Sharp-angled hooks for codfish and for salmon trolling

( after Drucker 1965:18)
ARCHAEOLOGICAL INVESTIGATIONS AT THE O'CONNOR SITE
PORT HARDY, BRITISH COLUMBIA

by

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B.A., Simon Fraser University, 1970

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ABSTRACT

Salvage excavations at the O'Connor Site (EeSu 5) on the north end of Vancouver Island, directed by the author in 1971 and 1973, have provided additional archaeological information for the central Northwest Coast.

A major portion of this thesis is given to the description and analysis of the cultural data obtained from those excavations and the subsequent laboratory work. Indications are that the site was occupied for a long and continuous period and two distinct cultural components are identified. The earliest, Port Hardy I, is represented by a poorly developed chipped stone industry with no microblade technology. It is suggested that this component is associated with an early coastal hunting and fishing population.

At 2500 - 3050 B.C. the appearance of shell-bearing deposits marks the beginning of the Port Hardy II component which is evidenced by a predominantly bone tool industry. This later and more intense occupation shows a marked increase in reliance on maritime and riverine resources and represents the beginning of a long and intensive exploitation of shellfish. No terminal occupation date is set, however there is no evidence of persistence into historic times.

Particular intra-site relationships and problems are discussed, and comparisons with other Central coast archaeological assemblages are made. The O'Connor Site is placed within the generally established scheme of cultural development for the area and suggestions as to future research in the area are put forward.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2 THE SITE SETTING: PHYSICAL AND CULTURAL</td>
<td>6</td>
</tr>
<tr>
<td>The physical setting</td>
<td>6</td>
</tr>
<tr>
<td>The cultural setting</td>
<td>12</td>
</tr>
<tr>
<td>Previous archaeological investigations</td>
<td>18</td>
</tr>
<tr>
<td>3 THE SITE: EXCAVATION STRATEGY AND STRATIGRAPHY</td>
<td>22</td>
</tr>
<tr>
<td>Site description</td>
<td>22</td>
</tr>
<tr>
<td>Excavation strategy 1971</td>
<td>25</td>
</tr>
<tr>
<td>Excavation strategy 1973</td>
<td>27</td>
</tr>
<tr>
<td>Methods and techniques</td>
<td>30</td>
</tr>
<tr>
<td>Physical stratigraphy, Area One</td>
<td>32</td>
</tr>
<tr>
<td>Physical stratigraphy, Area Two</td>
<td>35</td>
</tr>
<tr>
<td>4 ARTIFACT AND CULTURAL FEATURES</td>
<td>43</td>
</tr>
<tr>
<td>The Artifacts</td>
<td>43</td>
</tr>
<tr>
<td>Introduction</td>
<td>43</td>
</tr>
<tr>
<td>Lithic artifacts</td>
<td>48</td>
</tr>
<tr>
<td>Bone artifacts</td>
<td>65</td>
</tr>
<tr>
<td>Shell artifacts</td>
<td>109</td>
</tr>
<tr>
<td>Antler artifacts</td>
<td>110</td>
</tr>
<tr>
<td>Tooth artifacts</td>
<td>112</td>
</tr>
<tr>
<td>Obsidian</td>
<td>119</td>
</tr>
<tr>
<td>Cultural features</td>
<td>129</td>
</tr>
<tr>
<td>Hearths and rock concentrations</td>
<td>129</td>
</tr>
<tr>
<td>Human remains</td>
<td>135</td>
</tr>
<tr>
<td>5 CHRONOLOGY AND CULTURAL CHANGE</td>
<td>137</td>
</tr>
<tr>
<td>Port Hardy I</td>
<td>138</td>
</tr>
<tr>
<td>Port Hardy II</td>
<td>144</td>
</tr>
<tr>
<td>Intra-site relationships</td>
<td>149</td>
</tr>
<tr>
<td>CHAPTER</td>
<td>PAGE</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>6</td>
<td>SUMMARY AND CONCLUSIONS .................. 151</td>
</tr>
<tr>
<td></td>
<td>Technology, economy and subsistence .. 152</td>
</tr>
<tr>
<td></td>
<td>Seasonality .............................. 155</td>
</tr>
<tr>
<td></td>
<td>External Relationships ................. 156</td>
</tr>
<tr>
<td></td>
<td>Future research ......................... 158</td>
</tr>
<tr>
<td></td>
<td>BIBLIOGRAPHY ............................ 163</td>
</tr>
</tbody>
</table>

vii
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>63</td>
</tr>
<tr>
<td>3</td>
<td>78</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>7</td>
<td>97</td>
</tr>
<tr>
<td>8</td>
<td>116</td>
</tr>
<tr>
<td>9</td>
<td>116</td>
</tr>
<tr>
<td>10</td>
<td>117</td>
</tr>
<tr>
<td>11</td>
<td>120</td>
</tr>
<tr>
<td>12</td>
<td>128</td>
</tr>
<tr>
<td>13</td>
<td>146</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vancouver Island and adjacent mainland</td>
</tr>
<tr>
<td>2</td>
<td>Hardy Bay</td>
</tr>
<tr>
<td>3</td>
<td>Aerial photograph: O'Connor Site</td>
</tr>
<tr>
<td>4</td>
<td>O'Connor Site: site map</td>
</tr>
<tr>
<td>5</td>
<td>Profile; Area One, unit H</td>
</tr>
<tr>
<td>6</td>
<td>Profile; Area One, unit K</td>
</tr>
<tr>
<td>7</td>
<td>Profile; Area Two, unit P</td>
</tr>
<tr>
<td>8</td>
<td>Profile; Area Two, unit Q</td>
</tr>
<tr>
<td>9</td>
<td>Profile; Area One, units G, J and L</td>
</tr>
<tr>
<td>10</td>
<td>Profile; Area Two, units Q, P and M</td>
</tr>
<tr>
<td>11</td>
<td>Ground slate points and chipped bifaces</td>
</tr>
<tr>
<td>12</td>
<td>Miscellaneous chipped stone</td>
</tr>
<tr>
<td>13</td>
<td>Celts</td>
</tr>
<tr>
<td>14</td>
<td>Lignite pendant</td>
</tr>
<tr>
<td>15</td>
<td>Shaped abrasive stones</td>
</tr>
<tr>
<td>16</td>
<td>Unshaped abrasive stones</td>
</tr>
<tr>
<td>17</td>
<td>Frequency graph: abrasive stones and slabs</td>
</tr>
<tr>
<td>18</td>
<td>Barbed projectile points</td>
</tr>
<tr>
<td>19</td>
<td>Ulna awls/perforators</td>
</tr>
<tr>
<td>20</td>
<td>Splinter awls/perforators</td>
</tr>
<tr>
<td>21</td>
<td>Needles and bird bone awls/perforators</td>
</tr>
<tr>
<td>22</td>
<td>Deer metapodial artifacts</td>
</tr>
<tr>
<td>23</td>
<td>Wedge-based and miscellaneous bone points</td>
</tr>
<tr>
<td>24</td>
<td>Large bone points</td>
</tr>
</tbody>
</table>
FIGURE  PAGE

25 Miscellaneous and large bone points .......... 89
26 Frequency graph: miscellaneous bone points ... 93
27 Bipoints, undifferentiated tip development .... 98
28 Bipoints, differential tip development ........ 99
29 Frequency graph: bipoints .................... 100
30 Frequency graph: fragments of pointed bone objects .................. 102
31 Miscellaneous bone artifacts .................... 105
32 Miscellaneous bone artifacts .................... 106
33 Frequency graph: worked bone ................. 108
34 Ground shell ..................................... 110
35 Tooth artifacts ................................... 115
36 Distribution of obsidian ....................... 121
37 Circular hearth; Area One, unit H .......... 131
38 Circular hearth cluster; Area One, unit I .... 132
39 Circular hearth and ash feature; Area One unit H .......... 133
40 Vertical distribution of major artifact groups 136
CHAPTER 1

INTRODUCTION

The major focus of this thesis centers on two seasons of archaeological investigations at the O'Connor Site (EeSu 5) near Port Hardy, British Columbia. The town of Port Hardy now lies on the western shore of Hardy Bay, a large body of water which opens northward onto Queen Charlotte Strait, on the northeastern tip of Vancouver Island (Fig. 1). The town was initially established across the bay from its present location, but in the early 1900's it was relocated to accommodate a large government wharf. Since that time, and particularly in the past several years, the community has expanded rapidly. Major logging, mining and fishing interests, as well as related secondary industries, are all situated in close proximity to the town. Port Hardy is a major redistribution center for the central and northern coasts.

In 1971 federal funds became available to the Department of Archaeology, Simon Fraser University, specifically for salvage-oriented archaeological projects within British Columbia. The Port Hardy area was initially considered as a potential location for one of these projects for two primary reasons. First, no previous archaeological excavations (and very limited survey) had occurred in the immediate area other than one small
Figure 1

Vancouver Island and adjacent mainland with ethno-linguistic boundaries
test excavation at nearby Fort Rupert (Capes 1964). Secondly, several archaeological sites had already been destroyed by construction activities associated with the growth and development of the town, and the likelihood of further destruction in the near future appeared to be great. Thus, it was determined that the area should be investigated with the intention of salvaging some small portion of the area's essentially unknown prehistory if this proved feasible.

First reconnaissance indicated that the entire perimeter of Hardy Bay had been occupied at various times in the past. Interspersed midden deposits, most of which had already been destroyed or damaged to some extent, dotted the shoreline. The O'Connor Site, a large shell midden on the east side of the bay, was one of these and it too had been partially destroyed. A small private road had been cut through the site and consequent erosion had damaged a large portion of the cut-bank. A boat dock and ways at the northern limit of the midden had caused surface disturbance of that area as well. At the time of this preliminary reconnaissance it was learned that construction plans for a private home and for a log skid, both of which would further destroy two significant areas of the site, were being seriously considered. The necessary permission for excavation was readily obtained and salvage excavations, which continued for approximately six weeks, were immediately initiated. By 1973 construction was not yet
underway and it was possible to further excavate the site for a two and one half month period.

In most circumstances salvage or emergency archaeology is restrictive in nature. One is necessarily concerned with the immediate recovery of material from the endangered area, and oftentimes from a quite specific and limited area within the site. This poses certain methodological problems and it remains the task of the archaeologist to determine how best to proceed within these confines. Naturally, the procedures adopted will be governed by the information desired and the questions which are posed. A salvage situation does not necessarily negate problem-oriented research; however it does mean that problems must be defined within this context.

Initial attention at the O'Connor Site was directed towards the recovery of prehistoric cultural information within one specific area of the site, and hence the first season's excavations were primarily exploratory in nature. As it became possible to return to the site for an additional field season, the overall goals and problems of concern could be somewhat more explicitly defined on the basis of the initial field work. Apart from specific problems which were examined, it was anticipated that the increase in sample size would permit preliminary placement in a chronological and culture-historical framework, and that general conclusions regarding cultural affiliations
and prehistoric subsistence patterns would emerge from the ensuing analysis. Chapter 3 discusses the specific limitations, strategies and techniques employed during the excavations of each season.

The largest portion of this thesis is given to the detailed presentation of the empirical data recovered from the excavations and subsequent analysis. Despite the lack of archaeological material from the immediate vicinity, comparisons with other assemblages from the central coast are made wherever possible. This is done in order that some suggestions can then be offered with regard to the position of the O'Connor Site within the generally known archaeological sequence for this part of the Northwest Coast.

In relation to the overall site area, the data obtained through excavation represent only a very small sample of the total extant midden deposit. Therefore, no attempt has been made to establish a rigid chronological sequence or a series of distinct cultural phases, but rather a tentative statement about site utilization and cultural development within the site is put forward. In addition, recommendations concerning the nature and direction of future archaeological investigations within the local area are discussed.
CHAPTER 2

THE SITE SETTING: PHYSICAL AND CULTURAL

The Physical Setting

The area of concern lies within the region of British Columbia commonly referred to as the Coastal Trough. Topographically this is a low-lying area which extends from Puget Sound and the San Juan Islands in the south, north-westward to Dixon Entrance. Bounded by the Insular Mountains to the west and the Coastal Mountains to the east, the trough narrows to a width of approximately ten miles near Kelsey Bay in Johnstone Straits, and this constriction acts as a dividing line between the Hecate Depression to the north and the Georgia Depression to the south (Holland 1964:32). Hardy Bay is situated in the Nahwitti Lowland, an area of low relief and, in fact, one of the few areas in the Hecate Depression which lies above sea level. More specifically, it is within the Suquash Basin which is characterized by a gently rolling topography, very seldom rising above the 1000 foot level (Holland 1964:34).

The climate in this area is typical of the inner coast, cool and moist, with a January average temperature of 35°F. and a July average of 56°F. (Kendrew and Kerr 1955). The mean annual precipitation is high (64.44") but less than the
adjacent Quatsino Sound area of the west coast which receives a mean annual total of 93.45" (Temperatures and Precipitation Table for B.C. 1967:30,31).

Mixed forest of Sitka spruce (Picea sitchensis), Western red cedar (Thuja plicata) and hemlock (Tsuga heterophylla) form the climax vegetation in this area of the generally defined Coast Forest Biotic Region of British Columbia (Chapman and Turner 1956:23). Occasional growths of Douglas fir (Pseudotsuga menziesii) are found in areas with good southern exposure; fir (both Abies amabilis and A. grandis) and Western yew (Taxus brevifolia) are not uncommon. The typical undergrowth consists of dense and often impenetrable salal (Gaultheria shallon), ferns and mosses of several varieties in the shaded areas, and numerous berry bushes and wild rose in the more exposed areas. In places of low drainage, particularly along roadsides and forest openings, huckleberries (Vaccinium parvifolium and V. ovalifolium) and thimbleberries (Rubus parviflorus) are abundant; salmonberries (R. spectabilis) are equally common on marsh and creek edges. Alder (Alnus sinuata) and hemlock, with some vine maple, comprise the usual secondary growth.

Shelford defines this region as the "rainy western hemlock biome" of Vancouver Island and determines a difference, or dividing line, at the 51°N latitude line (Shelford 1963:211). Here, he claims, a change in the plant and animal communities
occurs, south of this line the subdivision of the biome is "hemlock - wapiti - cedar" and north of it is a "hemlock - deer - Sitka spruce" biome. The O'Connor Site is very nearly on this dividing line (50°44'N; 127°30'W) and indeed, a mixture of the two biomes is evident.

