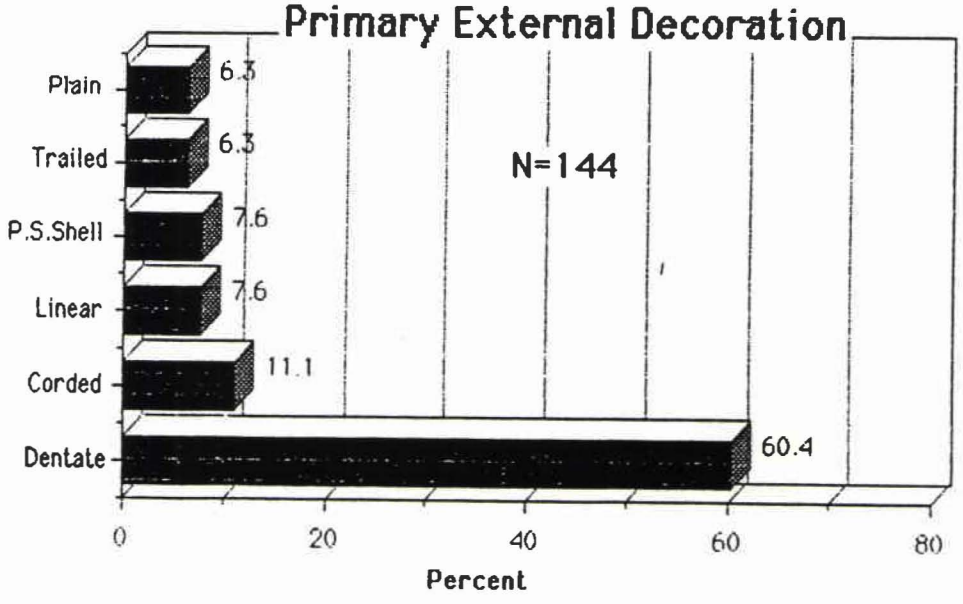
by Finlayson were used where applicable; new profile shapes and design sequences are numbered consecutively from Finlayson's last entry.

Primary External Decoration

Primary external decoration refers to the type of tool used to decorate the vessel's exterior immediately below the lip. With the inclusion of the plain and corded ceramics, both of which I consider as forms of decoration for this category, six different types of primary decoration were recognized.

By far the most prevalent primary decoration is dentate stamping (Plates 1-3). Of the 144 instances in which primary decoration was observable, 87 (60.4%) were dentate stamped. Dentate impressions are created by pressing a thin notched rectangular tool into the moist clay. These tools may have been

Figure 8



manufactured from wood at the Boresma site, as none were recovered. At the Shultz site in the Saginaw valley of eastern Michigan, at least some of the dentate stamp tools were manufactured on the edge of clam shells (Fitting 1972:233), and a stone dentate stamper has been recovered as a grave offering in Cameron's Point Mound 'C', in southeastern Ontario (Spence and Harper 1968; Plate V1,Figure 4).

The second most common type of primary decoration was cord marking (Plate 5). This type of decoration is characterized by a rough surface finish of irregular parallel lines created by pressing a cord, wrapped around a paddle, firmly into the moist clay. Sixteen vessels (11.1%) with cordmarking as their primary form of decoration were encountered. These vessels are identical in surface appearance to those illustrated by Stothers, Pratt and Shane (1979:51) for the Western Basin Middle Woodland, and also by Fitting (1972:153) from the Schultz site. While these vessels were found in definite association with Middle Woodland artifacts, on the basis of surface texture they are impossible to distinguish from the Early Late Woodland corded vessels illustrated by Keenlyside (1978), from sites on Point Pelee.

Pseudo-scallop shell (Plate 4) and linear stamped vessels were each represented by eleven vessels, or 7.6% of the collection respectively. Pseudo-scallop shell impressions are made by a narrow rectangular device carved to leave curvilinear marks thought to resemble the edge of a scallop shell. Linear stamped designs are simply straight narrow lines created by pressing or stamping a flat plain edge into the clay.

Incised (Plate 6) and plain vessels (Plate 4) were also equally represented, with nine (6.3%) of each. The incised vessels include: seven which were decorated by a narrow stylus 1 mm in width which was either pushed or trailed across the

surface of the vessel; one example of scarification (Plate 6, Figure 5), a technique in which the vessel surface is repeatedly lacerated in multiple directions with a sharp narrow stylus; and one vessel which has been decorated with broad, 3 mm wide, trailed vertical lines (Plate 6, Figure 1).

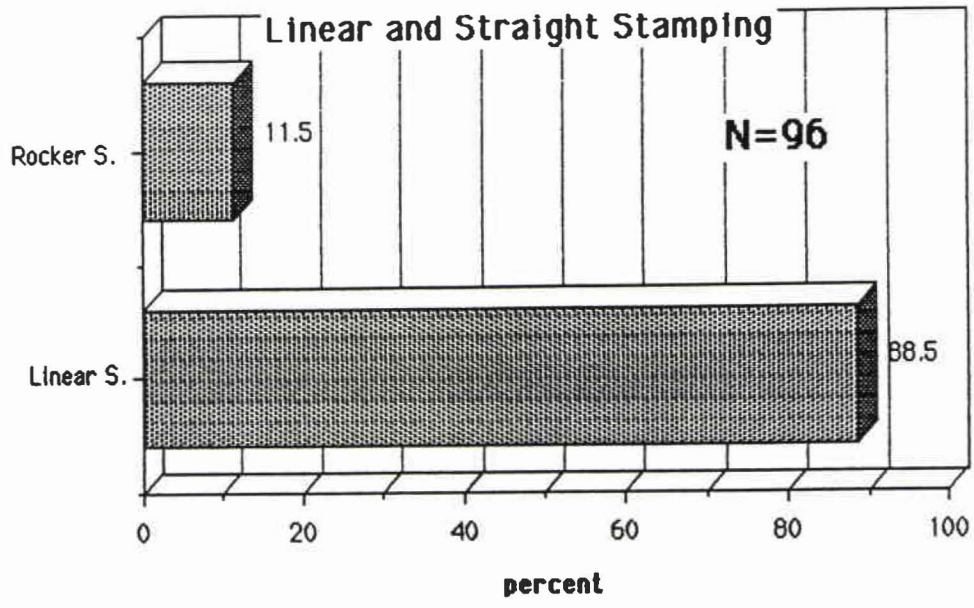
Punctates are conspicuous by their absence as a form of external vessel decoration at the Boresma site.

Rocker and Straight Stamping

There are 96 vessels in the collection which have stamped motifs as their primary form of decoration. Straight stamped designs are created by impressing a tool in order to leave distinct straight designs which are not trailed or dragged. Often this technique is referred to as "linear stamping" (Daechsel 1981:610); however, the term "linear stamping" is also used for describing stamped impressions made with a plain tool. To avoid confusion, I use "linear stamping" in reference to impressions made with a plain linear tool, while I present the term "straight stamping", to refer to the technique of tool application. Rocker dentate stamped designs are made by rocking a straight tool back and forth over the vessel surface, creating designs which look like attached V's (See Plate 3: Figure 1).

Straight stamping is the dominant technique at the Boresma site (88.5%, N=84). The twelve rocker stamped pots consist of nine which are dentate stamped, two that have linear rocker stamped motifs, and one with a rocker pseudo-scallop shell design. While the large majority of rocker stamped vessels are dentate stamped, given the small sample size of twelve pots, linear rocker stamped and pseudo-scallop shelled rocker stamped vessels are represented in proportions similar to their occurrence as a straight stamped motif.

Figure 9



Secondary Decoration

Secondary decoration refers to additional, different forms of decoration in the zones beneath the primary decorative band. If the upper rim area of a vessel is encircled with a band of straight dentate stamps, under which lies another band of straight dentate designs, this vessel does not have secondary decoration. However, if the underlying band consisted of rocker dentate stamps, or some other different type of tool or method of application, then this vessel would have secondary decoration.

Secondary decoration is extremely rare at the Boresma site. Of the 118 rimsherd vessels which could be checked for this attribute, there are only four (3.4%) with secondary decoration. The secondary decoration consists of one example of incised lines under straight dentates, one vessel with incised lines

under a plain rim, one instance of straight dentates under a rocker dentate stamped rim, and one example of linear rocker stamping under a straight linear stamped rim.

Superimposed Tools

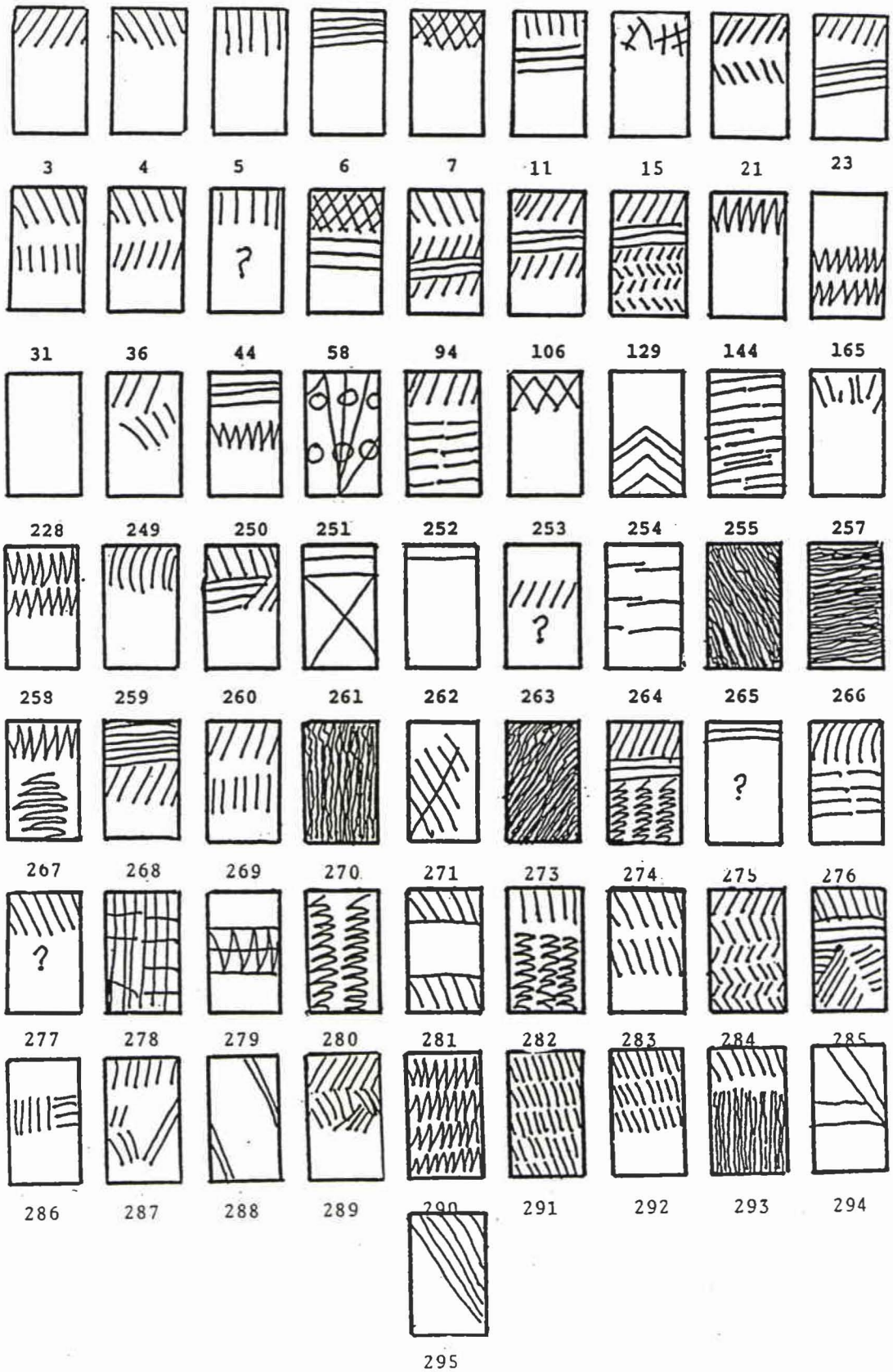
The superimposition of one decorative technique over another is also quite rare. Of 147 rim sherd vessels, superimposition was present on only four (2.7%). In two instances a base pattern of straight dentate stamps has been overlain with trailed lines, while there are two examples of trailed lines incised over rocker dentate stamping. The majority of the rim sherd vessels were very fragmentary, and I suspect that superimposed trailed lines might be slightly more common lower on the vessel.

Exterior Design Sequences

It was possible to observe the sequence of design motifs for 97 vessels. The design sequences for both exteriors and interiors are presented in Figure 7. The collection was very variable, with the two most prevalent sequences, #228 (plain) and #275 (horizontals over indeterminant), represented only eight times each. Also popular, with six and five representations respectively, are curving obliques (right) and vertically impressed cord marks.

The most common first band decorative motif consists of a row of obliques or verticals (N=45): 24 to the right, 12 left, three vertical, and one irregular. Horizontals in the first band are represented eleven times, while there are six instances of crisscrosses in the upper design area. Design sequences #3 through #228 were also identified on the Donaldson and Thede

Figure 10: Exterior and Interior Design Sequences



sites, while the remainder are new sequences, as yet reported only from the Boresma site (See Figure 10).

Table 12: Exterior Design Sequences

(R)= Sloping Up To Right (L)= Sloping Up To Left

Design Code	Design Sequence	f	%
275	Horizontals/Indeterminant	8	8.3
228	Plain	8	8.3
259	Curving Obliques (R)	6	6.2
270	Vertical Cord Impression	5	5.1
263	Undecorated/Obliques (R)/Indeterminant	4	4.1
269	Obliques (R)/Verticals	4	4.2
3	Obliques (R)	3	3.0
252	Obliques (R)/Broken Horizontals	3	3.0
265	Oblique (L) Cord Impression	3	3.0
273	Oblique (R) Cord Impression	3	3.0
277	Obliques (L)/Indeterminant	3	3.0
280	Vertical Rocker Stamping	3	3.0
5	Horizontals	2	2.0
15	Irregular Crisscrosses	2	2.0
21	Obliques (R)/Obliques (L)	2	2.0
23	Obliques (R)/ Horizontals	2	2.0
7	Overlapping Regular Crisscrosses	1	1.0
11	Verticals/Horizontals	1	1.0
31	Obliques (L)/Verticals	1	1.0
36	Obliques (L)/Obliques(R)	1	1.0
44	Verticals/Indeterminant	1	1.0
58	Regular Crisscrosses/Horizontals	1	1.0
106	Obliques (R)/Horizontals/Obliques (R)	1	1.0
249	Irregular Obliques(R)/Irregular Obliques (L)	1	1.0
250	Horizontals/Horizontal Rocker Stamp	1	1.0
254	Plain/Stacked Chevrons	1	1.0
255	Broken Horizontals	1	1.0
257	Irregular Obliques (R and L)	1	1.0
258	Horizontal Rocker Stamping (two rows)	1	1.0
260	Obliques (L)/Opposed Horizontals and Obliques(R)	1	1.0
261	Horizontals/Crisscross	1	1.0
264	Irregular Broken Horizontals	1	1.0
267	Horizontal Rocker Stamp/Vertical Rocker Stamp	1	1.0
268	Horizontals/Obliques	1	1.0
271	Irregular Crisscrosses	1	1.0
272	Undecorated/Irregular Crisscrosses	1	1.0

Con't

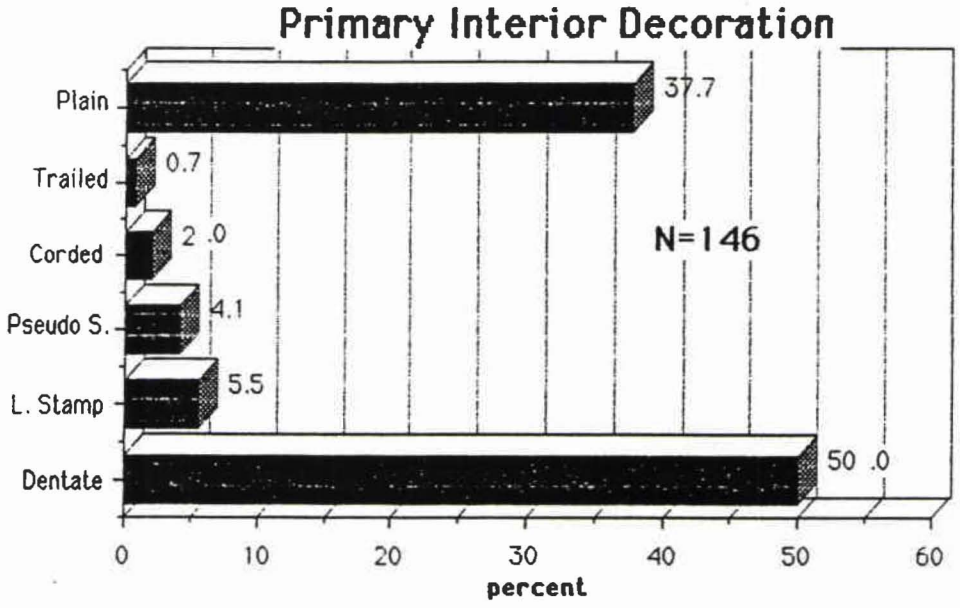
Table 12: Continued

274	Obliques(R)/Horizontals/Vertical Rocker Stamp	1	1.0
276	Curving Obliques(R)/Horizontals	1	1.0
278	Verticals with Irregular Horizontal Crosses	1	1.0
279	Horizontal Rocker Stamp with Horizontal Crosses	1	1.0
281	Obliques(L)/Horizontal/Blank/Horizontal/Obliques(L)	1	1.0
282	Verticals/Vertical Rocker Stamping	1	1.0
284	Obliques(R)/Obl.(L)/Obl.(R)/Obl.(L)/Obl.(R)/Obl.(L)	1	1.0
285	Obliques(L)/Horizontals/Opposed Obliques	1	1.0
286	Irregularly Opposed Horizontals and Obliques	1	1.0
287	Obliques(R)/Indeterminant	1	1.0
288	Obliques(R)/Opposed Obliques	1	1.0
289	Obliques (L)-Widely Spaced in Pairs	1	1.0
290	Horizontal Rocker Stamp (Four Bands)	1	1.0
291	Obliques (L) (Five Bands)	1	1.0
292	Obliques (L) (Three Bands)	1	1.0
293	Obliques (L)/Vertical Cord Impression	1	1.0
294	Opposed Horizontals-Obliques-Blanks	1	1.0
295	Obliques (L) and Opposed Blanks	1	1.0

Interior Decoration

It was possible to observe the attribute of interior decoration for 146 rimsherd vessels. The interiors are far less gaudy than the exteriors, as only 62.3% were decorated, with all decoration confined to the upper rim area. Once again dentate stamping dominates, as fifty percent of the vessel interiors were decorated with this tool. Another clear indication of the simplicity of the interior decorations in comparison to their exterior counterparts is the absence of any interior secondary decoration. Superimposed interior decoration is limited to one instance of hollow reed punctates impressed over a dentate stamp motif. Figure 11 summarizes the interior decoration data.

Figure 11



Interior Design Sequences

It was possible to code the interior design sequence for 124 vessels. Sequence #228 (plain) dominates (N=53), while obliques left and right and the non-overlapping crisscrosses are each represented ten times. Table 13 presents the interior design sequence data.

Body Decoration

The rimsherd vessels from the Boresma site are with few exceptions very fragmentary. In order to get a better idea which techniques of decoration were prevalent on the bodies of the vessels, I examined each of the 1,155 analyzable body sherds which

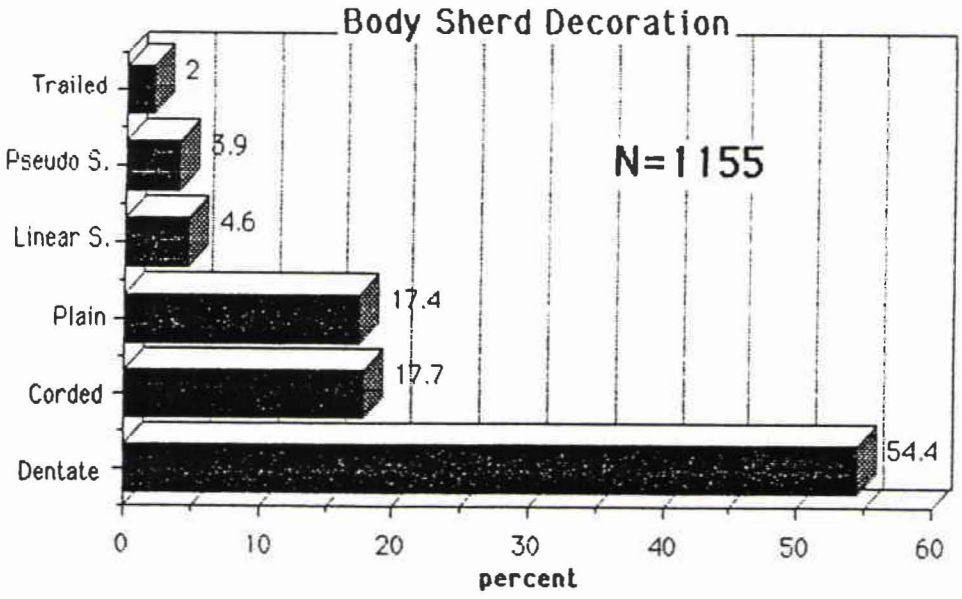
Table 13: Interior Design Sequences

(R)= Slopes Up To Right (L)= Slopes Up To Left

Design Code	Design Sequence	f	%
228	Plain	53	43.1
3	Obliques (R)	10	8.1
4	Obliques (L)	10	8.1
253	Non-overlapping Crisscrosses	10	8.1
259	Curving Obliques (R)	7	5.7
21	Obliques (R)/Obliques (L)	5	4.1
36	Obliques (L)/Obliques (R)	4	3.3
144	Horizontal Rocker Stamping	3	2.4
266	Horizontal Fabric Impression	3	2.4
23	Obliques (R)/Horizontals	2	1.6
275	Horizontals/Indeterminant	2	1.6
5	Verticals	1	0.8
6	Horizontals	1	0.8
7	Overlapping Crisscrosses	1	0.8
15	Irregular Crisscrosses	1	0.8
44	Verticals/Indeterminant	1	0.8
94	Obl.(L)/Obl.(R)/Horizontals/Obl.(R)	1	0.8
129	Obl.(R)/Horizontals/Obl.(R)/Obl.(L)/Obl.(R)/Obl.(L)	1	0.8
165	Horizontal Rocker Stamps/Horizontal Rocker Stamps	1	0.8
251	Irregular Obliques with Punctates	1	0.8
262	Single Horizontal	1	0.8
275	Horizontals/Indeterminant	1	0.8
277	Obliques (L)/Indeterminant	1	0.8
283	Obliques (L)/ Obliques (L)	1	0.8
292	Obliques (L) (Three Rows)	1	0.8
295	Obliques (L) with opposed blanks	1	0.8

had not been assigned to a rim, for primary tool decoration. Once again dentate stamping dominates at 54.4%; however, dentate designs are 6% less common on the bodies than on the rims. Linear dentate stamping comprises 41.8% of the collection, while rocker dentate stamping adds a further 12.6%. Corded (17.7%) and plain (17.4%) body sherds are each much more common than corded and plain rimsherds, suggesting that in many instances tool impressions were restricted to the upper rim area. Figure 12 presents the body sherd decoration data.

Figure 12



Lip Shape and Decoration

It was possible to code for the attribute of lip shape for 159 vessels. Flat lips predominate, comprising 54.7% (N=87) of the collection. Rounded lips were present 26.5% (N=41) of the time, with pointed lips least common, at 19.5% (N=31).

Of the 128 flat or rounded lips, 90 (70.3%) were decorated. The most common form of lip decoration is linear dentate stamping, present on 47 vessels (36.7%); a total of 38 (29.6%) lips are plain, while 27 (21.4%) are decorated with a linear stamp. Eight (6.3%) lips are pseudo-scallop shell impressed and seven (5.5%) have trailed motifs. Only one lip in the collection was decorated with cord impressions. Thirty-two lips had their decorative technique impressed so firmly that it created an actual lip notch. On all but four of the 90 decorated lips the decoration crossed the lip, while there are two

instances of encircling dentate stamps and two cases of encircling plain linear stamps.

Rim Profiles and Thickness

It was possible to code for the attribute of rim profile for 100 rimsherd vessels (Figure 13). Out-flaring rims are most common, as 87% of the vessels slant out at the mouth; straight rims, and inflaring rims are represented seven and six times respectively. There are no vessels in the collection with collars, although some of the more exaggerated outflares provide collar-like areas for decoration.

Rim thickness was measured 25mm below the lip in order to avoid attempting to measure the pointed rims at the lip. The average rim thickness was 7.4mm, with a range of 3.7mm to 16.5mm.

Vessel Shape and Construction

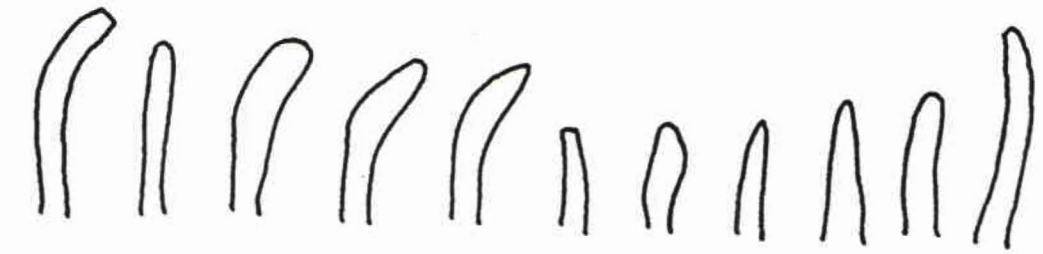
Although the Boresma site vessels are very fragmentary, it is possible to make several general observations about their form. Six basal sherds were recovered, four of which are pointed, suggesting a conoidal shape for many of the vessels, while the other two basal sherds are gently rounded, indicating that some of the Boresma pots may have had a more globular form. Judging from the better preserved rimsherd vessels, most are weakly shouldered with slightly constricting necks and out-flaring rims with flattened lips.

It is also likely that there is a wide range of vessel sizes represented in the collection. It was possible to observe an orifice diameter of approximately 7.5 cm for two vessels, while the mouth of one nearly complete larger specimen is

Figure 13: Rim Profile Codes and Percentage of the Boresma Collection

4 5 6 7 8 9 11 13 15 16 18

8% 8% 4% 14% 5% 3% 1% 4% 2% 1% 1%

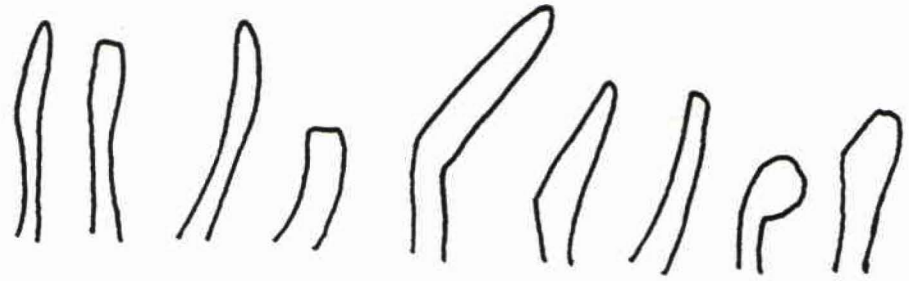


20 22 23 25 27 35 45 59 61 62 68

1% 3% 7% 1% 1% 2% 1% 1% 2% 1% 4%

72 76 86 87 88 89 90 91 92 93

1% 1% 1% 1% 1% 1% 1% 3% 1% 1%



94 95 96 97 98 99 100 101 102

4% 1% 1% 1% 1% 1% 2% 1% 1%

twenty-three centimeters across. There are also several other more fragmentary vessels, which on the basis of rim curvature, may have exceeded thirty centimeters at the mouth. The wide range in rim thicknesses also supports the proposition that the size of vessels was quite variable at the Boresma site.

