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An Analysis of the Lithic Material from the Late Woodland Component of the Draper Park Site (20SC40) in Port Huron, Michigan

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AN ANALYSIS OF THE LITHIC MATERIAL FROM THE LATE WOODLAND COMPONENT OF THE DRAPER PARK SITE (20SC40) IN PORT HURON, MICHIGAN

by

Fran Seager

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

Western Michigan University
Kalamazoo, Michigan
December 1988
This research examines the lithic assemblage of the Draper Park site, which consists of over seventeen thousand specimens including detrital material, implying on-site manufacturing techniques. Artifact attributes are analyzed and correlated within the context of the site and compared with known Late Woodland fishing sites. The intensive use of the site and strategic location suggest that it was a fishing station located at the headwaters of the St. Clair River. The site was seasonally occupied from A.D. 600 through A.D. 1300.
ACKNOWLEDGEMENTS

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Although the credit goes to those persons mentioned above, the responsibility for the conclusions and speculations presented herein is entirely my own.

Fran Seager
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Seager, Frances, M.A.
Western Michigan University, 1988

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CHAPTER I
INTRODUCTION

The habitation of Late Woodland Indians in the southeastern part of Michigan is fairly continuous, lasting approximately from A.D. 600 through A.D. 1300, after which a hiatus seemed to have occurred. Varying hypotheses have been put forth to explain this phenomenon, notably, increased aggression from Iroquois groups (Heidenreich 1971:86-90) and climatic change (Baerreis and Bryson 1965), or as Fitting (1975a:148) suggested a decline in the demand for goods in these areas may have caused population decrease. Early European itinerants, during the contact period of the seventeenth and eighteenth centuries, generally remarked on the lack of population in north-central Ohio, southwestern Ontario, and southeastern Michigan (Brose 1971). Early historic accounts referred to the area as a buffer zone between groups visited by hunting parties but serving as a homeland for no group.

The Draper Park site correlates with the occupational time span of other Late Woodland sites of southeastern Michigan. Its ceramic complex yielded evidence of four major Late Woodland traditions affiliated with northern Ohio, southeastern Michigan, and southwestern Ontario dating between A.D. 600 and A.D. 1200 (Hoxie 1980). However, the most intensive occupation appeared to have taken place during the later portion of that period, between A.D. 900 and A.D. 1100, by people strongly affiliated with the Wayne tradition (Hoxie 1980).
Although some local glacial material was utilized, the majority of the lithic material found on the Draper Park site was Kettle Point chert imported from southwestern Ontario in the form of small nodular cobbles, suggesting that either populations from southwestern Ontario were utilizing the site, or that the Draper Park inhabitants were involved in an exchange system with the occupants of southwestern Ontario. Because of the homogeneity of the lithic material and large representation of black shale from the Kettle Point source area in the assemblage, it is surmised that the raw material was collected directly by the people of Draper Park.

The occupation of Late Woodland sites from the seventh through the fourteenth century corresponds with the milder Neo-Atlantic climatic episode which occurred between A.D. 800 and A.D. 1300 (Baerreis and Bryson 1965; Fitting 1975a:145). The climate was warmer with adequate moisture for horticulture which, in turn, may have brought about increased agricultural practices, thus supplementing the exploitation of natural resources. With the addition of agriculture into the preexisting subsistence-settlement system, a more sedentary adaptation may have been initiated. This may explain the later more intensive use of Draper Park site by the Wayne tradition people between A.D. 900-1100. Cleland (1966:33) notes that "during the Neo-Atlantic period, there was a resurgence of cultural activity in southern Michigan."

Baerreis and Bryson (1965) describe a period of cooler, drier climate starting approximately A.D. 1300 and lasting into the
mid-fifteenth century, which they refer to as the "Pacific Episode." During this period a decrease in agricultural production and an increase in external aggression may have exerted pressure upon the indigenous population from both within and without, thus disrupting their economic base. The lack of occupancy in the southeastern area of Michigan noted by European journeymen during the seventeenth and eighteenth centuries may be ascribed to a time of transition for the native population due principally to climatic factors. Eichenlaub (1979:230-237) describes a relatively warm period in Europe between the years A.D. 900 through A.D. 1300, which supports Baerreis and Bryson's "Neo-Atlantic Climate Episode." Like Baerreis and Bryson, Eichenlaub suggests that after A.D. 1300 the climate became progressively colder, and that "the little ice age" lasted up to the mid-nineteenth century. Because of wind and weather patterns, northern Europe and the Great Lakes area were affected by similar jet stream patterns created by global atmospheric pressures, thereby producing similar weather conditions (Eichenlaub 1979:231). Since the climate was distinguished by shorter growing seasons, severe frosts and heavy winter snows, it lends even greater credence to the eventual breakdown of subsistence patterns practiced in southeastern Michigan toward the end of the fourteenth century.

Up until recently, the Late Woodland occupation of the southeastern area of Michigan has been an enigma. Sites excavated to date indicate a highly specialized nature; many are burial complexes, namely Gibraltar, Younge, Springwells, and Riviere Au Vase sites.
Village site debris, other than ceramics, are rare. This would indicate a low population density if it were not for the extremely high density of burials. At several sites there were more people than pots. Very likely the people had base villages somewhere else. From the ceramic styles, I suspect these were somewhere to the east. Southeastern Michigan seems to have been a place where people went to die . . . rather than a place where they lived.

Unlike those sites mentioned, Draper Park had an enormous amount of occupational debris with numerous ceramics, tool manufacturing debris, and features containing thousands of fish bone fragments and evidence of cultigens. For this reason, it stands out as a very important site in southeastern Michigan and will further add to our understanding of the area. The site is located near the rapids at the headwaters of the St. Clair River, where major seasonal fish migrations occur, and is strategically situated as a crossroad between southeastern Michigan and southwestern Ontario (Figure 1).

The focus of this study is an analysis of the lithic remains at Draper Park, which includes a study of (a) the lithic distribution and tool attributes, (b) cultural affiliations with other Late Woodland sites, and (c) an overall view of the regional settlement systems.
Figure 1. Draper Park Site With Locations of Regional Sites Mentioned in the Text.
(Modified from Hoxie 1980:10.)
CHAPTER II
SITE DESCRIPTION AND EXCAVATION HISTORY

The Draper Park site (20SC40) is located in Port Huron, in southeastern Michigan. It lies approximately 200 meters from the current position of the St. Clair River located just northwest of the Bluewater Bridge, which spans 2.5 km between Port Huron, Michigan, and Sarnia, Ontario. The exact location of the site is the SE\text{1\textdegree}, NE\text{1\textdegree}, SW\text{1\textdegree} of section 35, Fort Gratiot township, T17N R17E, St. Clair County, Michigan.

The site is situated on an Algoma Beach ridge, which was formed approximately 3,000 B.P. The site is at the head of the St. Clair River, which drains from Lake Huron south into Lake St. Clair and ultimately interconnects Lake Huron with Lake Erie via the Detroit River straits.

Draper Park is so named because it is now a recreation area set aside in the old section of Port Huron at the corner of Elmwood and Forest streets. The archaeological site which occupied the northwest corner of the park has since been filled in and covered with grass. It was initially discovered by a survey crew under the direction of the Michigan History Division in the spring of 1974 (Weston 1979).

The crew also relocated numerous sites that had been plotted on an 1871 map drawn up by Gillman (Weston 1979). Among them was a thick midden exposed through erosion on a gentle slope in Draper
City Park. Gillman had apparently mistaken the discontinuous Algoma Beach ridge for mounds and had numbered the numerous natural ridges as man-made mounds (Figure 2). The erosional midden was found just within Gillman's description of "mound" No. 2 (Figure 3); which he delineates as "bounded on the north by a small stream known as McNeil's Creek (today completely filled in), which also runs southwardly all along its eastern slope, as well as a part of the south end of the mound" (Fitting 1970b:86). Remnants of McNeil's Creek were found at the north end of the Draper Park site during excavations in 1977.

Through the expansion of the City of Port Huron many of the original sites noted by Gillman have been destroyed. Because of the paucity of the samples, especially in lithic remains and ceramics, Fitting (1970b:93), when examining the material at the Peabody Museum, was able to make only very generalized statements concerning the 1500 years from Early through Late Woodland occupations represented in Gillman's collections.

The materials excavated from Gillman's mounds 1 and 2 obviously represent an important facet of prehistory in the region. Some of the material recovered therein corresponds with that of Draper Park, suggesting they may be contemporaneous or even part of the Draper Park site (Marek 1983:15; Weston 1979:4). This, in turn, would change the overall significance of the site since both mounds 1 and 2 indicate the habitation of a large population.

The following section is a summary of the excavations carried out by the students of St. Clair Community College under the
Figure 2. Gillman's Mound Locations (Jenks' 1912 Map).

Figure 3. Relocation of Gillman's "Mound" Sites.

supervision of Donald Weston between the years 1974 and 1977. It is based on Weston's 1979 report outlining his field techniques and initial discoveries.

The first field crew in 1974, after establishing an overall grid pattern for the entire park, excavated two 25 ft long and 10 ft wide east-west trenches (A and B) which included the erosional area initially discovered on the east facing slope (Figure 4). Each trench was divided up into 5-ft square units and excavated to a depth of 1.5 m. All levels were removed by arbitrary 3-inch intervals with hand trowels.

All units, with the exception of 11 random ones, were measured from datum and referenced by their southeast coordinates. Contents of the units were screened through a 1/4-inch sieve and approximately one-fourth to one-half of the soil taken from the refuse pits was water screened through 1/8-inch mesh in an attempt to recover paleobotanical remains. This latter process proved to be nonproductive.

Four cultural levels were defined. Level I, which averaged 4 inches below surface, was defined as modern sod. Level II, consisting of fill dirt "hauled onto the site from an unknown location" (Weston 1979:13), averaged approximately 6 inches below surface and contained some Middle Woodland artifacts. Level III was composed of an historic component, dating from the late nineteenth century, and averaged 12 inches below surface. Level IV was composed of Late Woodland general site midden. Level IVA consisted of unstratified Late Woodland deposits in trenches A, B, and D with depths varying from 1.5 ft to a maximum of 4 ft. The Old Creek Bed's prehistoric
Figure 4. Location of Excavated Trenches A and B at the Draper Park Site.


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deposits ranged from Level IVB through Level XXIII with a maximum depth of 8 ft (Weston 1979).

Weston’s 1974 trenches A and B revealed dense concentrations of features, artifacts, and fire-cracked rock. Thirty feet southwest of the trenches a 10-ft square unit C was excavated with negligible cultural material recovered (Figure 5).

In 1975 a third 10 ft x 25 ft contiguous trench was opened on the north side of the 1974 excavations (Figure 4). It too encompassed concentrations of features; however, numerous modern intrusions obliterated many of the aboriginal refuse pits (Figure 5).

During the 1976 field season, a random sampling technique was employed to delimit the extent of the site. Outside the park area surveys were conducted examining roadcuts, driveways, garden beds, and recent construction sites.

On the basis of his sampling procedure and reconnaissance, Weston calculated that the site size was approximately 12,800 sq ft (1189.1 sq m or .12 ha). Unfortunately, more than 53% of the area had been destroyed by recent landscaping on the front of the ridge, with basement construction to the north, roadway and sidewalk construction to the west, and some limited slope erosion on the face of the ridge. He determined that the concentration of aboriginal deposits was confined to the top of the Algoma Beach ridge on the west edge of the park. A turn-of-the-century dump was located at the extreme south end of the ridge. From 90 ft south of datum past 170 ft, a late nineteenth-early twentieth century garden bed was uncovered. The sampling units on the south end of the ridge were
Figure 5. Block Excavations Showing Trenches A, B, D in Level IVA.

shallow, however those in the extreme north were very deep, up to 101 inches in the Old Creek Bed area.

In 1977 an L-shaped block was excavated to the extreme north of the site, up against a cement wall (see Figure 4). Three feet below the modern surface, a prehistoric midden was discovered which sloped north-northeast at a 30° angle. Upon further investigation, below the midden a former creek channel was encountered exposing stratified layers of cattails alternating with cultural material. Between each layer of cattail and cultural material there was a thin, sterile lens of sand. The creek, approximately 4-6 ft wide and 2 ft deep, was delineated by clay banks with a gradient of 6 in./15 ft (Figures 6 and 7). The creek proved to be a very important aspect of the site. Having deep stratified layers, it contained Early Late Woodland through Late Woodland cultural deposits in sealed levels. An abundance of preserved paleobotanical material consisting of seeds, nuts, both charred and uncharred logs, a wooden paddle (Figure 6), a fish net sinker with cordage still attached, several animal skulls along with numerous lithics, ceramics, deer bones, and multitudes of fish scales were recovered from both the sealed levels and the refuse pit encountered within the stream bed.