In general the food resources, although often seasonal, are varied and abundant. The dominant land mammals are the small Columbia blacktail deer (Odocoileus hemionus columbianus) and black bear (Ursus americanus vancouveri). Roosevelt elk (Cervus canadensis roosvelti) are not commonly found in the immediate area of Hardy Bay, however, occurrences have been noted from such nearby locations as Cape Scott to the northwest and Nimkish Lake to the southeast (McTaggart-Cowan and Guiguet 1966:362). Other, smaller, land mammals include marten, cougar, racoon, mink, beaver and otter.

Hardy Bay itself does not support a large population of sea mammals; however, some Hair seal (Phoca vitulina) and Harbour porpoise (Phocaena vomerina) occupy the bay throughout the year, and Dall porpoise (Phocoenoides dalli) are common in the offshore waters at the mouth of the bay. Northern sea lion (Eumetopias jubata) have large summer rookeries on the islands off the northwestern tip of Vancouver Island, but in winter frequent the more protected channels and bays. Sea
otter \textit{(Enhydra lutris)} also winter nearby. Gray whales \textit{(Schrichtius glaucus)} have been recorded from nearby Quatsino Sound on the west coast of the Island, Sei or Pollack whale \textit{(Balaenoptera borealis)}, Pike Whale \textit{(Sharpnosed Finner)} \textit{(B. acutorostrata)} are both common on this part of the coast and the Pacific Killer whale or "Blackfish" \textit{(Eubalaena sieboldi)} has been known to actually enter the more shallow waters of the bay (McTaggart-Cowan and Guiget 1965).

Numerous species of fish are found locally. Most important of these, both in quantity and in terms of prehistoric subsistence patterns, are the salmon. The Quatse River which drains into the south end of Hardy Bay (Fig. 2), supports annual runs of sockeye \textit{(Oncarhynchus nerka} Walbaum\textit{)}, coho \textit{(O. kisutch} Walbaum\textit{)}, pink \textit{(O. gorbuscha)}, chum \textit{(O. keta} Walbaum\textit{)} and spring \textit{(O. tshawytscha)}. The Glenlion River also accommodated large runs in the past, as did Tsulquate River, but these have now disappeared since the rivers have been reduced tremendously in size as a consequence of road construction and general development. Pink (humpback) and coho (silver) appear in Hardy Bay during August and head upriver to spawn sometime in mid-September. The chum, or dog salmon, arrive about a week later in the bay and run from September through to November. These runs will be considered in greater detail at a later point in connection with seasonal use and exploitation at the O'Connor Site. Important in the past, and today, are
Figure 2

Hardy Bay and the O'Connell Site
Figure 2
the halibut (Hippoglossus stenolepis) fishing grounds to
the north at Nahwitti, Shusharti and Hope Island as well as
some of the offshore islands around the peninsula in Beaver
Harbour. Cod (Gadus macrocephalus Tilesius) and herring
(Clupea pallasii) are abundant and available locally, as are
several species of rock fish (rock cod) and the small shark/
dogfish (Squalus suckleyi Girard).

Shellfish have clearly played an important role in the
subsistence economy of occupants of the bay area since very
early times. Although large clam beds still exist in Hardy
Bay they are no longer exploited because of contamination by
industrial and domestic waste. There are many excellent sources
outside the bay for butter clams (Saxidomus giganteus Deshayes),
horse clams (Schizothaerus nuttali Conrad) and cockles, parti-
cularly in Beaver Harbour where the first are much sought
after. Mussels (Mytilus edulis Linnaeus), abalone (Haliothis
kamtschatkana Jonas), crabs,(edible Cancer magister Dana, 
red C. productus Randall), rock oysters (Pododesmus macroshis-
ma Deshayes) and barnacles,(giant Balanus nublis, acorn B.
carious Pallas) are also readily available.

Birds and waterfowl are plentiful and include many species
of ducks, geese and grebes in addition to eagles, crows, ravens,
loons and great heron.
As with the animal resources, vegetable foods are likewise abundant seasonally and available throughout the area. The sea provides several varieties of kelp and seaweed, while numerous species of berries (noteably elderberries, huckleberries, salmon berries, salal berries) and roots can be harvested from the land.

The past occurrence and use of these various animal and plant resources will be discussed at greater length in Chapter 6, at which point the ethnographic pattern will be reviewed and used as a basis for examination of past resources exploitation and subsistence strategy.

The Cultural Setting

The O'Connor Site lies within the ethnographically defined and recognized territory of the Southern Kwakiutl. In broad terms this area encompasses the northeastern portion of Vancouver Island and the adjacent mainland and offshore islands from Cape Mudge in the south to Rivers Inlet in the north (Fig. 1).

With the Nootka, the Kwakiutl are incorporated in the Wakashan linguistic family. The Southern Kwakiutl actually belong to one of three main groups into which Boas (1966:12) divides the Kwakiutl branch of the Wakashan family; the other
two groups are the Heiltsuk and the Haisla, both inhabiting areas to the north of the Southern Kwakiutl. Boas (1966:37) distinguished two dialects among the Kwa'g ul (herein simply referred to as the Kwakiutl): a northern one on the west coast of Vancouver Island and on the east as far as Nigel Island and on Smith and Seymour Inlets; and a southern dialect "...spoken by all the tribes further to the east". Further, Boas identified twenty tribes within these groups, a number which excluded subdivisions or sub-tribes of such groups as the Kwakiutl proper. These twenty tribes were in turn divided into groups which Boas (1966:33) called numay'ma (numayma) and which Drucker (1967:10) prefers to call námíma (namima). More recently, Rohner (1970) uses the term numima to describe these corporate groups which consisted of one or more household groups that were strongly linked by social obligations, and which held rights over fishing locations and other sites of economic importance. Rohner (1970:87) suggests that the numimas were originally independent "village-communities" which eventually congregated at one main winter village site along with other numimas to form a tribe. During the non-winter months the constituent numima followed the well-known pattern of seasonal rounds.

Few areas of the Pacific Northwest Coast have received as much attention from ethnographers and anthropologists as has this particular one. An enormous body of literature is available for the Southern Kwakiutl; most of voluminous and noteworthy are the publications of Franz Boas. Boas began his work in
British Columbia in the 1880's and continued periodically throughout the following fifty years. His publications specifically concerning the Kwakiutl are numerous (see Boas 1966: bibliography) and deal with every aspect of Kwakiutl life from the dramatic winter ceremonies, feasts and dances, to social organization, mythology, art forms, linguistics and technology. A somewhat neglected aspect of Kwakiutl life however, is one which would be of great use to the prehistorian interested in the area; that is, detailed accounting of the patterns of seasonal rounds and specific resource utilization. Boas (1909) does give a brief overview of subsistence activities, however there are no detailed accounts of economic organization. These are largely overlooked, not by Boas alone, but also by more recent anthropologists who devote primary attention to the more impressive or dramatic events mentioned above.

Through the work of Dawson (1887), Boas and Drucker (1943, 1955, 1965) and others, as well as through some of the early explorers such as Vancouver, Menzies and Johnstone, we have come to know and understand the post-contact culture of the Southern Kwakiutl quite well. This is not the place to review social and political organization, mythology and the like, as that is all well documented and readily available elsewhere. Of concern here is that ethnographic and historic information which might be pertinent to the reconstruction of past human activities at the O'Connor Site.
One of Boas' most significant works was his compilation of geographical place names of the Kwakiutl (Boas 1934). In Hardy Bay he records twenty-two locations, three of which are in the immediate vicinity of the O'Connor Site (Boas 1934: map 6). It is not clear whether or not the site coincides with any of these however and although many of the older residents of the Fort Rupert and Tsulquate bands recall the use and location of various seasonal campsites and fish camps, none remembers the occupation of this particular site. Indeed, there is no historical component present archaeologically.

Portions of the ethnographic literature which often are useful to the archaeologist are the detailed accounts of manufacturing methods and techniques and the explanations of the relationship of particular artifacts to subsistence activities. Boas (1909, 1921, 1966) offers singularly thorough and well-documented descriptions for some of the Southern Kwakiutl technological processes. Although care must be exercised in applying direct analogies from the ethnographies to the prehistoric data, parallels can often afford at least initial clues for explanation of the archaeological record. Such parallels are drawn wherever possible in Chapter 4 and 6.

We may also glean some relevant information from the accounts of early explorers and traders. Evidence of trade and extra-
group contacts are particularly traceable through these sources. For instance, we know that trails heading inland into Nootka territory were undoubtedly in use long before Captain Vancouver's visit in 1792. Menzies' notes (from Johnstone's Report written at Cheslakees village at the mouth of the Nimpkish River) indicate that trade between the Kwakiutl and Nootka was already well established at that time.

They also talked much of Maquinna the Chief of Nootka Sound with whom they seem to have kept up considerable intercourse as they spoke of having received from him almost every article of Traffic in their possession such as Cloths Muskets...


Furthermore, Chief of the village, Cheslakees, was apparently able to tell Vancouver quite precisely that Nootka Sound was sixty miles away, about a four day overland journey for his people. Later on in his account Menzies states that sea otter skins and salmon were the main articles for which his group traded with the Kwakiutl, and mentions also that the sea otter were more plentiful here than anywhere else encountered on their voyage.

Boas (1966:117-118) gives additional indication of close contact between the Nootka and Kwakiutl peoples in his account of an early Nootka war. A Nootka tribe seeking revenge apparently sent to the Nimpkish (to whom they were related by marriage) a request for help against the tribe who had killed their Chief and his son.
The Nimpkish followed their call, and a party in two canoes went up the Nimpkish River. They cut up their canoes and carried the pieces over the divide to the navigable river running down to the West Coast. There they sewed up the canoes and went on.

Even today there are people at Nootka and Hesquiat on the west coast of the Island who retain the same names as their Kwakiutl relatives, and some still recall having made the journey to Nimpkish (Calvert: personal communication).

Goddard (1945:17) also noted that Vancouver Island was crossed by several trails. He specifically listed three: first, the one already mentioned from Nimpkish Lake to Kyukuot and Nootka Sounds, another from the head of Alberni Sound to the east coast, and a third from Fort Rupert to Quatsino Sound.

Trade or contact with other Southern Kwakiutl peoples on the adjacent mainland is not as clearly established. The early traders and explorers had little contact with that particular section of the mainland coast and consequently mention is seldom, if ever, made to the people and/or settlements there at contact times. However, there are definite references to a situation of continuing warfare between the Kwakiutl and the Bella Coola (Boas 1966), so the journey across the hazardous waters of Queen Charlotte Sound was at least accomplished occasionally. In addition, ethnographic accounts indicate that Southern Kwakiutl groups at the mouth of the
Nimpkish River and at Fort Rupert possessed oulachon fishing rights at the head of Kingcome and Knight Inlets respectively (Boas 1934; Curtis 1915:22,23). Perhaps resources such as the mountain goat which were not available on the Island were also exploited periodically, however this author has found no specific references to such activity.

It is clear then that a trade network or means of exchange existed at the time of contact, and it would be unreasonable to suggest that similar patterns did not exist in pre-contact times as well. Trade and the significance of exchange will be discussed with specific reference to the O'Connor Site at a later point.

**Previous archaeological investigations**

Although there is much ethnographic and historic information for this area, until quite recently there has been a conspicuous lack of archaeological data for the central coast. The earliest systematic archaeological investigations in the locale were those of Philip Drucker. In 1938, for approximately six weeks, Drucker conducted an archaeological survey, with some test excavations, on an extensive portion of the coast from Prince Rupert south to Rivers Inlet. His survey of Southern Kwakwaka'wakw territory however, was minimal "due to the lateness of the season and inclement weather" (Drucker 1943:106), and
little specific information for the study area with which this thesis is concerned is available. It is safe to say that prior to that survey no archaeological investigations in this particular area had occurred, and following Drucker's work there is a remarkable gap of some thirty years before a renewed interest in the archaeology of the central coast is noticed.

The Central Coast does not have well-defined or consistently acknowledged boundaries. Drucker, as a result of his 1938 survey and additional consideration of museum materials from the Northwest Coast, suggested that three main cultural divisions or aspects could be delineated, and to each of these aspects he ascribed certain diagnostic features. First was a Northern aspect which included Tlingit, Haida and Tsimshian territories; second, a Milbanke - Queen Charlotte Sound aspect which coincided with traditional Kwakiutl territory; and last, a Straits of Georgia - Puget Sound aspect (Drucker 1943:123). (In 1951 Drucker added the Nootka as a fourth aspect).

Presumably Drucker's second aspect, that which corresponds to the Kwakiutl territory, could be considered as the 'Central Coast' by nature of its intermediate position.

Hobler and Carlson (1974:1) however, delimit the area somewhat more narrowly, placing the northern boundary at Douglas Channel and the southern at Rivers Inlet; this
effectively excludes the southern Kwakiutl.

For the purposes of this thesis, the author has chosen to consider the Central Coast in the broader sense, that is, the area coextensive with all Kwakiutl territory.

Carlson (1970:10-17) has succinctly outlined the history of archaeology in British Columbia, and Simonsen (1973:12-13) has summarized well the main projects on the Central and Northern coasts since Drucker's survey. Recently Fladmark (1975:221-243) has detailed all major archaeological work on the Northwest Coast as well. There is no need to repeat that information here, and the following list indicates only those archaeological investigations since Simonsen's publication which are directly pertinent to this thesis. Reports for most of the following projects are on file with the Archaeological Sites Advisory Board of British Columbia.

1973: - Carlson, R.L. and P.M. Hobler (Simon Fraser University); survey of Seymour Inlet, Quatsino Sound and adjacent localities (Carlson and Hobler 1976).

  - Chapman, M. (Simon Fraser University); excavations at the O'Connor Site (EeSu 5) (Chapman 1971).
  - Mitchell, D.H. (University of Victoria); excavations, Raleigh Passage (Mitchell 1974c).

1974: - Carlson, R.L. (SFU); excavations at McNaughton Island (ElTh 10) (Carlson 1976).

  - Apland, B. (SFU); survey of portions of Bella Bella area.

1975: - Cybulski, J. (National Museum of Man, Ottawa); excavations at Rivers Inlet - Owikino.

1976 - Mitchell (U. Vic); excavations at Hopetown Village.

In summary, the years since 1968 when Hobler and Hester initiated the Bella Coola and Bella Bella projects have witnessed considerable archaeological work on the Central Coast. Although the northern end of Vancouver Island specifically has received attention in the form of systematic survey, the sole archaeological excavations there, except for Capes (1964) small test pit at Fort Rupert, remain those at the O'Connor Site.
CHAPTER 3

THE SITE: EXCAVATION STRATEGY AND STRATIGRAPHY

The preceding chapter outlined the physical and cultural setting within which the O'Connor Site is situated. A more detailed description of the site is now offered as a prelude to discussion of excavation strategy and the ensuing description of the physical matrix of the site.