All of the vessels were grit tempered with fragments of granite which were probably obtained from rotting fire-cracked rock. Coiling was the prevalent method of vessel construction, as sherds with coil breaks are common throughout the collection. Three fragments of fired coils and three miscellaneous fired lumps of clay were recovered from the midden area, suggesting that at least some of the vessels were manufactured at the site. The coil fragments ranged between nine and eleven millimeters in diameter.

Two very small poorly manufactured rims which may be examples of juvenile produced vessels were also collected. Both have a rim thickness of four millimeters, and one has been decorated with very crude oblique incisions sloping left. Judging by the curvature of the rims, these vessels had an orifice diameter of approximately three to four centimeters.

Chipped Lithics

The Boresma site excavation has produced the largest extant lithic sample from a Middle Woodland site in Ontario. A total of 12,623 pieces of chipped lithics were collected, including 244 formal lithic tools and 201 utilized flakes. The size and diversity of the Boresma lithic assemblage is consistent with the interpretation of the Boresma site as a multi-purpose basecamp, in that tools relating to many different

functions are found in the collection. Table 14 summarizes the frequencies of lithics tools and debitage.

Table 14: Lithic Categories

Item	f	%
Chipping debitage	12,083	95.7
Utilized flakes	201	1.6
Projectiles	93	.74
Biface fragments	67	.53
Bipolar cores	46	.36
Pièces Esquillèes	36	.27
Random flake cores	31	.24
End scrapers	21	.16
Bifaces	20	.16
Hafted end scrapers	13	.1
Drills	9	.08
Side scrapers	4	.02
Tip scrapers	3	.02
Total	12,623	99.95

Raw Materials

The lithic materials from the Boresma site were identified solely on the basis of macroscopic analysis. Reference was made to the chert type collection housed at the Ministry of Culture and Communication office in London Ontario, and samples of the Boresma collection were identified by both Dr. Chris Ellis of the University of Western Ontario and Mr. William Fox of the Ministry of Culture and Communication.

There are four chert types represented in the Boresma collection: Onondaga, Kettle Point, Selkirk, and Flint Ridge. Both Onondaga and Selkirk chert can be collected in cobble form from the river gravels near Komoka, 2.5 kilometers north of the

site (William Fox 1989:pers.comm.), while the Kettle Point chert originates from the Kettle Point/Port Franks area, 50 kilometers northwest on the Lake Huron shore. Flint Ridge chert is a high quality import from Ohio, found in only small quantities at the Boresma site.

Onondaga chert was by far the most common lithic material, comprising 58.4% of the chipping debitage and 49.7% of all bifacially worked tools. This is a rather low quality form of Onondaga chert, gathered from secondary deposits in the Thames river gravels. The cobbles tend to be very small, with frequent internal fractures. On the basis of the core metric data, few cobbles were larger than seventy centimeters in diameter.

Kettle Point chert was the second most common lithic material at the site, comprising 24.6% of the lithic debitage, and 32.4% of the collection of bifacially worked tools. With Kettle Point chert 8% more common in finished bifacial form than as chipping detritus, it seems likely that at least some of the Kettle Point tools were not manufactured on site. While there are no large random flake Kettle Point cores in the Boresma collection, there are 26 smaller bipolar cores, indicating that some of this material was reaching the site in unfinished form. With the Kettle Point source only 50 kilometers to the northwest, both trade or self provisioning may account for the high percentage of this material, although trade with groups further to the northwest seems likely.

Selkirk chert comprises only 1.3% of the site's chipping detritus, but 6.8% of the bifacially worked tools. While Selkirk chert is locally available as a secondary deposit, no Selkirk cores were recovered and the percentage of finished Selkirk tools is nearly five times greater than the percentage of detritus. It is possible that this material was collected and worked at some other aspect of the Boresma site's inhabitants

seasonal movements, or possibly it was traded for in a finished form from other local groups. Almost all of the Selkirk chipping detritus consists of small retouch flakes.

Flint Ridge chert from Ohio probably arrived at the Boresma site in finished form. Only .5% of the chipping debitage at the site is Flint Ridge, while 2.6% of the finished tools are manufactured from this material. The Flint Ridge chipping detritus consists of small retouch flakes which are probably the result of resharpening imported bifaces and projectiles.

Cores

A total of 67 cores were recovered, 36 (53.8%) of which were bipolar, while the remaining 31 (46.2%) were random flake cores.

Of the 31 random flake cores (Plate 14), 29 were Onondaga chert and two were unidentifiable due to heating; no large pieces of Kettle Point chert were recovered. Twenty-one of these cores had areas of yellow/orange patination, betraying there origin as river cobbles, with some having had only one or two flakes removed before rejection due to low material quality. The largest random flake core was 70.5 mm long, while the average was 52.7 mm. Total metric and non-metric observations for the random flake cores are available in Appendix 2.0.

The collection of 36 bipolar cores is comprised of 18 of Kettle Point chert (50.0%), 17 of Onondaga (47.2%), and one (2.7%) of an unidentified material (Plate 13: Figures 10-14). The bipolar technique of lithic reduction involves placing a small piece of chert on an anvil stone and striking with a hard hammer. In this manner it is possible to obtain several more flakes from a core too small to be hand held. This was an important technique for the inhabitants of the Boresma site, as

Figure 14

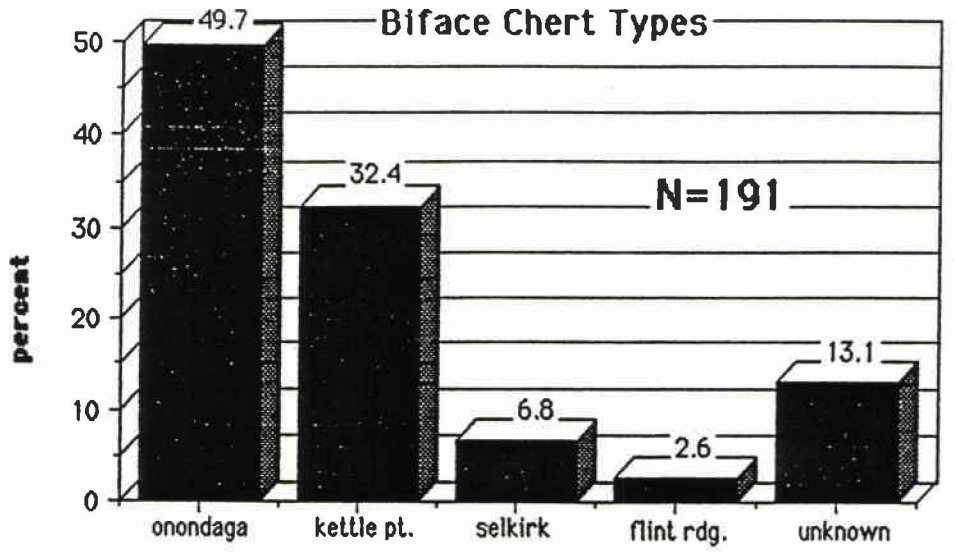
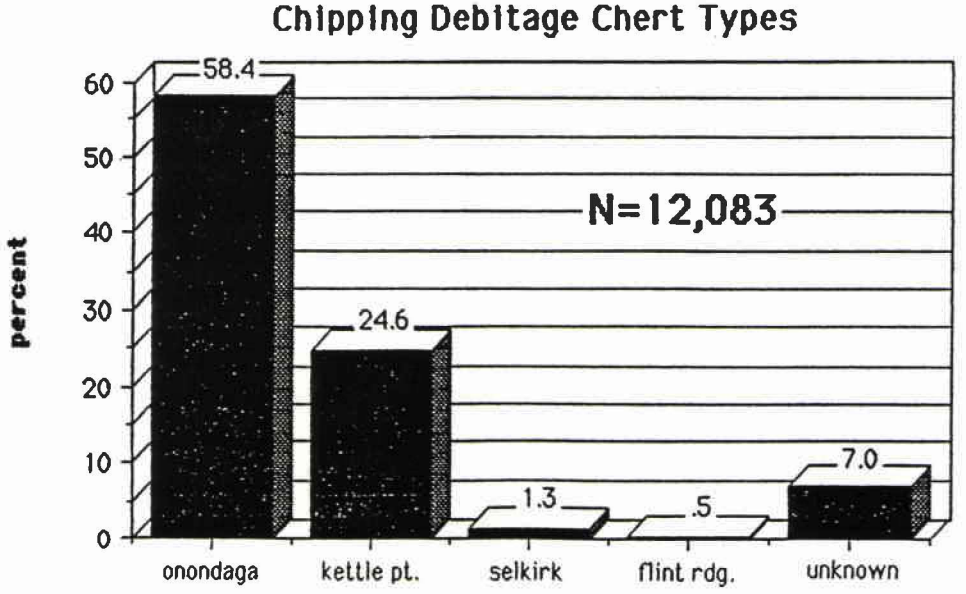


Figure 15



most of their local chert resources consisted of small cobbles. With 50% of the bipolar core collection consisting of Kettle Point chert, it appears that it was a preferred material, with all available pieces reduced as far as possible.

The largest bipolar core was 57.8mm long; however, the average was 31.4mm, with a standard deviation of 7.4mm. Metric and non-metric observations for the bipolar cores are available in Appendix 2.1.

Pièces Esquillées

Thirty-six pièces esquillées or "scaled pieces" were recovered during the excavations. These are small rectangular artifacts, commonly biconvex in cross-section with one or more axes of bipolar percussion. Dorsal and ventral aspects usually display concentric rippling and/or step and hinge fractures. Often pièces esquillées are recycled from bifacially worked tools, which is good evidence that they are not simply small bipolar cores (Lothrop and Gramly 1982:8). While there is no definite evidence for function of these artifacts, experimental studies have shown that they serve well as wedges for splitting wood and antler, and they probably were part of the bone and antler working toolkit (Lothrop and Gramly 1982:19).

Pièces esquillées are frequently indistinguishable from bipolar cores and are often classed as such (see Finlayson 1977: Plate 10, Figures 7-12, 18-22, and 26-32). It proved particularly difficult to sort them out at the Boresma site, as bipolar percussion was being used to reduce the small river cobbles and imported cherts. The pièces esquillées which have been identified were categorized primarily on the basis of size; their average length is only 22.5mm. It seems unlikely that these small pieces of chert served as cores, as flakes this

small were only infrequently utilized by the site's inhabitants. Further supporting the hypothesis that these items served as tools and not cores are three former projectiles and two end scrapers which have been reused as pièces esquillèes. All five of these artifacts show the classic hinge and step fractures characteristic of bipolar percussion. In addition to these five reworked tools, there are three more projectiles and one end scraper with columnar fractures running parallel to their long axes, also a good indication of their use as pièces esquillèes.

Of the 36 pièces esquillèes, 25 (69.5%) were manufactured from Kettle Point chert, nine (25.0%) from Onondaga, one (2.7%) from a small piece of Flint Ridge chalcedony, and one from an unidentifiable chert. It appears that the Kettle Point material was favored for this tool type as pièces esquillèes are more than twice as likely to be manufactured from Kettle Point chert than are bifaces. Metric and nonmetric data are summarized in Appendix 2.2.

End Scrapers

Twenty complete or partial end scrapers were recovered during the excavations. Thirteen (65%) of these were manufactured on Kettle Point chert, once again showing the preference for this high quality material. Of the remaining seven, five (25%) were flaked from Onondaga chert and two were made from a chert rendered unidentifiable by heating. These tools are characterized by steeply retouched bit edges which are located on the distal end of expanding flakes. All but one had bit edge angles ranging between 75 and 90 degrees, while the last has been retouched to approximately 45 degrees. Only two of the end scrapers were manufactured on flakes with parallel

sides; all of the rest expand towards the bit end.

The average end scraper length is 27mm, with a standard deviation of 8.1mm for sixteen possible observations. The longest complete end scraper was 42.8mm long, and the smallest 12.2mm. Complete end scraper metric and nonmetric data are provided in Appendix 2.3.

Side Scrapers

Only three side scrapers are present in the Boresma site collection. Two have been manufactured from Kettle Point chert, and one has been made from Onondaga. Two of the specimens have been retouched on one side, while the third has been retouched on both. The angles of retouch are not as steep as the end scrapers, as they range between 60 and 80 degrees. The two single edge side scrapers are complete, and are 46.7mm and 30.6mm long. Further metric and non-metric data are presented in Appendix 2.4.

Tip Scrapers

Three scrapers were recovered which have been manufactured on the proximal end of broken biface tips (Plate 11, Figures 12, 13, and 15). Two of these were made from Kettle Point chert and the third from Onondaga. The angle of retouch is less than that of the end scrapers, ranging between 70 and 80 degrees. The profiles of these artifacts are biconvex in two cases and plano/convex in the third. The average length is 28.8mm. See Appendix 2.5 for further metric and nonmetric data.

Hafted Scrapers

During the course of the excavations and controlled surface pickups we encountered thirteen partial or complete hafted scrapers (Plate 11, Figures 1-10). Six (46.1%) each were manufactured from Kettle Point and Onondaga chert, while one was made from Selkirk. All but one of these appears to have been recycled from a broken projectile, while the last specimen is a shallowly notched biface with a convex base narrowing toward the bit end which may have been manufactured specifically as a scraper from the biface blank. Of the remaining scrapers, all but one are characterized by large expanding U-shaped side notches which extend down to the basal ears. This notch form gives the scrapers an expanding stem appearance which is also characteristic of the Boresma projectile points. The remaining scraper is square stemmed, and seems out of place in the collection, and may possibly be a curated Early Woodland or Late Archaic form. Complete metric and nonmetric data for the hafted scrapers are presented in Appendix 2.6.

Drills

Nine fragmentary drills were recovered, five of Onondaga, two of Kettle Point, and one manufactured from an unidentified, heated chert. Two of the drills are T-shaped with flat bottoms (Plate 9, Figures 16 and 18), while two more are similarly shaped, but have either been snapped off just short of the base or were manufactured on broken biface tips and their bases have not been retouched (Plate 9, Figures 15 and 17). Of the two remaining nearly complete specimens, one is triangular with the drill bit only slightly thinned, and the second is a crudely manufactured side notched form with a full 18 millimeters of

body between the proximal end of the bit and the hafting element. Complete metric and nonmetric observations for the drills are available in Appendix 2.7.

Biface Fragments

During the course of the excavations 67 bifacially worked fragments were recovered. Of these, 29 (43.2%) were Onondaga, 21 (31.3%) Kettle Point, four (6.0%) Flint Ridge chalcedony, one (1.5%) Selkirk, and twelve (17.9) are unidentified due to heating. Among this collection are eleven basal fragments which belonged either to hafted scrapers, drills, or projectile points. Of these, seven have convex bases and four are flat. As with the hafted scrapers, the seven fragments with observable hafting elements show a range of side notched to expanding stemmed forms, with four of seven best classified as side-notched. The nature of the hafting elements is further discussed in relation to the projectiles.

Bifaces

Twenty complete bifaces were recovered (Plate 12, Figures 1-10; Plate 13, Figures 1-9), thirteen of which were flaked from Onondaga chert, five from Kettle Point, one from Selkirk, and one of an unidentified material. Twelve of the bifaces were roughly triangular in shape, three were lanceolate, and five were irregular. Ten of the lanceolate and triangular bifaces and all five of the irregularly shaped bifaces have hinge islands on one or both sides, and were probably rejected during manufacture. Only two of the bifaces show any macroscopic sign of reworking or edge utilization.

Average biface length is 49.8mm, width 19.7mm, and

thickness 6.8mm. Complete metric and nonmetric observations for the bifaces are presented in Appendix 2.8.

Hafted Projectile Points and Knifes

The Boresma site excavations were extremely productive in terms of projectiles and/or hafted knives; in total 93 specimens were recovered. Forty-six were manufactured from Onondaga chert (49.5%), twenty-six from Kettle Point chert (28.0%), ten from Selkirk chert (10.8%), and one from Flint Ridge chalcedony (1.1%). The material of the eleven (11.8%) remaining points could not be identified due to heat alteration. Seventy-two of the projectiles were relatively complete and could be sorted into two basic categories; side-notched and expanding-stemmed.

Forty (56%) of the seventy-two complete or near complete points are characterized by wide side-notch openings which tend towards an expanded U form. There are few clear-cut examples of side-notched points, as in most instances the lower notch margin is not clearly defined and extends almost down to the basal ears (Plate 7, Figures 1-20; Plate 8, Figures 1-15). This gives many of these points an expanding-stem appearance. It is important to note that there is a definite continuum between the side-notched points and the expanding-stem forms, as each time I attempted to sort the collection along these lines I came up with slightly different results.

Points similar to the side-notched examples from the Boresma site are common throughout the northeast during the Middle Woodland period, with similar examples in collections from New York (Ritchie 1980: Plate 76, Figures 4 and 8), Illinois (Morse 1963: Plate 8, Figure 2), Wisconsin (Mason 1966; Plate 9), northern Ontario (Wright 1967:Plate 4,figures 1 and 2), Ohio (Stothers, Pratt, and Shane 1979:Figure 8.6, A,C,D) and

from sites in southern Ontario (Finlayson 1977: Plate 8, Figures 1,10,11,12, 13,14,15; Plate 32, figures 2,3,10 and 11). Particularly close matches to the Boresma specimens have been excavated from the Schultz site in the Saginaw valley of eastern Michigan (Fitting 1972: Plates 61-62).

In southwestern Ontario projectiles matching this description have been categorized as Saugeen points (Kenyon 1979). I have chosen not to employ the local nomenclature for two reasons. First, the Saugeen point classification has been defined rather broadly, including projectiles with both side-notched and expanding-stemmed hafting elements. In Chapter Four I suggest that it may be profitable to distinguish between these morphological variants, as expanding-stemmed points may seriate earlier than the side-notched form. My second reason for avoiding the local terminology is that as yet it has not been satisfactorily demonstrated that the Saugeen points represent a distinct projectile-point type. Morphologically similar points are found throughout the northeast in the Middle Woodland period, and I believe that the variation encompassed under the "Saugeen Point" rubric is already adequately described by a number of previously established terms.

Following Justice's (1987:208-214) typology, the side-notched points from the Boresma site are best described as Chesser Notched, a type Justice suggests makes an initial appearance in the northeast circa A.D.300. While I will argue that Justice's date of origin for these points may be as much as a century or more too late, I agree that the Chesser Notched points fit chronologically between the Middle Woodland Snyder Cluster and the Early Late Woodland Jack's Reef points.

Twenty-eight (38.9%) of the complete or near complete points have expanding stems, of which nineteen have relatively straight-edged expanding stems and nine have excurvate

expanding-stems (Plate 9, Figures 1-12). The primary difference between the straight edged expanding-stemmed projectiles and those which I classified as side-notched is that the lower notch margin extends down in a very straight line to the tip of the basal ear. These straight-edged expanding-stem points resemble very closely the Lowe Flared Base and Baker's Creek points illustrated by Justice (1987:Figures 45-46), although they do not have hexagonal cross-sections.

Once again this point type is widely spread across the northeast, making an initial appearance as early as A.D.150 (Justice 1987:211). Examples similar to the Boresma points have been found in Illinois (Morse 1961: Plate 8,Figure 1), Upper New York State (Ritchie 1980:Plate 76, Figure 5), Michigan (Griffin, Flanders, and Titterington 1970:Plate 52,B), northern Ontario (Wright 1967:Plate 4,Figure 30), Wisconsin (Mason 1966: Plate 9, Figures 1 and 2), and from southern Ontario (Finlayson 1977: Plate 8, Figures 5-6). The closest matches to the Boresma materials are found from the Middle Woodland levels of the Schultz site in eastern Michigan (Fitting 1972:Plates 61-62).

The remaining nine expanding-stem points have excurvate stems which curve upward from the basal ears to the upper-notch margin. Often points such as these are identified as corner-notched. Four of these points (Plate 8, Figures 16, 17, 18, and 20) resemble the Steuben Expanding Stem projectiles from the Steuben site in Illinois (Morse 1963; 57-58). Justice groups the Steuben points in the Lowe Cluster as contemporaries of the Baker, Lowe Flared Base, and Chesser Notched projectiles. Near identical points were also found at the Schultz site (Fitting 1972).

A further four excurvate expanding-stemmed points fall within the parameters of the Snyders Cluster (Justice 1987). One large, heavily reworked point manufactured from Flint Ridge

chalcedony is a classic example of a Snyders point (Plate 10, Figure 1); however, it has been so frequently retouched it now has concave blade margins rather than the graceful excurvate form associated with these points in Hopewellian burial contexts.

Two smaller Affinis Snyders points (Plate 10, Figures 2-3) are also present in the collection (Justice 1987:202; Winters 1963). The Affinis Snyders points are characterized by small triangular blades relative to their large excurvate expanding stem hafting element. Once again, several of these points are illustrated in the Schultz collection (Fitting 1972: Plate 62). An Affinis Snyders point has also been recovered from the Sibelius site, a Middle Woodland occupation located only one kilometer down river from the Boresma site (Fox 1982: Figure 14:4).

The fourth point from the Snyder Cluster (Plate 10, Figure 11) is an extremely well made base fragment which shows all of the characteristics of the western Michigan Norton points (Griffin, Flanders, and Titterington 1970). Regrettably, the specimen has been badly burned, although it appears to have been manufactured from a non-local material.

Projectiles from the Snyders Cluster have been associated with radiocarbon dates ranging from B.C.200-A.D.400, although they are generally thought to be more common in the early part of this period (Justice 1987:201-202). One large point manufactured from Onondaga chert and sharing the same basal characteristics as the Affinis Snyders points was also recovered (Plate 10, Figure 4); it also closely resembles the Marshall Barbed points illustrated by Morse (1963:Plate 7, Figure 2).

One classic Meadowood projectile point (Ontario variant, Plate 12, Figure 11), and two other projectiles showing Early Woodland characteristics were collected (Plate 12, Figures

13-14). These points were probably curated by the Boresma site's inhabitants, although it is possible there is a minor Early Woodland component on the site. I believe the first explanation is more likely, as two of these projectiles were found in the midden in good association with large amounts of Middle Woodland debris. No Vinette 1 ceramics were located on the Boresma site, although there is an Early Woodland site (AfHi-122) located only 150 meters north, along the edge of the abandoned river channel.

We also recovered one Jack's Reef point (Plate 12, Figure 12) and one probable Jack's Reef fragment. Jack's Reef points have been dated to the terminal Middle Woodland period, and it is possible that these two points are associated with the cord-wrapped stick sherd and the Levanna point which were noted on the western end of the site. This possibility is further discussed in relation to the radiocarbon dates in the next chapter.

Examining the projectile collection as a whole, of 82 instances in which the base shape was observable, 54 (65.8%) are convex, 26 (31.7%) flat, and only two (2.5%) slightly concave. From the sixty projectiles on which the blade edges were well preserved, 35 (58.3%) were obviously reworked. Five of the larger points, including the Flint Ridge Snyders point were heavily retouched and have the crushed edges characteristic of use as a knife. The average projectile length is 43.9mm, width 23.4mm, and thickness 8.3mm. All metric and nonmetric data for this class of artifacts are presented in Appendix 2.9.

Rough and Ground Stone

Hammer Stones

Six hammer stones were recovered during the controlled

surface pickups and excavation (Plate 15, Figures 4-9). Three of these artifacts have use wear on one pole, with narrow wear extensions on their angular lateral margins. The use wear on the sides of the hammer stones appears to be the result of grinding rather than striking, and may have resulted from use in stabilizing thin striking platforms through abrasion. All three of these hammerstones have abraded platforms.

Two of the six hammer stones have use wear around their circumference. On one of these the wear encircles 75% of the circumference, while on the other 90% of this area has been utilized. The sixth hammer stone was probably manufactured on the pole end of a broken celt. It has use wear on both ends and its body has been carefully ground.

Interestingly, two of the hammerstones were manufactured from Onondaga chert cobbles; the rest were made from locally available metamorphic and igneous material. They ranged in length from 63mm to 91mm, with an average length of 74.5mm. Complete metric and nonmetric data for the hammerstones are presented in Appendix 2.10.

Celts and Gouges

One complete and one partial celt, along with one ground stone gouge, were recovered. The gouge is convex/concave in cross-section, measuring 112mm in length, 51mm in width, and is 27mm thick (Plate 15, Figure 1). The area of concavity is very shallow, measuring only one millimeter in depth, although this side of the artifact was polished along the lower two thirds of its length. The gouge was manufactured from a light green piece of fine-grained metamorphic material.

The complete celt was chipped and pecked from a piece of dark grey banded slate. Only the distal end shows evidence of

grinding, and is worked to a sharp edge (Plate 15, Figure 3). This celt measures 91mm in length, 37mm in width, and is 19mm thick. It is possible that this tool was manufactured at the site, as 19 slate flakes were recovered from the plowzone.

The final celt is incomplete, missing its proximal end (Plate 15, Figure 2). Like the gouge, it has been carefully pecked and ground to a smooth surface finish. The body of the celt is plano/convex in cross-section; however, the bit is ground to a biconvex form. It was manufactured from a piece of fine-grained light green metamorphic material almost identical to the gouge.

Anvil Stones

Three anvil stones were collected during the course of the investigations (Plate 16, Figure 1-2). These are relatively large, flat pieces of rock which have small circular pits centrally located on one or both sides. Only one of the Boresma anvil stones was bi-pitted, with the circular depressions measuring 1mm in depth and 37mm in width. Although these artifacts are sometimes referred to as "nutting stones" (Fitting 1972:245), and they may well have occasionally served this function, it appears more likely that the small circular depressions resulted from use as a platform for bipolar lithic reduction, rather than from cracking nuts. The three Boresma anvil stones have the following measurements respectively: length, 123mm, 113mm and 105mm; width, 122mm, 110mm, and 101mm; and thickness, 66mm, 83mm, and 65mm.

Abrading Stone

One large flat stone which has been used as an abrader for

grinding and polishing other stone and/or bone artifacts was recovered from one of the features. It measures 343mm in length, 143mm in width, and is 51mm thick. Eighty percent of the surface area has been ground to a depth of 3.5mm below the lateral margins and is covered with fine striae which run parallel to the long axis.

Net Sinkers

Four net sinkers were collected, all of which were manufactured from water-worn river cobbles (Plate 16, Figures 3-5). Three are notched on their short axis, while the forth is notched on the long axis. The respective measurements are: length, 90mm, 71mm, 71mm, and 105mm; width, 62mm, 70mm, 66mm, and 68mm; and thickness, 29mm, 20mm, 20mm, and 22mm.

Slate Whetstone

One of the more interesting artifacts recovered during the excavations is a "pointed slate whetstone" from level 5 of the midden (Plate 11, Figure 19). This is a small triangular, finely ground and polished piece of slate with a convex base and carefully squared edges. It measures 70.7 mm in length, 18.5 mm in width, and is only 4.6 mm thick. Artifacts very similar to these have been recovered from Hopewell influenced burial contexts in Upper New York State and in the Rice Lake area of southeastern Ontario (Ritchie 1980:224,plate 77, figure 19; Spence and Harper 1968:46; plate 1V, figures 20-21; Kenyon, 1986; plate 8). These artifacts have been referred to as whetstones, but their actual function is unknown.