Therefore, in the context of the lithic analysis, the northernmost 1977 creek excavations provided the only reliable stratified levels containing prehistoric material. In the southern portion where the trenches were excavated, only Levels IV and IVA were composed of Late Woodland material and most of that was disturbed by prehistoric refuse pits and historic intrusions. The cultural
Figure 6. Plan View of Creek Bed Area Showing Features 69 and 70. (Note wooden paddle.)

Figure 7. Topographical View of Old Creek Bed.

material taken from that portion of the site was generally found in the prehistoric refuse pits, whereas very little cultural material was recovered from Level IVA surrounding the features.

The only reliable sequential information which could be gained came from the sealed, stratigraphic, undisturbed levels of the Old Creek Bed. Only very generalized statements could be put forth concerning the activity area in the trenches.

Over the four years of excavation 70 features were recorded: 29 prehistoric refuse pits, 26 prehistoric pits with modern and historic intrusions, 4 rock hearths, 2 historic ash pits, 2 prehistoric sheet middens, 1 historic sheet midden, a privy, a prehistoric dog burial, a wooden board, an historic dump, and an animal burrow (Figure 5). In addition, between 150 and 200 prehistoric post molds and one historic post mold were identified. Altogether, a total of 115.6 m² and 1,592 m³ of earth were excavated at the Draper Park site.

Before interpreting the function of the Draper Park site within its regional settlement system, it is important to realize a few of the problems encountered during the initial investigation and excavation of the site. Namely, these were: (a) Many known sites that existed along the Algoma Beach ridge have since been destroyed through the expansion of the City of Port Huron; (b) Gillman's mounds No. 1 and 2 may have been an extension of or related to the Draper Park site; (c) even if they were not associated with Draper Park, we know that only 47% of the overall site remained and only a small portion of that was actually excavated; and (d) many of the
upper levels of the Late Woodland component were found to be disturbed by succeeding occupants, both historic and modern.
CHAPTER III

THE GEOLOGICAL SEQUENCE AND LITHIC RESOURCES

The raw material used by the peoples of the Draper Park site, in the production of their lithic tools, consisted mainly of Kettle Point chert (83%). The primary source of this material is found in Lambton County, Ontario, at Kettle Point in the SW¼ of Bosanquet Township and Stoney Point. Another source may occur at an outcrop near Rock Glen on the Au Sable River, also in Bosanquet Township (Luedtke 1976:246-247; Figure 8). Janusas (1984:2) reported that Kettle Point chert is found irregularly in widespread submerged outcrops with a distribution extending from the tip of Cape Ipperwash approximately 1350 meters north into Lake Huron, ranging in widths from less than 50 meters to 100 meters. Although today these outcappings are located in shallow water (0-2 m), in the prehistoric past the elevations of the Great Lakes have varied significantly.

Kettle Point chert was difficult for the author to recognize because of the variety of colors represented. It necessitated several collection trips to Kettle Point. Two varieties can be procured. One variety is embedded in layers less than 8 cm thick and is generally medium to dark gray N5/ to N6/ (Munsell), with a fine texture, shiny luster and translucent on thin edges (Luedtke 1976). The other variety occurs as small nodules in gray shale and brownish gray limestone and "is homogeneous to streaked and mottled in structure, the color is gray to light gray or grayish purple N7/ to
Figure 8. Close-Up of Kettle Point Location.

7.5YR 8/2 to 10YR 5/2. Some material is brick red 10YR 5/4 and commonly weathers brown, 7YR 5/4" (Luedtke 1976:247). The texture varies from fine to medium; luster is medium to shiny and it is opaque to translucent. It has small fossil and crystalline inclusions.

A pinkish gray 5YR 6/2 also occurs when the surface is broken and exposed to the effects of weathering. It is generally referred to as mauve (Janusas 1984:26). Other properties noted by the author was a greenish gray coloration with some specimens exhibiting banding. The nodular variety was most prevalent at the Draper Park site with only a few tools fashioned from the dark gray imbedded variety. All the color variations were represented at the site.

Other chert types included glacial cobble (15%), Onondaga (.6%), Upper Mercer (.4%), Bayport (.9%), and quartzite (.1%).

The Kettle Point chert has been referred to as Ipperwash chert because of its proximity to the Ipperwash formation in the geological sequence (Luedtke 1976), and Port Franks chert because Jury during the early 1940s, investigated the Port Franks/Kettle Point area for samples and after discovering the outcropping he named it after the town (Janusas 1984; Jury 1949). Today, however, it is generally referred to as Kettle Point because of its geographic location at Kettle Point and its geologic emplacement at the interface of the Middle Devonian Hamilton group and the Upper Devonian Kettle Point sedimentation layers (Janusas 1984:7; Figure 9).

During the Devonian period which transpired approximately 405 to 345 million years B.P., Michigan and Ontario, at the southern
Figure 9. Geological Interfaces Between Hamilton and Kettle Point Formations.


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end of modern Lake Huron, were influenced by the same geological forces. However, because of subsequent uplifting, folding, and changes in marine levels, substantial erosion took place causing the sequence of stratified layers to differ.

Deposited during the Middle to Upper Devonian period, the Ipperwash limestone is the uppermost layer of the Hamilton group formation. Superimposed over the Ipperwash limestone lies the Kettle Point formation consisting of black and dark brown bituminous shale. The formation is 250 ft thick near southeastern central Michigan (headwaters of the St. Clair River) but thins southeastward to less than 100 ft at the Chatham sag before thickening to 1000 ft along the south shore of Lake Erie (Figure 10). The Kettle Point shale correlates with the Antrim shales in Michigan which are located in the eastern half of the northern lower and eastern half of the central lower peninsula, as well as in southeastern Michigan.

The Antrim shale of Michigan, the Ohio shale of Ohio, and the Kettle Point bituminous black shale containing various sizes of concretions are all part of the same formation. Small nodules of chert have been found in the Kettle Point outcroppings and also in the Ohio strata. Stothers (personal communication, October 1987) found a Kettle Point chert source at Pike Creek in northern Ohio at the western end of Lake Erie. The Michigan exposure is located in the northern lower peninsula where it is quarried in Alpena (Kesling, Segall, and Sorenson 1974). In southeastern Michigan the Antrim shale is covered by successive Mississippian shale which include the Coldwater shale and Marshall formation and later by surface
Figure 10. Cross Section Through Devonian Rocks of Southwestern Ontario Showing Placement and Outcropping of Kettle Point Chert.

glacial drift. Wells dug in Wayne County in the early 1900s located the base of the Antrim/Kettle Point shale at a depth of 381 ft (94 m) below surface (Sherzer 1913:55).

Although many of the same forces affected both Michigan and southwestern Ontario, regional variances occurred. Having been subjected to uplifting, erosion, and folding, an outcrop appearing in one area, for example, Kettle Point chert, may be deeply buried in an adjacent region.

So far the most recent geological forces influencing Michigan during the Pleistocene era have not been discussed. The recent past bore witness to the glaciers which advanced and retreated several times; carrying with them and dropping assorted debris, they shaped the current topography of Michigan. Correlating with glacial movements were the fluctuations in levels, depths, and shapes of the Great Lakes. As the glaciers receded, most of the lower peninsula became covered by glacial till with pockets of rich black loams where glacial lakes once stood and glacial waters flowed.

Procurement from chert outcroppings was by no means the only source of lithic material. With a vast abundance of glacial drift, prehistoric stone workers had an assortment of debris from which they could glean cobbles with the most desirable qualities. Luedtke (1976:84) cautioned that chert "directly exposed in the walls of cliffs and bluffs was usually not used" because heavy weathering produced large frost fractures. She added that:

Secondary sources were probably very important to prehistoric chert users in many parts of the midwest, for stream and lakeshore cobbles are generally more accessible and of
higher quality than the material from bedrock exposures. In glacial areas cobbles of chert in till were commonly used. (Luedtke 1976:84)

At the Draper Park site both Kettle Point chert and glacial cobbles were used. The Kettle Point material comprising about 80% of lithic material is far in excess of other raw materials utilized. Since Kettle Point chert is found commonly on sites in Ontario, Luedtke (1976:382) suggested that "the materials might have been brought to Michigan by peoples who normally lived in Ontario."

However, the proximity of the Draper Park site to the source (Figure 11) indicates that the Kettle Point chert was probably procured directly.

The Kettle Point collecting areas range between 48-64 km from Draper Park by land and 40 km by boat across the southern end of Lake Huron. Although the St. Clair River has undergone a few geographic alterations, the rapids have historically been fast flowing. Early historic accounts described regular canoe traffic taking place in the Sarnia Bay area around the southern end of Lake Huron. Apparently the rapids were negotiated even during fairly rough weather (Marek 1983:23). It is, therefore, not inconceivable that during fair weather procurement of lithics was done by boat, and it is noteworthy that a paddle was uncovered in a prehistoric context (Figure 6).

The Kettle Point chert often is found eroded out of the lamellar beds of black shale through the wave action of Lake Huron. Jury (1949:11) described a reef a mile north of the tip of Kettle Point which could be traced 30-50 ft into the water:
Figure 11. The Draper Park Site and Locations of Kettle Point and Bayport Outcroppings. (Modified from Janusas 1984:12.)
Portions of flint of various sizes, usually of a proportion to be carried by a man, and from which several artifacts might be manufactured, are continually broken away by erosion. By wading into the water only a few feet, material for thousands of tools and weapons might be easily procured in a short period.

Nodules of Kettle Point flint, seldom larger than 13 cm, were utilized at the Draper Park site; tools, cores, and discarded nodules fell well within a 7-13 cm size range. The exterior surface or patina, though varying in color, was usually found to be water worn. It may be that because of difficulty in transporting larger nodules, smaller ones were selected, or as this author experienced, nodules found while wading in waters just south of Kettle Point, a little closer to Draper Park, generally fell within the 7-13 cm range.

Another very important lithic resource obtained from the Kettle Point formation was the black shale. Most of the large scaling knives and several fish net sinkers were fashioned from black shale. Also numerous unidentifiable pieces of tools fashioned from shale were recovered from the site. Therefore, the combination of Kettle Point chert plus black shale suggests direct procurement from Kettle Point by the aboriginal population at Draper Park. By the terminal Woodland period, lithic assemblages in southeastern Michigan included greater amounts of Kettle Point chert (Figure 12).
Figure 12. Percentages of Kettle Point Chert on Woodland Sites in Michigan.

CHAPTER IV

THEORETICAL ORIENTATION

Problems inherent in the study of stone tool assemblages must first be understood before undertaking the analysis of lithic remains. For over 2,000,000 years or over 99% of Homo sapien's inhabitation on earth, stone tools have been the major technological product, thereby providing the largest record of human creativity on earth. These tools, in turn, have been classified and put into categories from the crudest choppers found in Paleolithic australopithecine camps right up through the sophisticated micro-lithic industries of the Upper Paleolithic and into recent times. Mere classification and categorization of stone tools, however, cannot illuminate a holistic view of past cultures; absent from the record are hunting techniques, ideologies, and socioecological considerations (Hayden and Kamminga 1979:3).

An increase in replicative experimentation during the last 25 years has become crucial to the understanding of lithic functions. Through their work as modern flint knappers both Francois Bordes and Donald Crabtree are credited as leaders in the scientific advancement of lithic studies. In 1964, a translation of Russian author Semenov's *Prehistoric Technology* spurred a greater interest in use-wear studies and functional analysis of stone tools. By the latter half of the 1970s scores of experimentation took place in controlled environments, exploring the nature and behavior of edge-wear (i.e., analyzing residues and examining polishes), as well as replicating
and utilizing artifacts. Studies in use-wear analysis have therefore enhanced the understanding of lithic behavior and site function.

Hayden and Kamminga (1979:2), in their introduction to the first

Conference on Lithic Use-Wear, stated:

No other discipline is involved in seeking relationships between technology and other cultural manifestations: we cannot turn to others for the answers we seek; answers to such questions as: what causes change in technology; how does technology affect other domains of culture; and on what basis do humans make decisions regarding technological and cultural change. It is in this context that use-wear studies must fit.

In 1977, Newcomer and Keeley were experimenting with replication and a "high-powered approach" which included the use of several kinds of binocular microscopes, ranging up to 400X magnification. At the same time, scanning electron microscopy for examining residual polishes was adopted. Because of the expense of the equipment and small sample sizes, their work triggered lively debates. One criticism levied against the high-powered approach was:

Far from being a cure-all or a functional panacea, . . . the high-powered approach has definite disadvantages. The most salient of these are the excessive amount of time expended and the possible lack of replicability from one raw material category to another (Odell and Odell-Vereecken 1980:89).