The O'Connor Site lies on a small point which projects into Hardy Bay from the southeast side (Figs. 2,3). The precise limits of the site have not been determined; nonetheless, it is known that the O'Connor Site is an extensive one, covering at least 3,000 square metres. The midden extends from the boat dock and ways at the northerly end, south around the point to the log dump at the southern limit; a distance of some 120 m. The deposit extends at least 25 m. inland from the water. The road cut through the site follows the contour of the shoreline, and is approximately 4 m. wide; a considerable amount of deposit has obviously been removed from this area. The actual point is a bedrock formation of sandstone which extends into the bay, and this is devoid of any deposit, either natural or cultural. From the point north the midden merges into the bedrock, whereas to the south the midden meets the beach which is laden with washed out shell from the adjoining deposits.
Figure 3

Aerial photograph: O'Connor Site
A great deal of obsidiandebitage is scattered on the beach, and although neither the 1971 nor the 1973 projects recovered any other artifactual material from this littoral zone, at least one local resident has collected artifacts here. (The author is aware of one ground slate bead and one knife or celt.) The amount of midden which has eroded in this inter-face zone cannot, of course, be determined, yet it is clear that it has been the recipient of constant wave action for many years, particularly toward the southern limits where activities associated with the operation of the log dump have exercised a major influence.

A creek also cuts through the midden, but it is sufficiently small in volume that it dries up for a short period in the summer months and does not appear to have had a significant effect on the site. That is, it has not caused any severe down-cutting or erosion of the adjacent banks.

The surface of the site is covered with a dense growth of salal, thimbleberry and huckleberry, intermingled with wild rose, young alder and hemlock. Several large stumps remain on the site as testimony to logging activities there in the early 1900's, and the areas further back from the water support secondary growths primarily of western red cedar and hemlock. The undergrowth in this latter area is not heavy.
The site is relatively well protected from northerly winds blowing in from the mouth of Hardy Bay, and the southern exposure is especially well protected from the prevailing southwesterly winds. As well, proximity to the Quatse, Glenlion and Tsulquate Rivers is undoubtedly of primary importance. Although the first of these rivers alone now sustains salmon runs of any size, it has only been since the growth and development of Port Hardy that the others have been eliminated. In the past all three would have been valuable resource locales for the anadromous fish.

In sum, the O'Connor Site must have proved an excellent location for the prehistoric occupants. They would have had immediate access to seasonal resources such as salmon, berries and certain land mammals in addition to the fish, shell fish, sea mammals and plants available in the bay. Also, protection from winds and proximity to fresh water are essential to a comfortable habitation site, and these requirements were also met.

**Excavation Strategy: 1971**

As indicated previously, plans for construction of a log skid and a private home ensured further substantial destruction of the site. So far as could be determined on arrival in 1971, the log skid construction would be the first undertaking, and this became the determining factor of excavation location. Aside from delineating a rather specific area of the site,
often limitations of time and personnel are also imposed on salvage investigations, and this project was no exception. Although these restrictions were perhaps the most severe, they went hand-in-hand with somewhat lesser limitations such as the necessity to avoid large immovable stumps and trees.

At the outset the questions or problems under consideration were largely of a general nature. For instance: why was this particular site used? what was it used for? and could particular depositional events or occupations be determined? And in a more specific vein, when was the site occupied? and for how long?

Excavation strategy ought to be governed by the questions which the researcher is attempting to answer within a framework of known limitations. Because the problems were of such a general nature, and because of the limitations mentioned, it was decided that a series of scattered test pits would be most suitable for excavation of this one specific area.

Test pits are by definition small, non-contiguous units. Such units are useful in preliminary investigations of depositional problems and as a means of solving site cultural history problems.

(Binford 1964:438)

As Binford mentions, test pits are also useful as a means of collecting a dispersed sample of cultural material. It was expected that the excavation of such units would provide initial information about site utilization, particular
depositional events and occupation, chronology and culture change.

On this basis, a permanent datum point was established, and on a north-south grid orientation five arbitrarily selected 2 x 1 m. units (A-E) were laid out. This location was labelled Area One. One additional excavation unit of 2 x 2 m. (F) was excavated near the road on the south side of the point (Fig. 4).

Although it was not assumed, or even anticipated, that the initial excavations might be the prelude to a larger or longer term project, it was recognized that these test excavations would in all likelihood expose site-particular problems which could be investigated in the future.

**Excavation Strategy: 1973**

It became possible to return to the site for a second season of excavation before any construction had occurred, and some of the questions and problems arising from the 1971 excavations could therefore be considered more explicitly. The excavations were still salvage-oriented, and the primary objectives of this second season may be outlined as follows:

1. To obtain a larger sample from Area One. This was necessary first, to judge whether or not the initial sample of artifact types were representative of that
Figure 4
O'Connor Site: Site map
Figure 4
particular area, and secondly it was necessary to increase the sample if any valid comparisons were to be made with assemblages from other sites.

2. To test at least one additional area of the site, preferably one which would be impacted by the construction of the house. This would not only salvage another endangered portion of the site and thereby provide additional information through a larger artifact inventory, but would also serve to point up any differences which might exist between one area of the site and another.

3. To answer some specific questions which will be briefly enumerated here, and further discussed in Chapter 5 & 6.

a) Was the absence of certain artifact types (hammerstones, toggling harpoon valves, adze blades, tools of Mytilus californianus, to mention a few) which normally accompany coastal midden assemblages a reflection of the small and biased sample obtained in 1971?

b) Was the large amount of obsidian detritus at the site indicative of a larger obsidian tool-making tradition? and was the particular concentration of detritus near unit P associated with a specific activity area?

c) Was there any evidence for an earlier component at the site?
With these objectives in mind, the excavation strategy in 1973 was again to use discontinuous excavation units which were non-randomly selected. First, a series of six 2 x 2 m. units (G-L) were located in Area One. Two of these were adjacent to the 1971 units with the high obsidian concentration, and the remainder explored a more extensive portion of the area. These units were intentionally situated with the same north-south orientation as the previous season, so that at least one side of each unit was on the same axis as at least one other unit. Thus a longer, albeit interrupted, cross-section of the stratigraphy was obtained than would have been the case with single non-aligned pits.

In addition, Area Two was investigated. This area encompasses a ridge on the south side of the creek and the adjacent slope down to the road, and was to have been largely destroyed by construction of the private home. Three 2 x 2 m. units (M,N,P) and two 1 x 2 m. units (O,Q) were placed along a north-south axis on the slope to the height of the rise. These Area Two units were initially laid out from a second, separate datum point (DP') which was later tied into the main site map and original Area One datum. Again, all units shared at least one profile with one other unit (Fig. 4).

Methods and Techniques

In both 1971 and 1973, all units were excavated in
arbitrary 10 cm. levels. Although consideration was given to the possibility of excavating natural stratigraphic units, it was felt that given the discontinuous and complex nature of midden stratigraphy this would not provide enough additional information to warrant the time spent on such an endeavour.

Shovels were generally used only for removal of the top several centimetres of overburden and the lowermost deposits; trowels were the regular excavation equipment. All excavated material was passed through 1/4" mesh screens with the exception of the basal deposits in Area One. These were very wet and congealed due to the constant seepage of ground water and could not be satisfactorily screened. This problem was solved by removing the deposit by bucket from the pit to a plywood sorting board where it was then trowelled.

Features, and artifacts when possible, were recorded in situ. Otherwise all cultural material and faunal remains were recorded and sorted according to each arbitrary level of each unit, as were representative samples of shell. Samples suitable for radio-carbon assays were taken at every opportunity, and on completion of excavation in each unit large soil samples and shell samples were taken from every identified stratum.
Physical stratigraphy: Area One

The main strata in Area One are generally quite distinct and uniform however, as is typical of most Northwest coast middens, the stratigraphy within these main strata are often complex. There are many discontinuous lenses and pockets of accumulated charcoal, ash and particular species of fish (or fish remains, sea urchin spines etc.). Also, the stratigraphic profile in this area varies somewhat from the front of the midden (at Unit A) to the rear portions at Unit L. In spite of this minor variability, three main stratigraphic zones are identified beneath the first 10 - 30 cm. deposit of culturally sterile humus and root matter.

Zone A, the basal deposit of some 25 - 60 cm., is a wet shell-less matrix composed predominantly of beach gravels mixed with dark sand. In the excavation units closer to the front portion of the site this matrix varies somewhat and contains more water-deposited sands and clays than gravel. The bottom of this zone was normally reached at a depth of ca. 250 cm., however in units H, I, J, K, and L the water table was encountered while excavating the deposit and this precluded any further excavation. The separation between this zone and that above it is well-defined and nearly horizontal (Figs. 5 and 6) representing, perhaps, the demarcation of an old water table.
Figure 5
Profile: Area One, unit H
Figure 6

Profile; Area One, unit K
Zone B, the first shell-bearing stratum, is normally a dark matrix of some 40 - 80 cm. which contains highly fragmented clam and mussel shell. In several instances, a concentrated fragmented mussel shell lens and/or small layer of black greasy soil (often with decomposed fish remains) marks the beginning of this zone, and with few exceptions the matrix is more dense and has higher soil:shell ratio than the following zone. This is not the pattern in Units H and I (Fig. 5) where the overlying strata contains more shell, although it too is very highly fragmented.

Zone C ranges from 90 - 100 cm. in thickness and usually can be clearly differentiated from the preceding zone on the basis of quantitative differences in shell content. The zone is a heterogeneous deposit, comprised of black soil with a high content of fragmented shell of various species. There are numerous discontinuous lenses of ash and charcoal, and particularly characteristic are several large concentrations of loosely packed relatively whole clam and barnacle shell. Fire-broken rocks were recovered with far greater frequency in Zone C than the preceding zone. Figure 9 is a profile from Units G, J and L in Area One.

Physical Stratigraphy: Area Two

There are, of course, similarities between the physical make-up of Areas One and Two as there are in all shell middens.
The main stratigraphic differences between each area at the O'Connor Site are two: first, the initial deposit in Area Two was laid down on a sandstone bedrock formation rather than the wet sand and gravel deposits of Area One and secondly, there is no clear definition or separation into three zones. The bedrock formation is rather undulating and rises gradually from Unit Q near the road up to the rise and Unit M. All units were excavated to this bedrock and the deposits diminish in depth in a similar direction. That is, Unit Q was 3.0 m. deep, whereas bedrock was encountered at a depth of only .9 m. in one corner of Unit M.

The earliest zone, A-2, follows the bedrock contour and has a consistent depth of ca. 20 - 35 cm. It is a black greasy matrix which frequently is mixed with small pebbles and rocks. As in Area One, this zone does not contain shell.

The separation between this zone and the overlying Zone B-2 is usually distinct, and marked by a dense layer of black soil (which becomes a dark grey when dried) mixed with some highly fragmented clam and mussel shell. This layer ranges in depth from ca. 15 - 40 cm. and is not always clearly separated from the deposits above. For this reason it has been designated Zone B-2a. The remainder of the zone, B-2b, is similar to Zone C in Area One in that it is a mixed matrix composed of black soil with varying densities and
Figure 7
Profile; Area Two, unit P
Figure 8
Profile; Area Two, unit Q
concentrations of shell, charcoal and ash. This portion of the strata ranges in depth from ca. 160 cm. in Unit Q to 60 cm. in Unit M. Although distinctions between various strata in Zone B-2 are quite clear in some excavation units, this is not always the case and it therefore was felt that separation into two definite zones was not warranted.

Zone B-2 is topped by a layer of culturally sterile humus and root matter averaging 30 - 40 cm. in thickness but reaching as much as 60 cm. in some units. Figures 7, 8, and 10 are representative profiles from Area Two, and they clearly show the variability in depth and composition.

Unit F near the point was not completely excavated, however it was dug to a depth of ca. 220 cm. At this level a zone similar to Zones B (Area One) and B-2a (Area Two) had been in evidence for ca. 80 cm. Above this was a black greasy layer of some 50 cm. which contained several rock concentrations and lenses of ash and charcoal. This was subsequently overlaid by a stratum ca. 100 cm. which consisted predominantly of whole and fragmented clam shell with little soil.

It is apparent from the physical stratigraphy that although there are no major discontinuities in the depositional history of the site, at least two distinct and separate stages of deposition can be identified. The earliest is recognized by the black shell-less matrix in each area,
designated here as Zones A and A-2. The later deposition is recognized by the matrices containing shellfish remains, and stratigraphically described by Zones B and C in Area One, and Zones B-2a and B-2b in Area Two.

This separation of the physical stratigraphy into two major depositional stages correlates with a similar identification of two main cultural components. Thus Zones A and A-2 relate to an early occupation of the site: Component I; and Zones B and C (in Area One) and B-2a and B-2b (Area Two) are associated with a later occupation: Component II. These cultural components are defined by stratigraphic changes in particular artifact groups, and therefore specific discussion and elaboration follows the descriptive analysis of artifacts and features in the next chapter. It might be briefly noted now, however, that a similar pattern of an early non-shell midden deposit and a later one with shellfish has been observed at Namu (Luebbers 1971:57), and Fladmark (1976) suggests that this is a characteristic pattern for all areas of the Northwest Coast.
Figure 9

Profiles; Area One
Units G, J and L at 0North line
Figure 10
Profiles; Area Two
Units Q, P and M at 1 West line
CHAPTER 4

ARTIFACTS AND CULTURAL FEATURES

Introduction

The purpose of this chapter is to present the raw data obtained from analysis, and to provide the reader with a general summary of the cultural remains from the O'Connor Site. In order to view these data in a coherent manner and in such a way that meaningful groups can later be considered, a classification of the artifacts is necessary. That is, the specimens are ordered into homogenous groups or classes, in which all included specimens share certain specified attributes. These specified attributes are then the definitive characteristics for each class that is created. This classification is an organizing device (Dunnell 1971:46) whose main object is to present the data in a consistent and ordered form. The intent is not to set up an exhaustive typology within a particular artifact class.

As will be evident throughout, the following classification is largely based on subjective decisions as to which attributes and criteria will be used for class definition. Of late, many archaeologists have made an attempt, for the sake of scientific objectiveness, to proceed with their classification on a purely statistical basis. However, as Rouse aptly
comments on this attempt of some to rationalize the intuitive basis of classification, this is:

...based on vain hope, because statistical procedures are no better than the attributes to which they are applied, and the attributes must be intuitively formulated...
(Rouse 1972:46).

To be sure, Rouse also points out some of the several advantages of statistical methods, such as the fact that they permit the use of more attributes in the analysis and that these can then be manipulated more efficiently. The method of recovery and sample size obviate the possibility of using statistical methods in the present analysis. Although the attributes to be used may be subjectively selected, they must still be useful and meaningful in the final analysis. In the context of this thesis, the attributes are considered to be meaningful if they provide, in the end, the basis for a clear grouping of artifacts which will be useful in considering the overall cultural context at the site; and if they provide, in addition, a solid basis for future comparative work.