Native Copper

All three pieces of native copper recovered from the site came from the plowzone. Two of the pieces are only fragments, one weighing one gram and the second only half a gram. Both are irregularly shaped sheets; the larger measures 24mm by 13mm, and .8mm thick, while the smaller is 16 by 14mm, and .6mm thick.

The third copper artifact may have been a rolled bead, although it is now completely flattened. It is 51mm long and 15.7mm wide (Plate 11, Figure 14). The copper sheet used in its construction, if unrolled, would form an oval measuring 51mm by 33.3mm. The copper was pounded to a thickness of .51mm and weighs exactly six grams.

Bone and Antler Artifacts

Thirty-seven bone or antler artifacts were recovered from the site, all of which were analyzed by Rosemary Prevec as part of the faunal analysis (Prevec 1990). The collection consists of punches, needles, antler tine projectiles, flakers, and the debris associated with their manufacture. No decorative bone or antler objects were recovered. Table 15 summarizes the rates of recovery of the various bone and antler objects.

Table 15: Bone and Antler Artifacts

Deer Antler		Bone	
Pressure Flakers	2	Deer Ulna Punch	2
Scored Antler	7	Polished Bone	6
Antler Debris	9	Scored Bone	1
Hacked Antler	2	Needle	1
Antler Tine Points	4		
Worked Antler	3	TOTAL	10
TOTAL	27		

Antler Tine Projectiles

Four deer antler projectiles were collected from the midden (Plate 11, Figures 17, 18, 20, and 21). These artifacts were manufactured by grooving and snapping off the end of an antler tine, hollowing out the marrow, and sharpening the point (Murray 1982:306). Two of these points measured 69mm in length, while a third near complete point would have been 4-5mm longer. Judging by the orifice diameters, the antler tine projectiles were mounted on shafts which ranged between 10-11mm in diameter at their distal end.

Similar antler tine points have been recovered as grave goods from Norton Mound Burial 3; however, the Boresma points have a flat base, while the Norton specimens have a slight tang (Griffin, Flanders, and Titterington 1970: Plate 166). The best match for these projectiles comes from the Schultz site in eastern Michigan (Murray 1972a:227).

Pressure Flakers

Two antler fragments with ground and flattened distal elements probably represent pressure flakers used in the production of chipped lithic tools. The smaller of the two is 52mm in length and 11mm in diameter (Plate 11, Figure 16). The larger specimen is 58mm long and 17.4mm wide (Plate 11, Figure 11).

Deer Ulna Punches

Two deer ulna punches were recovered, both of which are very fragmentary. The most complete specimen is a mid-shaft portion which has been ground and polished to a fine point. The

second punch is simply a worked shaft fragment with the tip missing.

Miscellaneous Worked Bone

Twenty-nine fragments of worked bone and antler were recovered during the excavations. One mammal bone fragment has been ground to a fine point and probably represents the distal end of a bone needle. Three antler tines show signs of work, and may be the tips of antler tine projectiles. A further six pieces of bone were polished, but are too fragmentary to assign to an artifact class.

The remainder of the artifacts are antler fragments which have been grooved and snapped, or simply hacked off larger pieces. The presence of a large amount of antler waste indicates that antler tools were being manufactured on the site. Antler would be most available in the fall, although it could have been curated from other locations. The presence of the 36 pièces esquillèes is also a good indication that the bone and antler was being worked on site.

Shell

One fragment of a worked marine gastropod is present in the collection. It is a small (36mm by 34mm) piece of shell from either a Busycon carlcum or Busycon perversum. Busycon carlcum occur from Cape Cod to Texas, and Busycon perversum are found from Cape Hatteras to the Gulf of Mexico. While this is only a small fragment, it is possible to note that the interior has been ground smooth, almost to the point of polish.

Chapter Four: Chronology

Middle Woodland research in southwestern Ontario, and in the Thames drainage in particular, has been hampered by the lack of a general chronology for ceramics and lithics. The Boresma site, with dated organic material in association with both ceramics and lithic diagnostics from the stratified midden deposits, provides the first opportunity to put our understanding of stylistic change in this area on firmer ground.

Radiocarbon Dates

Five carbon samples were submitted for analysis to the Beta Analytic laboratories at Coral Gables, Florida. None of the samples contained rootlet contamination and each was given acid and alkali washes to remove carbonate or humic acid contaminants. Samples four and five were quite small, 0.2 and 0.15 grams respectively, and were allowed quadruple-normal counting time to reduce attendant statistical errors.

The first sample consisted of a number of small fragments of wood charcoal collected from Feature 6 in square 180-75. This material dated to A.D.350+/-80 (uncalibrated), and was gathered from the general pit fill in association with one corded rim and four straight dentate stamped, four corded, and four trailed body sherds.

Sample two, a single piece of wood charcoal recovered during the excavation of 175-70-F-2 dated to A.D. 690+/-90 (uncalibrated). This large basin shaped pit contained one linear dentate stamped rim, one corded rim, and eight dentate stamped body sherds, one of which was rocker stamped.

The third sample consisted of small wood charcoal fragments from midden level 4. Carbonized material was only infrequently encountered in the midden, and it proved necessary to pool wood charcoal from 195-65-SS-12 and 200-65-SS-2 to obtain a sample large enough for conventional dating. The results indicate that this combined sample dates to A.D. 240+/-60 (uncalibrated).

Sample four, wood charcoal fragments collected from 200-65-SS-11 level 5, the lowest midden level with cultural material, dated to B.C.180+/-130 (uncalibrated).

The fifth sample, a single piece of wood charcoal collected from the ash lens above the hearth in level 3 yielded disappointing results. While the context of this sample seemed excellent, the resultant date of B.C.1200+/-200 (uncalibrated) is unacceptably early given the two later dates from levels 4 and 5, and the nature of the artifacts collected from level 3. It is possible that this sample consisted of intrusive carbon material washed into level three during flooding. This date is excluded from consideration in the following discussion.

Table 16: Boresma Site Radiocarbon Dates

Sample Number	Years BP	SD	BC/AD Date	Calibrated* Date Range
Beta-38142	2140	130	180 BC	505 BC-160 AD
Beta-34702	1710	60	240 AD	75 AD-445 AD
Beta-34701	1600	80	350 AD	225 AD-605 AD
Beta-34700	1260	90	690 AD	595 AD-910 AD

* following Klein et al 1982

All four remaining radiocarbon dates fall within the expected range for Middle Woodland occupations in the northeast. Finlayson (1977:604), on the basis of radiocarbon dates from

Donaldson and Thede, has suggested that the Middle Woodland period in southwestern Ontario begins with the advent of pseudo-scallop shell ceramics circa 700 B.C., lasting until approximately A.D.800. It now seems likely that the early radiocarbon dates of 585 B.C.+/-150 and 530 B.C.+/-150 from the Donaldson site, pertain to a small Early Woodland component represented by Vinette 1 ceramics, Meadowood-like projectiles, and a slate birdstone (Wright and Anderson 1963; Finlayson 1977; see also Spence and Pihl 1984:38). This still leaves the origins of Middle Woodland ceramics far from clear, although it seems probable that the Vinette 1 tradition was evolving into Middle Woodland ceramic forms circa 500-300 B.C.(Spence and Pihl 1984:38). The Boresma site, with the earliest deposits dating to B.C.180+/-130, provides no clear insights into the nature of this transitional period, although it is interesting to note that the only two rims with interior cord decoration were both recovered from the lower midden levels, one from level 5 and one from level 4a. Interior cord impression is a trait usually associated with the Early Woodland period (Spence and Fox 1986). Both of these vessels are thin and well made, with rim thicknesses of 6.1mm and 7.9mm, and are clearly of Middle Woodland origin.

The latest Boresma date, A.D.690+/-90, falls at the very end of the Middle Woodland sequence. During the course of the investigations we recovered two fragmentary Jack's Reef projectiles from the plowzone thirty meters to the east of the pit where the carbon for the late date was collected. Jack's Reef points are a type most often associated with sixth and early seventh century A.D. dates (Justice 1987:217). We also recovered a piece of cord-wrapped stick pottery and a number cord malleated sherds from a test square at the western end of the site 90 meters away from the area in which the carbon for

the late date originated. At this time the base of a Levanna point was noted on the surface at the extreme western end of the site, suggesting there may be an Early Late Woodland presence in this area.

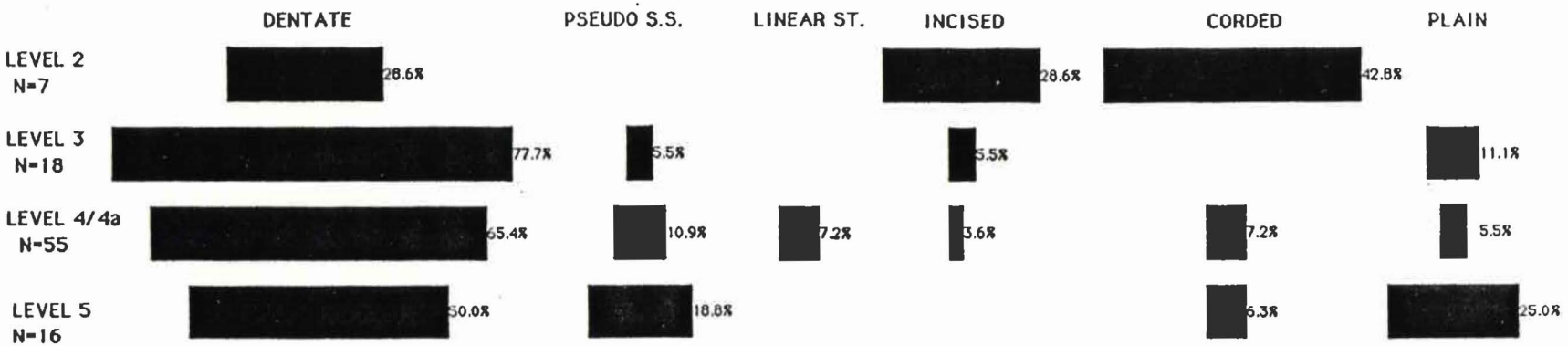
The two radiocarbon dates from the stratified midden deposits are particularly useful because they can be directly associated with significant samples of ceramic and lithic diagnostics. In the remainder of this chapter I explore the chronological implications of the artifacts recovered from the Boresma midden. The sample sizes from all but level 4 are small, and the patterns identified in the this analysis are at best trends rather than statistically significant progressions. For the purposes of the following seriation the seven vessels from level 4a have been included with the sample from level 4, as it seems likely they share a similar origin (see Chapter Two).

Chronology of the Midden Ceramics

Primary External Decoration

Ninety-five vessels with the attribute of primary decoration were present in the midden (see Figure 16). The most striking pattern which emerges is the increase of dentate stamped vessels from 50.0% (N=8) in level 5, to 65.4% (N=36) in level 4, to 77.7% (N=14) in level 3, before decreasing to 28.6% (N=2) in level 2. With the popularity of dentate stamping on the rise in levels 5, 4, and 3, the percentage of pseudo-scallop shell ceramics decreases from a high of 18.8% (N=3) in level 5, to 10.9% (N=6) in level 4, to 5.5% in level 3. The increased popularity of dentate stamped ceramics and concomitant drop in pseudo-scallop shell wares has previously been suggested by Finlayson for Saugeen materials from the Bruce Peninsula

Figure 16: Primary External Decoration Chronology



(1977:590; see also Stoltman 1973:85 for Laurel, and Wright 1967:121; Spence and Harper 1968:51; Johnston 1968, for Point Peninsula). However, the Boresma site collection provides the first stratigraphic evidence for this pattern in southwestern Ontario.

Also interesting is the the relatively high percentage of plain ceramics in level 5. Plain ceramics, which comprise only 6.3% of the site rim collection, make up 25.0% (N=4) of the level 5 materials. This percentage decreases by more than half in level 4 (5.5%, N=3) and level 3 (11.1%, N=2), and there are no plain rims in level 2.

Corded rims are present in low frequencies in levels 5 (6.3%, N=1) and 4 (7.2%, N=4), absent in level 3, and comprise 42.8% (N=3) of the sample in level 2. Incised ceramics make their initial appearance in level 4 (3.6%, N=2), increasing to 5.5% in level 3, and 28.6% in level two. while the samples from the upper midden levels are very small, the increase in cording and incising seems to anticipate their growing importance in Early Late Woodland collections. In particular, incised primary decorations in Middle Woodland assemblages may prove to be a good temporal diagnostic of the later part of the ceramic sequence.

Linear stamped rimsherd vessels appear only in level 4, where they comprise 7.2 % (N=4) of the sample. While a larger sample would be preferred, linear stamping may prove to be a good temporal diagnostic of the middle part of the Middle Woodland sequence along the Thames.

Interior Decoration

Interior vessel decoration follows a pattern similar to the exteriors. Once again dentate stamping increases through

time, with 43.8% (N=7) of the level 5 interiors dentate stamped, 53.6% (N=30) of the level 4 materials, 70.5% (N=12) in level 3, and 50% of level 2 (n=3). Pseudo-scallop shell interior designs are infrequent at all levels, comprising 6.3% of the level 5 (N=1) sample, decreasing in level 4 to 3.6%, N=2), and increasing slightly to in level 3 to 11.7% (N=2). Pseudo-scallop shell interior decorations are absent in level 2.

Plain interiors are common in the lowest midden level (43.8%, N=7), decreasing to 34% in level 4 (N=19) and 17.6% in level 3 (N=3), before increasing to 50.0% (N=2)in the small level 2 sample.

Once again, linear stamped interiors, like their exterior counterparts, are present only in level 4 (7.1%, N=4), while two vessels on the site were found with cord impressed interiors, one from level 5 and the other from level 4a.

Lip Decoration

A seriation of lip motifs also demonstrates the decline in popularity of pseudo-scallop shell designs. Twenty-five percent of the level 5 (N=5) lips are pseudo-scallop shell impressed, while only 4.2% (N=2) and 11.8% (N=2) are similarly decorated in levels 4 and 3 respectively. There are no lips decorated with pseudo-scallop shell designs in level 2. Dentate stamped lips comprise 45.0% (N=9) of the level 5 sample, 45.9% (N=22) in level 4, 35.3% (N=6) in level 3, and 33.3% (N=2) in level 2. The decline in dentate stamping on the lip in level in the upper levels is compensated for by an increase in linear stamped and incised decorations. Only 5.0% (N=1) of the level 5 lips are linear stamped, increasing to 16.6% (N=8) in level 4, 17.7% (N=3) in level 3 and 33.3% (N=2) in level 2. There are no incised lips in the lowest level, although they comprise 6.3%

(N=3) of the level 4 collection, 5.9% (N=1) in level 3, and 16.6% (N=1) in level 2. Incised lip decorations are generally very shallow and narrow (less than one millimeter), and often show evidence of fine striations from the stylus.

Lip notching may also prove useful as a general indicator of mid to late Middle Woodland ceramics. Only 6.6% (N=1) of the level 5 lips are notched, compared to 22.5% (N=14) in level 4, 15.0% (N=6) in level 3, and 42.8% (N=3) in level 2.

Lip Shape

In level 5, 75.5% (N=12) of the lips are flat, decreasing to 50.9% (N=31) in level 4 and 45.9% N=9) in level 3, before rebounding to 71.4% (N=5) in level 2/3. Pointed lips were the least popular of any lip form, comprising only 6.3% (N=1) of the level 5 collection, increasing to 24.6% (N=15) in level 4, before dropping to 20.0% (N=4) in the level 3 and 14.3% (N=1) in level 2. Rounded rims were only slightly more common, comprising 18.8% (N=3) of the level 5 collection, 24.6% (N=15) in level 4, reaching 35.6% (N=7) in level 3, before falling to 14.3% (N=1) in the very small level 2 sample. Interestingly, the thickness of the rims increases from an average of 6.8mm in level 5, to 7.3mm in level 4, 8.0mm in level 3, reaching an average of 8.2mm in level 2. The increase in rim thickness seems to indicate that vessels were getting larger over time, although this is difficult to confirm given the fragmentary nature of the collection.

Lithic Chronology

It is far more difficult to identify trends in the midden collection of chipped lithics. The primary reason for this is

that only twenty-three diagnostic lithic artifacts were recovered from this part of the site: one from level 5, three from level 4a, nine from level 4, six from level 3, and four from level 2. Three of these, two Early Woodland points and a Levanna-like triangular drill, have been excluded from consideration, leaving only twenty diagnostics for seriation. The continuum between side-notched and expanding-stemmed points discussed in Chapter Three also aggravates the problems of dealing with this small sample, creating difficulty in assigning projectiles and hafted scrapers to definite categories.

The only pattern which I could identify splits the midden lithics into two groups at level 4. Of the eleven projectiles and one scraper from levels 5, 4a, and 4, ten have expanding stems and only two are side-notched. This trend is reversed in upper two levels, where five of eight diagnostics are side-notched. On this admittedly shaky basis, I tentatively propose a slow evolution from expanding-stem to side-notched forms throughout the Middle Woodland sequence. While the evidence is far from strong, it does make some intuitive sense to view the expanding-stemmed points from the lower midden levels as the forerunners of the side-notched forms which prevail in the late Middle Woodland period. If this hypothesis is correct, it appears that the expanding-stemmed projectiles dominated the Boresma chipped lithic assemblages until at least A.D. 240+/-60, as only one of eight level 4 points is side-notched.

Regrettably, none of the four points typed to the Snyders cluster were recovered from the midden, although they probably date to the earlier part of the occupation. Justice (1987) suggests that the Snyders cluster is ancestral to the Lowe Cluster projectiles, dating to the last two centuries B.C.. With the early date of B.C.180+/-130 from level 5, it is possible

that the expanding-stem Lowe-like points characteristic of the lower midden levels are contemporaneous with the Snyders points in southwestern Ontario. This would push back the origins of the Lowe Cluster points several centuries.

Chapter Five: Settlement and Subsistence

With the general description of the excavations and collections complete, in this chapter I return to the question of settlement/subsistence patterns along the middle Thames. As I suggested after the presentation of the faunal data, I believe that there is good evidence that the Boresma site represents a Middle Woodland base camp, which was occupied on and off throughout the year. While a model of increased sedentism for hunter-gatherers in the temperate forest regions of eastern North America is not particularly novel (Keene 1981; Ramsden 1976), in relation to the Middle Woodland period in southwestern Ontario it conflicts with the prevailing model of a three-part seasonal round dominated by large fishing camps in spring and early summer (Finlayson 1977; Kenyon 1979a; Spence and Fox 1986; Timmins 1989; Deller, Ellis, and Kenyon 1986; Spence, Pihl and Murphy, in press).

When Wright and Anderson (1963:49) first defined the Saugeen focus, they presented a two-part seasonal settlement/subsistence cycle which was likened to the historically documented group movements of the "northern Algonkians". Wright and Anderson developed a macro-band/micro-band model in which large groups gathered at areas favorable for the exploitation of spawning fish in the spring and summer months, before migrating to winter hunting territories in the late autumn. It was argued that fissioning into small winter groups was necessary because the Bruce Peninsula "could not support a large population in the absence of an agricultural reserve" (Wright and Anderson 1963:49).

The three part seasonal round which currently finds favor was proposed by Finlayson (1977) on the basis of his doctoral

research at the Donaldson, Thede, and Inverhuron-Lucas sites. Finlayson agrees that large riverine sites like Donaldson served as spring/summer macro-band camps. However, he suggests that they were abandoned in the early summer in favor of a dispersed settlement system based on an exploitation of lakeshore resources.

The type site for this aspect of the settlement/ subsistence cycle is Inverhuron-Lucas, located on the Lake Huron shore 30 kilometers south of the embouchure of the Saugeen river. While the soil is highly acidic at this site, and bone preservation was poor, the presence of floral remains such as raspberries, elderberries, cherries, dogwood berries, beech nuts and butternuts, suggests that it was occupied during the late summer and early fall months. Finlayson (1977:576-577) points out that there are a series of Middle Woodland camps which he also suspects are late summer/fall occupations, strung along the Lake Huron shore between the mouth of the Saugeen River and the Pine River 55 kilometers to the south.

The winter aspect of the Saugeen three part settlement/ subsistence cycle has proved somewhat more problematic to pin down, and to date no positive identification has been made of a winter camp in southwestern Ontario. Finlayson (1977), following Wright and Anderson (1963), suspects that there are as yet undiscovered winter hunting camps located inland from the Lake Huron shore. Kenyon (1979a:15), on the basis of surface survey along the Maitland drainage, has suggested that these camps may be located adjacent to wetlands such as the Hullett swamp, which would be preferred yarding areas for deer.

Several problems are manifest when attempting to apply this established settlement/subsistence model to the middle Thames drainage. The first and most obvious is that the middle Thames, unlike the other areas of the province in which this

pattern has been proposed (Kenyon 1982,1982a; Finlayson 1977), is relatively land-locked. Lake Erie is the closest of the Great Lakes, lying 34 km to the south, but access is difficult with the Thames drainage basin separated from the Talbot Creek drainage by a glacial end moraine running from Lynhurst to Wallacetown. It also seems likely that the short drainages which flow south into Lake Erie, had their own Middle Woodland populations (Poulton 1980). If the Middle Woodland inhabitants of the middle Thames Drainage were indeed "land locked" both by geographical distance and by other groups, then the late summer/early fall lakeshore aspect of the seasonal round is not applicable to this area.

Further problems with the established settlement/ subsistence model arise in relation to the use of the historic northern Algonkian ethnographic analogy in southwestern Ontario. Whether or not one accepts the concepts of biotic provinces (Cleland 1966; Thaler and Plowright 1973), there is a very real difference in resource potential from south to north in Ontario. The Boresma site is located in what Cleland (1966:6-9) has termed the Carolinian biotic province. This area is characterized by a relatively mild environment in which the mean annual temperature varies from 46 to 50 degrees Fahrenheit and snowfall seldom exceeds fifty inches. The "northern Algonkian" ethnographic analogy is drawn from groups which inhabited the Canadian biotic province, a region in which the mean annual temperature ranges from 38 to 40 degrees Fahrenheit, with winter snowfall ranging between four and ten feet. A long list of floral and faunal variations between the two regions is also presented by Cleland (1966:6-9).

While the northern source of this ethnographic analogy does not in itself provide sufficient reason for its abandonment, the further from the original environmental setting

an analogy is applied, the more reason we have to be suspicious of its applicability. The Donaldson, Thede and Inverhuron-Lucas sites, along with the sites discovered by Kenyon in the Maitland drainage, all lie within the transitional zone between the two biotic provinces. It is possible that here the northern Algonkian analogy is a good one. The Boresma site lies further south than any of these occupations, and I suggest that the evidence from this region demonstrates the necessity to construct new explanations for the archaeologically observed behavior.

The extension of historic period analogies to prehistoric settings can also present its own set of difficulties. Stewart (1989), on the basis of faunal analysis of several maritime prehistoric sites, has questioned the utility of settlement/ subsistence models constructed on the basis of early historical information. The problems are especially apparent in the Bay of Fundy region where Champlain and other European reporters described a seasonal pattern of summer coastal agglomerations followed by winter dispersal inland. The faunal remains from prehistoric sites in the same region suggest a contradictory pattern, with major winter coastal occupations and only a limited summer presence. While Stewart does not fully explore the implications of her findings, she does raise the possibility that natives very quickly revised their seasonal subsistence rounds to meet the schedule of the Europeans who wished to trade for furs along the coast during the warm summer months.

A similar revision of prehistoric settlement/subsistence strategies may also have occurred among the northern Algonkian groups from which the current model for the southwestern Ontario Middle Woodland period draws support. One of the questions which will provide a productive area for future research will be to determine whether the winter dispersals of the northern

Algonkians were the result of environmental necessity, or were economically motivated by participation in the fur trade. If the desire to trap fur-bearing animals provided incentive for the reported pattern of winter dispersal, then the application of this model to prehistoric groups in the middle Thames drainage may be doubly suspect.

As Keene (1981:179) points out, there is a tendency to think of hunter-gatherers following a "seasonal round focusing on specific resources at a variety of locations at different times of the year". This model has been called into question by numerous researchers who suggest that the degree of residential stability of hunter-gatherers is related to the stability of their resource base (Wiens 1976; Rick 1980). Developing an example from the Saginaw valley of eastern Michigan, Keene (1981:179-180) suggests that "a strategically located base camp... could minimize the need for seasonal residential movements by placing most resources within a day's walk". These base camps would not be occupied year round, as periods of "intense economic activity", such as deer hunting, might necessitate the establishment of small special purpose camps. Other non-food reasons such as flooding, insect populations, or participation in extra-regional trade networks may all have provided reasons for temporary abandonment of base camps (Keene 1981:180).

Binford (1980:10-12) has described a somewhat analogous model for hunter-gatherer groups which he terms "collectors". Collector groups are characterized by "(1) the storage of food for at least part of the year and (2) logistically organized food-procurement parties" (Binford 1980:10). These logistically organized task groups move out to selected locations in order to procure specific predetermined resources which are often transported back to the main body of consumers in the

residential camp. Binford's logistically oriented collector model differs from Keene's base camp model in that residential camps are less permanent than base camps. Among the Nunamiut, Binford's example of a hunter-gatherer group which follows a collector subsistence pattern, residential camps are relocated several times each year, a pattern which I suggest seems not to apply to the middle Thames area during the Middle Woodland period.

Rick (1980:336-337) has approached the question of increased residential stability among hunter-gatherers by formulating a model of the archaeological correlates of the base camp settlement/subsistence strategy. He suggests that one of the obvious results will be a hierarchical settlement pattern dominated by large occupations with material remains from the many different activities. Rick also suggests that the pattern of garbage disposal at base camps will be more regimented than at the strictly seasonally occupations, with most refuse being transported away from the main activity areas to the site margins. He also expects that there will be a number of small special purpose extractive camps scattered throughout base camp's territory.

Brown (1985:215), exploring the origins of residential stability in the midwestern United States, has proposed similar archaeological correlates for a base camp system, although he places greater emphasis on the presence of permanent housing facilities and storage pits for identifying base camps.

The Boresma Site as a Base Camp

The best evidence for residential stability at the Boresma site comes from the faunal collection. The large number of walleye and sucker elements provide excellent evidence for early

spring occupancy at the site. Further warm weather occupation is indicated by the presence of immature bird bones, turtles, clams, and species such as bear, woodchuck, and chipmunk, which are dormant during the winter months.

Evidence for late summer/early fall occupation is perhaps the weakest, with only one immature beaver foot bone providing proof of activity at the site during this time of year. While the flotation analysis is not complete, no nut fragments have yet been recovered, and other carbonized seeds are rare. It may be that the late summer and early autumn was one of the periods during which the majority of subsistence activities were carried out at other site locations.

By late fall and early winter there was once again activity at the Boresma site. Given the difficulties of detecting clear evidence for winter occupation in the faunal record, the presence of two deer skulls with antlers recently dropped provides convincing proof of occupation during this season. The presence of a healthy worked antler industry may also indicate that many of the deer in the collection were taken in the late autumn; however, the possibility exists that the antler was curated from other sites. The winter occupation may have continued through to the spring fish runs, although several layers of sterile silt in the midden suggest that flooding was an occasional late winter/early spring problem.

The general diversity of the Boresma faunal sample, while not providing any direct proof of the seasonality of the site, does suggest that this was not a special purpose occupation. Deer and fish bone dominate the assemblage; however, twenty other species of mammal are represented, as well as six species of reptiles, seven species of birds, four species of clams, and two amphibiam species.