It is therefore prudent to suggest that the results of any single experiment of high-powered use-wear analysis using a specific lithic medium cannot be applied in another area where a variation in physical properties may result in a differing pattern of micro-wear. Thus tools fashioned from English chalk flint and tools fashioned from glacial cobbles, when subjected to identical tests, may reveal different edge-wear characteristics.
It has been found that with lower 20X to 40X magnification the action performed with a tool, cutting, scraping, sawing, drilling, and chopping can be determined (Tringham, Cooper, Odell, Voytek, and Whitman 1974). However, with the high-powered approach, distinctions between polishes in terms of brightness and dullness and its roughness or smoothness can be observed. Also, topographical features such as pits and undulations apparently prove highly useful in determining the source of the polish since it correlates with the material being worked. Keeley (1980:23) found that he could distinguish between tools worked with wood or bone by the different edge-wear polishes.

Therefore, before embarking on use-wear analysis both methods merit consideration. However, due to lack of equipment, expense, and time constraints, only a low power magnification was adopted for this research.
CHAPTER V

METHODOLOGY

This study delineates the variety of stone implements utilized by the aboriginal population of the Draper Park site. Tool form, attributes, and characteristics are described and discussed. Results of edge-wear analysis accomplished by employing a stereoscopic microscope with 20X to 40X magnification is described. However, because replication was not performed, no functional attributes will be directly ascribed to any given artifact.

The site was excavated over a period of four years from 1974 to the 1977 field season, during which time some 18,000 lithic items were recovered. A small selection of 600 specimens, comprising bifacial tools, unifaces, some cores, and a few utilized flakes, were stored in small boxes by unit and level. The remaining 17,000-plus items of debitage, flake tools, and cores were stored in 14 paper bags according to a crude ranking order by size. Most items were labeled with a site catalog number, and with the aid of a computer, they were sorted and enumerated by unit and level. Since site level sheets were unreliable, laboratory records, consisting of a card file listing artifacts by unit and level, became invaluable.

A workable model was devised in order to classify the assemblage. This was based on the predictable categories in which the waste material falls during the manufacture of a tool, in other

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words, basic steps are generally performed before creating a finished artifact. Starting with the raw material, decortication flakes are removed first then primary, secondary, and tertiary before an artifact is fashioned.

It is through the extraction of flakes, from a given rock, that clues can be gained concerning the aboriginal manufacturing process (Crabtree 1975:107). "Virtually all chipped stone artifacts in any assemblage can be identified according to the activity set which produced them; in this way, all of the activities represented by an assemblage can be inferred" (Collins 1975:15). Therefore, the classification of the lithic assemblage was broken down into workable units consisting of bifaces, unifaces, flake tools, utilized flakes with the debitage consisting of primary, secondary, and tertiary flakes and cores. Each category was then weighed according to their classifications as shown in Table 1.

The bifaces were based on attributes categorized by White, Binford, and Papworth (1963), Ozker (1976a), and White (1968); the analyses of the unifaces and utilized flakes were based on publications by Geier (1973), Hayden (1979a, b), Keeley (1980), Newcomer and Keeley (1979), and Wilmsen (1968). Descriptions of cores were borrowed from Binford (1963) and Crabtree (1972). Classifications are listed in Tables 2 and 3.

It is expected that through the analysis and description of the assemblage, further understanding of the site's seasonal occupation will be illuminated. Patterns will be sought within the context of the site to assess increased or decreased use of the site through
Table 1
Totals of Weight by Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Weight (g)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debitage</td>
<td>33,308</td>
<td>82.5</td>
</tr>
<tr>
<td>Cores</td>
<td>5,150</td>
<td>12.8</td>
</tr>
<tr>
<td>Scrapers</td>
<td>84</td>
<td>.2</td>
</tr>
<tr>
<td>Bifaces</td>
<td>525</td>
<td>1.3</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>127</td>
<td>.3</td>
</tr>
<tr>
<td>Hand Tools</td>
<td>1,173</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>40,367</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

time. Concentration of tools and debitage will be examined, which in turn, will illustrate areas of tool use, manufacture, and discard.
<table>
<thead>
<tr>
<th>Cores</th>
<th>Flake removal</th>
<th>Flakes</th>
<th>Utilized flakes</th>
<th>Flake wear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nucleus</td>
<td>Parallel</td>
<td>Decortication</td>
<td>Lamellar</td>
<td>Right lateral</td>
</tr>
<tr>
<td>Amorphous</td>
<td>Bidirectional</td>
<td>Primary</td>
<td>Ovate</td>
<td>Left lateral</td>
</tr>
<tr>
<td>Tabular</td>
<td>Multidirectional</td>
<td>Secondary</td>
<td>Expanding</td>
<td>Both laterals</td>
</tr>
<tr>
<td>Bipolar (Polyhedral)</td>
<td>Alternate flaking</td>
<td>Tertiary</td>
<td>Blocky</td>
<td>Distal</td>
</tr>
<tr>
<td>Hemispherical</td>
<td>Unidirectional</td>
<td>Unidentified</td>
<td>Bladelets</td>
<td>Multifaceted</td>
</tr>
<tr>
<td>Cylindrical</td>
<td>Inner directed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split</td>
<td>Outer directed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discoidal</td>
<td>Bipolar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cobble</td>
<td>Shatter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levallois-like</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biconical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pebble</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3

Bifacial and Unifacial Tools

<table>
<thead>
<tr>
<th>Unifacial flake tools</th>
<th>Scrapers</th>
<th>Drills</th>
<th>Projectile points and knives</th>
<th>Miscellaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>End</td>
<td>T-shaped base</td>
<td>Corner-notched</td>
<td>Large knives</td>
</tr>
<tr>
<td>Perforator</td>
<td>Semicircular</td>
<td>Y-shaped base</td>
<td>Side-notched</td>
<td>Gorget</td>
</tr>
<tr>
<td>Graver</td>
<td>Thumbnail</td>
<td>Expanding base</td>
<td>Diminutive</td>
<td>Hammer stones</td>
</tr>
<tr>
<td>Burin</td>
<td>Ovate</td>
<td>Form:</td>
<td>Triangular</td>
<td>Ground stone tools</td>
</tr>
<tr>
<td>Spokeshave</td>
<td>Lamellar</td>
<td>Reworked point</td>
<td>Ovate</td>
<td>Abrader</td>
</tr>
<tr>
<td></td>
<td>Side</td>
<td>Hafted</td>
<td>Levanna</td>
<td>Fish net sinkers</td>
</tr>
<tr>
<td></td>
<td>Mini</td>
<td>Elongated</td>
<td>Madison</td>
<td>Choppers</td>
</tr>
<tr>
<td></td>
<td>Square</td>
<td>Microgouge</td>
<td>Stemmed</td>
<td>Wedges</td>
</tr>
<tr>
<td></td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>Grinders</td>
</tr>
</tbody>
</table>
CHAPTER VI

CLASSIFICATION AND DESCRIPTION

Cores (n = 361)

The term "core" refers to "any block of raw material prepared so that flakes could be removed in a systematic manner for later use as blanks for artifacts" (Binford and Papworth 1963:83). Since the diagnosis of flaking techniques can be derived from the core, it becomes a very important aspect in the analysis of an assemblage.

Due to the extensive amount of debitage recovered from Draper Park, it was obvious that stone tool manufacture was a major activity on the site. Some cores were found abandoned after the manufacturer encountered multiple impurities. The cores were analyzed by shape, type of flake removal, and material source (Table 4).

Wasted Cores (n = 66)

The wasted or "exhausted" core was the largest class of cores. With further reduction being impossible, they were the smallest in size and weight (Table 5). Since a large number of these cores were small and angular with irregular cleavage planes, they may have been the result of shatter. Many lacked bulbs of percussion or prepared platforms but showed percussion rings. Twenty wasted cores exhibited bidirectional scarring, but were not considered a tabular core by virtue of their size. The heaviest concentration of
Table 4
Core Form Frequency and Source

<table>
<thead>
<tr>
<th>Form</th>
<th>Frequency</th>
<th>Source</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Kettle Point</td>
<td>Glacial</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Wasted Core</td>
<td>66</td>
<td>61</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Amorphous</td>
<td>58</td>
<td>50</td>
<td>8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Tabular</td>
<td>43</td>
<td>32</td>
<td>11</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bipolar</td>
<td>39</td>
<td>34</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Hemispherical</td>
<td>37</td>
<td>20</td>
<td>17</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cylindrical</td>
<td>35</td>
<td>29</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Split Core</td>
<td>29</td>
<td>19</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Discoidal</td>
<td>21</td>
<td>17</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cobble</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Levallois-like</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Ovate</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Biconical</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>353 (100%)</strong></td>
<td><strong>279 (79%)</strong></td>
<td><strong>70 (20%)</strong></td>
<td><strong>4 (1%)</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 5
Average Lengths, Widths, and Weights

<table>
<thead>
<tr>
<th>Form</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasted Core</td>
<td>2.38</td>
<td>2.03</td>
<td>5.11</td>
</tr>
<tr>
<td>Amorphous</td>
<td>2.55</td>
<td>2.76</td>
<td>18.51</td>
</tr>
<tr>
<td>Tabular</td>
<td>3.70</td>
<td>2.61</td>
<td>13.02</td>
</tr>
<tr>
<td>Bipolar</td>
<td>3.58</td>
<td>2.22</td>
<td>11.46</td>
</tr>
<tr>
<td>Hemispherical</td>
<td>3.68</td>
<td>3.05</td>
<td>22.80</td>
</tr>
<tr>
<td>Cylindrical</td>
<td>3.12</td>
<td>2.90</td>
<td>18.35</td>
</tr>
<tr>
<td>Split Core</td>
<td>3.51</td>
<td>3.15</td>
<td>19.49</td>
</tr>
<tr>
<td>Discoidal</td>
<td>2.04</td>
<td>3.43</td>
<td>16.00</td>
</tr>
<tr>
<td>Cobble</td>
<td>3.55</td>
<td>2.88</td>
<td>26.77</td>
</tr>
<tr>
<td>Levallois-like</td>
<td>2.18</td>
<td>4.74</td>
<td>43.18</td>
</tr>
<tr>
<td>Ovate</td>
<td>4.10</td>
<td>2.87</td>
<td>14.66</td>
</tr>
<tr>
<td>Biconical</td>
<td>3.46</td>
<td>3.27</td>
<td>14.46</td>
</tr>
</tbody>
</table>

Note: Total weight of all core forms is 5150.20 g.
wasted cores was found in the lower portion of the site associated with features. Ten were recovered from units 30S 40E through 35S 40E in and around Features 18 and 30.

**Amorphous Core (n = 58)**

The amorphous core, not having a classifiable shape, became a "catch all" for irregularly shaped cores. Forty cores showed multidirectional scarring with small flat flake removal from prepared platforms and large flake removal by direct percussion with distinct well-developed bulbs of percussion. Two cores appear to have been utilized as wedges exhibiting multiple hinged fractures opposite the surface of direct impact. Seventeen amorphous cores had crystalline inclusions which was the highest incidence observed in the assemblage and may have contributed to the irregularity in their shapes. Ten of the cores had bidirectional flake removal, and six appeared to show fracturing by the bipolar technique but were not considered true bipolar cores. The distribution of these cores were fairly even throughout the site, however, 13 were located in levels 16-18 in the Old Creek Bed at the northern edge of the site.

**Tabular Cores (n = 43)**

Tabular cores were categorized as such by their angular appearance and straight planes of cleavage (Figure 13:a). Although larger than the wasted cores, these cores were fairly small. Since eight tabular cores had remnants of cortex remaining, it was apparent that the raw material was small sized. Small nodules of fine-grained
Figure 13. Core Forms.
Kettle Point chert had been selected for this process. The knapping indicated that lamellar flakes had been detached by direct percussion or possibly block-on-block technique, as illustrated by Crabtree (1972:48), for the detachment of blades. Two cores had hertzian cones attached, as evidence of the direct percussion technique. "When force is applied vertically to a flat surface, the force will spread causing a cone to form" (Crabtree 1972:54).

Bipolar scarring was also present on thirteen of the cores. A definite pattern of distribution was noted: 14 were found associated with Features 5, 12, and 15 (Figure 14) in units 55S 25E and 60S 25E through 60S 30E. A total of 26 cores was recovered in the southernmost quadrant of the main activity area between 50S through 60S and 55E (Figure 15).

**Bipolar Cores (n = 39)**

Bipolars had a tendency to be long and pointed at one end, with evidence of battering and nibbling at both ends. The cone of force was generally observed at the wider end from which flakes were struck (Figure 13:b). The battering at the distal end suggested that the core had rested on an anvil to help control the flaking process. Several cores were observed to have multiple step or hinge fracturing at the proximal end possibly from attempts at further reduction. Not all flake scars ran the full length of the core; some terminated in a hinge fracture part way down, others were abandoned because of imperfections in the material.
Figure 14. Features in Trenches A, B, and D.