The following analysis primarily uses the general terminology and artifact classification scheme most often employed for midden assemblages on the Northwest coast. In the event that a particular group of artifacts does not coincide with a previously established class, a new class has been formed. When an established typology for a specific artifact class exists (e.g. McMurdo 1972 for barbed bone points) this is employed; again in an effort to facilitate comparisons.
In some instances miscellaneous classes have been formed. Each class is subsequently sorted into a number of sub-classes, and as stated earlier, there is no attempt herein to construct a typology. Although the concept of "type" is a much discussed archaeological issue of considerable importance, it will not be applied in this thesis. The term sub-class is adopted so as to avoid any lengthy theoretical discussion of types, modes etc.; and it is felt that for present purposes a separation of this sort is not only sufficient but has the advantage of being broad enough to afford flexibility.

Sub-classes are not generally established on the basis of raw material since this is the primary separation for discussion and few classes or sub-classes cross-cut this division. There is one exception; although a distinction as to kind of bone is not generally made, it is used when this is a major distinguishing factor within the class - for example, bird bone awls/perforators or beaver incisor tools. For the most part, sub-classes have for their bases of definition specific morphological traits. Different traits are, of course, selected for various sub-classes, and these are clearly outlined at the opening of each section.

There is a wide range of variation within many of the sub-classes, a variation which might reflect a functional difference, personal preference, socio-cultural patterning
of behaviour or a number of other possibilities. Particularly evident is a remarkable intergrading of forms, or range of variation, in the bone tool classes. This too will be discussed in some detail in the appropriate sections. It should be noted at this point however, that little effort has been made to split the sub-classes into successively smaller groups - a leaning, perhaps, toward a lumper position in the time honoured lumper-splitter opposition of anthropology.

Another apparent and recent archaeological trend is to avoid functional terms in the description of artifacts. This analysis follows that trend in many instances, yet heeds Gifford's remarks that:

...ethnological examples of diversity of form but identity of function should serve as a warning to the archaeologist not to stress objective types too strongly...

(Gifford 1940:155)

Nonetheless, when a functional term is a long-used and well defined one, or when function can be definitely ascertained, the term is accepted and used. Luebbers (1971:24) is undoubtedly quite correct in suggesting that purely descriptive terms such as 'pointed bone object' are insufficient in terms of distinguishing relationships between form and function. However, considering the wide diversity of forms within several of the classes, descriptive terms do, in fact, often seem the most appropriate and consequently are used here. This is not to say that function has not been suggested or inferred for each class and/or sub-class; it has, and recorded ethno-
graphic examples which may be pertinent are also noted.

It is axiomatic in all analytical work that a sample must be of a size sufficiently large to be representative of the whole... (Hodges 1968:76).

This statement brings attention to an additional problem which should be mentioned at the outset. The sample from the O'Connor Site was obtained judgementally on the bases mentioned in Chapter 3. The material dealt with in this analysis represents only a small portion of the total midden deposit; therefore, the sample is in no way one which has statistical significance in terms of the overall population size. This is not a suggestion that those artifacts and cultural features discussed are not significant, merely that probability statements of artifact frequency and distribution, activities represented etc. are not possible. Nevertheless, this does not deny generalized statements about cultural items, site utilization, particular artifact loci and so forth.

Related to this question of sample size, on a reduced level, is the size and condition of the artifacts themselves, for they too must adhere to the same conditions mentioned by Hodges. First, there must be a sufficient number of specimens to constitute a class or sub-class when one has not been previously established. Secondly, the artifacts must be in a condition complete enough to carry the diagnostic traits which allow them to be accurately placed in a sub-class. This second aspect is frequently a problem in the present analysis, and as such is one of the main reasons that sub-classes reflect
fairly broad and inclusive groupings. Again, this will be discussed when pertinent.

The above paragraphs are offered by way of introduction and a few final notes are necessary. All recorded measurements in the following pages are in millimeters unless otherwise stated, and indicate maximum length, width and thickness. When only two dimensions are given, the second figure represents the diameter of a round artifact. Figures in parentheses indicate an incomplete or fragmented specimen. Also, when numbers listed in the text or in tables refer to specific artifacts, these are the original catalogue numbers without the Borden (1952) site designation prefix of EeSu 5.

LITHIC ARTIFACTS

CLASS: Chipped stone [7]

Due to the small number of lithic artifacts which have chipping or flaking as their primary manufacturing technique, all such specimens have been subsumed under one class. The two sub-classes discussed below are likewise general, and are used for simple descriptive purposes rather than for definition of specific types.

sub-class a. Chipped stone bifaces: three

Figure 11a-e
Each of these artifacts was recovered from Area One in the water-logged basal deposits associated with Component I. All are manufactured of material which varies in quality, but which falls within the andesite/basalt range.

The first is of a poorer quality material than the others, and is the smallest of the three specimens (49.0 x 24.0 x 7.5 mm.). It is crudely fashioned and roughly leaf-shaped with a flat base which has been thinned by the removal of a flake on one face. The cross-section is almost flat.

The second artifact is leaf-shaped, and the dorsal face displays a small 'raised' area which has been ground smooth. This is the area of maximum thickness, and makes the piece almost plano-convex in profile. The edges are well-worn and smooth. (70.0 x 27.0 x 12.0 mm.)

The last piece is a (basal?) fragment of a crude biface which may have also been leaf-shaped. It is lenticular in cross-section and measures (6.0) x 32.0 x 9.5 mm.

Although it has long been suggested that minimal representation of a chipped stone industry was particularly characteristic of the central coast (e.g. Boas 1966:17, Drucker 1943:41), or at least that there was a relative difference in the use of chipped stone technology between the southern and
Figure 11

a,b    ground slate points

C-e    chipped stone bifaces
Figure 11

Figure 11
central coasts (Mitchell 1972:41), bifaces such as these are now generally accepted as being representative of an early tradition in this area. There are no absolute dates associated specifically with these specimens from the O'Connor Site, however there are similar well-dated counterparts nearby. At Namu for example, similar crude and leaf-shaped bifaces have been dated from the earliest depositional phase ca. 5850 B.C. to approximately 490 B.C. (Luebbers 1971:91,92), and Simonsen (1973:36) notes that "...one such (leaf-shaped) point occurs in the early component in association with matrix dating before 2200 B.P." at Grant Anchorage. Mitchell (1972:25-27) records similar points from sites in Johnstone Strait, and the Cathedral Phase sites in the Kwatna region are typically associated with them (Carlson 1971:42-43) as are several beach sites in nearby Quatsino Sound which have been assigned to the Early Period (7000 B.C. - 2000 B.C.) (Carlson and Hobler 1976:130-134).

More detailed discussion of chronological placement is presented in the following chapter.

sub-class b. **Miscellaneous chipped stone:** ten

Figure 12 a-e

Four of the artifacts included here are manufactured of the same basaltic material as sub-class a, five are
Figure 12: Miscellaneous chipped stone
quartz flakes and the last a quartzite specimen. Only one (Fig. 12d) is associated with the early component and all were recovered in Area One. A brief description of each follows.

#206 Figure 12a a small andesite/basalt flake which has been retouched on alternate edges of each face

#507 Figure 12b a primary flake with unifacial retouch on two edges; has snapped at the proximal end and in the process a small flake has been removed from the dorsal face

#300 Figure 12c a quartzite cortex spall or uniface with evidence of unifacial retouch or utilization on one edge; (may be fortuitous rather than intentional as it was recovered immediately under the surface)

#501 Figure 12d cortex spall or flake uniface which may have been utilized however the edges are well-worn and this cannot be accurately determined; this is the artifact associated with Component I

#745 Figure 12e a pebble which has had a flake detached from each face at one end, suggesting bipolar manufacturing technique; specimen has broken at other end

Not any of these are particularly diagnostic artifacts and similar specimens are a part of most prehistoric archaeological assemblages on the coast.

CLASS: Ground stone [11]

Once more, this is a generally defined and inclusive class and is used here as a basic descriptive division. All
included artifacts have grinding as their principal manufacturing technique, and some are also polished.

sub-class a. ground slate points: two

Figure 11 a,b

The extreme tip and one basal corner of the first specimen are missing, and the upper portion of one face has foliated and subsequently been re-ground. It is triangular in shape and exhibits bifacial facets or bevels on both blade edges. Dimensions are (59.0) x 22.0 x 2.5 mm. and it is associated with Component II in the excavation unit on the point. The second artifact is manufactured from poorer quality material than the first, and is severely damaged. Not only is the base completely missing, but the edges are fragmented. Because it too has foliated, only one face remains. It is triangular in shape and there is evidence of bevelling on the intact face. Area Two: (42.0) x (21.5) x (3.0) mm.

Although triangular ground slate points have been recovered from sites throughout the Northwest Coast, they do appear to be more frequently associated with assemblages in the southern parts of this region. None are recorded from Namu, Grant Anchorage or Fort Rupert, but Mitchell (1972:31) recovered one from the Johnstone Strait area, and further south on Vancouver Island they are present at the Sandwick and Courtenay River
middens (Capes 1964:31). Points such as these are particularly characteristic of the late prehistoric periods in the Fraser Delta (Stelax phase) and Gulf of Georgia (Montague Harbour III) regions (Borden 1970:110, Mitchell 1971:88). Triangular ground slate points are normally considered to be arming points for (slotted) composite toggling harpoons.

sub-class b. **celts**: four

Figure 13 a-d

The first two artifacts in this group are well-manufactured nephrite specimens which are rectangular in outline, and both are extensively polished on the surfaces. The first is bifacially bevelled on both edges and the bit, or cutting edge, is also formed by bevelling on each face. The poll is rough and displays no evidence of grinding. This roughness might be a result either of heavy battering or simply that it was intentionally unmodified. It measures (59.0) x 35.0 x 15.5 mm. and was recovered from Area Two. Although not as distinct, the edges of the second specimen are also bevelled. The poll is partially ground flat, and the cutting edge has been chipped, presumably through use. (67.0 x 40.0 x 21.0 mm; Area One)

The other two artifacts included here are manufactured on pebbles. Figure 13 c, from Area Two, is the largest of the four (70.0 x 44.5 x 20.0 mm.), and it exhibits a wide bit.
Figure 13: Celts
Figure 13

(a) [Image of an artifact]

(b) [Image of another artifact]

(c) [Image of a third artifact]

(d) [Image of a fourth artifact]
The sides taper slightly toward the poll which has been ground to an almost-flat surface. There are no faceted edges. The last artifact is badly fractured: most of one edge has broken from the bit, and the other edge, although partially chipped and broken, is well-ground and straight. A portion of the poll is also missing and the cutting edge is bevelled. Dimensions of this artifact are 69.0 x (35.5) x 18 mm. (Area One).

Celts of various sizes and forms are widely distributed on the coast. They are assumed to have been used as hafted adzes or as chisels and are the typical implements of the well-developed coastal woodworking industry. They may also have been used for working bone and antler. The celts recovered at Fort Rupert (Capes 1964:75) and those from Johnstone Strait (Mitchell 1971:31-32) are similar to the O'Connor Site specimens. The Namu specimens vary somewhat however, and Luebbers (1971:97) has divided them into two groups on the basis of surface polishing: those which are ground and polished and those with no surface polish. Interestingly, the only celts with such polish are considerably larger than the others from Namu and the EeSu 5 celts.

sub-class c. lignite pendants: five

Figure 14

The illustrated artifact is the most complete, and measures (36.0) x 13.0 x 9.0 mm. It is vaguely 'tear drop'
in shape and has a drilled perforation of 2 mm. in diameter. All the specimens were excavated in close proximity to each other (unit J, Area One, 90 - 100 cm. below surface) and were in an extremely deteriorated condition. Only one other artifact retains evidence of a drilled hole, but it is likely that all were originally of a shape similar to the more complete specimen.

No similar artifacts have been reported from this general area, however Simonsen (1973:44) does record one coal (lignite) bead from Grant Anchorage. Lignite artifacts, particularly labrets, have been excavated from several middens on the southern coast, and five perforated coal objects (one of which is similar in shape to Fig. 14) were recorded from the Buckley Bay Site (Mitchell 1974:91).

Figure 14: Lignite pendant
CLASS: Abrasive stones and slabs [53]

This class consists of all those stone artifacts which show evidence of utilization, on one or two faces, as an abrader. The class constitutes a large portion of the total lithic assemblage from the O'Connor Site, not a surprising fact in light of the very high percentage of bone tools which have grinding as their primary manufacturing technique.

sub-class a. shaped abrasive stones: sixteen

Figure 15 a-f

All the artifacts subsumed in this group are manufactured of a fine-grained greenstone, with the exception of two fine-grained sandstone pieces (Fig. 15 3,b), and all have at least two intentionally shaped edges. In most instances, both faces have been ground and utilized and there are few specimens which are not of a uniform thickness. The majority are either bar-shaped or rectangular with parallel edges, and all are broken.

Figure 15 gives indication of the range of variation with this sub-class. The most complete (Fig. 15 d) is bar-shaped with a biconically drilled perforation and flat surfaces; some are marked by one or two distinct surface depressions (Fig. 15c&f.), while still others have barely visible areas of use (Fig. 15 b).
Figure 15: Shaped abrasive stones
Figure 15
sub-class b. unshaped abrasive stones: thirty-one

Figure 16 a-e

Included here are all those abrasive stones which show no evidence of intentional shaping. Nine of the specimens are manufactured of the same fine-grained material as the shaped specimens and may therefore simply be fragments of the previous sub-class. The remaining twenty-two artifacts are predominantly manufactured of sandstone which varies considerably in coarseness. The majority of this latter group have been worked on one face only, but the extent of modification through use is highly variable. Some probably served specific abrading functions: for example, Fig. 16a has six well-defined grooves which would be most suitable for grinding small bone, or wood, points.

sub-class c. abrasive slabs: six

not illustrated

With the exception of one heavy granitic piece, all are manufactured of medium-to-coarse-grained sandstone and each specimen has been used on one face only.