The settlement pattern data can also be interpreted within the framework of the base camp hypothesis. While no definite house structures were identified, one post cluster was partially uncovered which may represent the remains of a small house structure subject to many phases of reconstruction and repair. Only 4.9% of the total occupation area was excavated, and it seems likely that many more post "clusters" are scattered around the site.

The location of a major midden along the extreme southeast edge of the site also supports the proposition of longer term residency. It appears that there was a consistent effort on the part of the site's inhabitants to keep the central occupational area clear of unwanted debris, a pattern associated with base camps among other hunter-gatherer populations (Rick 1980). However, in the case of the Boresma site it is also true that treefalls and other natural depressions in the central part of the occupation area were filled with refuse.

The Boresma artifact collection, like the faunal sample, is also very generalized. While only 4.9% of the site was excavated, we recovered 93 projectile points, 20 bifaces, 67 biface fragments, 21 end scrapers, 13 hafted scrapers, nine drills, four side scrapers, three tip scrapers, 36 pièces esquillèes, 165 rimsherd vessels, and various ground stone and bone tools. This is a very diversified collection, indicative of the varied activities which were taking place at the site.

The large sample of projectile points and scrapers demonstrates the importance of hunting and animal processing, while the drills and pièces esquillèes suggest bone, antler, shell and/or wood were also being worked.

The 12,083 pieces of lithic debitage along with the 31 random flake cores, 46 bipolar cores, hammer stones, anvil stones, and antler pressure flakers provide good evidence that

many bifacial tools were being produced on the site. It also appears that some, if not all, of the ceramic vessels were manufactured here, as coil fragments and miscellaneous pieces of fired clay were recovered from the midden.

While the wide diversity of artifacts recovered at the Boresma site does help demonstrate the generalized nature of the activities being carried out, it does not in itself provide proof of the base camp hypothesis. A comparison of the Boresma assemblage with the Donaldson materials helps to highlight some of the key differences between these large riverine camps.

When comparing these sites it is necessary to exercise caution because the methods of excavation were quite different. The Boresma site was not threatened by development and because of this the decision was made to adopt a slow, thorough approach, screening all plowzone through 1/4 inch sand screen. This process, while time consuming and not overly productive in terms of many artifact classes, did provide us with 65 of our 93 projectiles and the great majority of our cores. The drawback to this approach was that we were only able to uncover 281 square meters of the site.

At the Donaldson site a salvage approach was employed because the main occupational area was threatened with the construction of cottages. In this case all plowzone was removed by bulldozer or otherwise shoveled away, and a much larger area of 1,925 square meters was examined. There is no doubt that had the Donaldson plow zone been screened more lithic tools and potsherds would have been recovered. However, nearly seven times the Boresma site area was excavated at Donaldson, and a large midden and many features were carefully screened. This may help balance the fact that the plow zone was not examined and allow for some careful comparisons to be made.

One way to approach the question of site function is to

consider the ratio of rimsherd vessels to projectile points. This approach is particularly pertinent as the low ratio of projectile points to pots at the Donaldson site was one of the original reasons why Wright and Anderson (1963:46) felt it represented a spring/summer fishing station.

At the Donaldson site excavations conducted by Finlayson, 14 projectiles were collected along with 351 rimsherd vessels, producing a ratio of .04 projectiles per pot. During the Boresma site investigations we recovered 93 projectiles and 165 rimsherd vessels; a ratio of .56 projectiles per pot, 14 times as high as at Donaldson. Even if the Boresma sample is restricted to the 20 projectiles and 95 vessels from the midden, the resultant ratio of .21 projectiles per pot is still 5.25 times greater than at the Donaldson site. The low ratio of projectiles to pots at the Donaldson site is consistent with Finlayson's assertion that it represents a spring/early summer fishing station. If one attempts to force the Boresma site into the model of the three-part seasonal as a spring/early summer fishing station, then the high ratio of projectiles to pots must be considered somewhat unusual.

It is also revealing to look at the frequencies of chipping detritus on the two sites. At the Boresma site a total of 12,083 pieces of waste chert were recovered, while only 1,623 were collected during the Donaldson excavations. Even the Boresma midden level 4 produced 2,122 pieces of detritus, 499 more than all pits, refuse filled depression, and middens in the 1,925 square meters of excavation at Donaldson.

These comparisons suggest that the Boresma site was serving as something more than strictly a spring and early summer fishing station. While the Boresma site was oriented towards the harvesting of early spring fish resources, the high rate of recovery of hunting related tools and the debris

associated with their production, along with the faunal evidence of late fall and winter occupation, points strongly to occupation at the site on and off over the better part of the year.

Other Sites in the Middle Thames Area

If the Boresma site was a base camp, there should be other small special purpose extractive camps scattered throughout the middle Thames drainage. These satellite occupations, if occupied for only short periods of time and for specific purposes, should not have the generalized artifact assemblages of sites like Boresma. Instead, special purpose sites, or what Binford has termed field camps (1980), should have a restricted inventory of artifacts which relate to the particular site's function. In the remainder of this chapter I review the data available from other sites in the middle Thames drainage area, to check the degree of fit with the proposed base camp hypothesis.

The Butler's Woods Site

The Butler's Wood site is located in Ekfrid Township, about 20 kilometers west-southwest from the Boresma site along a height of land which separates the Sydenham and Thames drainages. Mitigative excavations were carried out at the site over a six day period in the fall of 1988 by the Museum of Indian Archaeology, during which time 45 one meter squares were excavated (Timmins 1989).

The total artifact assemblage from the site consists of 93 pieces of lithic debris, two projectiles, one biface, three utilized flakes, and portions of two vessels. The lithic waste assemblage is particularly interesting as it is dominated by

biface thinning and resharpening flakes, the type of debris associated with lithic maintenance rather than production.

Features on the site include a hearth and one pit feature of unreported depth which contained three pieces of chipping detritus and a small amount of carbonized material. Two other subsoil stains were interpreted as possible remnants of living floors, each of which contained one chert flake.

Based on the scarcity of material remains at the site, Timmins has suggested that it was probably occupied for a very short period of time, maybe only a matter of one or two weeks. He also presents the possibility that this may be a cold weather occupation because the site is located on a protected east facing terrace overlooking a relic stream. In terms of the base camp hypothesis, whether or not the Butler's Woods site was a warm or cold weather occupation is less important than the fact that it seems to have been only temporarily occupied. Judging by the limited tool kit, it may represent an outlying hunting camp which was utilized only once.

The Sibelius Site

The Sibelius site is located on the north bank of the Thames River, only one kilometer southwest of the Boresma site. It was subject to mitigative excavation by the Ministry of Culture and Recreation in July of 1978 prior to the construction of Highway 402. The excavation strategy involved mechanically stripping the topsoil from a 0.8 hectare area in order to identify subsurface posts and features. In total, 39 definite posts, eleven features, and four small shallow midden areas were uncovered.

Fox (1982:31) suggests that "native activities on the Sibelius site were of a short term, transitory nature". While

the ceramics collected from the midden areas and pit features were very fragmentary, they indicate that the site was repeatedly used for up to 1000 years. The presence of several pieces of interior and exterior corded ceramics similar to vessels recovered from level 5 and level 4a of the Boresma midden provide good indication that the site was in use by the second century B.C., while a small collection of early Late Woodland ceramics was also recovered.

Although the Sibelius site is located on a slight rise directly beside the Thames, only one element of fish bone was recovered in a faunal assemblage otherwise dominated by deer. Fox suggests that the faunal remains indicate that the site may have functioned as a deer procurement and processing station. This hypothesis is supported by the general abundance of deer foot and lower limb bones, which Fox suggests indicates that the deer were being butchered at the Sibelius site for consumption elsewhere (1982:32). The large number of chert and slate knives at the site, along with a high percentage of biface thinning flakes in the detritus collection, indicating resharpening rather than production of lithic tools, is also consistent with this interpretation. The presence of butternuts and hickory nuts in the floral assemblage indicates that the site was probably in use during the early autumn months.

Fox suggests one explanation for the repeated utilization of the Sibelius site was its possible use as a deer drive location.

> When a fence was erected within a productive hunting ground, subsequent hunting parties could well avail themselves of the use of the existing structure through simply affecting any necessary repairs. Once the drive or series of drives were completed, the kill site would be the scene of much butchering and some consumption of the acquired game. The Sibelius tool assemblage and

> faunal remains are consistent with this speculative scenario and suggest that some initial hide processing may also have occurred on site.
>
> Fox 1982:32

Champlain described the results of a deer drive which he witnessed in October of 1615 in which one hundred and twenty deer were captured over a thirty-eight day period (Biggar 1922-36:82-85). It is possible that these cooperative methods of deer harvesting were also practiced during the Middle Woodland period. If this is the case, then large supplies of meat could have been procured for later consumption at the base camps.

The Pond Mills Cluster

Twenty-five kilometers east the Boresma site, in the southwest corner of the City of London, three small Middle Woodland camps have been partially excavated by the Museum of Indian Archaeology. These sites are situated in an interesting environmental setting atop the Ingersoll moraine around a cluster of small kettle ponds and bogs. One of these occupations, the Pond Mills site (Poulton 1985), has produced portions of eight Middle Woodland vessels and a radiocarbon date of A.D.755+/-75. Little else can be said with certainty about the function or season of this habitation, as excavations were limited and the Middle Woodland component was impacted by a later Middleport occupation.

Two other occupations in the same general area, the East and West Bog sites, are both multi-component camps with evidence of occupation spanning the last 9000 years (Timmins 1989). While the final reports are not yet available, they appear to have been short-term occupations, with no appreciable buildup of occupational debris. The West Bog site produced two Snyders-like

projectiles from the general vicinity of a small cluster of features, while the slightly larger East Bog site produced a series of Middle Woodland points and portions of three dentate stamped vessels. A radiocarbon date of A.D.555+/-100 was returned from organic material from a feature on the south end of this site.

Timmins (1989) interprets the East and West Bog sites as temporary hunting camps. In the absence of floral or faunal data the seasons during which the sites were occupied are difficult to assess, although Timmins believes they may have been oriented towards the migratory avian species which would have been attracted to the pond environments in the fall.

The Barclay Road Sites

During the summer of 1989, the Museum of Indian Archaeology partially excavated two undisturbed Middle Woodland occupations located in the southwest corner of the City of London. These small sites were located on opposite sides of a small bog which probably was a shallow pond during the period of the occupations (Timmins 1989:14). While the final report is not available, post molds were numerous, and one possible structure measuring 4m x 4m with an internal hearth has been tentatively defined. Timmins (1989:15), on the basis of the "sheltered inland location" of the site suggests it may have been occupied in the fall and winter.

In the absence of the final report, I agree that the sites may have been occupied in the fall, but see difficulties with the wintering camp interpretation. The presence of a potential structure with an internal hearth provides possible evidence for a cold weather occupation. However, the pond environment which seems key to the site's placement would have been unproductive

after freeze up, which occurs in the late autumn or very early winter. The suggestion that the "sheltered inland location" of the sites indicates they may have served as winter camps may also be suspect. Timmins (1989:15), having proposed a non-lacustrine adaptation for Middle Woodland groups on the middle Thames, does not indicate what the Barclay Road sites were "inland" from. Almost any location along this stretch of the Thames River would meet this criterion, in particular locations on the valley floor.

Timmins (1989:15) mentions that projectiles dominate the lithic assemblage, and it is possible that these two sites were repeatedly occupied fall hunting camps.

The Brodie Site

The Brodie site is a large multi-component occupation located on a slight rise in the Thames river floodplain three kilometers north of the Boresma site (Fisher 1987). In the summer of 1973 small scale test excavations were conducted under the direction of William Roosa. While the exact extent of the Middle Woodland occupation is not known, rich sub-plowzone midden deposits were encountered, which may indicate that the site had a function similar to the Boresma occupation.

The ceramics from the Brodie site suggest that this occupation may seriate earlier than the Boresma site. Although there are only eight rimsherd vessels, of which just seven retain their primary external decoration, two of these are pseudo-scallop shell impressed, two are plain, two are dentate stamped, and one is drag-stamped. While the sample size is very small, the high incidence of plain and pseudo-scallop shell vessels suggests that the site may have been occupied early in the Middle Woodland sequence, possibly before the deposition of

the Boresma midden level 5. The body sherds from the Brodie site also support this conclusion. Of the 115 which were analyzable, 43.5% are dentate stamped, 22.6% are plain, 20.0% are pseudo-scallop shell impressed, 11.3% are plain linear stamped, and 5.3% are corded. At the Boresma site, which I believe seriates later than Brodie, pseudo-scallop shell impressed body sherds comprise only 3.9% of the the sample.

Settlement/Subsistence Discussion

In proposing that the Boresma site is a base camp, I am not suggesting that it was continuously occupied year round, rather that it served as the central point from which a small group harvested resources from their band territory. As Keene (1981) has suggested, there could be many reasons why such a camp would be temporarily abandoned, such as, insects, flooding, involvement in extra-regional trade, or the need to establish temporary special purpose camps closer to areas of intense economic activity. The exact nature and extent of the activities carried out away from the Boresma site are at this time only poorly understood, although I suggest that the Sibelius site, the Barclay Road sites, the sites of the Pond Mill's cluster, and the Butler's Woods site, all appear to represent logistically oriented special purpose camps. At present it appears that the fall may have been one of the periods during which activities at other locals were essential. Sterile levels of sand in the midden suggest that late winter/early spring flooding may have also required temporary abandonment of the site.

Chapter Six: Boundaries

The Boresma site, located one kilometer northeast of the "Western Basin" Sibelius site (Fox 1982), and three kilometers southwest of the "Saugeen" Brodie site (Finlayson 1977; Timmins 1989), provides the first large ceramic sample from the proposed frontier zone. In this Chapter I compare the Boresma ceramic collection to the collections from the Donaldson and Thede sites, and also to the limited material available from the recently defined Couture complex. Rather than the Boresma collection falling clearly into either the Saugeen or Couture complex, it shares diagnostic elements from both. On the basis of these comparisons I present the possibility that there may not be an easily identifiable boundary between Couture and Saugeen, and explore the implications of this suggestion.

There are several problems inherent in utilizing these broad culture complex categories to order Middle Woodland prehistory. If it is assumed that there are archaeologically identifiable Saugeen and Couture "complexes" which correspond to real social groups, then it becomes logical to formulate questions concerning the cultural affiliation of these peoples, and the nature of interaction across their frontier. While the Saugeen focus was originally defined by Wright and Anderson to account for ceramic variability in collections from southwestern Ontario and areas further east, the meaning of the term "Saugeen" has been gradually expanded to include the possibility of a sociopolitical "alliance" in which Saugeen groups interacted "relatively intensely with one another but less so with non-Saugeen people" (Spence, Finlayson and Pihl 1978:115; see also Finlayson 1977:561-562).

The problem with this proposition is the lack of evidence

which can be marshaled in its support. The data from the Boresma site and other sites along the proposed western Saugeen frontier suggest that Middle Woodland groups in this area shared ceramic decorative motifs and techniques with groups further north as well as with groups to the west. The eastern Saugeen frontier is equally amorphous, with sites along the Grand and Nottawsaga drainages having been alternatively assigned to both the Saugeen and Point Peninsula complexes (Conway 1975; Stothers 1976; Wright 1967; Finlayson 1977). It may be best not to lose sight of the fact that "Saugeen", "Couture", or "Western Basin", have yet to be proven anything other than analytic conveniences, and may bear little or no relation to prehistoric social or linguistic groups.

The Saugeen Complex

Prior to Wright and Anderson's (1963) definition of the Saugeen focus, Middle Woodland sites throughout southwestern Ontario were believed to be western expressions of the Point Peninsula 2 focus of the Woodland Pattern (Lee 1951, 1952; Wright and Anderson 1963:23). Upon excavation at the Donaldson site in Bruce county, Wright realized that the established Point Peninsula ceramic typology (Ritchie and MacNeish 1949) was impossible to apply to the materials from this area, and suggested the establishment of the "Saugeen focus" to account for the observed variability.

Wright and Anderson (1963:46) clearly pointed out that "the differentiation of the Saugeen focus from other Early and Middle Woodland complexes is, for the most part, based upon the ceramic complex". The two factors which were viewed as critical in excluding Saugeen ceramics from the Point Peninsula seriation were "the crude decorative techniques and their application on a

crude paste" (Wright and Anderson 1963:47). Further ceramic traits which were seen as distinguishing the two areas were the tendency towards near total vessel decoration in the Saugeen focus, along with the popularity of crisscross motifs and secondary and superimposed decorations. Other than the ceramic differences, Wright and Anderson (1963:50) suggest there are "few specific qualitative traits which seem to be the sole property of the Saugeen focus. Rather, the varieties of worked beaver incisors, projectile points, scrapers, and so forth, appear to be shared in varying degrees with other Middle Woodland manifestations".

When the Saugeen focus was first defined, other sites also included in this new categorization included the Burley site, located at the mouth of the Ausable River (Jury and Jury 1952), and the Inverhuron and Lucas sites, located thirty kilometers south of the embouchure of the Saugeen river (Kenyon 1959; Lee 1960). While these three sites are all located along the western edge of the Bruce Peninsula, based on earlier surveys by Lee (1951, 1952) and Wintemberg, the distribution of the Saugeen focus throughout the remainder of southwestern Ontario was tentatively suggested to include the Grand River along with the headwaters of the Thames (Wright and Anderson 1963:50).

The next major study of the Saugeen occupations of southwestern Ontario came with Finlayson's excavations at the Donaldson, Inverhuron-Lucas, and Thede sites. Finlayson prefers the term "culture" to "focus", and suggests that the Saugeen occupations in southwestern Ontario can be considered a "region" as defined by Willey and Phillips (1958:19-20). Within this region Finlayson envisioned a number of smaller areas or "localities", corresponding to "the space that might be occupied by a single community or local group (Willey and Phillips 1958:19; Finlayson 1977:560). On the basis of his examination of

several small collections from the Thames, Grand, and Nottawasaga drainages (Finlayson 1977:607-610), he suggests that these localities were centered on large rivers which had rich fish resources. With the limited data available at the time, he suggested that there were probably Saugeen communities present on the Maitland River, Ausable River, Grand River, Nottawasaga River, and along the headwaters of the Thames.

Although Finlayson's excavations were confined to Bruce locality sites, he assumed that "those communities classified as belonging to the Saugeen culture were interacting relatively intensively with those other communities which are also classified as Saugeen and that their interaction with communities which were not classified as Saugeen was considerably less" (Finlayson 1977:561). On the basis of this assumption he further assumed there must have been an "alliance" or "alliance network" in which there was a practice of obtaining spouses from other communities, which would have served both to cement the alliance, and facilitate the transmission of those ceramic traits which were viewed as characteristically "Saugeen" (Finlayson,1977:561-562).

Classic Saugeen vessels are most often decorated with dentates, followed in decreasing order by: pseudo-scallop shell impressions, plain linear stamping, annular punctates, and cord wrapped stick (Finlayson 1977). One of the most characteristic aspects of Saugeen ceramics is the tendency towards near total exterior decoration, so much so that Mason has suggested that "the Saugeen potter seems to have suffered from a horror of unfilled spaces" (1981:266). The vessels also tend to have a very high incidence of lip and interior decoration (82.0%), and are relatively thick, averaging 8.5 mm when measured 2.5 cm below the lip.

The Couture Complex

The Couture complex is a recently defined provisional category for the Middle Woodland occupations in the southwestern corner of the province (Spence, Pihl, and Murphy, in press:144-148). Prior to the presentation of a working definition for the Couture complex, Middle Woodland occupations in this area were generally considered part of the Western Basin Middle Woodland culture, better known in adjacent parts of Michigan and Ohio (Stothers 1976; Stothers, Pratt, Shane 1979).

Spence, Pihl, and Murphy suggest that "the Couture complex displays very few direct relationships with the Saugeen peoples to the east". Typical Couture vessels are generally cord marked, with the upper rim area occasionally decorated with a dentate or pseudo-scallop shell tool. Vessel interiors are often decorated with dentate obliques, rocker stamping, or incising, and lip notching is common (Spence, Pihl, and Murphy,in press:144).

The problem with this depiction of the Couture ceramic complex is that it has been generalized from very few vessels. The Couture site, located on the Bothwell sand plain in Kent county, produced only two fragmentary rimsherd vessels. Both of these pots had corded exteriors, one with a single band of oblique dentates impressed around the upper rim. Other Couture material includes body portions of two possible Middle Woodland cordmarked vessels from the Robson Road site, and a collection of corded body sherds from the Rauch site (Spence and Fox 1986).

There is also a collection of ten rim sherds collected from the shallows of Lake Erie just east of Pointe aux Pins, in Rondeaux Provincial Park. These rim sherds, which must have recently eroded out of the sandy spit, include five with bands of pseudo-scallop shell impressions over cord-impressed bodies;

however, incised, rocker stamped, plain, and scarified vessels were also present.

Ceramic collections from sites in the proposed Couture/Saugeen frontier zone are equally small. The Middle Woodland ceramics from the Sibelius site, which has been tentatively designated as a Western Basin component (Fox 1982), consist largely of corded and dentate stamped body sherds. The only Middle Woodland rimsherd vessel from the site has dentate impressions over a corded exterior. The Timber Drive site, located in southwest London, has been identified as a "single unmixed" Western Basin component on the basis of remains from a single cord malleated vessel recovered from one of the two 1m test squares which comprise the only excavation at the site (Pihl 1983: 9-10). The Butler's Woods site, located twenty kilometers west of the Boresma site (Timmins 1989), has been tentatively identified as a Saugeen occupation, even though the fragments from the two vessels which comprise the collection have cord malleated bodies with trailed lines superimposed over dentate stamped motifs on the upper rim. The East Bog site, in the Pond Mills area of London, has been suggested to be a Saugeen occupation on the basis of the extremely fragmentary remains from three dentate stamped vessels (Timmins 1989:14), and the Pond Mills site has been similarly designated as Saugeen, even though corded body sherds were common (Poulton 1985).

Boresma Site/ Bruce Locality Ceramic Comparisons

Other than the Boresma collection, the only large samples of Middle Woodland ceramics in southwestern Ontario come from the Donaldson and Thede sites. In the section that follows I compare these collections in order to highlight some of the

differences in the ceramic traditions between the two areas. One problem in attempting these comparisons is that the length and intensity of occupation at the three sites may not have been exactly the same. While the radiocarbon dates suggest that the Donaldson, Thede, and Boresma sites were in use over roughly the same period (See Table 17), it can not be assumed that the rate of deposition of the ceramics at the three sites was equal or constant. In order to insure as far as possible the comparison of temporally related ceramics, in the following analysis of primary external decorative techniques I use the Boresma midden levels and the block units of excavation from the Thede and Donaldson sites as the units of comparison (See Figure 17).

This method of comparison, while better than using the entire ceramic collections from each site as the units of analysis, is not without its own set of difficulties. The most serious problem is that only one of the units Finlayson used in constructing the Saugeen chronology has an associated radiocarbon date. This makes it very difficult to assess which of the units from the two chronologies are rough temporal equivalents. Finlayson (1977:586), on the basis of similarities between the ceramics from Donaldson Unit 2 and Donaldson feature 71-58 (radiocarbon dated to A.D. 5+/-75), suggests that the Unit 2 materials originated "sometime during or prior to 100 B.C.-100 A.D.". This would place Donaldson Unit 2 just slightly later than Boresma level 5, which was radiocarbon dated to B.C. 180+/-130. On this basis I suggest that level 5 from the Boresma site should be paired with Unit 2 from the Donaldson site for the purposes of comparison.

The one directly associated radiocarbon date for the Bruce locality chronology comes from a feature in Unit A at the Thede site (770 A.D.+/-100). Finlayson suggests that the ceramics from this feature are "generally representative of the nature of the

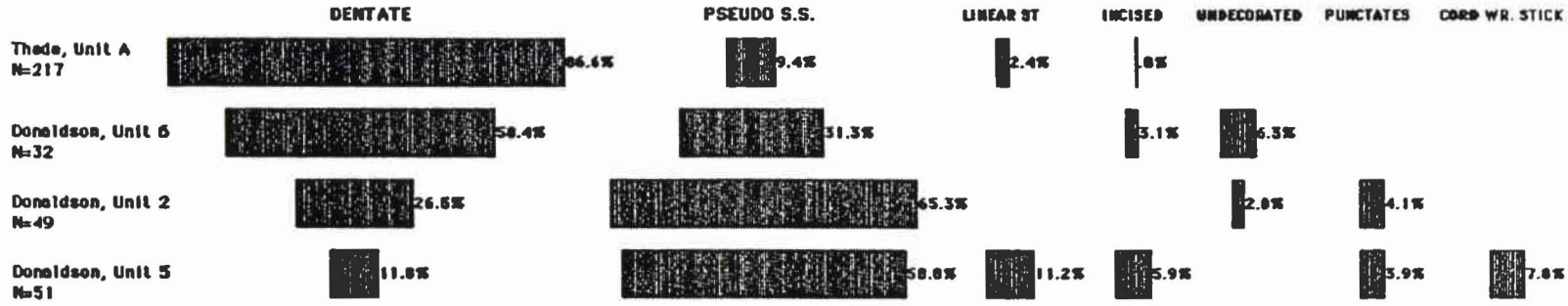
ceramics in Area A as a whole". While there is no corresponding date from Boresma midden level 3, for the purposes of comparison I pair these two levels, and similarly suggest that Boresma midden level 4/4a (A.D. 240+/-60) and Donaldson Unit 6 can be compared as rough temporal equivalents.

Before proceeding with the comparison, it should be noted that Boresma level 2 has been eliminated from consideration because of its small size (N=7), and the Boresma plain and cord impressed samples have been amalgamated to facilitate comparison with Finlayson's "undecorated" classification. The Bruce locality chronology follows information provided by Finlayson (1977:585), except that data from Donaldson features 71-1 and 71-29 have not been utilized because the sample sizes and the percentages of each decorative technique have not been reported. The exclusion of these collections is also warranted on other grounds, as both features were located in Block Unit 1, an area of the Donaldson site which Finlayson (1977:579-581) argues was repeated reused over many centuries with a great deal of "intermixing of deposits".

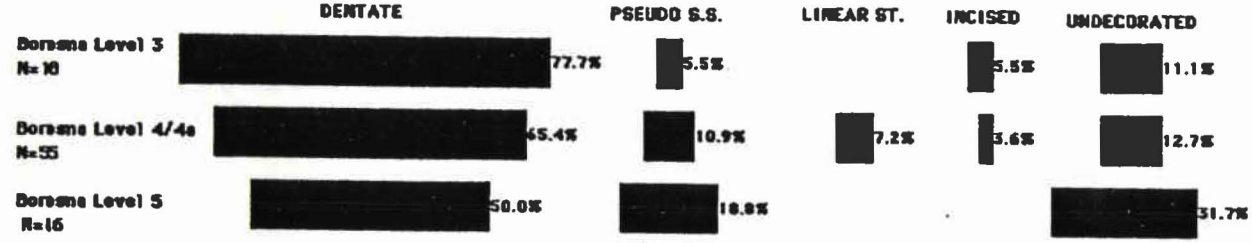
Table 16: Uncalibrated Radiocarbon Dates from the Boresma, Thede, and Donaldson Sites:

Site	Date
Thede	290+/-100 B.C.
Boresma	180+/-130 B.C.
Thede	100+/-200 B.C.
Donaldson	5+/-75 A.D.
Boresma	240+/-60 A.D.
Boresma	350+/-80 A.D.
Thede	495+/-110 A.D.
Donaldson	550+/-80 A.D.
Thede	690+/-90 A.D.
Boresma	690+/-90 A.D.
Thede	770+/-90 A.D.