Figure 15. Map of Entire Site Delineating Site's Limits and Excavation Units.
Fourteen bipolar cores were recovered from the Old Creek Bed associated with levels 15 through 23. Fifteen were associated with features throughout the site.

**Hemispherical Cores** (n = 37)

Almost 50% of this category was comprised of glacial cobbles. All cores still bore cortex on the outer circumference with only the inner surface displaying, at the point of cleavage, any form of modification. Although the cortical back was generally left unaltered, both proximal and distal ends had decortication flakes removed to serve as a better working platform (Figure 13:c). The material worked tended to be granular and heavy, similar to, but not, Bayport chert. McPherron (1967:138) noted that a number of hemispherical cores were recovered at the Juntunen site.

Eight were retrieved from 10S 40E; 18 were located in the Old Creek Bed, in levels ranging from 9-19. In units between 30S-40S and 35E-45E a cluster was associated with Features 35, 25, and 47 (Figure 14).

**Cylindrical Cores** (n = 35)

Since these cores were wider than the bipolar, they were dealt with separately (Figure 13:d). Only five had flakes removed by bipolar technique; the majority had bidirectional scarring and two bore multidirectional scars. Remnants of the cortex were observed on seven of the specimens while six exhibited crystalline inclusions. Most were fashioned from medium- to fine-grained Kettle Point chert;
one was made of quartzite, another of chalcedony, and two were of coarse-grained glacial cobbles. Excessive hinged fracturing and blunting along one edge of a very small core indicated use as a tool rather than platform preparation for further reduction. Another core appeared to have been utilized as a perforator. The apparent application of too much force resulted in a concave lip fracture producing a sharp point which later may have been modified for use as a perforator.

Split Cores (n = 29)

Unlike the hemispherical cores, the cortex of split cores was removed leaving the inner plane unmodified (Figure 13:e). The ventral plane showed only slight modification along the outer edges which allowed for some removal of the cortex. The diagnostic feature was the presence of parts of a genuine cone of percussion toward the proximal end on the cleavage plane. Five complete hertzian cones of force were found in this category. McPherron (1967: 138) believed that these were "unplanned results of a poorly controlled flaking procedure and were not a sought after product."

Lending support to his interpretation, most of the Draper Park cores were of medium to large grained material which may have limited the manufacturer's control over the raw material. Two were of quartzite, while 12 were from large-grained glacial cobbles. Seventeen still retained a third or more of their outer cortex.
Eight were recovered from the Old Creek Bed ranging from levels 9 through 19. Between 50S-60S and 50E, 13 were found while the remaining 8 appeared to be randomly distributed.

**Discoidal Cores (n = 21)**

With a biconvex cross section and a width greater than their length, both faces of the discoidal cores displayed scars created by the removal of multi-inner-directed flaking taken from the perimeter (Figure 13:f). Some exhibited ground prepared platforms; however, most showed evidence of direct freehand percussion. Two appeared to have been utilized as wedges. The raw material, mostly Kettle Point, consisted of medium to fine grained chert.

Nine cores came from between levels 14 to 23 of the Old Creek Bed, whereas 12 were recovered from the lower third of the habitation area.

**Cobble Cores (n = 10)**

Cobble cores exhibited the least amount of reduction flaking. Two were abandoned because of excessive impurities in the raw materials, and six retained one-third or more of their cortex. They were only similar in size and weight; otherwise the chert ranged from fine grained to heavy granular. Two were associated with Feature 5 in unit 55S 25E and the rest were randomly distributed.
Levallois-like Cores (n = 6)

The Levallois-like cores were some of the largest and heaviest. Like the discoidals, their widths were greater than their lengths (Figure 13:g). Unlike the discoidal, they were plano-convex in shape and slightly more irregular with no particular order in the removal of flakes. Further reduction could have taken place but for some reason they were abandoned. As with the cobble cores, selection of a particular quality of raw material was not observed. No particular dispersal pattern was apparent.

Ovate Cores (n = 5)

Ovate cores were included in with the cores because of their thickness and weight. Biconvex in cross section and bearing some primary flaking on both surfaces, they resembled unfinished bifaces (Figure 13:h). However, considered too "crude" to include with the bifaces, they are classified with the cores. All were located in the lower habitation area; none were found in the Old Creek Bed.

Biconical Cores (n = 4)

The biconical cores were classified solely by their shape. It appeared that flakes were removed from both ends thus creating a diamond shape (Figure 13:i). Two were fashioned of Kettle Point and two of glacial cobble.

Of the 353 cores, 27 appear to have been subjected to some kind of heat alteration. Further investigation was necessary to
find out whether they had been intentionally heat treated or whether
the alteration occurred after they were abandoned.

Heat Treatment and the Dispersal of
Heat-Altered Flakes and Cores

Heat treatment on raw material collected from Kettle Point was
carried out in order to observe changes in color, texture, and luster.
A crude backyard testing was performed without monitoring temperature.

One experiment was done in a closed Weber grill, exposing the
raw material directly to high heat for half an hour. The other test
subjected the chert to a long, even heat by burying the material
approximately 15-30 cm in the sand and building a lively wood fire
over the top. The latter remained in the sand under the hot coals
for the duration of one night, and by morning the coals still remained
hot. This experiment was conducted based on Rick's (1978:32) experi­
mentation conducted on Illinois chert, subjecting the chert to a hot
even heat for several hours and allowing it to cool slowly. The raw
material in the first test shattered, leaving a pimpled surface on
the cleavage plane and the color was noticeably duller. The chert
in the buried sample when removed from the warm sand had a complete
change in color and texture. The once lustrous greenish gray, fine­
grained chert had dulled to a light-bluish chalky appearance with
white speckled inclusions. The specimens closer to the fire were
more brittle and crazed, and although the nodules buried a little
deeper were less fractured and less brittle, both had undergone the
radical change in color and bore a lustrous waxy interior.
All obvious heat-altered flakes were noted during the initial sorting of the assemblage. After examining the heat-altered flakes and cores they were found to be clustered significantly around fire pits suggesting intentional heat treatment. However, upon completing the analysis of the entire assemblage it was found that the majority of the debitage and tools clustered around the hearths, thus the heat-altered cores and flakes became covariant with the distribution (Figure 16). In all probability heat alteration occurred accidentally and was not a sought after quality. In support of this, most of the tools on the site were either biconvex or plano-convex in cross section with obvious secondary flaking; few tools were finely tooled, lustrous with a lenticular cross section generally attributed to heat treatment (Rick 1978:34).

Debitage

The waste flakes created from the reduction of a core may be classified as follows: (a) decortication flaking, (b) primary flaking, (c) secondary, (d) tertiary, and (e) miscellaneous fragments. These can be subdivided still further; however, for the purposes of this report and given the relatively small size of the raw material, the fivefold classification was deemed appropriate.

Decortication Flakes

Decortication flakes were flakes with the dorsal surface partially or wholly covered by the cortex (Binford and Quimby 1963:287). Usually the cortex was the undesirable part of the raw material.
Figure 16. Draper Park Distribution of Heat-Altered Flakes and Cores With Debitage.

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because often it occurred in the form of a brittle rind which had been mineralized and was full of impurities.

The Kettle Point chert, on occasion, had a rough, bright orange rind which was removed by decortical flaking; however, most Kettle Point nodules retained a smooth cortical surface not too dissimilar from the interior chert. Because the majority of the raw material demonstrated little change in the exterior mineralization, cortical flakes appeared to be treated in the same manner as non-cortical flakes. In fact, one projectile point was found to have an entire surface sporting a cortical cover, with minor trimming flakes removed from its edges. McPherron (1967:135) found a similar situation at the Juntunen site:

Decortication flakes on the Juntunen site are generally as thin and well formed as any others and further, need not be treated as a separate class both because cortex is present on many artifacts and because it does not appear to have been regarded . . . as an inferior surface that must be removed.

In the context of the Draper Park site, decortication flakes were categorized as having the entire dorsal surface covered by the cortex with the ventral surface showing scars from direct percussion. The decortication flakes comprised 1,316 pieces or 10% of the total flake count.

Primary Flakes

Primary flakes were designated as such since some cortex was present on the dorsal exterior. High impact percussion scars with evidence of rippling became a diagnostic characteristic on the
ventral surface. (Some shatter may have unwittingly been included in this category.) Although these flakes were treated separately, they may well have been included with the decortication flakes, since both served a similar function, which was the initial shaping of the core. Both were often utilized as a separate entity, being fashioned into a tool or becoming a utilized flake. Two thousand, one hundred and ninety-five flakes were designated as primary and comprised 14% of the total.

Secondary Flakes

Secondary flaking procedures generally were involved with the modification of a preform into a nearly complete, or complete tool (Geier 1973:11). Although the cortex had been removed from most of the flakes, some still retained remnants of it. These flakes were identified by having one or more flake scars on their dorsal site. Many showed evidence of prepared platforms or were bladelets removed through bipolar technique, retaining one or more keels on the dorsal surface. Secondary flakes was the largest category on the site, numbering 8,451 or 55% of the total.

Tertiary Flakes

The tertiary flakes were produced during the final stages of tool manufacture and modification. More often than not, they were removed from the marginal areas of a tool, removing secondary and/or primary scar ridges at the point where they intersected along the lateral edges of a given tool (Geier 1973:11). Being very small in
size, many may have been lost through the quarter-inch screen. They represented 8% of the total of 1,262 flakes, which was the smallestdebitage category in the assemblage.

**Miscellaneous**

This was the last category and included a "catch all" of unclassifiable chips, shatter, and small unidentifiable partial flakes. There were 1,989 in all which made up 13% of the total (Table 6).

**Table 6**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decortication</td>
<td>1,316</td>
<td>10</td>
</tr>
<tr>
<td>Primary</td>
<td>2,195</td>
<td>14</td>
</tr>
<tr>
<td>Secondary</td>
<td>8,451</td>
<td>55</td>
</tr>
<tr>
<td>Tertiary</td>
<td>1,262</td>
<td>8</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1,989</td>
<td>13</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>15,213</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Utilized Flakes**

During the analysis, it was found that a large number of flakes had been modified for use or bore extensive use-wear along their lateral and distal edges. A small 10X hand lens was used in the
initial sorting to aid in determining actual edge-wear from "pseudo-wear." Obvious random edge damage with recent nibbling such as half-moon or crescent-shaped wear was not included (Keeley 1980). Other types of damage consisting of bag wear and trampling may have been incorporated in the initial sorting. Flakes numbering 2,015 were put aside for further edge-wear analysis. Due to time constraints the entire selection was not reanalyzed at a higher magnification.

It was at first decided to analyze a 15% sample, eliminating areas of excessive modern and historic intrusion. Two-thirds of the sample was drawn from the Old Creek Bed units (where sealed levels had excluded subsequent disturbances), south as far as 45S 45E which encompassed two fire hearths. The remaining third was drawn from the lowest activity zone, allowing for the mix of historic and modern intrusions to be included. The two-thirds/one-third sampling method had pros and cons. Since the presence of utilized flakes were more likely to be in the southern units where the greatest activity occurred, a larger sample from that area might have been preferable. However, in favor of the adopted sampling procedure, possible non-utilitarian edge-wear consequently would stand out, especially if numerous flakes were to be found in historic and modern contexts. Thus, the latter strategy was adopted and proved to be very successful. Figure 17 shows the distribution of all utilized flakes and the 15% sample.

The edge-wear observed on flakes were analyzed according to: (a) flake styles, (b) raw material, (c) position of wear in relation to the proximal point of percussion, and (d) type of wear observed.
Figure 17. Distribution of All Utilized Flakes and Flake Sample.
through 20X-40X stereoscopic microscope. Lengths and widths were measured with vernier calipers and recorded to the second decimal place. Lengths were measured along the general axis of the flake from the proximal to the distal end, and the widths were taken from the maximum portion of the bilateral extension. Weights were also recorded to the second decimal place using a triple-beam balance.

All information was recorded on computer data sheets and tabulated. On request, specific information was computed and cross correlated, that is, the computer revealed specific edge-wear tabulation by unit and level. Style of flake, be it lamellar, expanding, blocky, blade, etc., yielded information on specific types of edge-wear. Percentages of edge-wear by style of flake proved important for studying manufacture and use (e.g., were specific flake styles being used for a special purpose?).

Nomenclature used for flake termination was borrowed from the "Ho Ho Classification and Nomenclature Committee Report" (Hayden 1979a:133-135). The committee, consisting of Brian Cotterell, Brian Hayden, Johan Kamminga, Maxine Kleindienst, Ruthann Knudson, and Robert Lawrence, convened at the Ho Ho Restaurant in Vancouver and "was formed to constitute a provisional use-fracture classification that would be suitable for use-wear studies" (Hayden 1979a:133). Flake terminations were described as feathered, hinged, and stepped (Figure 18). Incorporating the above flake termination categories, the edge-wear was further analyzed into specific edge-damage characteristics based on Keeley's (1980:24) terminology.
Figure 18. Ho Ho Classification of Flake Terminations. (Taken from Hayden 1979:134).