The artifacts in this sub-class have been separated strictly on the basis of size and, like those from the Alberni area (McMillan and St. Claire 1975:44), are too large to be easily hand-held.
Figure 16: Unshaped abrasive stones
Table 1: Distribution of abrasive stones and slabs

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<th>Area Two</th>
<th>Point</th>
<th>Number</th>
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<td>-</td>
<td>16</td>
</tr>
<tr>
<td>b.</td>
<td>15</td>
<td>14</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>c.</td>
<td>3</td>
<td>-</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29</strong></td>
<td><strong>19</strong></td>
<td><strong>5</strong></td>
<td><strong>53</strong></td>
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Table 2: Abrasive stones and slabs

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<th>S.D.</th>
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<td>-</td>
<td>-</td>
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<td>14</td>
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<td></td>
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<td>21.18</td>
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<td>5.60</td>
<td>31</td>
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<tr>
<td>sub-class c.</td>
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<td></td>
<td></td>
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<td>13.53</td>
<td>5</td>
</tr>
<tr>
<td>weight</td>
<td>400.0 - 1075.0</td>
<td>740.0</td>
<td>289.72</td>
<td>5</td>
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</tbody>
</table>
Figure 17: Abrasive stones and slabs
Abrasive stones and slabs constitute a significant portion of virtually all archaeological assemblages on the Northwest Coast, and the unshaped variety are normally the most numerous.

BONE ARTIFACTS

CLASS: Barbed projectile points [7]

This class includes all barbed points manufactured of bone, which evidence some means of line attachment or hafting. It corresponds to McMurdo's Class 1: Harpoons (McMurdo 1972: 39). Although the classification here is more broad and general than McMurdo's, the type and sub-type designation from that typology are indicated in each instance below, and the same terminology for barb arrangement and shape, base shape and method of line attachment is used.

sub-class a. bilaterally barbed harpoons: one

Manufactured of sea mammal bone, this harpoon head has two asymmetrical open barbs at the head, and two
serrated or incised barbs which are broken, below these. The base is square, and there are bilateral shoulders for line attachment. It was excavated in Area Two and measures 99.0 x 18.0 x 5.0 mm. McMurdo, Type 1.

Capes recovered one bilaterally barbed harpoon from EeSu 1 which is not similar in form (four sets of barbs which are not serrated). It is associated, according to Capes (1964:76) with a date of 3325 B.C., however this association is not certain (Carlson 1970:17, Abbott 1973:6). Certainly it is unlikely that such an early date could be ascribed to the EeSu 5 specimen, for it lies undisturbed stratigraphically above several of the unilaterally barbed harpoons which are associated with a more recent date. The specimen in question has more morphological affinities with one from the Namu midden which has been dated to approximately A.D. 110 (Luebbers 1971: Fig. 10h). McMurdo (1969:94) suggests that in the Central Coast area the presence of bilaterally barbed harpoons does not necessarily indicate an early date as is often the case further to the north and to the south, but that both unilaterally and bilaterally barbed varieties appear at relatively early dates.

sub-class b. unilaterally barbed harpoons: four

Figure 18 c,d,g,h

There are only four specimens in this sub-class
complete enough to be definitely included. All are manu-
factured of land mammal bone, and all differ in form.

#655 Figure 18c This is a well-worked and polished
specimen. It has two barbs and an
indentation on the shaft which may be
a result of a third, broken barb which
has since been re-ground. There does
appear to be a notch for line attach-
ment, although this merges somewhat
with the constriction. The barbs are
both high, extended and isolated, and
the base is square. McMurdo, Type a/d.
69.0 x 15.5 x 6.0 mm.

#124 Figure 18d This artifact has three barbs, the first
of which is high and isolated; the second
and third are low and enclosed. The
extreme tips of the latter two barbs
are broken. There is a unilateral notch
for line attachment, but the base is
broken and shape cannot be determined.
McMurdo, Type II a. (72.0) x 13.5 x
6.5 mm.

#461 Figure 18g This largest specimen has two barbs,
one of which is broken. Because of a
marked constriction below the tip, it
appears that there may have originally
been a third barb which was broken and
subsequently ground smooth. The tip
is rounded and somewhat spatulate, and
the line attachment is a drilled hole
which is open on the barbed side due to
the ground and tapered shaft. The base
is broken. McMurdo, Type IV a. (104.5)
x 17.0 x 6.5 mm.

#729 Figure 18h This is a well-manufactured and highly
polished specimen with three barbs, the
first of which is high and enclosed,
and the other two are high, extended
and isolated. The tip is sharply pointed,
the base is square, and the specimen has a
shouldered line guard. McMurdo, Type
III a. 83.0 x 19.0 x 6.0 mm.
Figure 18: Barbed projectile points

| a, b  | fragments of barbed points       |
| c, d, g, h | unilaterally barbed harpoons |
| e, f  | small unilaterally barbed points |
| i     | bilaterally barbed harpoon       |
In addition to these four artifacts, there are two unilaterally barbed pieces which are missing the bases and any indication of method of line attachment. They therefore may not be confidently classified as harpoons, however in light of the fact that there are no fixed barbed points in the EeSu 5 collection, tentative placement with this sub-class seems reasonable. One artifact is antler and is discussed in a following section; the other (Fig. 18a) is manufactured of land mammal bone. It measures (48.0) x 15 x 4.0 mm., and has one low, enclosed barb at the tip, a second (broken) barb which was enclosed, followed by a third high enclosed barb. The specimen is broken immediately below the third barb.

There are three examples of butt ends only of unilaterally barbed harpoons, all of which still retain the method of line attachment. Each piece has a square base.

- #67 (28.5) x 10.0 x 4.0 mm. unilateral shoulder
- #660 (22.0) x 11.5 x 4.0 mm. unilateral notch
- #777 (51.0) x 16.5 x 6.0 mm. large open notch (shoulder?)

Similar harpoons are widely distributed throughout the coast in midden assemblages. Generally they seem to occur later in time than the bilaterally barbed variety, with the exception that in North-Central British Columbia they each appear at relatively early dates as already mentioned (McMurdo 1972:94). It is interesting to note here that although there
is considerable variety within this sub-class, only one fragmented artifact is manufactured of antler, and none of sea mammal bone. This is in distinct contrast to the specimens examined by McMurdo of which the majority were either of antler or sea mammal bone. Lack of availability of raw material does not seem a plausible explanation for the relative absence of antler at the O'Connor Site; it is a distinct peculiarity throughout the assemblage however, and as such will be further considered at a later point.

In terms of chronological placement, the earliest method of line attachment appears to be the unilateral notch (2590 - 1450 B.C. at Namu), followed by the notched line guard, unilateral line guard and unilateral shoulder, in that order. These last have dates of 1450-860 B.C. at Namu. Drilled holes are a later manifestation (McMurdo 1972:96). Considering the stratigraphic position and available dates at the O'Connor Site the unilaterally barbed harpoons also appear to be a more recent trait.

sub-class c. small unilaterally barbed points: two

Figure 18 e,f

These two unusual specimens, both manufactured of land mammal bone, resemble tiny harpoon heads. Each has a shoulder (for line attachment?), and a square base.
Figure 18e This artifact has a small hook-like barb or projection at the tip, and a second high, isolated, convex barb beneath it. The entire fragment is worked. 32.5 x 14 x 5 mm.

Figure 18f The second specimen exhibits only one low isolated barb, and the extreme tip is missing. It is flat in cross-section as the piece of bone has been split longitudinally and the narrow cavities are evident on the unworked dorsal face.

The author has not seen any archaeological specimens quite like these from the Northwest Coast, however they are similar in form and size to some ethnographic harpoon arrow tips from the Northern Coast (SFU Museum of Archaeology and Ethnography; Tlingit? arrow with tips).

CLASS: Awls/perforators [24]

This is a large class, and one of the few instances where a functional term has been employed for class description.

It was apparent that several groups of artifacts shared certain broad morphological traits which bound them together as a group; yet each of these groups in turn was sufficiently large in terms of numbers, and different enough in specific form to warrant separation on the sub-class level.
A descriptive term such as 'pointed bone object with tip circular in cross-section' would not only be most cumbersome, but the use of such a phrase is clearly not sensible when the word 'awl' has been used consistently in the archaeological literature to designate certain objects with a particular function. The use of 'awl/perforator' however, does not negate the possibility that the tool may have served more than one function. For example, ulna 'awls' have been shown in several instances to have been utilized as knives; but examination of wear patterns on tools included here, provide little evidence that this is the case. The distinguishing attribute of this class is that all have tips which are round, or nearly round, in cross-section; some display wear polish at the tip and/or the base of the shaft where held.

sub-class a. **ulna awls/perforators:** six

Figure 19a-e

This sub-class includes all tools manufactured of land mammal ulnae. Most appear to be specifically deer ulnae, however one specimen is very deteriorated (likely due to its deep stratigraphic position at 240-250 cm. below surface), and definite identification is not possible. Although there is considerable variation within this group, all tools are considered to have been used for a perforating function as the tips are all round or near-round in cross-
Figure 19: Ulna awls/perforators
section. Even the longest tool has no sharp cutting edge or evidence of use as a cutting or scraping implement. One fragmented artifact is included in the sub-class; the tip is missing, as is a splinter down the long axis from the tip. The remaining portion of the shaft is intact and is highly polished. The smallest specimen (Fig. 19 d) has a sharp tip which is ground and its length suggests that it may have been broken and subsequently re-ground for use.

Tips of ulna tools: twelve (not illustrated)

This group is not considered as a separate sub-class as it includes only incomplete specimens. Each is the tip of a land mammal ulna which has been ground to a point, and in all but three instances these show clear evidence of polishing. The majority are essentially round in cross-section, three are ground to form an acute angle at the tip, and one is vaguely spatulate in cross-section.

The length range for these ulna tip fragments is 20.5 - 90.0 mm. (mean: 48.87 mm.), and the width ranges from 7.5 - 18.0 mm. (mean: 26.66 mm.).
Ulna tools are common throughout assemblages on the coast. Drucker (1943:52) describes similar tools, and certainly they are recorded from all known excavated sites in the area.

sub-class b. splinter awls/perforators: seven

Figure 20a-g

These are tools which are manufactured on splinters of land mammal long bones. The extent of grinding and polishing along the shaft varies, and some (Fig.20 ) are particularly well-worked. All exhibit a well-worn and polished tip which is generally round in cross-section. All but two specimens are broken at the distal end. Again, these are perhaps one of the most common artifact types in all sites on the coast

sub-class c. bird bone awls/perforators: eleven

Figure 21c-j

Seven of these specimens are ground obliquely at the tip, and tip form ranges from a sharp point to a somewhat spatulate shape. The remaining four present a different form. The grinding has taken place so as to produce a tip with a small opening, and one which is basically round in cross-section. The diameter of the tip opening consequently
Figure 20: Splinter awls/perforators
Figure 21

a, b    bone needles
c-j    bird bone awls/perforators
Table 3: Awls/Perforators

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<td>34.90</td>
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<td></td>
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<td>(7)</td>
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<td>width</td>
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<td>1.85</td>
<td>(7)</td>
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<td></td>
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<td></td>
<td></td>
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<td>32.01</td>
<td>(11)</td>
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has a variable size as well (6-23 mm.). Only one artifact retains the distal end, and one is broken at the epiphysis; the others are all fractured. It is distinctly noticeable on five of the latter specimens that the distal fracture is oblique in nature. This appears to be a relatively common pattern on fractured bird bone pieces, and it would therefore seem likely that the form of the break determines, to a certain extent, the final size and tip shape of the tool. All but one are polished, and some quite extensively.

The artifacts in this sub-class may stand as an example of one tool serving more than one function. Although grouped here as 'awls/perforators', some may have been used as needles and some of the smaller examples perhaps as points or barbs for fish hooks.

Once again, these artifacts are regularly recovered from midden sites on the coast.

CLASS: Needles [2]

There are only two artifacts included in this class, and therefore no sub-class designation is required.
Both artifacts are highly polished and flat in cross-section at the head where there is a drilled eye.

#125 Figure 21b This specimen has a square end at the head, and approximately half way down the long axis of the artifact it becomes round in cross-section, continuing to a sharp round point. It is a well-manufactured symmetrical piece, with an eye diameter of 2.0 mm. 40.0 x 3.0 mm.

#38 Figure 21a The second specimen, manufactured on a bird bone splinter, is not as well made as the first. It is broken at the head, has not quite parallel sides, and the tip is also broken. The eye is 1.5 mm. in diameter. (31.0) x 3.0 mm.

Needles with eyes are commonly associated with midden assemblages to the south of this area (e.g. Marpole, Locarno and Stselax phases, Borden 1970; St. Mungo site, Calvert 1970 etc.), however these are generally larger than the O'Connor Site specimens, and often have oblong eyes which are gouged or incised. Interestingly, eyed needles are apparently lacking from other sites in the general Central coast locale; none are reported from Ft. Rupert (Capes 1966), Namu (Luebbers 1971), Grant Anchorage (Simonsen 1973) or Kwatna Inlet (Carlson 1972), or even from the west coast sites such as Port Alberni (McMillan and St. Claire 1975) or Yuquot (Dewhirst, pers. comm.).
CLASS: Deer metapodial artifacts [5]

There is no separation to the sub-class level for this class. All included specimens are culturally modified deer metapodials. Three have the distal epiphysis intact, one is broken at the epiphyseal end and the other is manufactured of the metapodial of a young individual and the epiphysis is missing.

Modification on three of the artifacts is in the form of polish at the top edges and naturally constricted tip of the metapodial. This polish could be the result of use as an awl or perforating implement. One tool (Fig. 22a) has been ground at the tip to a fine spatulate/square edge, and this is more highly polished than the previous specimens. The last specimen is altered only by the presence of four incisions on one face of the metapodial, and although the tip is broken there is no evidence of use as a tool.