Figure 17: Boresma Site/Bruce Locality Chronology Comparison



The Bruce Locality Chronology



The Boresma Site Chronology

Comparison Key: Boresma Level 5 - Donaldson Unit 2
Boresma Level 4/4a - Donaldson Unit 6
Boresma Level 3 - Thede Unit A

Figure 17 illustrates several key differences between ceramic collections from the Bruce locality and the Boresma site. While the trend towards an increase in dentate stamping and the correspondent decrease in pseudo-scallop shell decorations is characteristic of both chronologies, the actual percentages of these designs in the Boresma chronology and the Bruce locality chronology varies remarkably. When comparing Boresma midden level 5 to Unit 2 at the Donaldson site, the ratio of pseudo-scallop shell designs to dentate stamped designs are almost exact reciprocals. On this basis, and on the basis of the data from the Boresma level 4/4a:Donaldson Unit 6 comparison, and the Boresma level 3: Donaldson Unit A comparison, it appears that pseudo-scallop shell motifs were never as prevalent along the middle Thames drainage as on the upper Bruce Peninsula. This appears to have been particularly true early in the sequence (level 5:Unit 2), with the difference in proportion of pseudo-scallop shell to dentate designs becoming less evident later in the Middle Woodland period.

Another major difference between the two sequences is the relative importance of undecorated vessels at the Boresma site. In fact, in all three levels at the Boresma site the undecorated sample is larger than the sample of pseudo-scallop shell vessels. This is an important distinction between the ceramic traditions of the upper Bruce and the mid Thames, as one of the defining characteristics of Saugeen pottery is the tendency towards total vessel decoration. While the body sherds from the Boresma site have yet to be seriated, the tendency towards simplicity in the Boresma collection is also apparent. Undecorated sherds account for 35.1% of the sample at the Boresma site, but only 12.5% at Donaldson and 11.2% at Thede site.

While Finlayson does not provide data for attributes other

than body sherd decoration and primary external decoration by excavation unit, I believe the general percentages for secondary and superimposed decoration can also be used to highlight differences between the collections from the three sites. Secondary and superimposed decorations were only infrequently encountered at the Boresma site (5.4%). At the Donaldson site 19.9% of the rimsherd vessels had secondary or superimposed decorations, while at the Thede site 19.3% of vessels were so decorated. This is an interesting point of comparison in that one of Wright and Anderson's distinguishing characteristics for Saugeen pottery was the relative abundance of combined decorative techniques and superimposed vertical lines (1963:47). Once again these figures seem to indicate that the Boresma collection is somewhat less baroque than the Bruce locality collections.

Discussion

It appears that the Boresma site does not fit neatly into the Saugeen complex, which serves to demonstrate some of the problems associated with employing these large culture categories. One of the most obvious problems arises from the assumption that these archaeologically defined units correspond to real prehistoric sociopolitical or linguistic groups. While the Saugeen culture was originally defined to account for the observed variability between Middle Woodland ceramics from the Bruce Peninsula and areas further east (Wright and Anderson 1963), it has more recently been treated as a "distinct" sociopolitical "alliance" (Finlayson 1977:561). It is interesting that Finlayson, who goes the furthest towards suggesting that the archaeologically defined Saugeen culture corresponds to a real prehistoric social group, also suggests

that it can be considered a "region" as defined by Willey and Phillips (1959:19). Willey and Phillips are extremely cautious in assigning social equivalents to this term; instead they suggest that most archaeologically defined regions are

> units of geographical space usually determined by the vagaries of archaeological history. Quite often it is simply the result of concentrated research by an individual or group. Rightly or wrongly, such a region comes to be thought of as having problems of its own that set it apart from other regions... Through constant reiteration they become fixed in the literature and achieve a kind of independent existence.
>
> Willey and Phillips 1959:19

I would suggest that this is exactly what has happened with the Saugeen culture.

Since Finlayson's dissertation research, there has been very little Middle Woodland research conducted in southwestern Ontario (Spence, Pihl, and Murphy, in press:125). However, during this time there have been numerous review articles and texts published in which the Saugeen concept, as epitomized by the Donaldson, Thede, and Inverhuron-Lucas ceramic and settlement/subsistence data, has become increasingly entrenched in the literature. The Saugeen boundaries, at first tentatively put forth, have likewise become increasing reified, as numerous sites with ceramic samples barely large enough to distinguish them as Middle Woodland have entered the literature as "Saugeen" because they are located within the area originally proposed for this complex (Timmins 1989; Poulton 1985; 1980).

The Boresma site excavation was the first relatively large scale investigation of a Middle Woodland occupation outside the Bruce locality, yet within the area defined as Saugeen. While Finlayson suggests that Saugeen culture is distinctive from

other Middle Woodland cultures in the Upper Great Lakes area, analysis of the ceramics and settlement/subsistence data from the Boresma site suggest this area may encompass a great deal more variability than originally thought. The Boresma ceramic collection, with its many plain and cord impressed body sherds, suggests that a clear cut boundary with other contemporaneous Middle Woodland manifestations to the west may be hard to define, while the non-lacustrine base camp settlement/ subsistence strategy stands in opposition to the three part seasonal round identified for Middle Woodland groups further north.

One of the problems associated with viewing the Saugeen culture as a distinctive social unit is that this behavioral pattern should have archaeologically identifiable correlates. It is just this assumption which has led to many recent attempts to assign very small collections of Middle Woodland ceramics from the London area to either the Saugeen or Couture complex (Fox 1982; Pihl 1983; Timmins 1989). De Atley and Findlow (1984:2) suggest that one of the preconceptions which archaeologists must overcome when studying boundaries is the "expectation that human groups have margins like organisms do; that is, that there is a limit, an envelope of some sort that contains and embodies the entire set of processes that characterize the cultural unit". Instead, they suggest that "most populations merge or overlap, and therefore they are not truly separated or unblended; as such they are not discrete".

Wobst (1978:305-306) has suggested that the tendency of archaeologists to divide the material record of hunter-gatherers into large, distinct, bounded groups, can be attributed to uncritical borrowing of units of cultural description and analysis from ethnographic research. Ethnographers, who most often construct their models of spatial variability with the

help of informants from a particular community or locale, are handicapped in their ability to deal with patterns of behavior on a larger geographic scale. Wobst argues that informants tend to dichotomize their universe into realms within which "predictable behavior is on the inside and unpredictable behavior is on the outside". This geographical space of "predictable behavior" which constitutes the area in which most of the informant's regular social interactions take place, has often been mistakenly translated by the ethnographer as "a bounded social unit ("society") circumscribing a finite set of individuals with shared behavior patterns" (Wobst 1978:306).

> Ethnographic practice tends to amplify the finiteness and boundedness of this construct... Thus, new fieldwork in a region usually attempts to maximize the social and spatial distance to previous fieldwork. This is easiest to achieve with informants whose information does not overlap that of informants of previous ethnographers. At the imaginary line where the two clash, a large amount of simultaneous behavioral contrast is predicted by the information the ethnographers have obtained at their respective field locales. The actual behavior at this boundary, if it should exist, is rarely observed among hunter-gatherers and even less frequently has been the topic of problem solving research.
>
> Wobst 1978:306

Wobst suggests that it is in this way that "pattern and homogeneity are artificially produced or exaggerated, and 'cultures' and 'societies' are created" by the ethnographic field researchers.

Spence, Pihl and Murphy (in press:148), have recently suggested that when the Middle Woodland archaeological record is more completely understood, a picture will "emerge of a series of localized complexes extending across the southern part of the province, each only marginally different from its neighbors but

more easily distinguishable from its more distant contemporaries". This model fits much more closely with recent anthropological views of hunter-gatherer behavior, which suggest there is considerable interaction between geographically adjacent groups, even across linguistic frontiers (Ericson and Meighan 1984:145)

Ericson and Meighan (1984:145) point out that "people living along a "border" (tribal, linguistic, or other) are often quite likely to interact with people on the other side, and are indeed more likely to interact with "foreigners" who are close by than with their own people who are at a greater distance". If this was the case during the Middle Woodland period in southwestern Ontario, then the model of a series of small localized complexes, each interacting relatively frequently with adjacent groups, but less so with more distant complexes, may prove to be more appropriate than Finlayson's suggestion of a distinct Saugeen "alliance". The presence of a series of culturally related groups spanning the area which has been divided into Point Peninsula, Saugeen, and Couture, also helps explain why the Boresma ceramic assemblage differs in so many key respects from the Bruce locality ceramics, and it also serves to clarify why there has been failure to agree on the eastern limits of the Saugeen culture (Spence, Pihl and Murphy, in press:148).

While Spence, Pihl and Murphy (in press) continue to employ the large culture complex labels, I suggest that future research will demonstrate that the heuristic value of these large inclusive categories will be outweighed by the assumptions which must necessarily be made in order to support their existence. Analysis of the materials recovered from the Boresma site suggests that the "distinctive" nature of the Saugeen culture (Finlayson 1977:631-633) is as much the result of

archaeological accident as it is representative of a real prehistoric "alliance network". The ceramic and settlement/subsistence data which have been used to define the Saugeen culture come almost exclusively from the upper Bruce Peninsula. If by chance Wright and Anderson had excavated the Boresma site and not the Donaldson site, a significantly different trait list for the Middle Woodland occupations in southwestern Ontario would have emerged.

It may eventually prove possible to identify real Middle Woodland social groups; however, given the ad hoc nature of the construction of the Saugeen culture and its boundaries, it seems unlikely that the initial guesses concerning the geographic extent of this archaeological culture bear much resemblance to a real social group. While this may be true, it also seems unlikely that terms such as "Saugeen" will be erased from the archaeological literature, and because of this, we should be careful not to continue assuming that they represent real social units. Given our spotty knowledge of the Middle Woodland period in southwestern Ontario, I suggest that these large inclusive categories may be best restricted to use as rubrics for areas where similar patterns of subsistence and settlement can be demonstrated. Problems of boundaries and the nature of interaction between groups are critically important; however, it is first necessary for archaeologists to demonstrate empirically the existence of groups and their boundaries before tackling higher level problems of social group interaction.

Chapter Seven: Summary and Conclusions

The Middle Thames River Complex

Up to this point I have avoided attaching a culture complex label to the Boresma occupation. There are several reasons for my hesitancy, not the least of which is a desire not to clutter the literature with new terminology unless absolutely necessary. However, as I have suggested in the last two chapters, there are significant differences between the Middle Woodland occupations in the middle Thames River area and the Bruce locality, both with regard to ceramic decoration, and more importantly, with regard to settlement/subsistence patterns. Because of this, I suggest it may be preferable to refer to the Boresma site as a Middle Thames River complex occupation rather than a Saugeen site.

Not surprisingly given its name, I tentatively set the boundaries for the Middle Thames River complex along the middle Thames River. With the data available at the present time, I would include in this categorization the area from east London to at least Delaware, although the limits probably extend further in both directions. At present it is impossible to determine whether or not this area is a "locality" in the sense that it is a "space that might be occupied by a single community or local group" (Willey and Phillips 1959:18), and it is not my intention to suggest that these boundaries circumscribe a "real" social unit. My purpose in defining the Middle Thames River complex is to distinguish a distinct non-lacustrine settlement/subsistence adaptation, which involved substantially more residential stability than the previously suggested model for this part of the province.

Settlement and Subsistence

The traditional view of settlement/subsistence strategies for the Middle Woodland period in southwestern Ontario has been generated largely from the excavations at the Donaldson, Thede, and Inverhuron-Lucas sites. Finlayson has defined a three part seasonal round in which small communities of hunter-gatherers exploited floral and faunal resources within an ascribed territorial limit, termed a "locality" (Finlayson 1977:612). The data from the upper Bruce Peninsula suggests that there were major spring/early summer macro-band occupations at or near rapids to facilitate the exploitation of spring spawning runs, followed by smaller micro-band dispersal to lake shore camps in the late summer and autumn. While no definite wintering camps have been excavated, it has been proposed that they were located inland, possibly around swamps which would have been preferred yarding areas for deer. As Wright and Anderson (1963:57) have pointed out, "the carriers of the Saugeen focus appear to have followed a way of life similar to the historic northern Algonkians".

Although the middle and upper Thames drainage has generally been considered part of the Saugeen culture area, there are several problems with extending the established three part seasonal round to this area. One of the obvious problems stems from the lack of an identifiable lacustrine aspect to the subsistence strategy. While the Boresma site is only 34 kilometers from the Lack Erie shore, access would have been hampered by a moraine which separates the Thames drainage from Talbot Creek, and there is good reason to suspect that the short drainages such as the Talbot Creek which flow south into Lake Erie, had their own resident Middle Woodland populations.

The larger problem in applying the established settlement

subsistence model to the middle Thames area arises in relation to winter dispersal. While no Middle Woodland wintering camps have been excavated in southwestern Ontario, the "northern Algonkian" ethnographic analogy has provided one of the primary sources of support for the proposition that hunter-gatherer groups dispersed inland during the winter months. One of the problems with using this ethnographic analogy in the middle Thames area is that it has been drawn from a significantly different environmental setting. The uncritical extension of historic period analogies to prehistoric situations may also prove to be more problematic than originally anticipated.

In large part on the basis of data excavated from the Boresma site, I propose that the settlement/subsistence strategy in the Middle Thames River complex area centered around riverine base camps. The best evidence for increased residential stability at the Boresma site comes from the faunal sample. The large number of elements from spring spawning fish provide good evidence that the site was occupied in March, April, and May. Further warm weather occupation is indicated in the collection by the presence of immature bird bones, turtles, clams, and species such as bear, woodchuck, and chipmunk, which are dormant during the winter months. Evidence for late summer and early fall occupation at the site is the weakest, with only one immature beaver foot bone providing proof of activity at the site during this time of year. The flotation analysis is not yet complete, but to date no nut fragments have been recovered, and carbonized seeds are rare.

There is also good evidence in the faunal collection for late fall and early winter occupation. Given the difficulties in collecting definite evidence for winter occupation, the presence of two deer skulls with their antlers recently fallen provides compelling evidence for occupation in December, January, and

February. The winter occupation may have continued through to the spring fish runs, although several layers of sterile silt in the midden deposit suggest that late winter and early spring flooding may have been an occasional concern.

The settlement pattern data from the site are also consistent with the base camp hypothesis. While we did not locate any definite house structures, we did partially uncover a post concentration which may represent the remains of a house structure subject to many phases of rebuilding and repair. While the presence of possible house structures does not provide any definite proof of on and off year round residency, they would be at least a minimal requirement for a cold weather occupation.

The artifact assemblage from the Boresma site also suggests that this was not just a spring/early summer fishing station. While only 4.9% of the site area was excavated, we recovered a very generalized collection which included 93 projectiles, 20 bifaces, 67 biface fragments, 21 end scrapers, 13 hafted scrapers, four side scrapers, three tip scrapers, nine drills, 36 pièces esquillèes, 165 rimsherd vessels, and various ground stone and bone tools, and three pieces of native copper.

The large sample of projectiles and scrapers suggest that hunting and animal processing activities were an important part of the activity at the site. When the ratio of projectiles to rimsherd vessels at the Donaldson site and the Boresma site were compared, the Boresma ratio was 5.25 times as high in favor of the projectiles. This is consistent with the assessment of the Donaldson site as a spring/early summer fishing station, while the high ratio of projectiles to ceramics at the Boresma site suggests it was occupied for other purposes as well.

Data gathered at other small sites in the Middle Thames River complex area also lend support to the proposition that large occupations such as the Boresma site served as base camps.

The Sibelius site, the Butler's Woods site, the Barclay Road sites, and the sites of the Pond Mills cluster, all appear to have been occupied for only short periods of time and for special purposes. There is limited evidence to suggest all but the Butler's Woods site may have been fall occupations, while the seasonality of the Butler's Woods site is equivocal. This may indicate that the autumn was a period when base camps were temporally abandoned in favor of special purpose sites close to specific seasonally available resources. The Sibelius site provides the clearest evidence, as the high proportion of deer lower limb bones and numerous hunting and butchering related tools suggest that this was a deer hunting and processing station (Fox 1982).

At present the exact nature and extent of the activities carried out away from the base camps are poorly understood. It appears that late summer and fall may have been a period during which there was a limited presence at occupations such as the Boresma site, while late winter and early spring floods may also have forced temporary base camp abandonment.

It also seems likely that there was a certain amount of subsistence related variability in the Middle Thames River complex area. In the City of London there are a series of small kettle ponds and bogs which are situated atop the Ingersoll moraine. These ponds provide a unique resource, and appear to have been heavily utilized from the Late Paleo-Indian period through to the Late Woodland period (Timmins 1989). Further west in the area of the Boresma site where this resource was not available, other subsistence related strategies may have been pursued. One possibility is that the Middle Woodland inhabitants west of the City of London were utilizing the small ox-bow ponds and swamps common in the floodplain environment. There are a series of small Middle Woodland occupations located within five

kilometers of the Boresma site along the Thames River (London Chapter 1987; Timmins 1989), however they are known only through surface survey and their exact role in the local subsistence strategy is at present unknown.

Material Culture

The only large ceramic assemblage from a Middle Thames River complex occupation comes from the Boresma site. While this makes it extremely difficult to know how much internal ceramic variability there is in the area, it is possible to draw some general distinctions between the Boresma ceramics and the classic Saugeen materials from the upper Bruce Peninsula.

The Saugeen focus was differentiated from the Point Peninsula focus largely on the basis of the ceramics (Wright and Anderson 1963; Finlayson 1977). The distinguishing characteristics of Saugeen ceramics include: 1) the tendency towards near total vessel decoration, often with more than one decorative technique, 2) the frequent use of superimposed decorations, especially trailed lines and punctates, and 3) the hasty application of decorative techniques onto thick walled, heavily tempered vessels. The most common Saugeen decorative techniques are dentate stamping, followed in decreasing order by pseudo-scallop shell impressions, plain linear stamping, annular punctates, and cord wrapped stick. Saugeen vessels also tend to have a high incidence of lip and interior decoration.

The most obvious distinctive feature of the Boresma ceramic collection when compared to the baroque pottery from the Donaldson and Thede sites is its relative decorative simplicity. In many instances tool impressed motifs seem to have been restricted to the upper rim area, as 35.1% of the body sherds are either plain or corded. The simplicity of the Boresma

vessels is further evidenced by a very low percentage of secondary or superimposed decoration, which was much more common at the Donaldson and Thede sites. Other differences betweeen the two areas include the relative lack of pseudo-scallop shell decoration at the Boresma site, especially in the lower midden levels.

The ceramics recovered from the stratified midden deposits at the Boresma site allow for some general observations to be made concerning ceramic stylistic change in the Middle Woodland period in the middle Thames area. One of the most striking patterns which emerges is the increase in dentate stamping and the concomitant decrease in pseudo-scallop shell designs. Other ceramic trends include increases in popularity of incising and cording in the upper midden levels, while linear stamped rimsherd vessels appear only in level 4, which was radiocarbon dated to A.D.240+/-60.

Non-ceramic elements from the Thames River complex area are less distinctive. As Wright and Anderson suggested when defining the Saugeen focus (1963:50), varieties of projectiles, scrapers, and other non-ceramic elements of material culture appear to be shared in varying degrees among many of the Middle Woodland groups in the Great Lakes area. Of the 72 complete or nearly complete Boresma site projectiles, 40 are characterized by wide notch openings which tend towards an expanding U form. There are few obvious side-notched points, as in most instances the lower notch margin is not clearly defined, and extends almost down to the basal ear. Twenty-eight of the complete or nearly complete points have true expanding stems, 19 have strait edged expanding stems, while the remaining nine have excurvate stems. Projectiles similar to those recovered from the Boresma site have been recovered from sites across the northeast, although there is a startling resemblance to the collection from

the Shultz site, located in the Saginaw valley of eastern Michigan.

Current Categories and Boundaries

The Boresma site, located along the proposed frontier between the Couture and Saugeen complexes, does not fall clearly into either, and serves to demonstrate some of the problems with employing these large generalized categories.

One of the most serious problems relates to the assumption that these archaeologically defined units represent real prehistoric sociopolitical groups. While the Saugeen culture was originally defined to account for the observed variability in ceramics from the Donaldson site and sites in southeastern Ontario and upper New York State, it has more recently been treated as a distinct sociopolitical alliance in which Saugeen groups were interacting more frequently among themselves than with "non-Saugeen" people.

The ceramic and settlement/subsistence data from the Boresma site suggest that the area presently defined as Saugeen may encompass a great deal more variability than originally thought. The Boresma ceramic collection, with its many plain and corded body sherds suggests that a clear cut boundary with contemporaneous Middle Woodland groups to the west may be hard to define, while the non-lacustrine base camp settlement/ subsistence strategy stands in opposition to the three part seasonal round identified for groups further north.

I suggest that the data from the Boresma site are in agreement with a model recently proposed by Spence, Pihl, and Murphy (in press, 143). They suggest that when the Middle Woodland archaeological record is more completely understood, a picture will "emerge of a series of localized complexes

extending across the southern part of the province, each only marginally different from its neighbors but more easily distinguishable from its more distant contemporaries". This would help explain why the Boresma ceramic assemblage differs in so many key respects from the Bruce locality ceramics, and it also helps clarify why the eastern limits of the Saugeen culture are equally as amorphous.

While the identification of real Middle Woodland social groups in southwestern Ontario should eventually prove possible, given our present spotty knowledge and the difficulties involved in isolating social units on the basis of archaeological remains, I suggest that labels such as the "Saugeen complex" and the "Middle Thames River complex" may be best applied to areas where distinctive patterns of settlement/subsistence behavior can be demonstrated. At present I would limit the use of term "Saugeen" to the Middle Woodland occupations along the Ausable, Maitland, Saugeen, and Nottawasaga drainage systems, where there is evidence to support the three part seasonal round model proposed by Finlayson (1977). The Couture complex may prove to be a useful categorization for a distinct settlement/subsistence pattern in the extreme southwestern corner of the province, as it appears there may have been spring/summer lake shore encampments in areas such as Rondeau, Walpole Island and Point Pelee, a pattern significantly different from either the Saugeen or Middle Thames River complex areas. The geographical extent of the non-lacustrine adaptive strategy I have proposed for the Middle Thames River complex is at present poorly known, and it is possible that future research will demonstrate similar settlement/subsistence patterns on the headwaters of other drainages in southwestern Ontario, in particular the Grand River.

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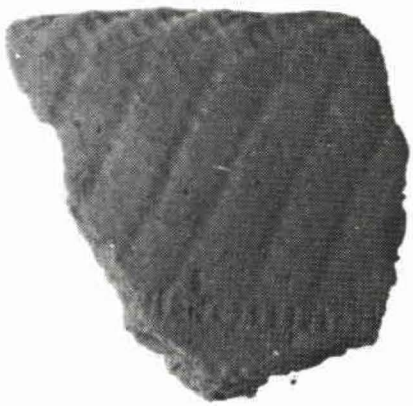
PLATES

(Scale in Centimeters)

Plate 1

Dentate Stamped Ceramics



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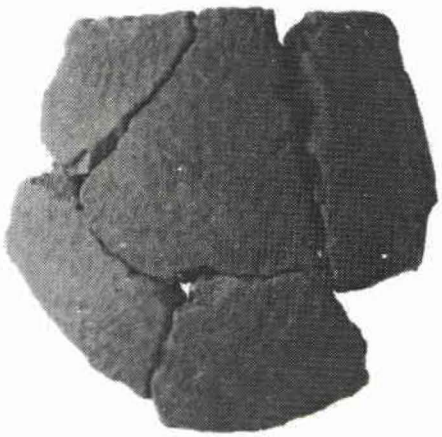

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Plate 2

Denate Stamped Ceramics

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Plate 3

Dentate Stamped Ceramics

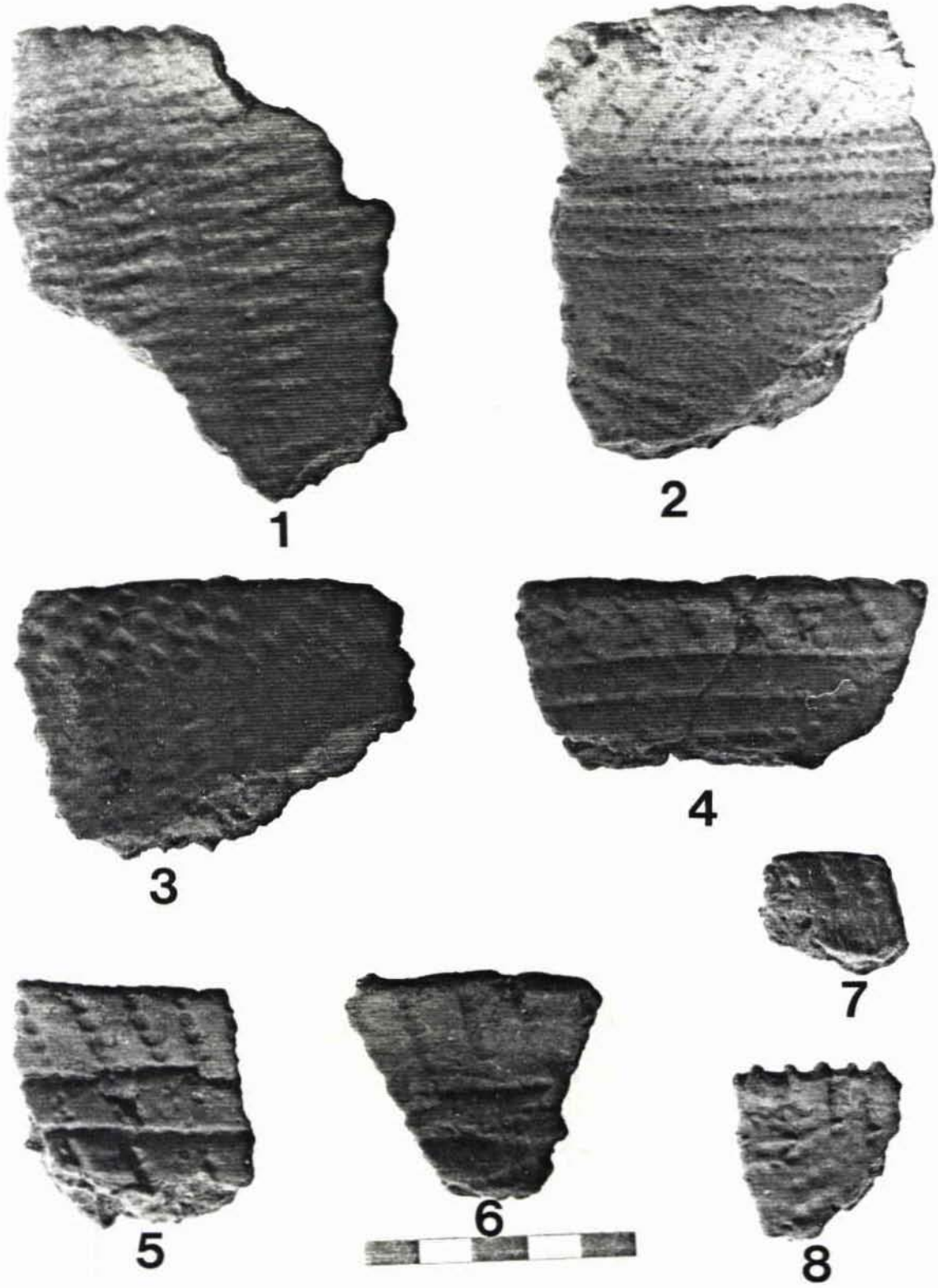
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Plate 4