Figure 19. Types of Edge-Wear Enlarged on Individual Specimens With Greater Magnification Illustrated to One Side.
Edge damage was observed at 20X-40X magnification. The terms used were codified as follows:

1. Continuous miniature stepped (STPD) had minute hinged flake scars resembling a nibbled edge (Figure 19:a).

2. Scalar (SCLR) were miniature continuous feathered scars resembling fish scales which also produced nibbling (Figure 19:b).

3. Complex multiple ovate (CMVT) had clustered scars with feathered terminations (Figure 19:c).

4. Continuous ovate (CNVT) were continuous rounded, feather-hinged scars larger than scalar (Figure 19:d).

5. Complex multiple-hinged (CMHN), associated with crushing, encompassed nested clusters of hinged scars along the working edge (Figure 19:e).

6. Steep multiple ovate (SMVT) occurred when the leading edge of the dorsal surface was pushed back, causing steep rounded scars with feathered terminations (Figure 19:f).

Other observations noted were scars occurring at the junction of the ventral and dorsal edges in the form of striations (STRT) or grinding (GRND) where heavy abrasive action had occurred and a polish (POLL) was noted where a finer grinding process was observed. Several utilized flakes had a sharp point (SHRP) at the terminous of the disto-lateral edge which evidently served as some type of perforator.

In the initial count of utilized flakes, 5% were decortication, 23% primary, and 67% were secondary with flake fragments representing 4%. However, of the 15% sample, 11% were decortication, 40% primary,
and 49% secondary with no flake fragments included. Unfortunately, the sample did not contain a greater representation of secondary flakes. Several styles of flakes were represented in the sample which were classified as: lamellar, expanding, bladelets, ovates, and blocky (Figure 20). Terminology was borrowed from White (1963: 5-70). The sample yielded 44% lamellar flakes, 25% expanding, 17% bladelets, 10% ovates, and 4% blocky (Table 7; Figure 21).

Table 7
Styles of Flakes Bearing Edge-Wear

<table>
<thead>
<tr>
<th></th>
<th>Lamellar</th>
<th>Expand</th>
<th>Bladelet</th>
<th>Ovate</th>
<th>Blocky</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decortication</td>
<td>15</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>Primary</td>
<td>50</td>
<td>37</td>
<td>17</td>
<td>9</td>
<td>8</td>
<td>121</td>
</tr>
<tr>
<td>Secondary</td>
<td>69</td>
<td>30</td>
<td>31</td>
<td>16</td>
<td>0</td>
<td>148</td>
</tr>
<tr>
<td>Totals</td>
<td>134</td>
<td>74</td>
<td>50</td>
<td>30</td>
<td>13</td>
<td>304</td>
</tr>
<tr>
<td></td>
<td>44.4%</td>
<td>24.5%</td>
<td>16.6%</td>
<td>9.9%</td>
<td>4.3%</td>
<td></td>
</tr>
</tbody>
</table>

Flake attributes were examined in order to discover whether, morphologically, they had been selected for a specific function or whether they had been chosen at random when the occasion commanded. Most of the flakes, regardless of shape, showed the highest percentage of steep multiple-ovate scarring along their distal edges. The utilized edge on 68% of the flakes showed grinding where the edge
Figure 20. Flake Styles.

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Figure 21. Percentages of Flake Styles Represented in 15% Sample.
scars were worn by an abrasive; 18% had polished edges; 7% were nibbled, and 5% were notched with 1% being denticular. Some retouch may have taken place; however, scarring probably occurred from use. Most of the distally worked flakes bore an obtuse angle ranging between 65°-80° as measured on a polar grid (Wilmsen 1968: 982-987). Of these, the lamellar, bladelet, and ovate flakes generally encompassed a convex edge. The expanding and blocky flakes usually were found to be straight to concave.

Complex multiple-hinged scarring was observed specifically on the distal edges of both the ovate and blocky flakes indicating a possible crushing use, such as a wedge or chisel (Figure 22).

Although the lamellar flakes presented no specific edge-wear, it was interesting to note that both left and right lateral margins demonstrated similar patterns of scarring (Figure 23).

The expanding flakes appear to have been utilized purely at random, having no specific wear pattern bilaterally (Figure 24).

Through the analysis of bladelet-wear it was observed that over 50% of the lateral edges of the bladelets consisted of scalar scars thereby providing evidence that they had been utilized for a very specific function (Figures 25 and 26). Functional influences will be discussed in greater detail later.

Most bladelet edges were straight or slightly convex bearing an acute angle of 20°-30° where scalar scars were present. Of these, 52% showed nibbling along the marginal edge between the dorsal and ventral surfaces and 43% were lightly polished. The steep multiple scarring along the lateral edges was less obtuse than the scarring
Figure 22. Distal Edge-Wear on Ovate, Expanding, and Blocky Flakes.
Figure 23. Left and Right Lateral Edge-Wear on Lamellar Flakes.
Figure 24. Left and Right Lateral Edge-Wear on Expanding Flakes.
Figure 25. Left and Right Lateral Edge-Wear on Bladelets.
Figure 26. Distal Edge-Wear on Lamellar Flakes and Bladelets.
observed on the distal edges. The lateral scarring ranged between 40°-60° degrees and had a ground edge. The rest of the lateral edges exhibited a variety of wear.

An areal distribution of bladelets by unit indicated major employment in the southern portion of the site where 40% were located around fire hearths F4 and F23; 32% were retrieved from southern refuse pits and middens; whereas only 28% were recovered from the creek bed area surrounding hearth F70. The remaining flake styles showed no specific pattern of distribution other than a general clustering around the four fire hearths.

The continuous ovate edge-wear noted on 68 flakes in various proportions apparently were recovered from a disturbed context which included 30 flakes from levels mixed with historic and modern debris, 11 from refuse pits, 6 found in features consisting of modern intrusions, and 11 taken from a prehistoric context had been damaged previously on one or more sides (e.g., partially broken, chipped, etc.), leaving only 10 retrieved from the prehistoric levels of the Old Creek Bed. Keeley (1980:34) noted a "run" of similar ovate feathered scars along the distal edge of a flake he had left in loamy soil in a high pedestrian traffic area. It was, therefore, safe to conclude that continuous ovate edge-wear may have been caused by subsequent activities other than from tool use. How or when it occurred is unknown; however, it is surmised that the cause of the scarring was from pedestrian traffic and not a product of bag wear. Table 8 illustrates edge-wear categories by area.
Table 8
Distribution of Flake Edge-Wear by Area

<table>
<thead>
<tr>
<th>Area</th>
<th>STPD N</th>
<th>STPD %</th>
<th>SCLR N</th>
<th>SCLR %</th>
<th>SMVT N</th>
<th>SMVT %</th>
<th>CMHN N</th>
<th>CMHN %</th>
<th>CNVT N</th>
<th>CNVT %</th>
<th>CMVT N</th>
<th>CMVT %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OLD CREEK AREA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Mixed Levels 4-13</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>14</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Prehistoric Sealed Levels 14-23E</td>
<td>11</td>
<td>16</td>
<td>25</td>
<td>32</td>
<td>20</td>
<td>26</td>
<td>1</td>
<td>5</td>
<td>16</td>
<td>24</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>15S 70E Near Old Creek w/Modern Mix</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>SOUTHERN AREA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modern-Historic Prehistoric Mix Levels 1-2</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>14</td>
<td>18</td>
<td>4</td>
<td>19</td>
<td>5</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Historic Prehistoric Mix Level 3</td>
<td>13</td>
<td>19</td>
<td>12</td>
<td>15</td>
<td>11</td>
<td>14</td>
<td>5</td>
<td>23</td>
<td>16</td>
<td>24</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Prehistoric Level 4</td>
<td>10</td>
<td>15</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>10</td>
<td>4</td>
<td>19</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>13</td>
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</tbody>
</table>
Table 8—Continued

<table>
<thead>
<tr>
<th></th>
<th>STPD</th>
<th>SCLR</th>
<th>SMVT</th>
<th>CMHN</th>
<th>CNVT</th>
<th>CMVT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
</tbody>
</table>
| SOUTHERN FEATURES
| Refuse Pits    | 16   | 23   | 21   | 26   | 15   | 19   |
| Midden        | 3    | 4    | 1    | 1    | 6    | 8    |
| Modern and/or Historic Intrusion | 7   | 10   | 2    | 3    | 0    | 0    |
| Prehistoric Hearths | 1   | 2    | 2    | 3    | 0    | 0    |
| TOTALS        | 69   | 100  | 79   | 100  | 78   | 100  |

Note. STPD = Stepped; SCLR = Scalar; SMVT = Steep multiple ovate; CMHN = Complex multiple-hinged; CNVT = Continuous ovate; CMVT = Complex multiple ovate.
Small Flake Tools

Small flake tools included 39 items which comprised 12% of the tool assemblage.

**Perforators (n = 19)**

Perforators were generally fashioned from small lamellar flakes. Both the disto-lateral or proximo-lateral margins were modified into a sharp point (Figure 27:a). Seventeen showed obvious polish and wear. They were designated as perforators because of their morphology and fragility.

**Gravers (n = 11)**

Gravers were less pointed and more chisel-like at the juncture of the disto-lateral edges (Figure 27:b). Seven were fashioned from expanding flakes, three from lamellar, and one from an ovate flake. The bits were generally blunted and worn with marginal feathered scarring.

**Burins (n = 7)**

Burins were all fashioned from lamellar flakes. Most were modified at the disto-lateral junction having had flakes removed purposefully from both the lateral and distal edges leaving a "spur," which revealed polish and wearing (Figure 27:c).
Figure 27. Small Flake Tools.
Spokeshaves (n = 2)

Spokeshaves showed beveled retouch and multiple scarring (Figure 27:d). One had been fashioned out of a primary flake and the other from a secondary.

Unifacial Artifacts

Scrapers (n = 33)

Fashioned from flake blanks, scrapers are generally unifacially worked with steep marginal retouch along the working edge (White 1963). Occasionally the ventral surface exhibited flat internal retouch concentrated on the bulbar area where the bulb of percussion was too prominent (Figure 28:i).

Scrapers comprised 10% of the tool assemblage. There were 21 distal end scrapers, 5 proximal, 7 right lateral, and 2 left lateral with 6 composites encompassing two or more of the above mentioned.

End Scrapers (n = 26)

End scrapers were the most numerous with both the proximal and distal ends modified, some bearing straight edges while others were convex (Table 9).

Semicircular End Scrapers. Semicircular end scrapers (n = 6) were usually wider than their length and were relatively thin with the majority having been utilized along their entire width (Figure 28:a).
Figure 28. Styles of Scrapers (Actual Size).
Table 9

Average Metric Attributes of End Scrapers

<table>
<thead>
<tr>
<th>Style</th>
<th>N</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
<th>Thickness (cm)</th>
<th>Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide Semicircular</td>
<td>6</td>
<td>2.08</td>
<td>2.62</td>
<td>.60</td>
<td>60°</td>
</tr>
<tr>
<td>Small Thumbnail</td>
<td>6</td>
<td>2.03</td>
<td>1.75</td>
<td>.63</td>
<td>61°</td>
</tr>
<tr>
<td>Ovate Convex</td>
<td>5</td>
<td>2.62</td>
<td>2.36</td>
<td>.47</td>
<td>65°</td>
</tr>
<tr>
<td>Small Lamellar Convex</td>
<td>4</td>
<td>2.63</td>
<td>1.55</td>
<td>.55</td>
<td>58°</td>
</tr>
<tr>
<td>Large Lamellar Convex</td>
<td>2</td>
<td>3.36</td>
<td>2.70</td>
<td>.85</td>
<td>73°</td>
</tr>
<tr>
<td>Small Lamellar Straight</td>
<td>2</td>
<td>1.66</td>
<td>1.46</td>
<td>.58</td>
<td>58°</td>
</tr>
<tr>
<td>Large Lamellar Straight</td>
<td>1</td>
<td>3.93</td>
<td>2.35</td>
<td>.74</td>
<td>61°</td>
</tr>
</tbody>
</table>

**Thumbnail End Scrapers.** Thumbnail end scrapers (n = 6) were separated from other convex-edged flakes because of their distinct shape (Figure 28:b). They were short, thick, and almost "thumbnail" shaped (McPherron 1967:162). The prominent distal hinge was retouched with semisteep lamellar beveling, while the ventral surface exhibited wearing.

**Ovate Convex End Scrapers.** The ovate convex end scrapers (n = 5) generally bore a wider working edge with a more obtuse angle (Figure 28:d).