Deer metapodials are frequently recovered from coastal sites, however often they are either unmodified or display polishing only with no abraded or incised surfaces. Capes (1964:76) records a "minute bone awl (?)" which, from the description, is similar to Fig. 22b. Capes suggests use for very fine basketry.
Figure 22: Deer metapodial artifacts
CLASS: Bone points [63]

This is the second-largest defined class in the present analysis, and as such it exhibits a wide range of variation and intergradation of artifact forms. Because of the remarkable diversification of forms, and the fact that the majority of the specimens are fragmentary, it was felt that a general and inclusive class grouping would best facilitate the objective of descriptive classification, and that subclass definition would then identify smaller groups which share more specific morphological traits. Therefore, the sole basis for inclusion in this class is simply any artifact manufactured on a splinter or section of bone which presents a single tip that has been worked to a point; naturally this absorbs numerous artifacts. The basis for subsequent separation into sub-classes is somewhat more difficult. The variation in length, width and/or diameter, tip form, shape of the base (when present), degree of polish and extent of overall modification is striking. Certainly some of the differences in particular attributes may reflect functional differences, however the author is inclined to believe that any isolated types or groups probably represent academic distinctions and are not necessarily indicative of specific functions or uses in the past. The following breakdown into sub-classes is purely descriptive, and the identified groups are certainly open to future modification or detailed typological analysis.
This class of bone points is considered to be equivalent in part, to Luebbers (1971:99-102) 'barb-points' and 'fish-hook barb-points' and to Dewhirst's 'unipoints' (1969:233), and although all included artifacts are likely parts of fishing (or perhaps hunting) gear, specific suggestions concerning function are put forward at the end of each sub-class discussion.

sub-class a. wedge-based bone points: seven

Figure 23 a-i

As the heading suggests, the characteristic feature of this group of artifacts is the shape of the base. The size is variable, but all specimens included here have a base which is thinned or wedge-shaped to a square butt when it is intact. All are basically excurvate in profile. Four of the artifacts (Fig. 23 a-d) are small (under 25.0 mm.), and of these two have sharp, polished points, one is somewhat more blunt, and the fourth is missing the extreme tip due to the state of deterioration. (Deterioration may be a result of its deep stratigraphic position of 200-210 cm. below surface.) The remaining three artifacts are larger, and although essentially flat in cross-section, the tips of two (Fig. 23 f,g) are rounded and polished. Four were recovered from Area One, one from Area Two and two from the excavation unit (F) on the point.
These artifacts are morphologically similar, (although the first four are smaller in size), to bone points which are usually assigned the function of arming tips for composite toggling harpoons. Interestingly, no valves for such harpoons have been recovered from the O'Conner Site. There is one possible valve preform manufactured of antler, and it seems probable that the absence of such artifact types may well be related to the small sample size.

Wedge based points have a wide distribution on the coast, from the Fraser Delta and Gulf of Georgia in the south, to Prince Rupert in the north. In the more immediate and comparable area, Simonsen reports eight such points (with only one valve) from the Grant Anchorage Site (Simonsen 1973: 48-52), and at Namu a number of 'barb-points' which are similar are recorded, but only two complete valves (Luebbers 1971:96-99). Mitchell (1974) reports toggling harpoon valves of both bone and antler from several sites in Knight Inlet; none were recovered from the Fort Rupert Site.

Table 4: Wedge-based bone points

<table>
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<th>S.D.</th>
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</thead>
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<tr>
<td>length</td>
<td>18.5 - 42.0</td>
<td>30.5</td>
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<tr>
<td>width</td>
<td>5.0 - 8.5</td>
<td>6.7</td>
<td>1.32</td>
<td>7</td>
</tr>
<tr>
<td>thickness</td>
<td>2.5 - 3.5</td>
<td>3.2</td>
<td>0.39</td>
<td>7</td>
</tr>
</tbody>
</table>
Figure 23

a-g  wedge-based bone points
h-n  miscellaneous bone points
sub-class b. **large bone points:** nineteen

Figure 24 a-j; Figure 25 j-0

This sub-class is distinguished from other bone points in the assemblage on the basis of size. Morphologically however, there is considerable variation and the included specimens can readily be separated into two groups.

The first group (Fig. 24 a-j) contains ten artifacts which characteristically have a flat cross-section and sides which are symmetrical in plane view. All are manufactured of sections of land mammal long bone, and the marrow cavity in most instances is all but erased through extensive grinding. Three artifacts (f,h,j) share an attribute worthy of mention: the base of each is broken in a notched fashion, either by accident or intention, and this notch has subsequently been ground on the inside edge. The overall effect is that the base appears to have a small tang, perhaps to facilitate hafting. There is no evidence however of other modification such as lashing marks or differential wear which would support such a suggestion. Neither is there any indication that these specimens were utilized as cutting implements and their size would seem to negate use as fish hook barbs. No exactly similar points are recorded from archaeological sites in the area. (Area One: 7; Area Two: 3).
Figure 24: Large bone points
Figure 25

a-i  miscellaneous bone points
j-o  large bone points
Figure 25
### Table 5: Large bone points

**CLASS:** Bone points

<table>
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</thead>
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<td>group 1</td>
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<td>group 2</td>
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<tr>
<td>length</td>
<td>(59.0)-(83.5)</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>thickness</td>
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<td>5.4</td>
<td>2.73</td>
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</table>
The second group in this sub-class (Fig. 25 j-o displays more variation. Cross-sections and tip shapes range from round to flat, and the degree of surface modification ranges from some specimens which are very highly polished (Fig. 25 j) to a piece which as severely deteriorated cortex (Fig. 25 o). Of the nine artifacts in the group, three are manufactured on bird bone; the others on land mammal long bone sections. Three of the specimens have particularly highly polished tips and may have functioned as awls or perforators. (Area One: 7; Area Two: 2).

sub-class c. miscellaneous bone points: thirty-seven

Figure 23h-n
Figure 25a-i

This sub-class subsumes the remainder of the bone points in the EeSu 5 assemblage which either retain their base or which are sufficiently complete that base shape can be inferred. It is this group of artifacts, more than any other sub-class, to which the introductory comments concerning variation of form apply. Diversification is great in every dimension and attribute, and because of the gradation of forms, no descriptive types or groups are isolated. With the exception of four bird bone specimens, all are manufactured of land mammal long bone splinters or sections. Fig. 23 (h-n)
shows ten points which are thinned and wedge-shaped at the basal portion, however other attributes such as base shape, cross-section profile and tip form vary. Fig. 25(a-i) shows another heterogeneous group of points included in the sub-class. Twenty specimens were recovered in Area One, sixteen in Area Two and one from the excavation unit on the point.

Diversity of form need not imply a similar variation in function. All specimens included in this sub-class were likely associated with the exploitation of riverine and maritime fish resources and could have functioned as composite fish hook piercing components or herring rake barbs. Some may represent drills, small awls or projectile points. Bone points form a major portion of most Northwest Coast midden assemblages.

Table 6: Miscellaneous bone points
CLASS: Bone Points

<table>
<thead>
<tr>
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<td>N=37</td>
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<tr>
<td>length</td>
<td>20.0 - 44.0</td>
<td>34.35</td>
<td>7.86</td>
<td>27</td>
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<td>width/diameter</td>
<td>2.5 - 7.5</td>
<td>3.9</td>
<td>1.25</td>
<td>36</td>
</tr>
</tbody>
</table>
Figure 26: Miscellaneous bone points
CLASS: Bipoints [92]

As with the previous class of bone points, the gradation of one form into another in this group is great. It is the largest defined class, and is similarly defined in a broad manner. All artifacts included are bone pieces which have been worked to a point at each end, and with the exception of three bird bone specimens, all are manufactured from splinters of land mammal long bone. Figures 27 and 28 give good indication of the variation exhibited in form. Not only does tip shape vary from facetted to round, and from a blunt to a very sharp point, but the overall shape varies considerably as well. The majority are asymmetrical in profile, and it is usually the larger specimens which are more regular, symmetrical and well executed. This may be a function of size in that it is undoubtedly easier to work a larger piece. Few artifacts have evidence of an intentionally manufactured medial constriction or notch, however due to the twisted nature of many of the splinters a number do have a naturally thinned area in the mid-section.

The diversity of particular morphological attributes poses a problem in classification, as the gradation from one to another is slight, and it is often difficult to chose an arbitrary yardstick with which to measure and separate. Even the basic distinction between bone 'points' and bone 'bipoints' is difficult at times. For instance, when does a
point with a distinctly tapered basal section and base cease to be called a 'point' and be termed a 'bipoint'? I expect that if a given number of archaeologists were presented with the total assemblage of 'points' and 'bipoints' from the O'Connor Site (and many others) for classification, one would receive as many such orderings as there were archaeologists. Nevertheless, the purpose here is to offer a satisfactory description of the artifacts in question, and a breakdown into two basic sub-classes is used. The separation is based on the degree to which each point on the artifact is developed.

sub-class a. undifferentiated tip development: fifty-seven

Figure 27a-z

This sub-class includes all bipoints which do not show any evidence of one tip being more well-executed than the other, or any signs of differential use. This is not to say that tip shape is the same at both ends: the shape is variable, as is the overall quality or extent of manufacture. The profiles of bipoints in this sub-class range from those which are spindle-shaped (three specimens) to others which display either a definite notch or worn area in the mid-section (10 specimens) to the remainder which have generally parallel sides and may be curved or straight. Two are manufactured of bird bone splinters.
Bipointed bone objects such as these are common to all midden assemblages on the central coast. All the Namu 'double ended barb-points' have identical tip development at both ends and would fall within this sub-class (Luebbers 1971:102).

Due to the fact that there is no differentiation in tip development, it would seem that both points were functionally equivalent and that these specimens were likely used as fish gorges or barbs for composite fish hooks which are fastened with both tips exposed.

sub-class b. differential tip development: thirty-five

Figure 28a-p

Artifacts grouped in this sub-class have as their defining characteristic one point which is more developed or finished than the other. Most often this differentiation is evidenced by one point being very much more highly polished than the other. This would suggest that both points were not of primary functional importance, as is the case with the previous sub-class, and that these artifacts could have been used in a number of ways.

Dewhirst notes a similar distinction with the Yuquot
artifacts, and in fact suggests that the only 'true' bipoine
are "...sharpened at each tip and indented in the middle..." (Dewhirst 1969:234).

Bipoints of many varieties are common in most midden assemblages on the coast. Those with medial constrictions are generally assumed to have functioned as gorges, while the others may have served a number of purposes such as barbs for composite fish hooks, arming points for projectiles or (with the smaller specimens) herring rake barbs.

Table 7: Bone Bipoints

<table>
<thead>
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<th>Attribute</th>
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<th>S.D.</th>
<th>No.</th>
</tr>
</thead>
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<tr>
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<td>N=57</td>
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<tr>
<td>length</td>
<td>23.0 - 95.0</td>
<td>39.6</td>
<td>14.96</td>
<td>47</td>
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<tr>
<td>width/diameter</td>
<td>2.0 - 7.0</td>
<td>3.5</td>
<td>1.06</td>
<td>57</td>
</tr>
<tr>
<td>sub-class b.</td>
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<td></td>
<td>N=35</td>
</tr>
<tr>
<td>length</td>
<td>22.0 - 72.0</td>
<td>37.3</td>
<td>14.04</td>
<td>29</td>
</tr>
<tr>
<td>width/diameter</td>
<td>2.5 - 6.0</td>
<td>3.6</td>
<td>0.95</td>
<td>35</td>
</tr>
</tbody>
</table>
Figure 27: Bipoints, undifferentiated tip development
Figure 27
Figure 28: Bipoints, differential tip development
Figure 29: Bipoints
There are 168 specimens which are not classified due to their fragmentary nature. The sole characteristic which binds all included specimens together is that they all have been intentionally ground to a point. Some are clearly tip fragments of points (of all classes identified here) and others are equally clearly portions of bone bipoints, some of which have snapped at a medial constriction or notch. However, if the tip is broken in any way the artifact does not then retain sufficient morphological characteristics to be placed confidently in any group other than this.

The diversity of dimensions and specific attributes which characterized both the point and bipoint classes is evidenced here as well. Nineteen of the fragments measure under 19.0 mm. in length (the smallest is 12.0 mm.) and the maximum length is 58.0 mm. Width or diameter ranges from 1.0 - 10.0 mm. Cross-sections of the shaft or body and of the tip vary, as does the tip shape, and the amount of modification or development is similarly diverse. Some display extensive grinding over the entire piece, while others are simple un-worked splinters which have a finely polished tip only.

The majority of these pointed fragments were likely fish hook barbs, fish rake teeth or fish gorges, and some may
Figure 30: Fragments, pointed bone objects
represent tip fragments of needles or awls. The frequency distribution of the specimens from Area One and Area Two is indicated in Fig. 30; the unit on the point produced five.

miscellaneous bone artifacts: [12]

All those complete or nearly complete artifacts manufactured of land or sea mammal bone which are singular in kind and do not fit into any particular class construct, are included here. A brief description of each follows.

#441 Figure 31a a long point manufactured of sea mammal bone (whale?) which has one section missing; roughly triangular in cross-section for most of the length although it becomes rhombic at the base which is squared-off; tip is rounded and there is some evidence of polishing; basal portion is 172.5 mm., tip portion 55.5 mm.; Area One

#778 Figure 31b a finely ground and highly polished split long bone object which measures 104.0 x 12.0 x 3.5 mm.; the tip is thinned and spatulate, and it resembles in shape Calvert's 'flesher' (Calvert 1970:62); local informants however suggest that such pieces were used as basketry/matting implements; two fragments in the miscellaneous worked bone section may be fragments of similar objects; Area Two
Figure 31e
worked whale bone which is rectangular at the squared proximal end and tapers very slightly toward the distal end where it is broken; several incisions/cut marks at this end may have weakened the piece sufficiently to cause the break (70.0) x 36.0 x 11.5 mm.; specimen resembles the handles of some archaeological and ethnographic examples of bark beaters; Area One

Figure 32a
the distal end of a deer radius which has been ground and bevelled at the end opposite to the epiphysis; 94.5 x 34.0 x 25.0 mm.; opening measures ca. 12.5 mm. have been used effectively as a haft; Area One

Figure 32b
land mammal long bone section which retains deep marrow cavity; the tip is ground and polished to a sharp point, and the other end, although pointed, is more blunt; specimen measures 71.5 x 10.5 x 6.0 mm. and is curved in cross-section; resembles some of the 'self-pointed' harpoon points recovered from several sites on the coast; Area Two

(not illustrated)
bone object which is roughly bipointed; thickest at mid-section and tapers to each broken tip; where cortex has not eroded, specimen is stained a darker colour than others and is polished; (56.0) x 8.0 mm.; unit F

(not illustrated)
specimen is manufactured on a section of land mammal long bone which, although it retains part of the epiphysis, is not identifiable; ground and highly polished on the inside face to form a flat surface which converges with other face at a sharp and spatulate tip; 5.0 x 13.0 mm.; Area Two

(not illustrated)
thick bone splinter which has been ground on two sides at one end to form a sharp, straight chisel-like edge; specimen is highly polished at this tip; 36.5 x 7.0 mm; Area One
Figure 31: Miscellaneous bone artifacts
Figure 31
Figure 32: Miscellaneous bone artifacts
#512 Figure 31c manufactured of bird bone, artifact is ground flat at the distal end; proximal end is broken, but one side is ground at an angle (ca. 45°) here; possible whistle fragment; 89.0 x 19.0 mm.; Area One, component II

#431 Figure 31d a large bird bone barb; ground at an acute angle to a sharp point at the proximal end; distal portion of the shaft is ground flat to facilitate hafting; curved in plane view; 95.0 x 8.5 mm.; Area One, component II

#801 Figure 32c a bird bone which is incised above a break at the distal end; incised and partially ground flat at the proximal end; possible drinking tube; (65.5) x 6.5 mm.; Area Two, component II

#346 (not illustrated) a finely worked and highly polished bird bone piece; extreme tip missing; probable pin or needle; (82.5) x 2.5 mm.; Area One, component II

Figure 32
miscellaneous worked bone: [186]

There are a large number of miscellaneous bone fragments, all of which have been culturally modified in some manner. This modification varies from pieces which are worked their entirety yet are too fragmentary to retain diagnostic traits which would allow even tentative placement in any specific artifact class, (e.g. some pieces undoubtedly fragments of bone points and bipoints but the tip is missing), to those which display evidence of grinding or abrasion, butchering marks, simple incisions or others which are polished through use and/or wear. Nine specimens resemble the basal portion of wedge-based bone points.