Figures 1-6 Pseudo-Scallop Shell Ceramics

Figures 7-9 Undecorated

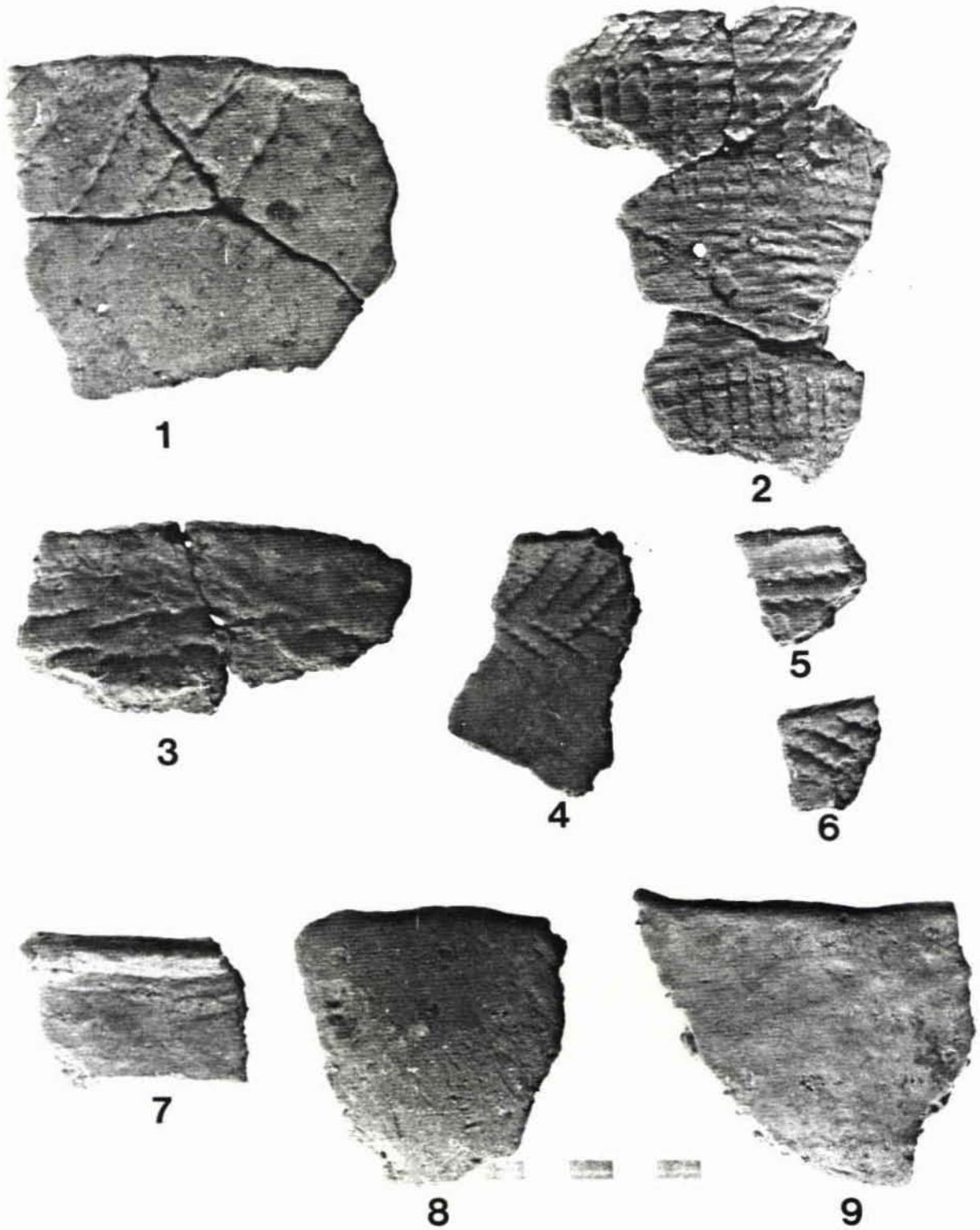
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Plate 5

Corded Ceramics

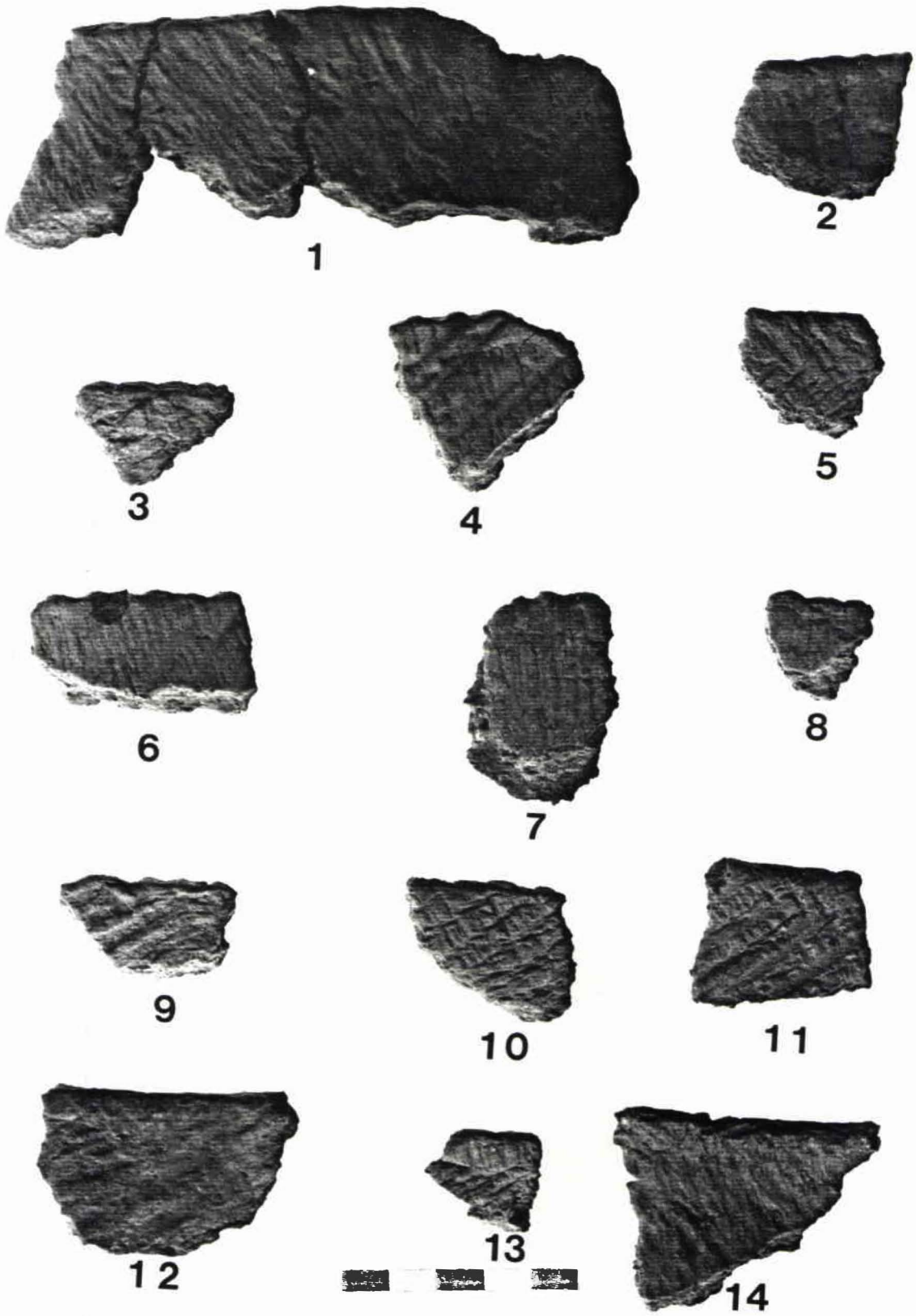
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Plate 6

Figures 1-7 Incised Rims

Figures 8-10 Fired Coils

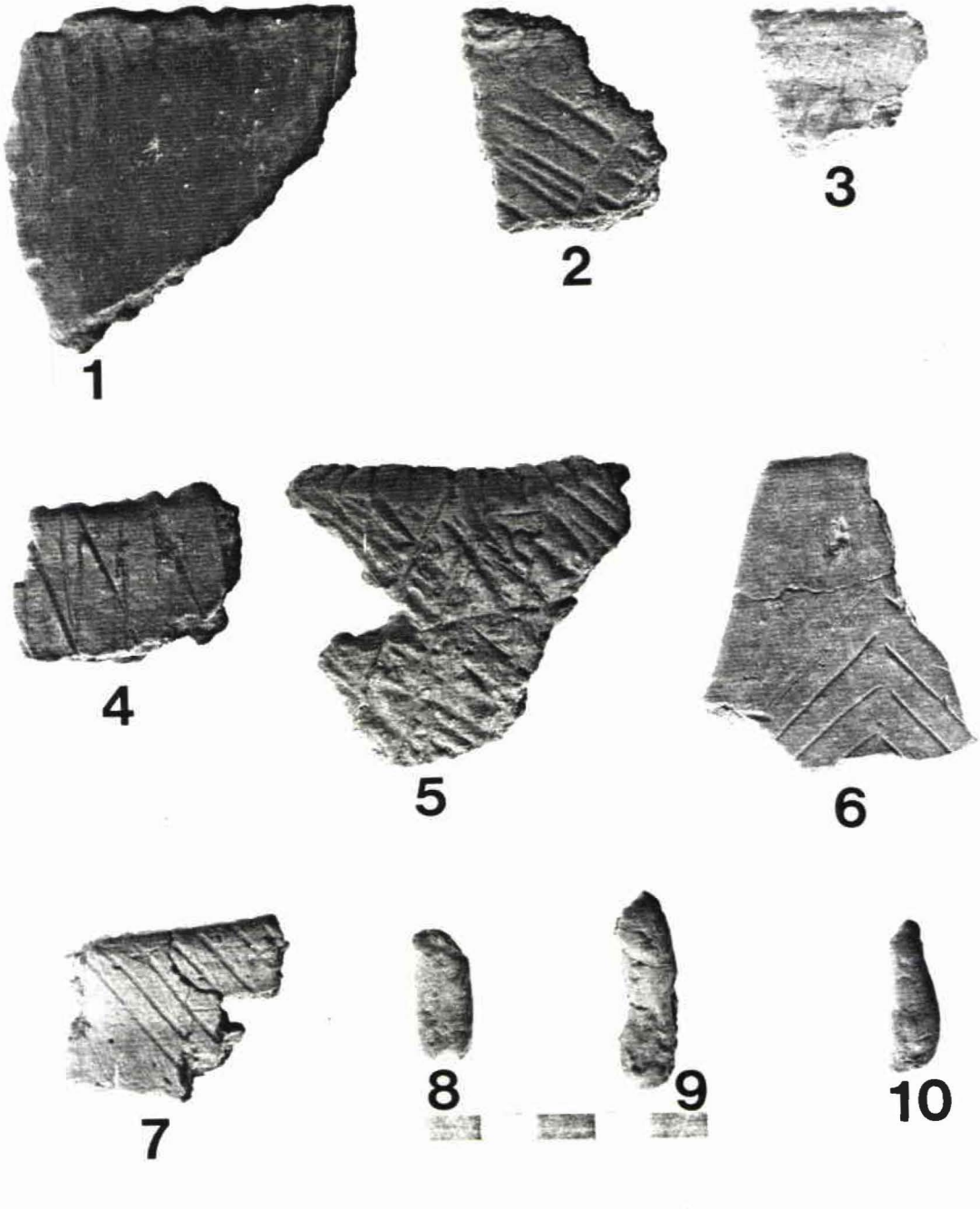
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Plate 7

Side-Notched Points

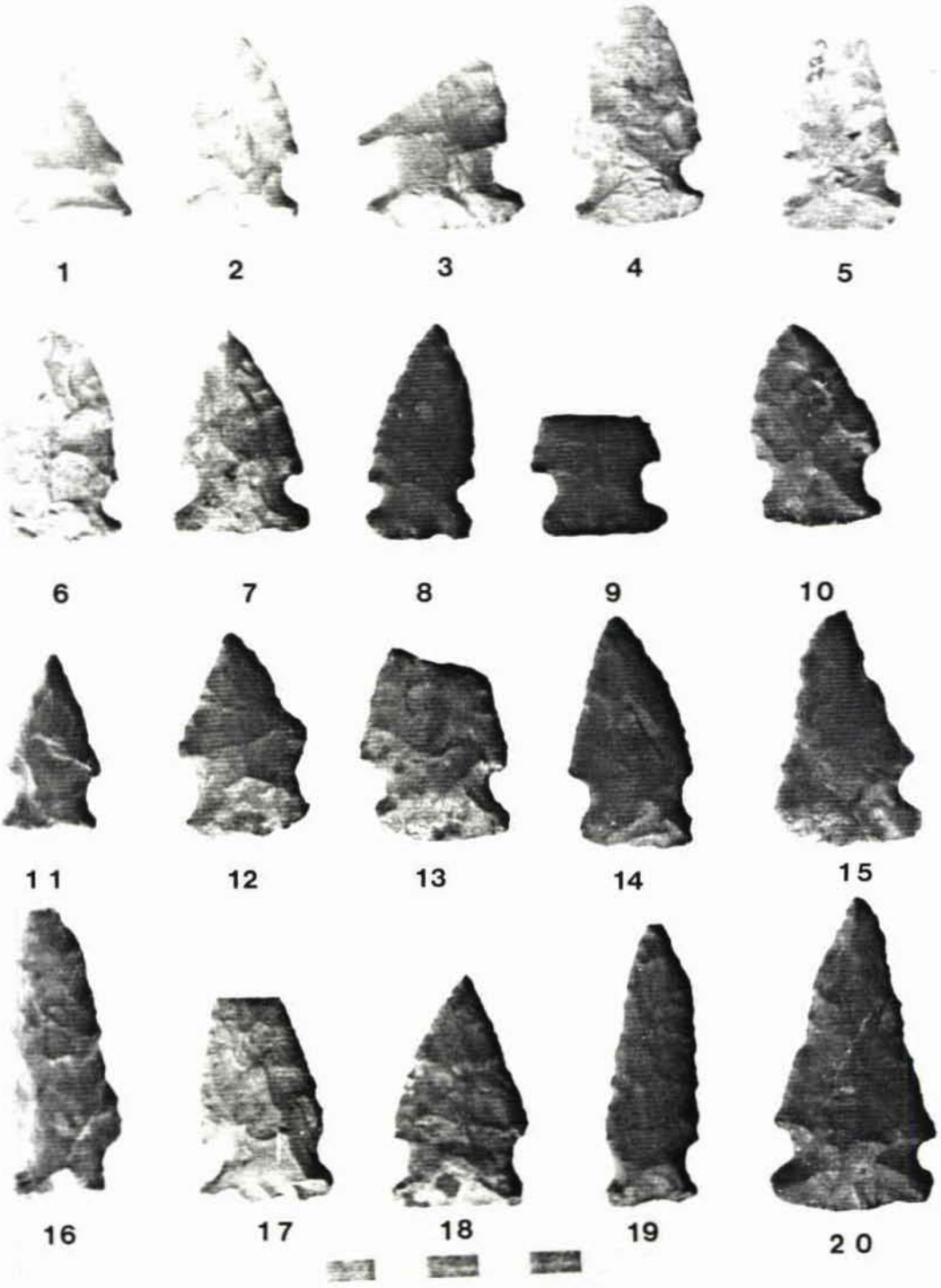
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Plate 8

Figures 1-15 Side-Notched Points

Figures 16-20 Excurvate Expanding-Stem Points

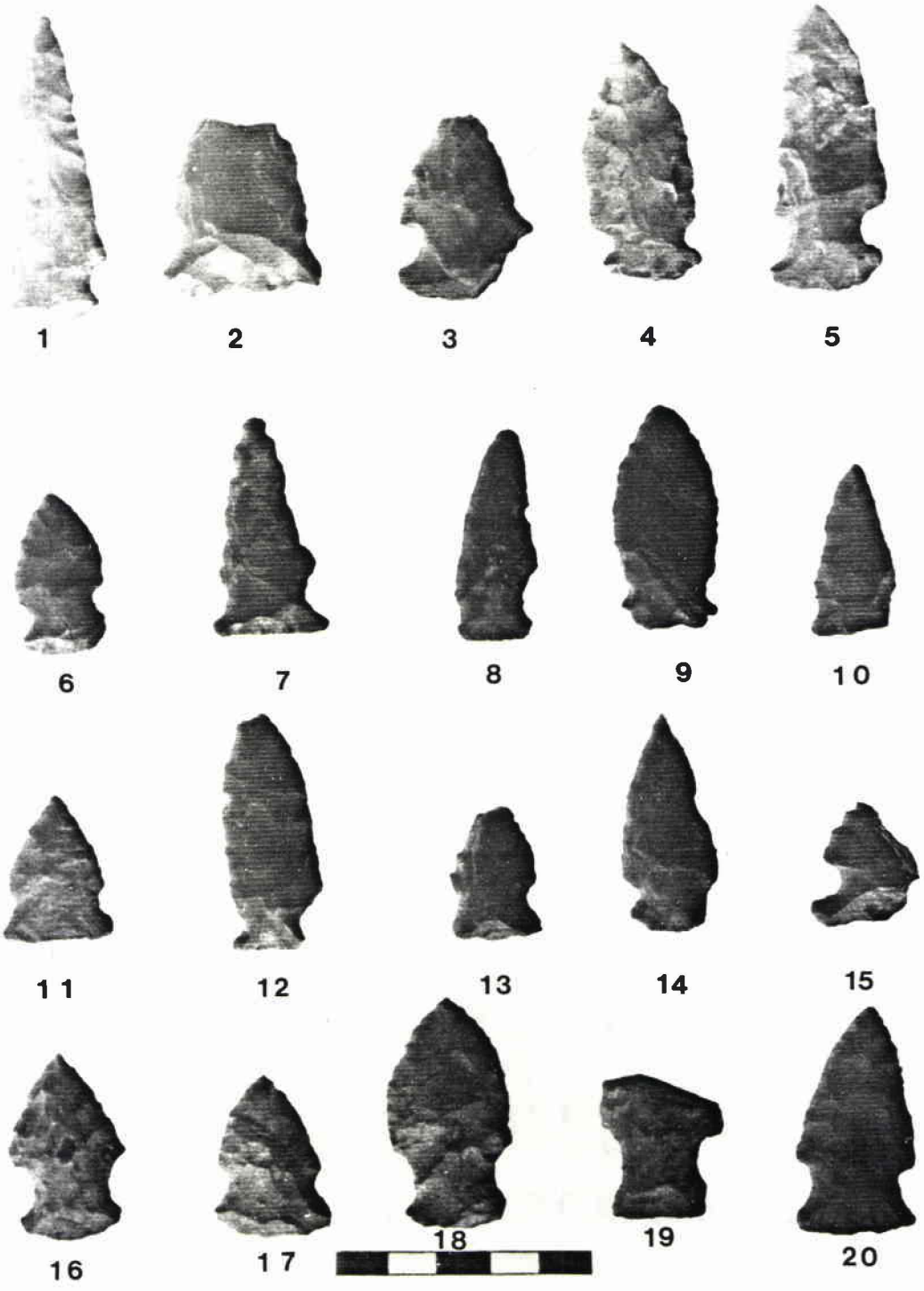
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Plate 9

Figures 1-12	Straight Expanding-Stem Points
Figures 13-14	Excurvate Expanding-Stem Bases
Figure 15	Excurvate Expanding-Stem Point

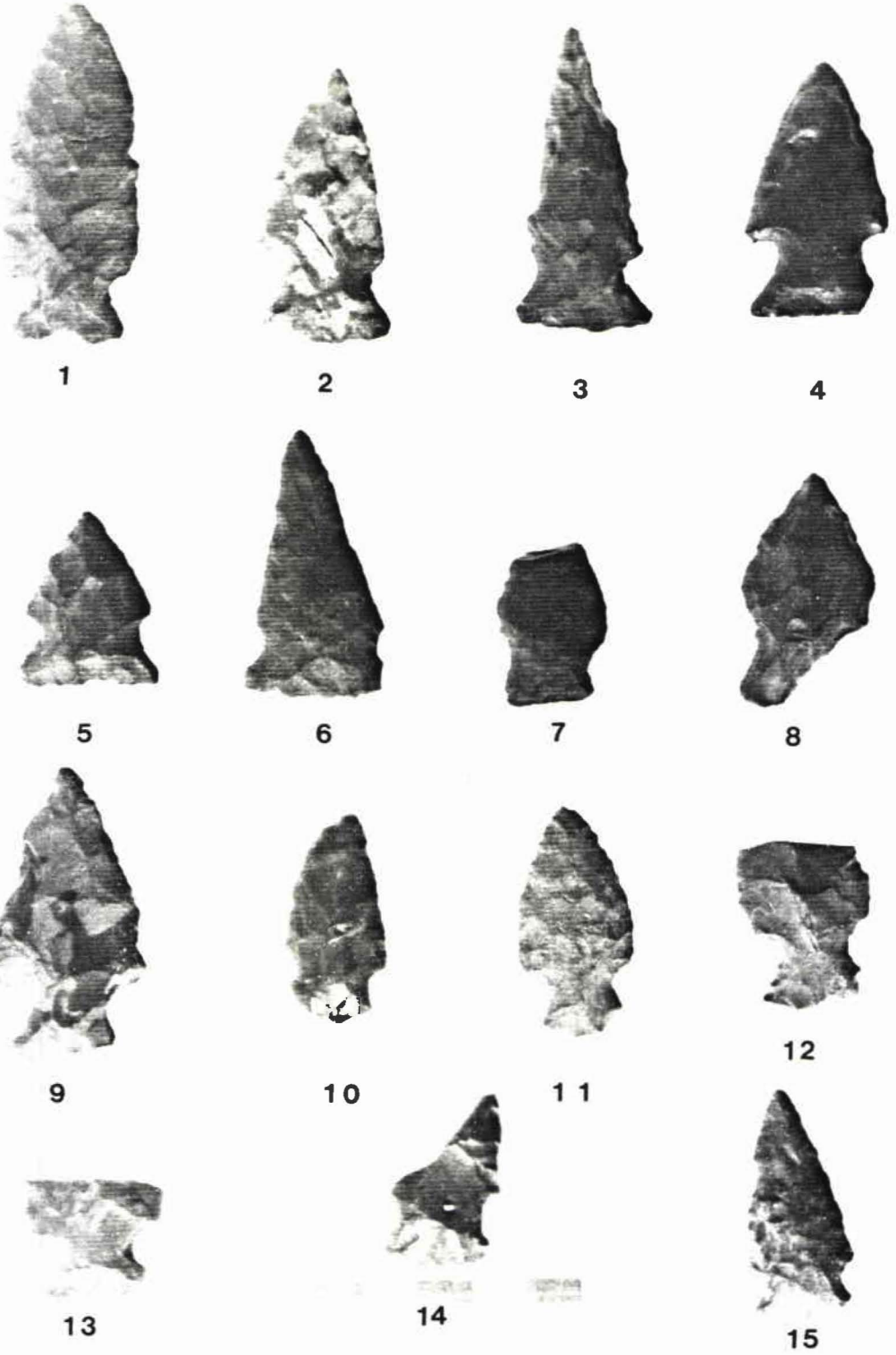
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Plate 10

Figure 1	Snyders Point
Figures 2-3	Affinis Snyders
Figure 4	Excurvate Expanding-Stem Point
Figures 5-10	Straight Edged Expanding-Stemmed Points
Figure 11	Norton Point
Figures 12-13	Drills
Figure 14	Straight Edged Expanding-Stem Point
Figures 15-19	Drills

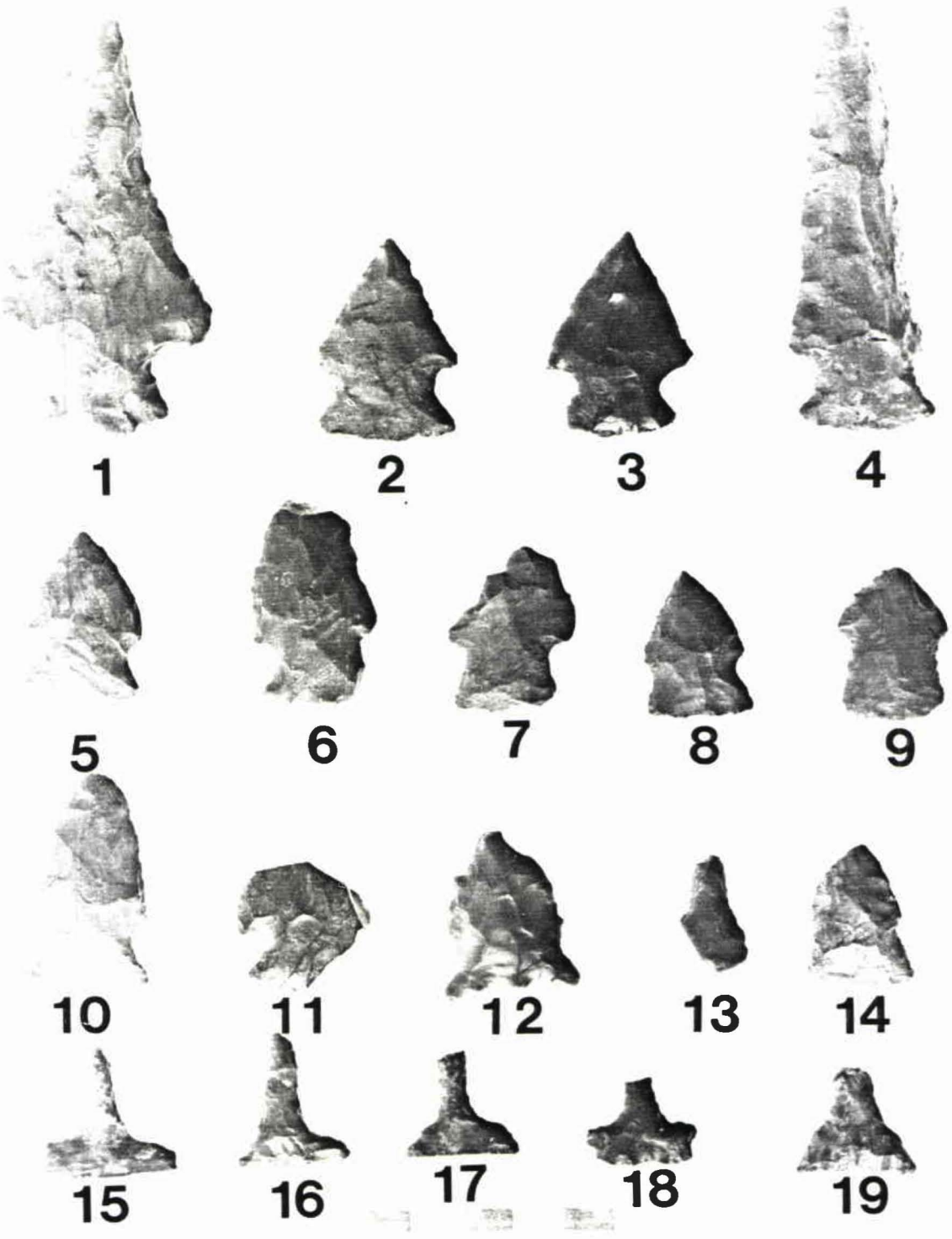
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Plate 11