**Small Lamellar Convex End Scrapers.** The small lamellar convex end scrapers (n = 4) were modified keeled secondary flakes with
beveling, bearing a fine polish along the margin of the ventral surface (Figure 28:c).

**Large Lamellar Convex End Scrapers.** The large lamellar convex scrapers (n = 2) bore steeper beveled edges while the margin demonstrated nibbling with some wear on the ventral edge (Figure 28:c).

**Straight-Edged Lamellar End Scrapers.** The straight-edged lamellar end scrapers (n = 3) were less beveled with a smaller angle than the convex flakes (Figure 28:e). The only differences between the two straight-edged categories were their size and thickness.

**Side Scrapers (n = 9)**

Side scrapers were retouched along their lateral edges. The straight-edged side scrapers (n = 3) had fairly acute marginal retouch of 47°, 49°, and 54° (Figure 28:f). The convex side scrapers (n = 6) had multiple ovate retouch with four averaging a 73° angle while two averaged 46° (Figure 28:g).

One multifunctional square biface (Figure 28:h) was included with the scrapers. Two edges were straight, one convex, while the fourth appeared to be worn, suggesting it may have been backed. Each edge bore a differing pattern of retouch and wear and a variance in angles.

**Mini Scrapers (n = 6)**

Mini scrapers refers to small, retouched, utilized flakes. Three lamellar and one ovate flake revealed light retouch with
miniature scarring at the convex margin. Two expanding flakes had straight side edge-wear. One expanding flake was completely worn smooth along its distal hinge with little evidence of scarring.

Bifacial Artifacts

Bifaces, unlike unifacial tools, were usually given much greater attention and care in their production. Both ventral and dorsal surfaces were finely flaked to produce a predictable style of tool which was often reused, resharpened, or reworked into another tool form. Many of the Draper Park bifaces demonstrated reshaping and resharpening. Bifaces were classified according to morphological attributes.

Drills (n = 60; 18%)

Drill shafts were generally bi-triangular or rhomboidal in cross section (Figure 29). Most were finely tooled and had a blunted point with concentric wear patterns around their tips. Many appeared to have been refashioned from points. The drills represented some of the finest worked specimens on the site and were separated into six classes: (1) Y- and T-shaped with bases, (2) expanding based, (3) ovate based with long shafts, (4) reworked points, (5) drill-like flakes, and (6) broken drill bits. Average metric attributes were recorded in Table 10 for greatest length, width, and thickness. The greatest thickness and widths were found at the base in most forms except the reworked points where the greatest thickness was near center shaft.
Figure 29. Drill Forms (Actual Size).
Table 10
Drill Attributes and Average Measurements

<table>
<thead>
<tr>
<th>Form</th>
<th>N</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
<th>Thick. (cm)</th>
<th>Weight (g)</th>
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<tr>
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<td>T-shape</td>
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<td>.92</td>
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<td>1.57</td>
<td>.65</td>
<td>2.45</td>
</tr>
<tr>
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<td>1.90</td>
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<td>2.80</td>
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<tr>
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<td>Ovate long w/broken shafts</td>
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<td>Preforms</td>
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<td>Longitudinal biface</td>
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<td>.64</td>
<td>4.34</td>
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</tbody>
</table>

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Y- and T-Shaped  (n = 7)

Within the Y- and T-shaped based drills, four had straight bases thinned for halving (Figure 29:a and b).

Expanding Based  (n = 7)

Three of the expanding based drills had concave bases, two had straight bases, and one convex (Figure 29:c). Two others appeared to have been abandoned during manufacture due to imperfections in the material.

Ovate Based With Long Shafts  (n = 9)

Six ovate based drills were finely made with long slender shafts which were observed to be rounded in cross section from retouch and use (Figure 29:e). The remaining three had become broken through use.

Reworked Points  (n = 18)

Ten of the 16 reworked points may not have initially served as projectile points but were possibly fashioned out of a similar type of preform utilized for projectile points (Figure 29:i). Three drills appeared to be reworked Madison points fashioned from Onondaga chert.

Three Levanna-styled points were reworked until the edges bore steep lamellar beveling (Figure 29:g). The cross section was more convex-trianguloid across the shaft but round and pointed at the tip.
The same type of flaking was observed on the diminutive side-notched point (Figure 29:f-2). The corner-notched point had a wide base with both shoulder barbs having been reworked into drill-like bits (Figure 29:f-1).

**Drill-like Flakes (n = 4)**

The drill-like flakes (Figure 29:d and h) were bifacially retouched and transformed, in some instances, into "microgouges" (Figure 29:d-2 and 3), and in one case into a "micro-drill" (Figure 29:d-1).

**Broken Drill Bits (n = 15)**

The remaining 15 drill bits were very blunted and thick with evidence of numerous resharpening and beveling. All were generally broken at an angle at mid to upper shaft.

Not too surprising, the predominance of drills were found in the lower activity area of the site in and around the refuse pits and fire hearths.

**Projectile Points (n = 116; 34%)**

Not all the points were utilized for hunting purposes. A large number consisted of knives while others had been reworked into gravers and scrapers. Of those enumerated, 42 consisted of unidentifiable partial points which included 31 point tips, 7 bases, and 4 midsections and/or one of the lateral edges.
Levanna Points (n = 33)

Levanna points was the largest category of identifiable points. These triangulate points were finely made, with concave, well-thinned bases (Figure 30:a). Ritchie (1961:31) first observed them in New York as characteristic of the Owasco occupation. Subsequently, they were recovered in other New York complexes dating around A.D. 700 and later, peaking around A.D. 900, they gradually disappeared approximately A.D. 1350. Twenty of the Draper Park points were styled from Kettle Point chert, 10 from glacial drift, and 3 appeared to be of Onondaga, a dark, almost black fine-grained chert. Fourteen were complete, 6 were three-fourths length with bases absent, and 14 were comprised of bases with their points broken. Table 11 lists the metric and nonmetric attributes.

Madison Points (n = 7)

Also triangulate in shape, the Madison points were generally smaller compared with the Levanna points. Ritchie (1961:32-33) associated them with the Iroquois in New York, replacing the Levanna style around A.D. 1350. Three were fashioned from Onondaga chert and likewise three were made up of Kettle Point chert while one was fashioned from a glacial cobble. Five were complete and two consisted of bases only (Figure 30:b).
Figure 30. Projectile Point Forms and Preforms.
### Table 11
Average Metric and Nonmetric Attributes of Levanna Points

<table>
<thead>
<tr>
<th>Provenience</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
<th>Thickness (cm)</th>
<th>Weight (g)</th>
<th>Base shapea</th>
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<td></td>
<td></td>
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<td>1.75</td>
<td>.52</td>
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<td></td>
<td>-</td>
<td>2.00</td>
<td>.55</td>
<td>2.98</td>
<td>CNC</td>
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<td></td>
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<td>2.98</td>
<td>.73</td>
<td>6.35</td>
<td>CNC</td>
</tr>
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<td>Prehistoric Levels 14-23</td>
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<td>-</td>
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<td>1.56</td>
<td>ABS</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>.60</td>
<td>3.26</td>
<td>ABS</td>
</tr>
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<tr>
<td></td>
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<td>7.31</td>
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<td></td>
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<td>2.22</td>
<td>.55</td>
<td>1.89</td>
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<td></td>
</tr>
<tr>
<td>Modern-Historic-Prehistoric Mix</td>
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<td>-</td>
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<td>.92</td>
<td>ABS</td>
</tr>
<tr>
<td>Levels 1-2</td>
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<td>-</td>
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<td>ABS</td>
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<tr>
<td>Historic-Prehistoric Mix Level 3</td>
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<td>2.33</td>
<td>.63</td>
<td>2.43</td>
<td>STR</td>
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<td>-</td>
<td>2.27</td>
<td>.60</td>
<td>2.14</td>
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<table>
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<th>AVERSAGES</th>
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<th>Refuse</th>
<th>Prehistoric</th>
<th>Historic</th>
<th>Prehistoric Level 1</th>
<th>Prehistoric Level 2</th>
<th>Prehistoric Level 3</th>
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</tbody>
</table>
Diminutive Points (n = 14)

Diminutive points was a very interesting category, most of which were side-notched or corner-notched. Smaller than the Madison, nine were complete, three comprised of bases, and two of points with damaged bases (Figure 30:c). Their total weight averaged 1.68 g. Bearing smooth ground bases, eight appeared to have been hafted. Their bases varied in shape: six were straight, four contracting, one convex, one bifurcated, and two had bases absent. One small point was lanceolate in shape (Figure 30:c).

Often found in Late Woodland assemblages, similar diminutive points have been recovered from the Schultz site (Fitting 1975a:93) and the Naugle site (Ozker 1976b:328).

Irregular Triangular Points (n = 13)

Reminiscent of the unifacial working noted for the Juntunen points (McPherron 1967:148-153, Plate 32), three of the irregular triangular points were unifacially worked with only small ovate retouch along the margin of the ventral surface with full, secondary scarring on the dorsal (Figure 30:d). Broken specimens comprised two bases, one point tip, and one midsection.

The majority of the triangular points were recovered from the southern, main activity area, except one which was associated with the hearth near the Old Creek Bed. Materials were comprised of seven cobbles, five Kettle Point, and one quartzite.
Miscellaneous Points (n = 13)

Other points represented were six corner-notched, only one of which was complete and another appeared to have been abandoned in manufacture. Three others were bases only and one was a mid-section. The complete form was irregular in outline and may have been reworked from a larger point. The other corner-notched point, unfortunately, was broken probably due to multiple imperfections in the raw material. It was the only representation of a Jack's Reef Corner-Notched point in the entire assemblage.

One complete side-notched point was recovered and one mid-section. One was an Early Woodland, deep notched, expanding, ground based point with a large asymmetrical ovate blade. A most unusual aspect was the fact that the point had been manufactured of heat-treated Bayport (Ozker 1976c:357-367) which was a highly uncommon material at the Draper Park site. It was recovered from level 3 which was mixed with the historic component. Level 2 was comprised of fill dirt brought into the area prior to the excavation and it apparently contained Middle Woodland artifacts from an unknown location (Weston 1979). The aberrant Early Woodland point may have been associated with that material and worked its way down through the soil by water and/or rodent activity.

Ovate Preforms (n = 24; 7%)

Most of the ovate preforms were "roughed out" by primary flaking with a few still retaining remnants of the outer cortex; few bore
bifacial secondary flaking. Considered to be unused, unfinished, proposed artifacts (Crabtree 1972:82), preforms were the intermediate stage between an unworked flake blank and a finished tool. Ovoid in shape and generally biconvex in cross section, they were not much longer than the predominant triangular point form, although considerably thicker and heavier (Figure 30:e). Nine appeared to have broken during manufacture, shattering along cleavages of imperfection or breaking at a point of crystalline inclusion. Eight were complete. The remaining few were comprised of four partial points, two bases, and one broken section. The average weight of all 24 was 12.55 g.

The distribution indicated that most were related to the high activity area in the southern portion while only two were recovered from the Old Creek Bed area.

**Bifacial Knives** (n = 17; 5%)

The bifacial knives were distinguished from preforms by their even, bifacial flaking and relative thinness of blade and lenticular cross section (Figure 30:f). Seven were small, flat, and ovate; six were rounded; one was a large mid-section of a biface; and three were fragments.
Large Handtools

Nonchert Knives (n = 22; 6%)

Most of the nonchert knives were fashioned from slate with the exception of two; one was fashioned from an argillite cobble. The knives were found to vary in shape and size; some were rounded with marginal retouch, others demonstrated crushing with multiple hinged scars along the working edge. Still others were quite uneven, possibly having been utilized in a chopping function. Almost all were associated with heavy concentrations of fish remains in refuse pits, suggesting possible use in processing fish. Several were observed to have deep striations perpendicular to the working edge, with the edge quite blunted from use.

An experiment was conducted on fresh slate collected by the author to see if they had been utilized in the removal of fish scales. Both wet and dry specimens were used for that purpose. It was found that the dry slate tended to splinter more readily and that the fresh, damp slate was a more useful tool. The scaling of fish left deep striations in the slate perpendicular to the edge, similar to those found on the prehistoric specimens. Stothers (personal communication, September 1987) has found similar knives associated with fish remains in the Maumee River basin. Cleland (personal communication, March 1985) noted the use of such knives as scalpers among native populations in northern Canada.
The distribution of the slate knives was found associated with fish remains clustering in the refuse features of the southern activity area and in Feature 69 of the Old Creek Bed.