By far the largest portion of these artifacts are manufactured on land mammal long bone fragments or splinters; only fifteen pieces have been identified as bird bone, and approximately the same number are sea mammal bone.

Figure 33 charts the distribution of the worked bone specimens from Areas One and Two. The single excavation unit on the point produced fourteen such pieces, twelve of which were between arbitrary levels 2 and 7.
Figure 33: Worked bone
SHELL ARTIFACTS

CLASS: Ground shell [8]

Each of these artifacts is manufactured of large sea mussel shell (*Mytilus californianus*) and is fragmentary. All exhibit at least one edge which has been ground and bevelled on the interior surface to form a sturdy, and often sharp edge, and two pieces are similarly ground on the exterior surface. Only two specimens show modification in the form of abrasion on the exterior surface. One of these fragments measures (24.5) x (27.5) x 6.0, and if it were not for one small chip removed from the corner, the two ground edges would meet at approximately a 90° angle. Three fragments are severely charred and much less friable than the others, however there is no indication that they were intentionally burned. Fig. 34 is the largest specimen (65.5) x (45.0) x (57.5 mm.); the smallest is (21.5) x (7.5) x 3.0 mm.

Artifacts of *Mytilus californianus* shell are not uncommon on the Northwest coast. Complete specimens most often recognized are celts or adzes, points and knives. Fragmented specimens such as those from the O'Connor Site may represent portions of the above but would still function effectively as cutting or scraping implements.
No class or sub-class groupings have been employed for this portion of the EeSu 5 assemblage due to the fact that there are only six artifacts manufactured of antler, all of which differ from one another, and are fragmentary. All are associated with Component II, and with the exception of one piece, all were recovered from Area One. A brief description of included artifacts follows.
Figure 18b

A unilaterally barbed point fragment: four barbs and specimen is broken immediately below the fourth; barbs are high, extended and isolated; similar in size and shape to some of the bone unilaterally barbed harpoon heads; (60.0) x 14.0 x 4.5 mm.

Tip only of a small antler tine which has been ground and slightly polished; curved in cross-section; 48.5 x 6.0 mm.

Ground tip of an antler tine with the extreme point broken; 45.0 x 10.0 mm.

Single antler fragment; tip deteriorated and broken; grinding evident below deteriorated area; butchering (?) scars at base which is broken; (120.0) mm.

Antler fragment with incisions and cuts where it has broken at the base; the two tines are both broken and exhibit rough cutting or grinding scars; (103.0) x 26.5 mm.

Antler fragment which has been split lengthwise; upper portion has been ground flat on one side; tip ground to a rounded point making it plano-convex in cross-section; basal section unmodified; possibly a blank or preform for toggling harpoon valve; (62.0) x 10.0 x (6.0) mm.

Area Two

As a raw material for tool manufacture, antler does not appear to have played an important role in this region. No antler artifacts were recorded from the Fort Rupert Site, and further north at Namu only one possible pre-formed antler blank is mentioned by Luebbers (1971:96). One antler composite toggling harpoon valve, and an antler sleeve haft were found on the Johnstone Strait survey (Mitchell 1971:40). The Grant Anchorage Site yielded a similar number and variety of antler
artifacts to the O'Connor Site (Simonsen 1973:60). The Alberni Valley area however, which in many aspects shows strong similarities to the EeSu 5 assemblage, has a large antler assemblage, toggling harpoon valves being particularly well-represented. (McMillan and St. Claire 1975:54).

TOOTH ARTIFACTS


There is no sub-class separation for this group of artifacts, however there may be a separation as to kind of teeth. Two are fragmented beaver (Castor canadensis) incisor. Each has been ground at the bit to form a sharp chisel-like edge which also displays some lateral abrasion on the surface. Both were recovered from Area Two. Fig. 35d measures (24.0) x 8.0 mm. and Fig. 35f is (44.5) x 8.0 mm.

The two remaining specimens have been tentatively identified as porcupine (Erethizon dorsatum) incisor tools. They are similar to the beaver incisor specimens
in that they are also ground to an acute chisel-like edge at the bit. Each is broken at the distal end, and the smaller piece is split lengthwise but has no signs of abrasion or that the splitting was intentional. The larger of the two was excavated in Area Two, the smaller in Area One. Fig. 35c measures (23.0) x 7.0 mm., Fig. 35e is (53.0) x 5.0 mm.

Tools such as those included in this class have a widespread distribution on the coast, and are assumed to have been used primarily as incising tools and small woodworking tools, although as small chisels they may also have been used for working bone and antler.

CLASS: Tooth pendants [2]

No sub-class separation is employed for the two artifacts included in this class. The smaller of the two (Fig. 35a) measures 17.0 x 4.0 mm. It is a dog(?) (Canis familiaris?) incisor which has been ground to form two flat facets and a squared tip at the root end, and this area was subsequently drilled biconically to form a hole which is 1.0 mm. in diameter. The second specimen (Fig. 35b) is a very highly polished sea lion (Eumetopias jubata) tooth which is similarly ground, flattened, and biconically drilled at the
root end. The enamel tip has also been abraded to a small flat surface on both faces. Dimensions are 27.0 x 11.0 mm., and the drilled hole is 2.0 mm.

Tooth pendants are recovered from most coastal sites, although frequently they are notched or grooved to facilitate suspension rather than being drilled. In the Central coast area pendants such as these were recovered from the Grant Anchorage Site (Simonsen 1973:51), but Luebbers (1971) does not record any tooth artifacts from the Namu midden.

**miscellaneous worked teeth**: two

(not illustrated)

Both specimens are dog first mandibular molars, and each has been ground flat on the lingual (?) side of the enamel portion. There is no other modification present. Both were recovered from Area One, Component II. Again, culturally modified teeth of various sorts appear in many coastal assemblages, and Simonsen (1973:51) specifically records similar specimens.
Figure 35: Tooth artifacts

a, b  pendants
c-f  incisor tools
Table 8: Excavation units and artifact yields**

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<tr>
<td>A</td>
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<td>B</td>
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</tr>
<tr>
<td>C</td>
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<td>50</td>
</tr>
<tr>
<td>D</td>
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<td>26</td>
</tr>
<tr>
<td>E</td>
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</tr>
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<td>(F)</td>
<td>(2.20)</td>
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</tr>
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<td>G</td>
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</tr>
<tr>
<td>H</td>
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<td>55</td>
</tr>
<tr>
<td>I</td>
<td>2.30</td>
<td>65</td>
</tr>
<tr>
<td>J</td>
<td>2.50*</td>
<td>56</td>
</tr>
<tr>
<td>K</td>
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<tr>
<td>L</td>
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<td>AREA TWO</td>
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<td>66</td>
</tr>
<tr>
<td>O</td>
<td>2.30</td>
<td>68</td>
</tr>
<tr>
<td>P</td>
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</tr>
<tr>
<td>Q</td>
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<td>12</td>
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</table>

*tested an additional .50 m

---

Table 9: Breakdown of major artifact groups**

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<th>Industry</th>
<th>Number</th>
<th>Percent of Total</th>
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<td>Stone</td>
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<tr>
<td>Bone</td>
<td>576</td>
<td>85.3</td>
</tr>
<tr>
<td>Shell</td>
<td>8</td>
<td>1.2</td>
</tr>
<tr>
<td>Antler</td>
<td>6</td>
<td>0.9</td>
</tr>
<tr>
<td>Tooth</td>
<td>8</td>
<td>1.2</td>
</tr>
<tr>
<td>TOTAL</td>
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</table>

**excluding obsidian
Table 10: Distribution of artifacts* by area

<table>
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<th>CLASS</th>
<th>Number</th>
<th>% of total</th>
<th>AREA</th>
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<th>Two</th>
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</tr>
<tr>
<td>GROUND STONE</td>
<td></td>
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continued--
Table 10: Distribution of artifacts* by area

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* excluding obsidian
The obsidian assemblage from the O'Connor Site is discussed in a separate context from the main lithic industry and requires special consideration primarily for two reasons. First, this assemblage alone is larger than the total number of catalogued artifacts from the site, and as such represents an anomalous and noteworthy situation. Secondly, it is an unusual assemblage for its size in that few distinct diagnostic artifacts have been identified within it.

A total of 887 fragments of obsidian were recovered during the two seasons of excavation. The overwhelming majority of this sample is simply debitage; that is, there is little evidence of intentional retouch or utilization, and no indication of the manufacture of specialized tools. Microscopic examination revealed some pieces however, which do appear to have been worked or utilized, although such differences are often difficult to discern. Table 11 indicates the specific numbers of such pieces. Most specimens are very small, the largest being a cortex flake measuring 47.0 x 50.0 x 5.5mm.

These small obsidian flakes were encountered in both areas of the site and were also collected from the beach. Figure 36 charts the distribution of obsidian within the excavated units, and from this some general observations are immediately
TABLE 11: Distribution of modified obsidian flakes and flake fragments

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<th>D</th>
<th>E</th>
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TOTAL: 145 (16.3% of total obsidian assemblage)

NOTE: The length range of these specimens is 12.0 - 47.0mm, width range 7.5 - 50.0mm, and thickness range 1.5 - 15.5mm.
Figure 36

Distribution of obsidian
apparent. First, there is a noticeable difference in the total number of specimens recovered from each locality. This may be due in part to the larger excavated sample from the first area, yet a unit-by-unit comparison shows this difference to hold true. Specifically, the relative percentages for each unit are significantly higher in Area One. A second readily noticeable aspect of the distribution is that the peak of frequency in Area One lies between 110 and 190 cm. below the surface whereas Area Two in no instance produced obsidian at a depth greater than 100 cm. Since the excavated sample is not necessarily representative of the overall obsidian assemblage at the O'Connor Site, any attempt to account for these distributions with more than general suggestions would be unwise at this stage. Further discussion however is continued in Chapter 6 where other intra-site relationships are considered.

For many millenia obsidian has proved an important raw material for the manufacture of a wide variety of artifacts throughout the interior and coastal areas of British Columbia. Incidences of use vary, of course, not only from one locale to another but through time as well. On the coast most, if not all, excavated sites have produced cultural items of obsidian. The earliest component at Namu is particularly characterized by an obsidian microblade industry, and the sample from the site also includes a number of utilized and developed flakes, scrapers and gravers (Luebbers 1971:81-88).
Simonsen (1973:36,38) records miscellaneous chipped obsidian and fine scrapers from the Grant Anchorage site; two of the twenty-two artifacts from the nearby site at Fort Rupert were obsidian flakes (Capes 1964:72); and further to the south in the Courtenay/Comox area Capes (1964:61,62,64) records "tiny obsidian and quartz flakes in quantity". The intent here is not to enumerate all recorded archaeological occurrences of obsidian, but to indicate that it does show a widespread distribution throughout the central coast as in other areas.

Recently it has become possible to analyze and recognize obsidian from specific flows (e.g. Evans and Wilmeth 1971, Nelson et al. 1975). The information obtained from such analyses can provide the archaeologist with much valuable information, particularly in establishing trade routes or differential use of particular sources. Fifty-two pieces of the obsidian sample from EeSu 5 were submitted to Dr. Erle Nelson (Department of Archaeology, Simon Fraser University) for analysis by a technique known as 'energy-dispersive X-ray fluorescence' (Nelson et al. 1975). The specifics of this technique need not be elaborated here, but it was anticipated that the original source or sources might be discovered through identification of the samples' trace elements and subsequent comparison with specimens of known parentage. Forty of the analyzed fragments were from Area One, seven from Area Two and five from the beach below the latter area.
Results thus far indicate that the obsidian falls into two groups, neither of which corresponds to any presently recognized sources. These groups have been temporarily termed 'A' and 'B' by Nelson. On the basis of the distribution of known geological obsidian sources in relation to archaeological occurrences of obsidian from unknown sources, it has been suggested that a potential location of the 'A' and/or 'B' sources might be somewhere in the Coastal Mountain area of the mainland across from Vancouver Island (Nelson 1976: per. comm.). This possibility is lent support by the suggestion from Wilmeth (1973:39) that the unknown source for Namu 'group 3' obsidian is probably geographically closer to Namu than to the Rainbow Mountains. Certainly further survey, specifically oriented toward locating and recording additional obsidian sources, will be necessary before any concrete information can be obtained or any definite statements regarding trade routes etc. be made. In any event, it is interesting to note at this stage that obsidian analyzed from several excavated archaeological sites in the environs of Port Hardy (for example, Fort Rupert, Knight Inlet, the Courtenay/Comox area and Port Alberni) is either fully or partially of the 'A' and/or 'B' variety.
Data from the trace element analysis which are presently available are not conclusive. It is necessary to have a larger sample from both areas, particularly from Area Two, in order that any confident statement of general trends be made. Notwithstanding the discrepancy of the sample size however, a number of interesting points about the analyzed sample may be noted so long as the tentative nature of any statement be kept in mind. Whether these particular aspects would hold true with future analysis of a larger sample remains to be seen.

First, with the two groups 'A' and 'B' a potentially significant distribution exists. The thirty-nine specimens in Nelson's 'Group A' are restricted to those samples from Area One at EeSu 5 with the exception of two fragments from unit P, Area Two, and one beach fragment which also falls within this group. Area Two specimens fall, for the most part, in Group B. There are four Group B pieces in Area One however, and it is perhaps worthy of note that these are all from within the first 30 cm. of deposit. Interestingly, of the five specimens from the beach below Area Two, four are also Group B.

A second factor which has been noted on preliminary examination is that there is a definite difference in the quality of obsidian analyzed from EeSu 5. Samples range
from an opaque pitchstone-like variety to a glassy, translucent variety. At this time the distribution of obsidian fragments of differing qualities seems to be completely random. That is, there are quite widely varying qualities in each group, simply indicating non-preferential use of various qualities from the same flow.