Figures 1-10	Hafted Scrapers
Figures 11 and 16	Pressure Flakers
Figures 12,13 and 15	Tip Scrapers
Figure 14	Native Copper Artifact
Figures 17, 18, 20, and 21	Antler Tine Projectiles
Figure 19	Slate Whetstone

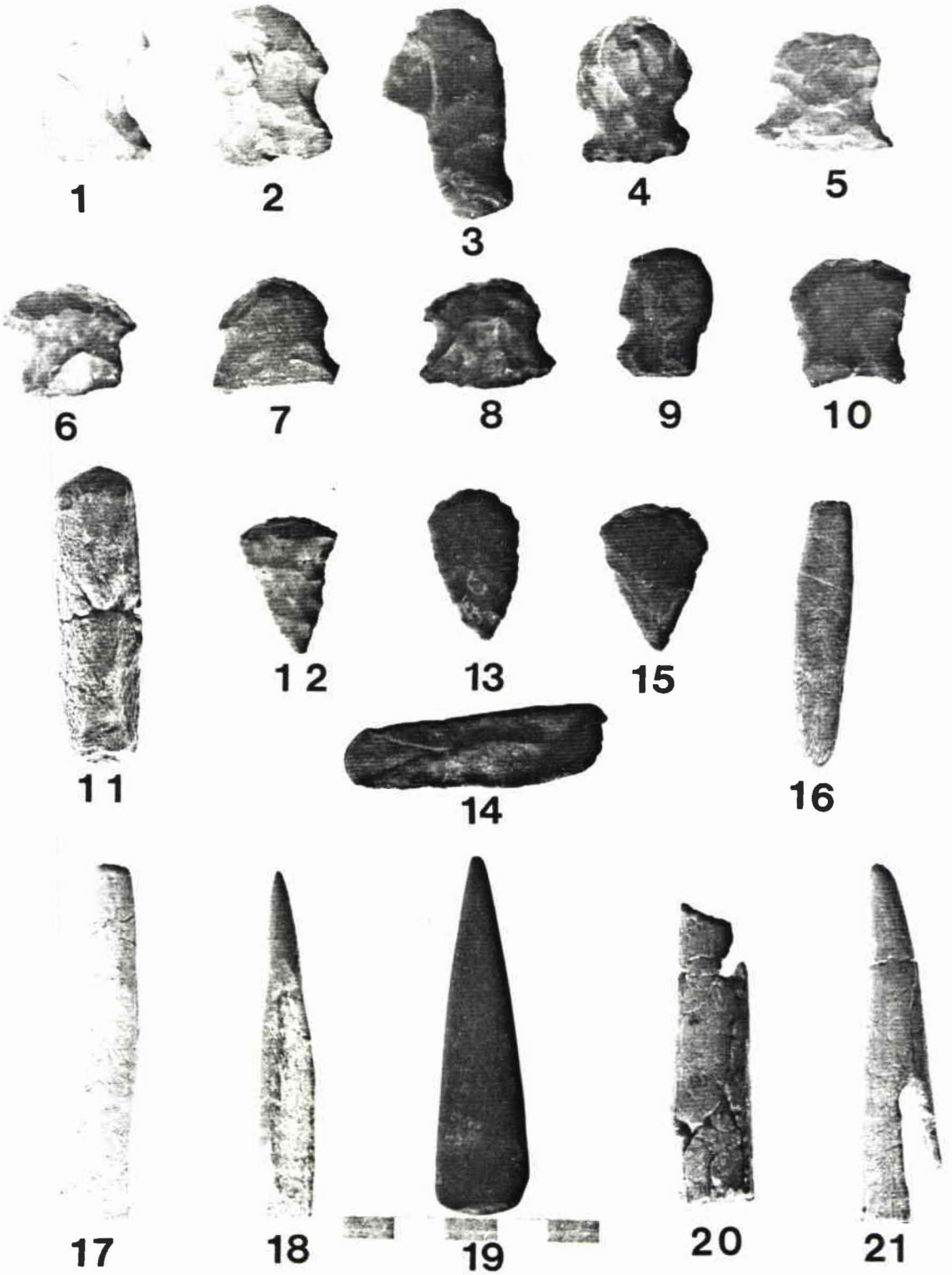
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Plate 12

Figures 1-10	Bifaces
Figures 11, 13 and 14	Early Woodland Points
Figure 12	Jack's Reef Point

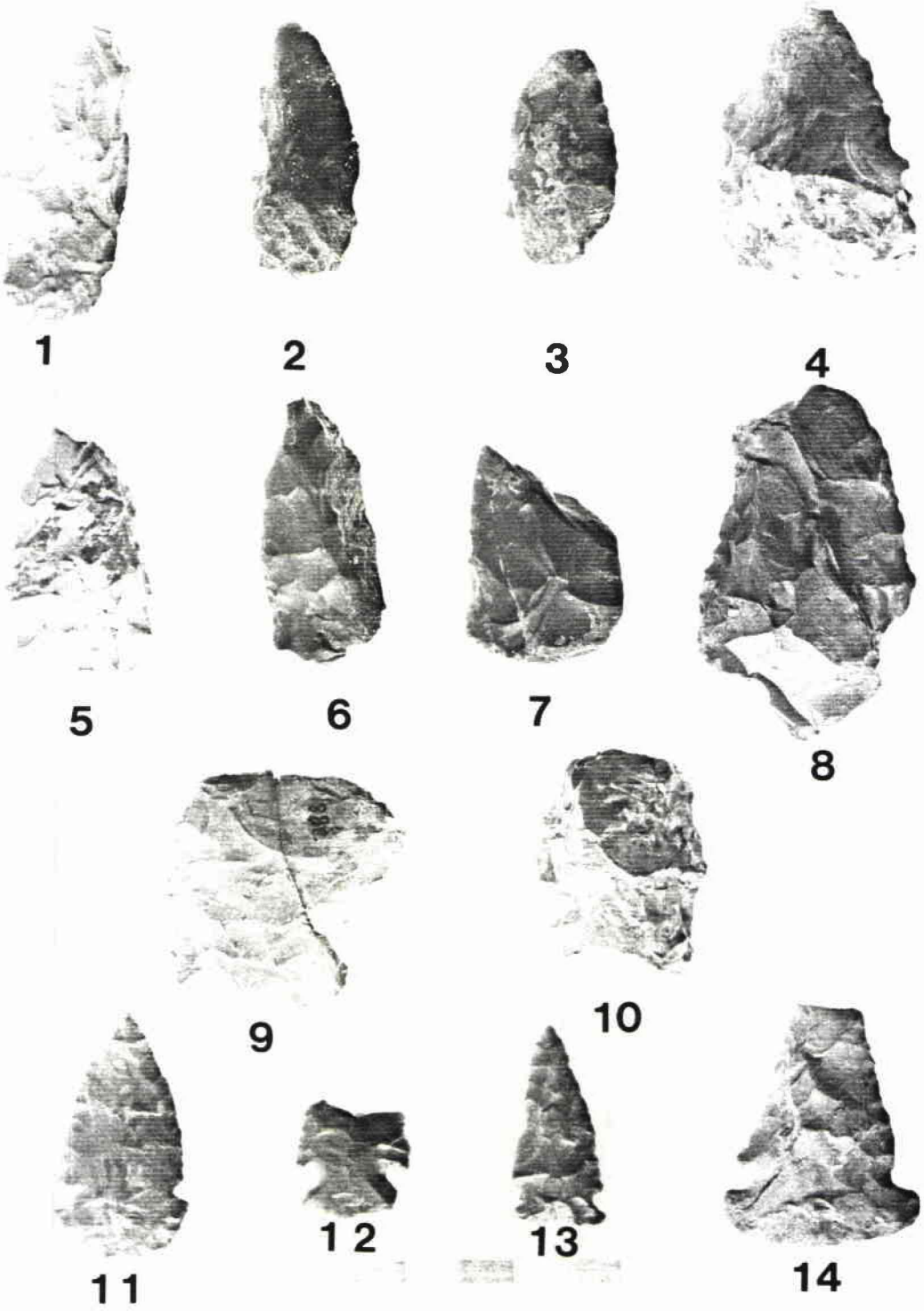
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Plate 13

Figures 1-9 Bifaces

Figures 10-14 Bipolar Cores

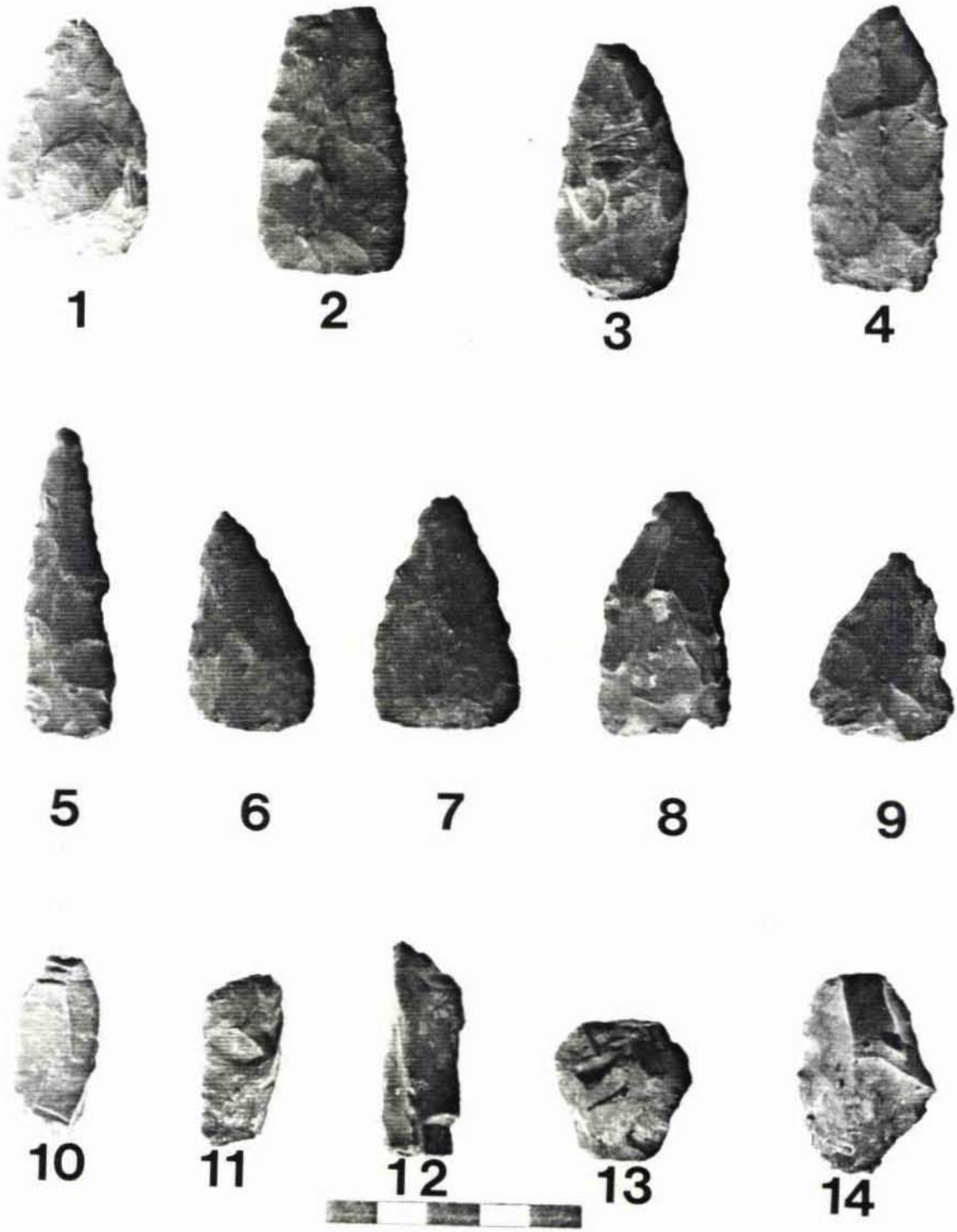
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Plate 14

Random Flake Cores

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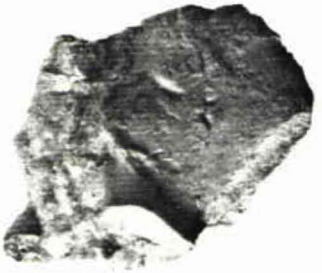

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Plate 15

Figure 1	Gouge
Figure 2-3	Celts
Figures 4-9	Hammer Stones

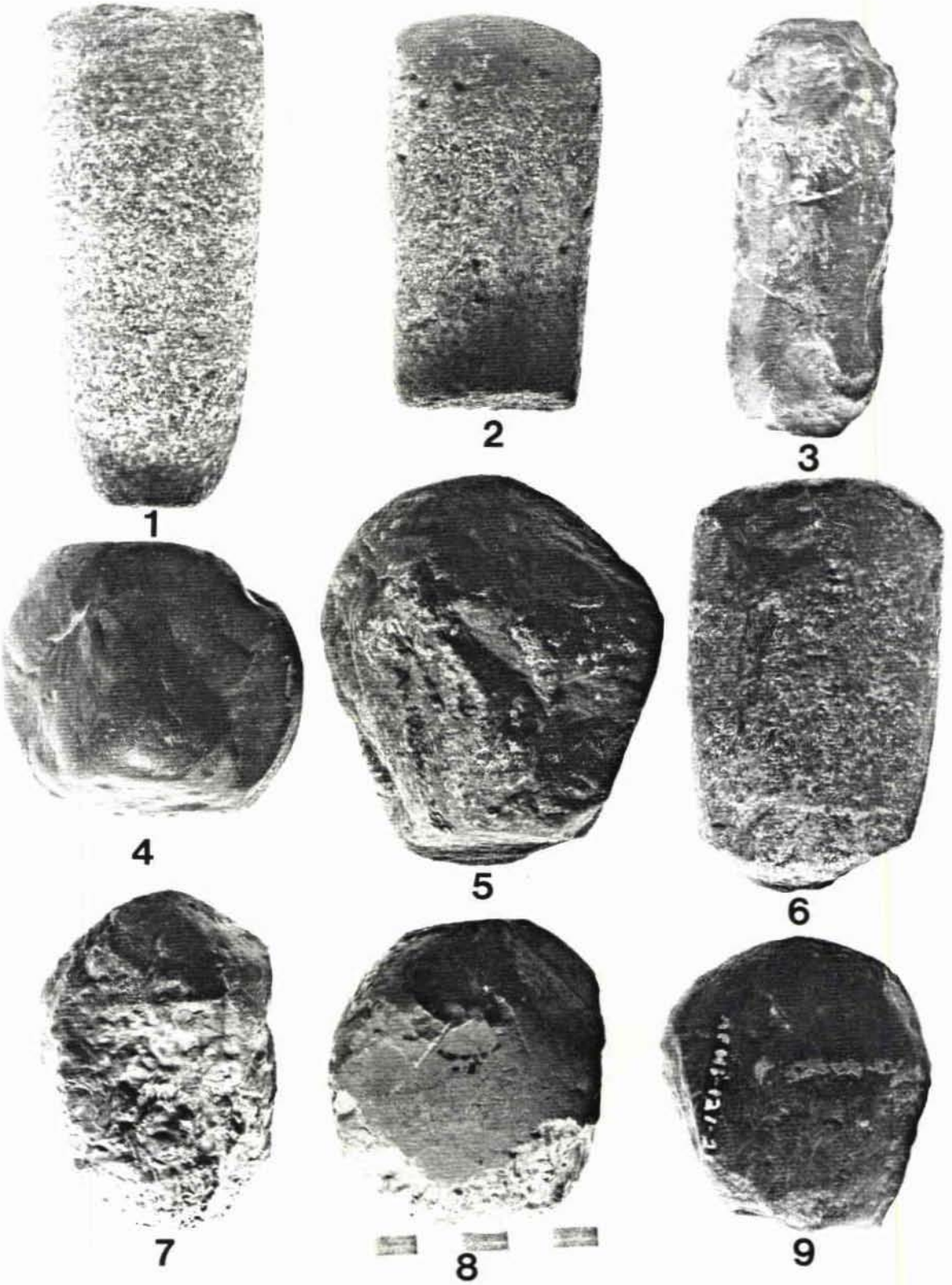
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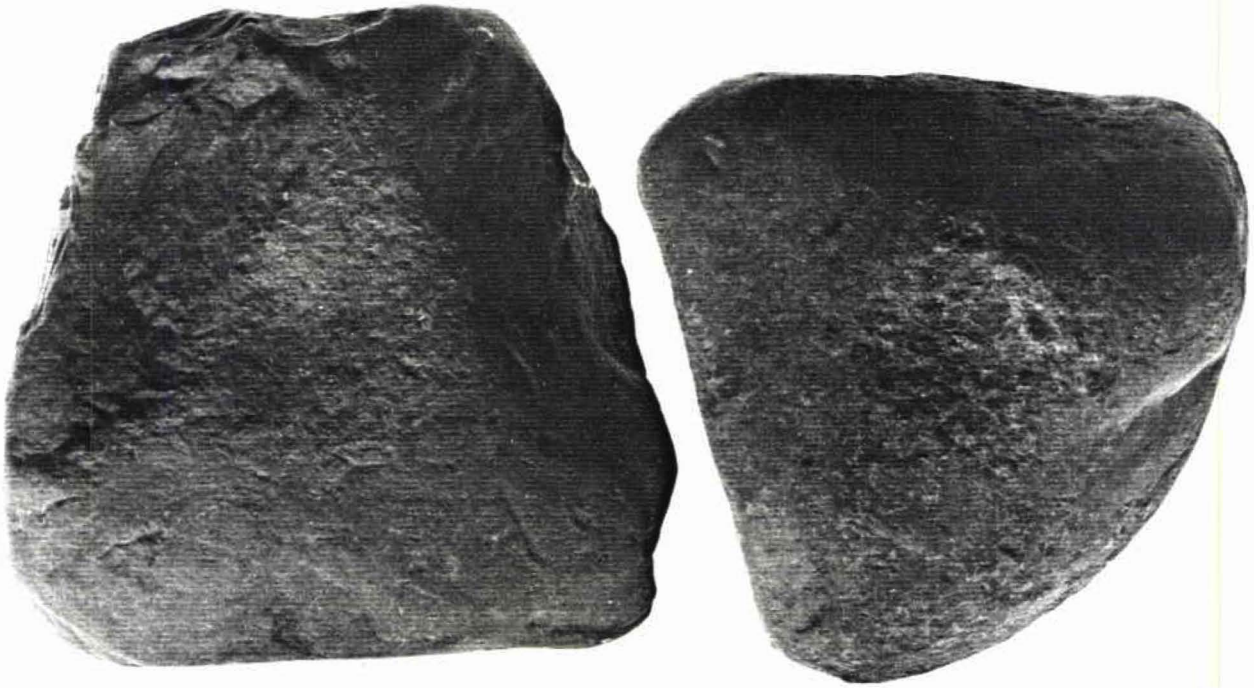
Plate 16

Figures 1-2 Anvil Stones

Figures 3-5 Net Sinkers



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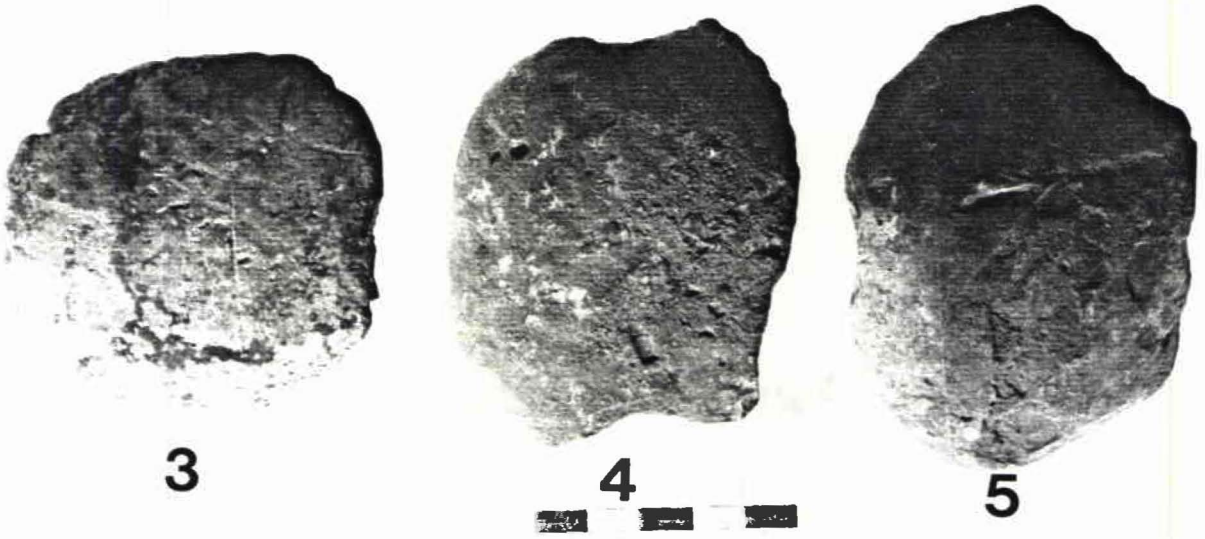

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APPENDIX 1:
CERAMIC METRIC AND NON-METRIC DATA

Abbreviations:

Ves#	Vessel Number
Pri.T	Primary External Tool
Pri.Tec	Primary External Technique
Sec.Tool	Secondary External Tool
Sec.Tec	Secondary External Technique
Sup.T	Superimposed Tool
Sup.Tec	Superimosed Technique
Int.T	Interior Tool
Int.Tec	Interior Technique
Int.Sup	Interior Superimposed
Lip.T	Lip Tool
L.Notch	Lip Notch
L.Sh	Lip Shape
L.Th	Lip Thickness
D.Seq	External Design Sequence
I.D.Seq	Interior Design Sequence
Profile	Rim Profile

Codes:

Tools

1	Dentate Stamped
2	Pseudo-Scallop Shell
3	Plain Linear Stamped
4	Incised
5	Corded
6	Undecorated
7	Punctates

Tecniques

1	Linear
2	Rocker

Lip Notch Code:

1	Notched
2	Unnotched

Lip Shape Code

1	Flat
2	Pointed
3	Round

Ves.#	Pri.T	Pri.Tec	Sec.Tool	Sec.Tec	Sup.T	Sup.Tec	Int.T	Int.Tec	Int.Sup	Lip.T	L.Notch	L.Sh	L.Th.	D Seq.	I.D.Seq.	Profile
1	1	1	-	-	-	-	1	1	-	1	1	3	8.1	106	3	86
2	1	1	+	+	+	+	1	1	-	1	0	3	5.7	44	3	87
3	1	1	-	-	-	-	1	1	7	-	0	2	6.3	249	251	68
4	1	1	4	1	1	1	1	1	-	1	0	1	11	250	144	11
5	1	1	-	-	-	-	1	1	-	1	1	3	6.9	252	253	76
6	6	-	4	1	-	-	6	-	-	-	0	2	5.3	254	228	88
7	1	1	-	-	-	-	1	1	-	1	0	1	7	255	256	89
8	1	1	-	-	-	-	6	-	-	6	0	1	11	257	228	90
9	3	2	-	-	-	-	3	1	-	3	0	1	6.9	258	259	+
10	1	1	-	-	-	-	1	1	-	-	0	2	6.9	22	21	59
11	1	1	-	-	-	-	1	1	-	1	0	1	5.6	21	4	91
12	1	1	-	-	-	-	1	1	-	1	0	1	7.9	260	21	15
13	1	1	-	-	-	-	1	1	-	1	0	1	6.1	252	253	15
14	6	-	-	-	-	-	6	-	-	6	0	3	11	228	228	92
15	1	1	-	-	-	-	+	+	+	1	0	1	8.4	261	+	+
16	1	1	-	-	-	-	6	-	-	6	0	1	6.5	21	228	18
17	6	-	-	-	-	-	-	-	-	-	0	3	7.4	228	228	68
18	1	+	-	-	-	-	1	1	-	3	1	3	9.2	+	262	23
19	1	1	-	-	-	-	1	1	-	-	0	2	6.1	252	4	8
20	1	1	-	-	-	-	1	1	1	1	0	3	9.2	263	4	+
21	2	1	-	-	-	-	6	-	-	4	0	1	9.1	264	228	72
22	5	-	-	-	-	-	5	-	-	3	0	1	7.9	265	266	93
23	1	2	-	-	-	-	1	1	-	-	0	2	4.6	267	3	94
24	2	1	-	-	-	-	2	1	-	-	0	2	3.9	22	4	94
25	1	1	-	-	-	-	6	-	-	3	0	1	5.8	268	228	95
26	1	1	-	-	-	-	1	1	-	-	0	2	6.1	269	23	96
27	5	-	-	-	-	-	6	-	-	6	0	3	12	270	228	7
28	4	1	-	-	4	1	6	-	-	4	0	1	11	271	228	97
29	1	1	-	-	-	-	6	-	-	6	0	1	7	36	+	+
30	3	1	-	-	-	-	6	-	-	+	+	+	7.1	272	228	+
31	5	-	-	-	-	-	6	-	-	6	0	1	8.7	273	228	7
32	1	+	-	-	-	-	1	1	-	-	0	2	7.4	+	253	99
33	1	1	-	-	-	-	1	1	-	-	1	2	7.9	274	3	98
34	1	1	-	-	-	-	6	-	-	1	1	3	7.8	+	228	23
35	2	1	-	-	-	-	6	-	-	2	0	1	6.4	275	228	4

36	1	1	-	-	-	-	1	1	-	+	+	+	5.3	3	3	+			
37	1	1	-	-	-	-	6	-	-	+	0	+	5.3	275	228	100			
38	1	1	-	-	-	-	1	1	-	1	0	3	6.8	276	3	8			
39	2	1	-	-	-	-	6	-	-	6	0	3	6.8	3	228	68			
40	1	1	-	-	-	-	6	-	-	6	0	1	6.8	275	228	4			
41	1	1	-	-	-	-	6	-	-	6	0	2	7.5	3	228	68			
42	+	+	+	+	+	+	+	+	+	1	1	3	7.3	+	+	8			
43	1	1	-	-	-	-	1	1	-	1	1	3	6.5	275	6	23			
44	2	1	-	-	-	-	6	-	-	6	0	1	7	277	228	5			
45	4	1	-	-	4	1	6	-	-	4	0	1	5.9	278	228	6			
46	1	2	1	1	4	1	1	2	1	3	1	3	5.1	279	165	22			
47	1	2	-	-	-	-	1	2	-	1	1	3	12	280	144	4			
48	5	-	-	-	-	-	-	1	-	+	0	2	6	265	253	9			
49	1	1	-	-	-	-	1	1	-	1	0	1	6	281	4	6			
50	1	2	-	-	-	-	1	1	-	1	1	3	7.5	280	3	23			
51	4	1	-	-	-	-	6	-	-	3	1	1	8	15	228	7			
52	1	2	-	-	-	-	1	1	-	-	0	2	7.6	+	4	8			
53	2	1	-	-	-	-	6	-	-	6	0	1	5.3	275	228	4			
54	6	-	-	-	-	-	6	-	-	6	0	1	6.4	228	228	94			
55	1	1	-	-	-	-	1	1	-	6	0	3	8.6	+	36	7			
56	1	+	+	+	+	+	6	-	-	1	1	3	8.3	+	228	7			
57	3	1	3	2	-	-	3	1	-	-	0	2	6.6	282	283	8			
58	1	1	-	-	-	-	1	1	-	-	0	2	7.4	269	36	9			
59	2	1	-	-	-	-	3	1	-	-	0	2	8.8	284	253	9			
60	1	1	-	-	-	-	1	1	-	6	0	1	5.2	285	36	20			
61	1	1	-	-	-	-	1	1	-	1	0	3	11	286	253	7			
62	1	1	-	-	-	-	1	1	-	1	0	1	12	11	3	101			
63	1	1	-	-	-	-	+	+	+	1	0	3	8.9	263	+	7			
64	2	2	-	-	-	-	2	1	-	2	0	1	5.8	280	7	7			
65	4	1	-	-	-	-	6	-	-	7	0	1	6.8	5	228	7			
66	1	1	-	-	-	-	1	1	-	3	1	1	11	287	+	102			
67	1	1	-	-	-	-	1	1	-	1	0	3	6.9	277	5	7			
68	1	1	-	-	-	-	1	1	-	-	0	2	7.8	263	253	27			
69	4	1	-	-	-	-	6	-	-	4	0	1	7.8	275	228	5			
70	1	1	-	-	-	-	6	-	-	+	+	+	6.6	+	228	+			
71	3	1	-	-	-	-	3	1	-	-	0	2	6.8	+	253	+			