**Hammers and Choppers** (n = 16; 6%)

Hammers and choppers shaped from igneous rock consisted of granite, diorite, and gabbro. The hammers were blunted from repetitive blows, whereas the choppers were quite jagged and broken from heavy use. Three of the cobbles showed light use-wear; however, one particular pebble tool proved to be quite interesting. Heavy percussion flaking had removed several flakes from the margin of both sides of a small ovate pebble producing a wedge-like bit. It was recovered from one of the prehistoric refuse pits associated directly with the splintered long bones of a white-tailed deer (Barr, personal communication, 1979).

**Miscellaneous Artifacts** (n = 10; 3%)

Two milling stones were recovered; one was a plano-convex igneous rock showing heavy wear on the grinding surface, the other was rectangular and flat with wear striations on both surfaces. Three "nutting stones" were found in the northern fringe of the site. One was made of limestone having two small ovals pitted-out from use. The likelihood of it having been utilized for nut cracking is slim, but it may possibly have been functional for grinding paint pigments or dried seeds. The other two stones were large, igneous rocks with multiple pitting in the center, and may have served as anvils in
flint knapping. A large sandstone abrader was recovered from a refuse pit, possessing two long, straight, hollowed grooves parallel to the long axis of the rock which could have served in arrow shaft manufacture. Other important uses for grooved sandstone abraders included fashioning various implements of antler, wood, and soft stone (Crabtree 1972:8).

The remaining implements included a partial well-polished, ground stone celt of diorite with a straight, polished bit, and a partial black slate gorget with a small drilled hole observed at the point of breakage.

This study does not include the analysis of the 180 fish-net sinkers retrieved from the site which were not available to the author. Net sinkers were recovered from units throughout the site, however, although numerous in and around refuse pits where quantities of fish remains were located, the majority came from the Old Creek Bed in the northern portion of the site. One of the sealed levels in the creek revealed a sinker with cordage still attached. Seventy percent of the sinkers were comprised of soft limestone while the remaining 20% were of slate and beach pebbles (Weston 1979). Weston (1979) includes the Draper Park material in a comparative study of fish net sinkers.
CHAPTER VII

INTERPRETATION OF FUNCTIONAL ANALYSIS
AND INTRA-SITE DISTRIBUTION

Functional Analysis

The Draper Park site was seasonally occupied from A.D. 600 to 1300. From both the ceramic and lithic analysis it appears that the site became more intensively occupied about A.D. 900-1000 during which time four activities became prominent: (1) planting and harvesting squash, as well as gathering locally available fruit and nuts (Marek 1983); (2) fishing during the peak spring and fall migrations, supplementing the harvest by hunting small game and deer (Cardinal 1979); (3) manufacturing pottery for storage and cooking purposes (Hoxie 1980); and (4) fashioning tools for making and repairing fish nets, for whittling, skinning, cutting, perforating, etc.

Since all classes of debitage were recovered in large quantities, it is apparent that all stages of tool manufacture took place at the Draper Park site. Most of the finished tool production and reworking appeared to have taken place in the southern portion of the site. The utilized flakes were more prevalent in that area, and in particular the production and use of blades took place there. Most utilized flakes were recovered from within refuse pits and around fire hearths.

The edge-wear study conducted on the utilized flakes and scrapers demonstrated use for a variety of activities. Also suggested
was the utility of certain flake forms for a specific function such as the lateral edges of bladelets may have been utilized for cutting soft substances such as meat, skin, etc. The distal edges of lamellar and blade flakes had similar edge-wear generally attributed to skinning. In addition, a number of lamellar flakes were reshaped into fine perforators at the junction of the disto-lateral edges. Continuous ovate scarring was believed to have occurred from site disturbance and trampling rather than from previous use or bag wear. It was also found that ovate, expanding and blocky flakes were probably picked up at random and utilized with no specific function attributed to their forms.

Flakes with steep multiple-ovate feather scarring generally had obtuse edge angles. Flakes with complex-multiple-hinged scarring had a less obtuse edge angle with an appearance of crushing, indicating possible use on a hard substance such as wood or bone. Flakes with acute edge angles were observed to have either feathered scalar scars or stepped hinged scarring. These edges tended to be fairly fragile and translucent and were generally observed on the lateral edges of bladelets. Edge angles fell into groups of several classifications. Steep multiple ovate, observed on the distal edge of flakes, ranged between 70°-78° and 58°-66° on the lateral edges. Complex-multiple hinged ranged between 65°-75°. The angles on the flakes bearing scalar and stepped edge-wear overlapped somewhat. Generally, those bearing scalar ranged from 20°-35° and those with stepped flaking encompassed angles of 27°-38°.
In his study of edge angles, Wilmsen (1968:202) found that edges bearing angles of 66°-75° may have been associated with wood or bone working. This may also be true of the distally utilized flakes at Draper Park, however, the laterally worked edges bearing steep multiple ovate scars are better considered as backed edges. "Edge blunting is common in all of the Paleo-Indian collections studied. Retouch of about 50° or more was used to create dull edges on the backs of many cutting or scraping tools" (Wilmsen 1968:202). In support of Wilmsen's findings, 20% of the utilized bladelets bore steep multiple ovate scarring opposite the working edge, suggesting edge blunting or backing. The acute angled working edge bearing feathered scalar scars probably served as cutting tools for meat or skin and the flakes bearing hinged, stepped edge-wear may have been utilized as whittling knives for cutting twine or cordage (Semenov 1964).

Most of the scrapers fell well within the 55°-100° edge angles used for skinning (Hayden 1979b:209). The diversity of edge angles observed on the knives indicate that they were used for a variety of purposes, possibly in cutting and processing foods. Without controlled replication studies, further functional inferences could not be suggested.

The drills, which made up a large percentage (18%) of the overall tool assemblage, apparently played a major role on the site (Table 12). Many of this class were points reworked into drill-like bits. The tools appeared to have been reworked and utilized until nothing but a blunted stub was left. The only direct evidence of
Table 12

Classification of Stone Tools

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<tr>
<th>Classification</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
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<td>34</td>
</tr>
<tr>
<td>Drills</td>
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<td>18</td>
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<tr>
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<td>12</td>
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</tr>
<tr>
<td>Miscellaneous</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>337</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

drill use on the site was several small holes drilled in the sides of a ceramic pot demonstrating probable repair by lashing twine or sinews to hold it together. Obviously the drill played a more important role than the repairing of pots.

No other evidence of holes was observed in bone or antler tines indicating drill use in manufacture of toggles for harpoons. Nonetheless, sturgeon bones were recovered from several refuse pits on the site. They would have been too large to net and probably were harpooned. Cleland (1982) found in his research that both harpoons and gaff hooks were used in historic times for catching
sturgeon. Mason (1965:156) observed the use of toggles in the Middle Woodland North Bay component of the Portes des Mortes site on the Lake Michigan side of the Door Peninsula. Generally made of deer antler tines, other toggle harpoons have been recovered in Late Middle Woodland contexts from the Spider Cave site on the Garden Peninsula of Michigan (Fitting 1968:46-51; Mason 1965:156-163). Ritchie (1951:134) has also reported the use of toggle harpoons in New York during the Point Peninsula focus of Middle Woodland. Halsey (1976:635) found them in the Early Late Woodland Williams burial site, associated with the Wayne tradition ceramics in Kent County, southeastern Ontario just across from the Michigan Draper Park site. The Juntunen site (McPherron 1967), Fisher Lake site (Brose 1970:77), and Bussinger sites (Fitting 1971a:168) all revealed harpoons in Late Woodland contexts.

Another reference for possible drill use in the fishing industry was found in an historic context. Drills may have been used in making holes in the dried shoulder blade or pelvic bone of a deer in order to facilitate the production of twine from shredded bark. During the final stages of making twine, the stiff fibers were worked in the hands until soft and ribbon-like. However, in order to render the twine more pliable, Lyford (1953:183) reported that "to secure a softer fiber they were drawn through a hole driven in the dried shoulder blade or pelvic bone of a deer... The fibers were drawn back and forth until softened." Cordage, an important commodity, was used for multiple purposes, namely: netting, making fish traps, fastening floaters and sinkers to the nets, tying poles
of tripods supporting cooking vessels, drying racks, house poles, making netting for snow shoes, etc. (Lyford 1953).

One large shoulder blade was recovered from the sealed beds of the creek channel but unfortunately the brittle center had deteriorated leaving no evidence of drilling. Early historical reports attribute cord making as a woman's job, whereas the art of net making was traditionally carried out by men during the winter (Cleveland 1982). The production of cordage may have been a very important industry on the site for repairing and renewing nets.

No direct evidence of the use of drills in either the making of toggles or twine was found at Draper Park. Perhaps future studies will enlighten the extensive use of drills at a fishing station, a topic to be addressed in the final chapter.

The faunal analysis of the Draper Park site indicated that the site was primarily a fishing station (Cardinal 1979). The recovery of 185 whole fish net sinkers, some having remnants of cordage still attached, supported this hypothesis (Weston 1979). Although faunal remains of small animals and deer were recovered in the site's refuse pits (Cardinal 1979), the Draper Park site probably did not serve importantly as a hunting camp. With 34% of the tool assemblage comprised of points, many were either broken beyond recognition or were utilized as knives. Therefore, it is possible that the camp from which hunters foraged was set up elsewhere.

A surprisingly low percentage (5%) of hammer stones were recovered, which may be attributed to the lack of recognition of those tools by the participants involved in excavating the site.
Three of the seven hammer stones were recovered from a context involving high lithic activity, implying use in artifact production.

**Intra-Site Distribution of the Lithic Material**

Examination of lithic distribution indicated four intensive work areas clustering around the fire hearths. Each hearth was surrounded by several deep features, especially in the southeastern portion of the site. The features may have been associated with food preparation before being utilized as refuse pits for waste material such as mammal and fish bone, discarded flint tools, debitage, and broken pottery.

Units 35S 25E to 35S 50E and 40S 25E to 40S 50E were also found to be a high activity area yielding 2,212 pieces of debitage. The area may have included a fire hearth, or it was possibly an area of specialized activities, evidence for either interpretation has since been obliterated by modern intrusions. (Refer to Figure 14 for a plan view of features; note the modern disturbance.)

The debitage in the four units surrounding each hearth, encompassing a 100 ft (9.29 m) area, yielded: 2,514 from hearth, Feature 70 (Figure 14); 2,202 from hearth, Feature 23; 2,663 from hearth, Feature 4; and 2,588 from hearth, Feature 12; allowing for a total of 9,967 pieces of debitage which comprised 66% of the total. Thus it appears that a significant amount of tool manufacture occurred around the hearths.

Vertical distribution of material adjacent to and within the Old Creek channel (Table 13) reveals an increase of debitage through
Table 13

A Vertical Distribution of Lithic Remains in Units 10S 40E - 50E
Adjacent to and Within the Old Creek Bed

<table>
<thead>
<tr>
<th>Time Depth</th>
<th>Levels</th>
<th>Debitage</th>
<th>Points</th>
<th>Drills</th>
<th>Scrapers</th>
<th>Cores</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historic &amp; prehistoric</td>
<td>11-13 4-4C</td>
<td>273</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>289</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>40&quot;-50&quot; BS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prehistoric w/rock hearth</td>
<td>14-17 4D-4G</td>
<td>763</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>27</td>
<td>800</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>50&quot;-68&quot; BS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sealed prehistoric</td>
<td>18-20 4S1-S5</td>
<td>151</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>12</td>
<td>164</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>68&quot;-78&quot; BS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sealed C-14 A.D. 620-700</td>
<td>21-24 4S6-11</td>
<td>84</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>97</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>78&quot;-92&quot; BS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1271</td>
<td>15</td>
<td>4</td>
<td>2</td>
<td>58</td>
<td>1350</td>
<td>100</td>
</tr>
</tbody>
</table>

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time culminating in levels 17-14, then tapering off in levels 13-11 as the prehistoric sequence gave way to the historic occupation. The fire hearth uncovered at 55 inches below surface in the northern units (Feature 70) correlates stratigraphically with the increase in debitage. Hoxie (1980:127-133) found that the undecorated Wayne ware sherds were most numerous in levels 14-17.

Through the recovery of over 2,000 pieces of bone, whole and charred, located in units 10S 40 E - 55E in between levels 14-17 (50 inches and 68 inches below surface) the faunal analysis (Cardinal 1979) also indicated an increase in the harvesting of fish and small mammals during that time frame.

The Levanna points ca. A.D. 700-A.D. 1350 (Ritchie 1961) correlate, in time, with the Wayne ware ceramic tradition analyzed by Hoxie (1980).

Approximately 83% of the debitage comprised of Kettle Point with the remaining 17% encompassing glacial cobbles, Onondaga, quartzite, Upper Mercer, and Bayport (see Table 14). The last four sources were found in negligible amounts allowing for the reworking of trade implements or were introduced to the site by people traveling through. However, the prominence of the Kettle Point chert on the Draper Park site suggests direct procurement by the occupants.

An interesting correlation was observed between three Madison points and Onondaga chert; no other tool was located consisting of that raw material except one multifunctional, square knife taken from the upper level 3, suggesting a late arrival of people from Ontario bringing Onondaga chert with them to the site. Unfortunately
Table 14
An Areal Distribution of Debitage Chert Types

<table>
<thead>
<tr>
<th>Location</th>
<th>Kettle Point</th>
<th>Glacial cobble</th>
<th>Onon-daga</th>
<th>Quartzite</th>
<th>Upper Mercer</th>
<th>Bayport</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>10S 40-50E</td>
<td>2,761</td>
<td>576</td>
<td>23</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>3,388</td>
</tr>
<tr>
<td>20S 40E</td>
<td>416</td>
<td>95</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>511</td>
</tr>
<tr>
<td>25S 25E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30S 25-45E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35S 25-45E</td>
<td>1,807</td>
<td>243</td>
<td>8</td>
<td>3</td>
<td>18</td>
<td>64</td>
<td>2,143</td>
</tr>
<tr>
<td>40S 25-45E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45S 25-45E</td>
<td>2,678</td>
<td>416</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>25</td>
<td>3,135</td>
</tr>
<tr>
<td>50S 25-50E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55S 25-50E</td>
<td>4,904</td>
<td>822</td>
<td>47</td>
<td>5</td>
<td>18</td>
<td>27</td>
<td>5,823</td>
</tr>
<tr>
<td>60S 25-50E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95S 00-05E</td>
<td>236</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>285</td>
</tr>
<tr>
<td>100S 00-05E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110S 00E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150S 10E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>170S 00-50E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>00N 80W</td>
<td>15</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Totals</td>
<td>12,817</td>
<td>2,194</td>
<td>86</td>
<td>16</td>
<td>54</td>
<td>138</td>
<td>15,305</td>
</tr>
<tr>
<td>Percentages</td>
<td>83.7</td>
<td>14.3</td>
<td>.6</td>
<td>.1</td>
<td>.4</td>
<td>.9</td>
<td>100</td>
</tr>
</tbody>
</table>

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little can be said of the Upper Mercer material which consisted of 54 pieces of debitage, 1 preform, 1 Levanna point, and several partial points.

The tremendous amount of material concentrated in the refuse pits and around fire hearths implied that not only were the hearths used for cooking and food preparation, but they appear to have been a central focus in the making of tools and pottery, creating a general work area. This was where, presumably, men and women came together to carry out food processing and tool manufacture activities.
The lithic industry at the Draper Park site was mainly based on small tabular nodules of raw materials which contributed to artifact production by the bipolar technique, common in the Late Woodland northern Great Lakes area (Binford and Quimby 1963:280-288). As was observed on the Juntunen site, decortication flakes did not appear to be an undesired element, since several artifacts were fashioned still bearing the outer cortex. Most of the raw material appeared to be procured from a nearby source at Kettle Point.

The representation of points on the site were limited to the Late Woodland Levanna style, a few Madison points, and several diminutive points. The homogeneity of the assemblage was quite remarkable considering the variety of points generally located on many Late Woodland sites. In particular, Jack's Reef corner-notched point, prominent on many Early Late Woodland sites, was conspicuous by its absence at the Draper Park site (only one partial point was represented), and the ovate cache blades common in the Wayne Mortuary Complex (Halsey 1976) were also absent.

It was interesting to note that Hoxie (1980), in his research of ceramics at Draper Park, found in the lowest levels representation of transitional Middle to Lake Woodland motifs, whereas very sparse lithic material was recovered portraying that horizon.
The Levanna points, generally dating from A.D. 700-1350 and peaking around A.D. 900, represented the most numerous point form at Draper Park site. They fell well within the length Fitting (1970a:48) recorded for the Riviere Au Vase site. Fitting noticed an areal separation of Jack's Reef corner-notched and triangular forms at the Riviere Au Vase site which may be accredited to the presence of two components. The predominant point forms at the Riviere Au Vase site were those representing the Levanna style. The Madison points from that site were fewer and were located "spread over the surface" (Fitting 1970a:49) suggesting that they were introduced at a later time. This was also found to be true of the Draper Park site, where not only were they recovered from a mixed context, but three of the seven were fashioned from Onondaga chert. The Onondaga chert differed considerably from Kettle Point chert and had negligible representation on the site, comprising only .4% of the total raw material.

Ten of the Draper Park vessels portraying the Younge tradition were found to be similar to those recovered at Riviere Au Vase. Five Draper Park vessels were described by Hoxie (1980:133) as Riviere ware, while four were typical of the Vase phase and one specimen was typed as Macomb Linear Corded. The overlapping of both Wayne and Younge tradition was observed at both sites.

Numerous artifacts at the Riviere Au Vase site were fashioned from Kettle Point chert pointing to a possible relationship between the two locations (Figure 12). The Riviere Au Vase site, which was a distance of approximately 25 km from Draper Park, may have served
as the mortuary grounds for the Draper Park people, or the two
groups were perhaps associated within an exchange network.

Other bifaces at the Draper Park site included several unifa-
cially worked Juntunen style points with only marginal retouch being
evident on the ventral surface (Figure 30:d). They were more than
likely utilized as knives rather than for hunting purposes.

The diminutive points, similar to those located in the Late
Woodland component at the Schultz site (Fitting 1975a), and the
Naugle and Chippewa Nature Center sites (Ozker 1976a, b) were repre-
sented by nine complete and five partial specimens at the Draper
Park site. They were usually irregular in form and ranged from a
fine finish to a crudely worked biface of casual workmanship. Un-
classifiable and lumped together, these diminutive points may
constitute "variable point forms [which] may reflect several cen-
turies of experimentation before the minimal size and simple
production technique settled on the regularity of the Madison point
style" (Ozker 1976b:329). It was interesting to note that a
greater variety of raw material was utilized in producing the
diminutive points, which may suggest an increased use of small
pebbles as the raw material or that they may have been trade items.
However, the randomness of some of the shapes and sizes might well
have been the flint knapping of a child utilizing glacial pebbles.

Due to the low frequency of projectile points at the site, it
was concluded that hunting played a very minor role with the major
thrust being that of fishing, pottery making, and alternate subsist-
ence activities such as planting, gathering, and harvesting. The
high number of fish remains recovered from Draper Park totaled 4,574 fish bones during the 1974-1975 field seasons. The variety ranged from suckers averaging 2 lb to sturgeon averaging 20 lb or more (Cardinal 1979). The single most consistently relied upon plant food was squash. Since squash do not grow well in sand, they were probably grown in small gardens inland (Marek 1983). Fish were extracted in both the spring and fall coinciding with the planting and harvesting of squash which suggests an intensive use of the site from early spring to late fall.

Drills which have been frequently found on many Michigan sites from early Archaic through Late Woodland, have changed little through time which attests to their remarkable efficiency as tools. However, the unusual number of drills recovered from the Draper Park site may have played an important role in the technology involved with the fishing industry. Unfortunately, little can be found in the literature addressing this subject. Hopefully future research will explore this topic.

Summary

From the evidence gathered at the Draper Park site it was found that only a nominal amount of lithics was recovered in the lowest levels of the Old Creek Bed; items were limited to several cores, a few drills, and debitage. A small paddle recovered from the lowest levels indicated use of the waterways by boat or canoe. Hoxie (1980) observed that the occupation of the site peaked with the use of the plain, more utilitarian Wayne tradition ware. However, he also noted
the introduction or infusion of the Glen Meyer influenced Younge tradition which coincides with the introduction of Levanna points.

The Levanna points, associated with the Early Late Woodland Owasco phase in New York, were widespread by A.D. 900, later being replaced by the Madison points at approximately A.D. 1350. Ritchie believed that the Owasco sequences of New York state and southern Ohio were the progenitors of the Iroquoian cultures (Ritchie 1954: 134). The Younge tradition in Michigan was "strongly influenced and probably related to the Glen Meyer stage of the Lower Ontario Iroquois tradition" (Fitting 1975b:233).

It is therefore the contention of this author that the Draper Park site during its principal occupation was inhabited or strongly influenced by Early Ontario Iroquoian groups approximately A.D. 900-1000. After which time, Draper Park once again probably served as a transient fishing location by the less intensive later occupation. During the later phase, the Levanna point was replaced by the small Madison form, while the Kettle Point chert appeared to have been gradually replaced by the better quality Onondaga and Upper Mercer raw materials. This latter phenomenon was found to be true also for the terminal Woodland period in southwestern Ontario.

Unfortunately, in the known sites excavated in the southeastern area of Michigan, there is a dearth of lithics which makes it difficult to carry out comparisons between assemblages. The Furton and Fuller sites, considered transient fishing stations primarily of the Younge tradition (Fitting 1975b), may have coincided with the Younge phase of the Draper Park site.
Through comparisons of both lithic tools and ceramics, it was deduced that the Riviere Au Vase site was contemporaneous with the Draper Park site. Both locations served the same populations or at least were within their interaction sphere.

An unusual aspect of the site was the amount of refuse and artifacts recovered from what were presumed to have been storage pits. If the hearths and their surroundings represented living floor spaces, the accumulation of debris would have been an obstruction to daily activities. The refuse amassed near the creek bed was more easily understood since the creek, which presumably ran along the periphery of the site, served as an excellent working area with refuse pits away from the daily bustle of activity. By keeping flint knapping areas separate from living floors, bare feet would have been less likely lacerated by multitudes of flint chips.

Gillman's mound No. 2 may have included the Draper Park site or at least been part of the extended site. His description of the refuse heaps, fire hearths, abundance of fish remains, and quantities of pottery definitely suggest this. Fitting (1970b:83-94), in his research of the Gillman collections, observed "strong resemblances to some ceramics from the Riviere Au Vase site," as well as Wayne cordmarked pottery similar to the Ontario Glen Meyer Oblique, both of which were represented at the Draper Park site. Therefore, in conclusion, Draper Park may have represented but a small portion of a much larger, early spring to late fall fishing encampment.

Another interpretation was that Draper Park possibly served as a separate fishing site representing the reuniting of several small
families in early spring through late fall. A study of storage pits on Late Woodland sites revealed that summer sites, such as the Younge site, exhibited little refuse in pits (Greenman 1937:13-21). Other more transient short-term sites, such as the Late Woodland Mahoney site located in the Saginaw Basin (Bigony 1970), were also less likely to be filled with discarded tools and debitage. Sites with storage/refuse pits included: the intensive occupation of the Juntunen site where fish were harvested from early spring to late fall (McPherron 1967); the Stadelmeyer site where fish were caught from late spring to early summer; and the Fosters site fall/winter hunting camp (Bigony 1970). Storage pits at the fall/winter Bruner-Colasanti site in southwestern Ontario also revealed "intentionally dumped secondary refuse into storage pits" (Lennox 1982:4). In each of the above instances the pit clusters were found to be around hearths suggesting some sort of habitation in a cold weather environment.

At the Bruner-Colasanti site, Lennox (1982:9) proposed that:

While no substantial evidence such as house walls delineated by post molds was evident . . . the season of occupation, the presence of hearths (for heat and cooking), the clustering of storage features and refuse found within the storage pits (an indication that the day-to-day maintenance activities took place in close proximity to the pits) suggests the presence of dwellings.

The high activity areas observed around hearths at the Draper Park site suggest that dwellings may have been constructed. If so, the storage pits must have been substantially covered in order to allow the floor space over them to be utilized. The presence of post molds may indicate that seasonal dwellings were constructed.
From both the ceramic and the lithic analysis, it was found that the Draper Park site was occupied during the Late Woodland from A.D. 600 to 1300. The most intensive occupation probably occurred between A.D. 900 and A.D. 1000 when the Levanna points were most prominent. With the introduction of the later Madison point the use of the site appears to be less intensive, since only seven Madison points were recovered. Hoxie's (1980) analysis of the ceramics also supports this interpretation.

Through the research conducted it was found that the people of Draper Park site were probably affiliated with sites along the natural ridges of the St. Clair River referred to as Gillman's mounds No. 1 and 2 (Figures 1 and 3). The Riviere Au Vase site was also probably within their interaction sphere. The later phase of the site is believed to be correlated with the Fuller and Furton sites, which were transient fishing locations situated just south of the Draper Park site (Figure 1). Other seasonal activity sites of the Draper Park people, such as winter hunting camps, have not been located.

The object of this research was to analyze the lithic remains at the Draper Park site. The analysis of lithic production and tool attributes was carried out with an emphasis on patterns of functional characteristics. Possible cultural affiliations with other Late Woodland sites were discussed. Both the lithic forms and intersite analysis helped define cultural phases represented at the Draper Park site. An overall view of the settlement system could not be
obtained within the scope of the research conducted. Perhaps further research addressing that aspect may be conducted in the future.
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