72	1	1	-	-	-	-	1	1	-	-	0	2	7.9	288	253	23
73	4	1	-	-	-	-	6	-	-	4	0	3	6.4	270	228	23
74	1	+	+	+	+	+	1	+	-	1	0	1	17	+	+	13
75	1	1	-	-	-	-	1	1	-	1	0	1	10	+	+	+
76	5	-	-	-	-	-	6	-	-	3	1	3	8.1	270	228	45
77	3	1	-	-	-	-	6	-	-	-	0	2	7.4	5	228	25
78	6	-	4	1	-	-	+	+	+	2	0	1	9.1	228	228	7
79	1	1	-	-	-	-	1	1	-	1	0	1	7.1	275	275	100
80	1	1	-	-	-	-	1	1	-	1	1	1	7.8	289	259	7
81	1	1	-	-	-	-	1	1	-	6	0	3	11	+	228	62
82	6	-	-	-	-	-	6	-	-	6	0	1	4.6	+	228	13
83	1	2	-	-	-	-	1	2	-	1	1	1	8.5	290	129	91
84	1	1	-	-	-	-	1	1	-	1	1	1	13	291	292	91
85	2	1	-	-	-	-	6	-	-	2	0	1	5.7	277	228	5
86	1	1	-	-	-	-	1	1	-	3	1	2	9.1	+	+	+
87	1	1	-	-	-	-	1	1	-	1	0	1	5	+	+	5
88	1	1	-	-	-	-	6	-	-	6	-	1	5.1	259	228	+
89	+	+	+	+	+	+	+	+	+	6	0	1	7.1	+	+	+
90	+	+	+	+	+	+	2	1	+	2	0	1	5.8	+	+	+
91	1	+	+	+	+	+	1	+	+	1	0	2	7.3	+	+	+
92	+	+	+	+	+	+	+	+	+	2	0	1	8.7	+	+	+
93	1	1	-	-	-	-	1	1	-	1	0	2	6.3	+	+	+
94	6	-	-	-	-	-	6	-	-	6	0	3	6.1	228	228	+
95	+	+	+	+	+	+	+	+	+	3	1	3	14	+	+	+
96	+	+	+	+	+	+	+	+	+	6	0	1	4.5	+	+	+
97	+	+	+	+	+	+	+	+	+	6	0	1	9.1	+	+	+
98	1	1	-	-	-	-	1	1	-	1	1	3	7.1	259	259	+
99	1	+	+	+	+	+	1	1	+	1	0	1	8.4	+	+	+
100	1	2	-	-	-	-	6	-	-	1	0	1	6.3	+	144	7
101	3	1	-	-	-	-	3	1	-	3	0	3	6	+	+	+
102	+	+	+	+	+	+	6	-	-	3	1	1	7.2	+	228	5
103	1	1	-	-	-	-	1	1	-	1	0	1	8.5	31	259	7
104	+	+	+	+	+	+	6	-	-	6	0	3	6.3	+	228	61
105	1	1	-	-	-	-	1	1	-	6	0	1	8.2	293	21	+
106	1	+	+	+	+	+	1	1	-	1	0	3	6.3	+	259	+
107	1	1	-	-	-	-	1	1	-	1	0	1	8.3	259	4	+

108	1	+	+	+	+	+	1	1	-	1	+	1	4.8	+	3	+			
109	1	1	-	-	-	-	1	1	-	1	0	1	7.1	7	4	4			
110	1	+	+	+	+	+	1	1	-	1	0	1	8.3	+	277	+			
111	4	1	-	-	-	-	4	1	-	3	1	3	7.1	+	+	61			
112	1	1	-	-	-	-	1	1	-	6	0	3	9.4	+	+	+			
113	1	1	+	+	+	+	1	1	+	3	1	3	7.8	+	+	+			
114	1	1	+	+	+	+	1	1	+	1	0	1	10	259	253	+			
115	2	1	-	-	-	-	2	1	-	-	0	2	5.2	275	94	+			
116	3	1	+	+	+	+	3	1	+	3	0	3	11	+	+	+			
117	1	1	-	-	-	-	6	-	-	3	1	3	6.1	+	228	+			
118	5	-	-	-	-	-	5	-	-	1	0	1	6.1	270	266	4			
119	1	1	-	-	-	-	1	1	-	-	0	2	7.2	+	23	+			
120	6	-	+	+	+	+	6	-	+	3	1	1	6.9	228	228	+			
121	1	2	-	-	-	-	6	-	-	2	0	1	8.5	294	228	+			
122	+	+	+	+	+	+	2	1	+	2	0	1	5.6	+	259	+			
123	6	-	-	-	-	-	6	-	-	6	0	3	4.2	228	228	+			
124	1	1	-	-	-	-	1	1	-	-	0	2	5.1	23	+	+			
125	1	1	-	-	-	-	1	1	-	1	0	3	7.7	15	15	+			
126	1	1	-	-	-	-	1	1	-	-	0	2	6.4	58	36	94			
127	3	1	-	-	-	-	+	+	+	3	0	1	7.5	+	+	+			
128	3	1	-	-	-	-	6	-	-	3	1	3	6.1	+	+	+			
129	+	+	+	+	+	+	1	1	-	1	0	3	6.4	+	21	23			
130	+	+	+	+	+	+	1	1	+	-	0	2	9.1	+	180	+			
131	1	+	+	+	+	+	1	1	+	6	0	3	5.5	+	+	+			
132	3	1	+	+	+	+	6	-	-	6	0	1	5.7	+	228	5			
133	1	1	+	+	+	+	1	1	-	6	0	1	7.2	263	4	+			
134	1	1	+	+	+	+	1	1	+	1	0	1	7	+	+	+			
135	+	+	+	+	+	+	+	+	+	4	0	1	8.7	+	+	+			
136	4	-	+	+	+	+	+	+	+	6	0	1	7.9	+	+	+			
137	1	1	-	-	-	-	1	1	-	1	0	1	5.8	259	275	+			
138	1	1	+	+	+	+	1	1	-	3	0	1	12	23	4	+			
139	5	-	-	-	-	-	6	-	-	3	1	1	6.5	+	+	+			
140	5	-	-	-	-	-	+	+	+	3	1	1	9.5	+	+	+			
141	5	-	-	-	-	-	6	-	-	6	0	1	7.8	+	228	22			
142	5	-	-	-	-	-	6	-	-	3	1	1	6.1	+	228	22			
143	1	+	+	+	+	+	1	+	+	+	+	+	6.8	+	+	+			

144	+	+	+	+	+	+	+	+	+	6	0	1	6.3	+	+	+	
145	6	-	-	-	-	-	6	-	-	3	0	2	6.5	228	228	+	
146	+	+	+	+	+	+	6	-	-	6	0	1	4.7	+	228	16	
147	+	+	+	+	+	+	6	-	-	+	+	1	5.9	+	228	+	
148	5	+	+	+	+	+	+	+	+	3	1	2	7.2	+	+	+	
149	5	-	-	-	-	-	6	-	-	6	0	1	6.8	273	228	4	
150	5	-	-	-	-	-	6	-	-	3	1	1	6.6	270	228	5	
151	+	+	+	+	+	+	6	-	-	6	0	3	3.7	+	228	6	
152	4	1	-	-	-	-	6	-	-	4	0	1	7	+	295	5	
153	1	1	+	+	+	+	1	1	+	1	0	1	6.8	+	+	+	
154	1	1	+	+	+	+	1	1	+	6	0	1	6.9	+	+	+	
155	3	2	+	+	+	+	3	1	-	6	0	1	11	+	+	+	
156	1	1	+	+	+	+	1	1	+	+	0	2	5.8	259	259	+	
157	5	-	-	-	-	-	6	-	-	3	1	1	6.8	296	228	4	
158	5	-	+	+	4	1	3	1	-	5	0	1	6.8	273	44	13	
159	1	1	+	+	+	+	1	1	+	+	0	2	6.8	+	+	+	
160	+	+	+	+	+	+	6	-	-	6	0	1	6.2	+	228	35	
161	2	1	-	-	-	-	2	1	-	6	0	1	5.4	+	21	6	
162	+	+	+	+	+	+	+	+	+	+	+	+	7	+	+	+	
163	5	-	-	-	-	-	5	-	-	6	0	1	8.9	265	257	13	
164	5	-	-	-	-	-	6	-	-	3	1	1	7.7	+	228	35	
165	+	+	+	+	+	+	+	+	+	+	+	1	9.9	+	+	+	

APPENDIX 2:

Lithic Metric and Nonmetric Data

ABBREVIATIONS

BaseSh.....	Base Shape
Cat#.....	Catalog Number
Dr.Width.....	Drill Bit Width
NotchW.....	Notch Width
StemW.....	Stem Width
StDv.....	One Standard Deviation

EXPLANATIONS

CODES

Chert Types

1.....	Onondaga
2.....	Selkirk
3.....	Kettle Point
4.....	Flint Ridge
5.....	Unidentified

Base Shapes

1.....	Convex
2.....	Flat
3.....	Concave

Rework

1.....	Present
2.....	Absent

Profile

1.....	Biconvex
2.....	Plano/convex
3.....	Convex/Concave

Appendix 2.0: Random Flake Core Metric and Non-Metric Data

Material	Length	Width	Thickness	Comments
1	57.3	43.8	35.1	patination
1	45	40	23.2	
1	67	36.4	21.2	patination
1	45.2	39.4	29.7	patination
1	61.8	28	26.8	
1	46.2	25.3	23	patination
1	47.2	34.6	12.7	patination
1	53.1	46.4	23.6	
1	54.3	24	23.1	patination
1	58.3	43.6	20.7	patination
1	63.7	30.9	23.2	patination
1	59.5	33.5	18.7	patination
1	42.9	30.6	25.9	
1	55.9	45.1	24	patination
1	50.8	41	21.1	patination
1	43.7	30.9	19.6	patination
1	49.6	26.5	15	
1	42.2	38.7	28.4	patination
1	52.7	27.5	23.8	patination
1	59.6	23.1	13	
1	51	37.7	21.2	patination
1	46.8	30.7	13.7	patination
5	47.6	38.4	15.2	
1	43.5	37.8	27.1	
1	39	24.6	16	
1	43.6	25.3	21.2	
5	61.3	47	26.9	patination
1	49.9	30.7	25.5	patination
1	56	26.5	16.9	patination
1	68.8	59.1	30.8	patination
1	70.5	43.6	19.5	patination
N=	31	31	31	
Average	52.7	35.2	22.1	
SDV	8.5	8.6	5.4	
Max	70.5	59.1	35.1	
Min	39	23.1	12.7	

Appendix 2.1: Bipolar Core Metric and Non-Metric Data

Cat#	Material	Type	Length	Width	Thickness	Comments
876	1	ridge/area	40.4	44	8.7	patination
893	3	ridge/area	36.4	24.7	9.7	
728	1	opposed ridge	40.4	27.8	14.1	patination
875	1	ridge /point	33	15.5	8.7	patination
907	1	point/area	33	15.5	8.7	patination
811	1	ridge/area	45	19.5	12.9	
775	3	ridge/area	36.8	28.5	13.5	
838	1	opposed ridge	37.3	16.8	9.6	patination
781	1	ridge/ area	40.8	21.8	12.5	
917	3	ridge/area	23	24.8	7	
786	1	ridge/area	34.9	20.4	7.2	patination
801	1	opposed ridge	28.2	19.2	8	patination
801	3	ridge/area	26.7	14.6	12.4	
758	3	opposed ridge	27.2	12.9	8.1	
836	1	ridge/area	32.3	12.3	7.6	patination
856	3	point/area	35.7	19.3	13.1	
840	1	ridge/area	34	17	9.6	
841	3	ridge/area	29	17.2	6.5	
791	3	ridge/area	33.5	21	14	
901	3	ridge/area	26	19.2	12.3	
730	3	opposed ridge	31.8	11.1	6.1	
841	3	ridge/point	31.9	17.6	6.5	
902	1	ridge/area	26.9	17.4	10	
908	1	opposed ridge	24.5	15.3	9.5	
821	3	ridge/area	30.5	16.1	12.7	
841	3	opposed ridge	25.5	11.9	6.9	
815	1	point/area	25.5	13.4	9.4	
888	3	ridge/point	28.2	17.3	10.2	
781	1	opposed ridge	21.8	25.8	10.6	
768	1	ridge/point	31.1	14.1	13.6	
821	5	ridge/point	27.6	14.2	11.2	
790	3	ridge/area	23.1	13.1	11.9	
822	3	point/area	22.1	10.4	4.6	
747	3	opposed ridge	24.7	30.3	10.3	
834	3	ridge/area	23.6	9.2	8.3	
888	1	opposed ridge	57.8	46.6	29.9	patination
	N=		36	36	36	
	Average		31.4	19.3	10.4	
	SDV		7.4	8.2	4.2	
	Maximum		57.8	46.6	29.9	
	Minimum		21.8	9.2	4.6	

Appendix 2.2: Pièces Esquillées Metric and Non-Metric Data

Cat#	Material	Crushed Edges	Length	Width	Thickness	Comments	Type
866	1	3	28.4	27.9	13.1		opposed ridge
866	3	4	27.5	27.3	10.5		opposed ridge
818	3	2	28.7	20.3	7.6		opposed ridge
751	1	3	26.5	27.6	7.2		opposed ridge
869	3	3	25.7	16.9	7.8		opposed ridge
779	3	2	24.3	13.7	7.1		opposed ridge
718	3	2	26	17.6	7.4		opposed ridge
852	3	3	25.4	17.7	9.3		opposed ridge
761	1	2	25.3	17	6.8	patination	opposed ridge
856	1	2	29.9	19.4	12.6		opposed ridge
795	3	2	24.5	16.1	8.1		opposed ridge
825	1	2	24	25	5		opposed ridge
834	3	3	24.2	16.5	17.5		opposed ridge
753	3	2	25	17.8	7.8		opposed ridge
730	3	2	20.1	18.7	14.6		opposed ridge
844	3	4	16.7	13.6	4.4		opposed ridge
805	3	2	16.5	17	7.3		ridge/area
730	3	2	23.1	14.4	7.2		opposed ridge
841	1	4	17.2	15	5.4		opposed ridge
873	3	3	19.9	21	5.6		opposed ridge
765	1	3	19.6	17.9	6.8		opposed ridge
801	1	2	21.5	12.3	7		opposed ridge
901	3	3	17	15.4	9		opposed ridge
834	3	2	20.6	12.3	5.3		opposed ridge
791	3	2	21.5	16.4	4.5		opposed ridge
849	3	2	19.7	19	7.3		opposed ridge
880	3	2	13.5	9.6	5.6		opposed ridge
881	5	2	25.6	16.9	6.3		opposed ridge
673	3	2	17	16	7.2		opposed ridge
626	3	2	17.6	8.4	6.6		opposed ridge
689	4	2	22.5	9	5.3		opposed ridge
172	3	2	25.5	18.1	9.3	scraper	opposed ridge
250	3	2	30.2	14.4	8.3	projectile	opposed ridge
254	1	2	19	16.2	4.1	projectile	opposed ridge
265	3	2	20.7	18.5	6.1	scraper	opposed ridge
210	3	2	18.1	18	3.8	projectile	opposed ridge
		N=	36	36	36		
		Average	22.5	17.2	7.6		
		Standard Dev.	4.3	4.6	2.9		
		Maximum	30.2	27.9	17.5		
		Minimum	13.5	8.4	3.8		

Appendix 2.3: End Scraper Metric and Non-Metric Data

Cat#	Length	Width	Thickness	Chert
824	42.8	37.1	13.9	1
792	29.2	27.3	10.3	1
778	27.7	23	6.5	3
859	30.5	28.8	8.3	1
910	19.7	23.9	5.1	3
740	21.2	18.7	6.9	1
749	24.6	17.7	8	3
814	25.9	20.3	4.9	5
735	17	20	7.1	3
696	19	16.5	4	3
686	31.3	21.9	9.3	3
685	27.7	26.8	6.5	3
899	30.3		12.8	3
891		19.2	5.4	5
778			5.8	3
680	40.6	25.1	10.2	3
189				3
635	12.2	11.5	6.4	3
649	31.8	21.1	4.1	1
646		15.4	3.5	3
N=	16	17	19	20
Average	27.0	22.0	7.3	
Maximum	42.8	37.1	13.9	
Minimum	12.2	11.5	3.5	
SDV	8.1	6.0	2.9	

Appendix 2.4: Side Scraper Metric and Non-Metric Data

Artifact #	Chert	Length	Width	Thickness	Areas of retouch
759	1	45.9	19.2	7.3	1
687	3	30.8	24	8.1	1
787	1		15	7.1	2
	Average	38.35	19.4	7.5	

Appendix 2.5: Tip Scraper Metric and Non-Metric Data

Artifact#	Length	Width	Thickness	Chert	Profile
151	29.8	18.5	5.9	3	1
196	27.5	19.4	6.3	1	1
128	29	21.6	8.7	3	2
Average	28.8	19.8	7.0		

Appendix 2.6: Hafted Scraper Metric and Non-Metric Data

Cat#	Length	Width	Thickness	StemW	NotchW	Chert	BaseSh	Profile
127	29	22.7	9.5	20.7	15.8	1	1	2
116	30.9	30.4	13.2	32.9	20.5	1	3	2
143	21.1	23	8.5	21.4	19.8	1	1	2
125	23	23.3	9.7	23.6	18.1	1	1	1
177	23	21.1	7.4	19.2	20.3	1	3	2
126	21.1	21.5	8.1	25	19.7	2	4	2
124	23.2	21.5	6.1	22.5	19.5	1	1	2
141	23.4	23.4	7.5	20.1	19.1	3	4	1
172	20.5		9.8			3	1	1
265	22.6					3	2	2
208						3	1	2
249	31.2		10.4			3	1	2
238	41.9		9.2			3	1	1
Average	25.9	23.4	9.0	23.2	19.1			
StDv	6.3	3	1.9	4.4	1.5			
N=	12	8	11	8	8	13	13	13
Max	31.2	30.4	13.2	32.9	20.5			
Min	20.5	21.1	6.1	19.2	15.8			

Cat#	Length	Width	Thickness	Dr.Width	Chert	Profile	BaseShape
262	26.3	23.5	5.2	5.2	1	1	2
134	27.6	21.8	5	6	1	1	2
220		22.6	4	6	1	1	2
180		22	4	5.8	5	1	2
273		22.5	7.4	5.2	1	1	1
1000		22.5	7.4	5.2	3	1	1
741				7.3	3		
858				9.1	5		
872				6.6	1		
Average	27.0	22.5	5.5	6.3			
N=	6	6	9	9	6	6	6
Max	27.6	23.5	7.4	9.1			
Min	26.3	21.8	4	5.2			
StDv	0.9	0.6	1.6	1.3			

Appendix 2.8: Biface Metric and Non-Metric Data

Cat#	Length	Width	Thickness	Chert	Rework	BaseSh.	Profile
118	80.3	29.7	9.8	1	1	2	1
119	55.7	26.3	12.3	1	2	2	1
16	44.9	25.5	9.2	1	2	1	1
120	46.8	29	9.6	2	2	2	2
191	54.7	37.2	23	1	2	2	1
243	47.7	29.5	11.7	1	1	2	1
140	61.8	19.1	9.1	3	2	1	1
224	62.1	26.7	11.5	1	2	1	1
247	49.9	25.8	13	1	1	2	1
146	32.9	28.8	11.5	3	2	1	1
157	51.5	21.7	14	3	2	1	1
31	50.3	26	12	1	2	1	1
164	50	21.7	15.7	3	2	1	1
163	40.6	21.3	9	3	2	1	1
611	47.5	28	13.3	1	2	2	1
288	45.4	45.4	9	1	2	irregular	1
205	66.5	39.8	17.6	1	2	irregular	1
242	56.7	27.5	13	1	2	irregular	1
162	29.7	24.4	7.5	1	2	irregular	1
297	20.3	19.2	4.2	5	2	irregular	1
Average	49.8	27.6	11.8				
StDv	13.2	6.7	4.0				
N=	20.0	20.0	20.0				
Max	80.3	45.4	23.0				
Min	20.3	19.1	4.2				

Cat #	Length	Width	Thick	StemW	NotchW	Chert	Rework	BaseSh	Profile
Average	43.9	23.4	8.3	21.7	17.2				
N=	58.0	76.0	79.0	71.0	75.0	93.0	60.0	82.0	66.0
Max	83.5	42.0	13.0	36.1	31.3				
Min	23.3	12.3	3.8	11.5	10.2				
StDv	11.7	4.4	1.8	4.7	3.6				
Cat #	Length	Width	Thick	StemW	NotchW	Chert	Rework	BaseSh	Profile
85	83.5	27.5	13.0	28	20.3	1	1	1	1
110	45.5	24.3	8.0	20	16.5	2	2	1	2
169	41.5	26.1	9.2	19.4	23	3	1	1	2
106	34.0	16.5	7.5	11.5	14.9	1	1	1	2
114	32.5	20.3	7.8	23.5	17.2	2	1	1	2
98	39.8	28.0	9.5	28.5	20.1	1	1	1	1
136	50.6	24.0	9.0	26.5	21.2	2	1	1	1
223	48.0	23.8	7.6	23.7	17.7	5	2	2	1
91	45.5	27.0	8.6	26	21.1	1	2	2	1
104	48.0	21.4	7.3	20.6	14.5	1	2	1	1
81	44.3	23.7	8.6	24.7	17	1	2	1	2
89	45.3	25.0	10.0	22.1	18.7	1	2	2	1
149	61.1	23.0	7.5	20.5	18.1	1	1	1	1
137	33.5	22.5	7.3	22.3	18.1	1	1	1	1
96	42.7	21.0	7.6	21	14.9	1	2	2	1
2000	61.2	31.5	12.0	31.7	24.3	3	1	1	1
147	56.0	30.0	10.3	20	15	5	1	3	1
112	50.4	23.9	11.5	25.1	17.4	1	2	1	1
99	55.8	21.8	11.2	25.5	16.4	1	1	1	1
113	40.5	23.0	6.6	22.4	17	1	2	1	3
152	41.2	29.8	8.0	21.6	16.5	3	1	1	1
155	42.0	19.6	7.9	13.3	15.1	5	1	2	1
131	40.0	19.6	7.0	11.5	14.1	3	1	1	1
92	83.5	42.0	10.4	25	20.7	4	1	1	1
107	39.5	22.7	8.8	22.5	17	1	1	2	1
142	40.9	25.2	8.9	27	17.5	2	2	2	1
23	40.7	25.7	8.7	24.7	19.6	1	1	1	2
83	43.2	25.8	9.1	25.5	17.8	1	2	1	1
102	32.5	23.3	8.1	26	19.9	5	1	2	1
101	29.7	19.2	6.3	22	16.7	2	2	2	1
129	42.0	25.7	7.5	24	15.8	5	2	2	1
108	32.5	18.0	6.8	16.8	13.1	3	2	1	1
144	26.8	17.7	8.1	18.6	14	3	1	1	1
133	30.0	21.3	6.3	19.7	17.1	1	1	1	1
117	52.6	22.5	12.6	22.4	14.8	1	1	1	1
90	32.7	23.8	9.6	21	15.5	1	1	1	2

Appendix 2.9: Projectile Metric and Non-Metric Data (Continued

95	39.9	24.4	9.1	23.3	18	1	2	1	1
121	57.1	22.6	8.6	18.9	15.3	3	1	1	1
148	47.7	19.0	8.0	15	11.7	3	1	2	2
111	54.4	13.4	6.3	13	14.5	1	1	2	1
130	42.3	16.1	8.1	15	12.9	1	1	2	1
2001	43.3	20.0	7.8	23	15.9	3	1	2	1
85	35.2	22.8	7.8	25.1	19.8	1	1	2	1
132	34.7	19.9	7.6	19.8	14.9	3	2	2	1
100	29.5	20.0	7.0	20.8	16.5	1	1	1	1
135	44.0	19.9	9.0	16.8	13.4	3	2	1	2
239	42.4	25.7	9.6	24.4	18.1	1	2	2	1
150	23.3	21.4	8.3	15.1	12.8	1	2	1	1
103	43.4	18.4	9.4	21.6	16.5	5	1	1	1
156	26.7	21.3	7.6	19.4	17.5	1	1	1	1
97	64.0	26.0	8.1	20.5	14.8	1	2	1	1
88	35.5	22.8	7.8	25.3	20	3	1	2	1
115	44.2	21.8	9.2	19.7	10.6	3	2	1	1
147	56	29.8	10.2	15.0	19.6	1	1	3	1
86		29.4	8.3	26.8	31.3	1	1	1	1
109	47.6	24.4	4.2	20.4	25	1	2	1	1
122	37	12.3	3.8	14.0	12.7	2	2	2	1
148	47.0	18.5	8.1		15	2	2	2	1
86		29.4	7.6	36.1	25.7	1		1	1
153		29.5	8.2		20.3	3	1	1	2
105		27.0	8.9	31	25.8	3		2	
248		26.0	11.7		17.6	3		2	
185		24.2	12.0		15.1	1		2	
97		25.5	8.0	20.5	14.6	1		1	2
82		24.2	7.6	26.3	19	1	2	2	2
256			9.2	20.5	18	3		1	1
202		24.9		20.1	17.6	1		1	
94		22.1	4.7	19.6	13.1	3		1	
87		25.6	7.0	24.5	16.7	5		1	2
93		29.2	6.8	25.9	20.6	1		1	
84		24.7	9.0	17.3	13.6	1		1	1
145		21.3	7.5	21	15.5	3		1	
123		20.1	7.9	16.2	14.4	1		2	
161				25.5	19.6	2		2	
251		24.2				2		1	
139	42.9	22.4	11.9			1		1	
269			8.2	19.9	10.2	1		1	
250			6.2			3			
187						5		1	
260			8.4			1			
181						3			
201						3		1	
265						3			
192						3			
49			8.5			1			

Appendix 2.9: Projectile Metric and Non-Metric Data (Continued)

682						2			
802						5			
283						5		1	
292						3		1	
278						3			
259		22.6	4.5			1			
138		20.3	6.6			1			
610						5		1	1

Appendix 2.10: Hammer Stone Metric and Non-Metric Data

Artifact #	Length	Width	Thickness	Comments
255	83	63	63	
21	63	58	45	
24	67	60	53	onondaga
861	76	49	45	onondaga
266	67	63	45	
265	91	55	31	
N=6				
Average	74.5	58	47	
Maximum	91	63	63	
Minimum	63	49	31	
SDV	10.9	5.4	10.6	