Once more, it should be emphasized that these are preliminary (and in the latter case, subjective) observations and at this time no inferences about the possible changes in relative importance to the prehistoric population of either Group A or Group B, or the possible differential use of different source materials ought to be made. These distributions aside, the obsidian assemblage from the 0'connor Site represents an important aspect of the prehistoric occupation there by virtue of size alone. There is no obsidian source presently recognized on Vancouver Island. The nearest suggested source is on the adjacent mainland, and the closest known source is the Anahim Peak/Rainbow Mountain region even further to the east. Clearly the prehistoric occupants were taking some effort to obtain the obsidian, whether through trade or indirect exchange. Wilmeth (1973:49) has observed, 

... it seems reasonable that, in the absence of local sources of obsidian, distinct sources will be exploited only if no local substitute (e.g. basalt or chert) is available.
In the case of the O'Connor Site, several questions arise in this connection. Particularly: are there no suitable lithic sources available locally - that is, was there a need for the obsidian? and, assuming that such a need did exist, why were no well-manufactured tools or artifacts recovered from such a large collection?

In response to the first question, a variety of lithic resources are available in the area, though no vitreous materials such as basalt or chert. There is no major obsidian association with the early component at EeSu 5 as there is at Namu, so either the 'need' arose during the later occupation of the site, or there was no actual 'need' as such but at some point the obsidian became more easily accessible. The terms 'need' and 'use' ought to be distinguished. Certainly some of the obsidian flakes could have been usefully employed to cut and/or scrape fish, shellfish and some of the smaller waterfowl and land mammals, but generally they are too small to be used comfortably or effectively in this manner; the 'need' is therefore debatable.

As to the second question, one would logically expect that material which had been obtained through trade, or even through indirect exchange, was considered an important commodity and would have been utilized more fully. Perhaps
the lack of diagnostic tools or artifacts can be explained by the vagaries of the sample obtained that specific tools were indeed manufactured but the sampling of the site simply failed to produce them. This is not an entirely satisfactory explanation, yet until a detailed microscopic examination of the flakes is executed, and until the unknown sources are identified any comments or suggestions are tentative at best.

It is evident however, that an unusual situation exists at the O'Connor Site: there is a large collection of obsidian detritus, no known source of the material in the immediate vicinity, and yet only a small number of the specimens have been utilized or intentionally altered. The identification of obsidian sources corresponding to Groups A and B would certainly facilitate an explanation.

Table 12: Distribution of analysed obsidian

<table>
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<th>Locality</th>
<th>Group A</th>
<th>Group B</th>
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<td><strong>13</strong></td>
<td><strong>52</strong></td>
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CULTURAL FEATURES

Hearths and rock concentrations

The majority of features recorded at the O'Connor Site were identified as fire hearths, or the remains thereof. These hearths assume a variety of forms, but may initially be described as formations or concentrations of rock and fire-broken rock which are normally in association with ash and/or charcoal. In some instances charred shell and bone also accompany the feature. Much fire-broken rock was encountered throughout the midden in both Areas One and Two, however it is only those concentrations which could be isolated as distinct formations that were recorded as features. These hearths can be separated into three main forms:

a) well-formed circular fire hearths containing ash and/or charcoal
b) well-defined clusters of rock and fire-broken rock ash and/or charcoal in close association
c) scatterings of fire-broken rock which appear to be disturbed hearths

Four hearths are representative of the first variety. The first was exposed in Unit B at a depth of 80 cm. Within the rock formation and immediately around it, there is grey ash and highly fragmented clam and mussel shell. A second
such hearth (Fig. 37) was recorded from Unit H at 120 cm. It is of a similar size, but contains charcoal and ash with no shell. The third example is not complete, but a semi-circular ring of fire-broken rocks extends from the east wall of Unit I at a depth of 70 cm. The estimated diameter is 50 cm. and the ash and charcoal associations remain outside the feature. The last such feature was partially exposed in the northwest corner of Unit N at a depth of 50 cm. It has an estimated diameter of 60 cm. and bounds an area of concentrated clam shell, but has no ash or charcoal.

Eleven hearths are included in the second group. Four are well-defined circular clusters similar to Fig. 38. Each is intermixed with ash and charcoal, and two also have concentrated areas of fragmented mussel shell close by. The average diameter of these four is 70 cm. Two were recorded at 120 cm. in the excavation unit near the point; and two (one illustrated, Fig. 38) from Area One. The remaining seven features in this group are more variable. The hearth illustrated in Fig. 39 is a distinct cluster of rock and fire-broken rock mixed with charcoal and ash, and associated with it is an equally well-defined area of ash and highly fragmented shell. Both measure ca. 50 x 60 cm., and were exposed in Unit H at 100 cm. The remaining hearth features in this group vary in size from small clusters of ca. 40 x 40 cm. to one which measures 70 x 90 cm, at its maximum extent. All
Figure 37: Circular hearth
Area One, unit H, 120 cm below surface
Figure 38: Circular hearth cluster
Area One, unit I, 60 cm below surface
Figure 39: Circular hearth and ash feature
Area One, unit H, 100 cm below surface
are associated with greater or lesser amounts of charcoal and ash, and some have areas of fragmented shell nearby, although none are so distinct as that which is illustrated. All are associated with Component II in Area One.

Eight features fall within the last group, and are identified as scattered or disturbed fire hearths by virtue of their association with charcoal and/or ash. Again, all were recovered in Area One, Component II. There were large amounts of fire-broken rock scattered throughout the Area Two deposits but no distinct concentrations were isolated.

Other recorded rock features include two concentrations of particularly large rocks in Area Two units, for which there is no explanation, and three clusters of rounded and homogeneously sized rocks which are identified here as boiling stones. The latter were recovered from Units H and I in the lowermost portions of Component II.

There was no clear evidence of pits which might have been used for steaming or baking, but the circular patch of ash and charred shell in Fig. 39 may represent the remains of a feature such as this. No structural remains were encountered, and neither were there any features (e.g. post moulds) which might have suggested the presence of such remains.
Human remains

One disturbed burial was exposed in Unit F near the point at 80 cm. below surface. The vertebrae were complete and articulated, as were the flexed long bones of the right leg. The remaining skeletal material, although immediately adjacent, was scattered and several bones were totally absent. The skull was not present, yet the possibility that it lay outside the parameters of the excavation unit in the north wall should not be ignored. Both innominates were recovered, in a somewhat deteriorated state, and from these and the other remains the individual has been identified as a female, approximately 24 years old at the time of death (McKern: pers. comm. 1971). There was no indication of a pit having been used, and no artifacts were found specifically associated with it.

The only additional human remains identified are one third molar from Area One, and four fragments (?) representing one mature individual from Unit P in Area Two (Sheanh 1975:8,9).
Figure 40

Vertical distribution of major artifact groups for components Port Hardy I and Port Hardy II, exclusive of obsidian. Dashed lines indicate major discontinuities.
CHAPTER 5

CHRONOLOGY AND CULTURE CHANGE

The previous chapters offered a description of the physical stratigraphy, the artifact assemblage and other cultural features encountered at the O'Connor Site. Attention is now directed to the correlation of these data, with a view to delineation of some chronological order. It was established in Chapter 3 that those zones identified in the stratigraphic profiles from Areas One and Two were correlated with two main cultural components, one early (Component I), and one later (Component II). These components are now respectively termed Port Hardy I and Port Hardy II. Detailed discussion of these cultural components was postponed until this stage since the identification of each component is based on the presence, absence or relative frequency of particular artifact groups. The discussion will be facilitated now that the basic description is complete.

Stratigraphic positions of the major artifact classes and sub-classes within the EeSu 5 assemblage have been plotted along a vertical scale and are indicated in Fig. 40. The resultant distribution has provided the basis for preliminary identification and characterization of each component. At this stage it is advisable to emphasize that the occurrences
of some artifact groups are small, and should not be considered as necessarily representative of the total distribution within the site.

**Port Hardy I**

This earliest cultural unit, which corresponds to the shell-less Zones A and A-2, is evidenced by artifactual remains in Area One only. The characteristic assemblage is chipped stone, and is represented in this area by three crude leaf-shaped bifaces and a single uniface. In addition, one ulna awl is perhaps associated with this component, however there are no other bone tools present. No cultural features such as hearths were recovered.

Faunal remains, although not abundant, were an integral part of this zone. Fish remains generally constituted the largest portion of bone from each unit, succeeded in respectively lesser quantities by sea mammal, land mammal and bird bone. Actual amounts of faunal remains varied from unit to unit, and in most instances were not identifiable.

Presumably the presence of this non-artifactual bone material would negate an argument that poor preservation was responsible for, or could satisfactorily explain, the absence of a developed bone tool industry in these shell-less and often wet deposits. No doubt preservation is better in the upper shell matrices, however the possibility that a bone tool
industry was part of the prehistoric occupation at this level, and that the excavations have simply failed to produce evidence of it, should not be overlooked.

Although no artifacts or features were recovered in Area Two from the corresponding component, faunal remains were recovered in somewhat less quantity, but similar proportions to Area One.

Since 1968 comparable early assemblages have been identified at several sites on the Central coast. The Namu site easily provides the best-documented situation of an early non-shell midden deposit associated with a lithic industry only. The early component there is particularly characterized by obsidian microliths, but also present are large cores and core flakes, crude bifaces and obsidian and basalt detritus. Typical of this component is non-artifactual faunal material (especially fish remains) in context with the microblades, but no bone artifacts were recorded. This component has been firmly dated at 7190 - 5850 B.C. but Luebbers (1971:107) allows for the possibility that the component may persist until 4050 - 3050 B.C. There are morphological similarities between the bifaces from this deposit and the Port Hardy I component, however there are equally similar specimens from a later period at Namu dated from ca. 930 B.C. In terms of dating, precise morphological similarities of biface forms are perhaps not as significant as the coincident appearance at ca. 2590 B.C. of a
bone tool industry and the shell-bearing deposits which mark the termination of the early component. By comparison, the Port Hardy I component, although not containing a similar microlithic industry (but analogous in other respects such as faunal material, a shell-less basal deposit and no developed bone tool industry), could be chronologically assigned to a period pre-2590 B.C.

In the Kwatna Bay region to the north and east (Fig. 1), similar chipped stone assemblages have been recorded from several sites and are assigned to the Cathedral Phase (Carlson 1972:41). None of the artifact groups initially defined in this phase were from midden deposits but were recovered from beaches, sometimes in association with middens, and therefore no radiocarbon dates on in situ material are available. Carlson has placed this phase between ca. 4000 and 1000 B.C. on the basis of sea-level changes (Carlson 1972:43).

The McNaughton Site (ElTb 10) south of Namu has produced several chipped stone tools from an early black greasy deposit, as well as leaf-shaped points, crude bifaces, scrapers and obsidian from the beach in front of the midden (Carlson 1976, Pomeroy and Spurling 1972). All have been initially assigned to the Cathedral Phase (Carlson 1976:102,103).
At the Grant Anchorage Site, leaf-shaped points were also recorded from the earliest component, but these were associated with shell midden deposits dated at ca. 1530 B.C. (Simonsen 1973:75).

Closer to the O'Connor Site, Mitchell (1974) has recorded similar chipped stone points from a site in Raleigh Passage (EeSo 1) as well as from several beach sites which front midden deposits in the Johnstone Straits region (Mitchell 1969, 1972). From the latter group of sites Mitchell has arbitrarily selected a date of 1550 B.C. to separate 'early' and 'late' assemblages, however this separation applies only to that particular suite of C-14 samples and cannot be applied to the area as a whole. The bifaces and unifaces bearing closest resemblance to those at EeSu 5 appear to be dated between 4300 B.C. ±110 and 1690 B.C. ±110 (Mitchell 1974:41).

From these examples it is clear that a chipped stone industry, most often associated with basal non-shell deposits or with beach sites, is typical of early occupations on the Central coast, but by no means limited to this area. Fladmark's recent (1976) paleoecological model for Northwest Coast prehistory provides a sound explanation for what he terms an 'Early Lithic Period' as a distinct stage on the coast before 5000 years ago. The pre-3050 B.C. date is based largely on post-glacial sea level and climatic changes, and Fladmark suggests that during this period
...all coastal cultures are represented by simple lithic assemblages lacking ground stone ornaments or art work, and large shell-middens (Fladmark 1976:261). Full-scale midden deposits are all seen to occur post-3050 B.C., after which time there is a stabilization of sea levels and a consequent climax of salmon productivity.

Fladmark points out an important north-south cultural variation which corresponds to the effects of respectively higher and lower sea levels in the early period, and this will be considered later. It is the date for the appearance of shell midden deposits which is important at this point.

Hobler and Carlson (1974) offer a chronological division into three periods for the northern portion of the Central coast:

- Early Period 7000 - 4000 B.C.
- Middle Period 4000 - 1000 B.C.
- Late Period 1000 B.C. - A.D. 1800

The early period is seen by them to be represented only by the Namu Site, and although associated in general with a chipped stone industry, it is particularly typified by a microblade technology (Hobler and Carlson 1974:5). Included in the Middle Period are the Cathedral Phase sites as well as the earliest shell-bearing Namu deposit which is dated at 2590 B.C.
If the Port Hardy I component is to be fit into this temporal scheme, it must be excluded from the early component due to the absence of microblades, but it would have a restricted placement in the initial stages of their Middle Period. Such a restriction is based first on the fact that Port Hardy I is *not* associated with a shell matrix, and presumably corresponds reasonably closely to the Namu date of 2590 B.C. and Fladmark's date of 3050 B.C. for the first appearance of shellfish remains in midden deposits. Secondly, in light of radiocarbon dates associated with the later component at EeSu 5 which will be discussed shortly, the termination date of 1000 B.C. for this Middle Period is considerably too late in time to be associated with Port Hardy I.

In sum, the Port Hardy I component is minimally represented by a chipped stone industry, and there is possible indication of a bone tool industry as well. Faunal material constitutes an integral part of the component. The absence of a microblade technology would appear to limit the temporal span to a period somewhat more recent than ca. 4050 B.C. on the basis of comparison with the Namu Site, and its association with the basal non-shell deposits suggests a terminal date of ca. 2500 - 3000 B.C. A larger sample from the Port Hardy I component, preferably supported by radiocarbon estimates and/or additional sites in the immediate area with similarly early assemblages, is needed before the temporal limits can be firmly established.
Port Hardy II

The abrupt appearance of shell in the midden defines the separation between the Port Hardy I and Port Hardy II components. There is no evidence of a period of dislocation or non-occupation of the site but, rather, a gradual change is seen through the artifact inventory. New artifact groups emerge and there is an increase through time in both the numbers and variety of artifacts represented. These changes are indicated in the frequency graphs of the larger artifact groups and in Fig. 40. It is evident that while some artifact groups appear late in the sequence and occupy a temporally restricted position, others show persistence from the beginning stages of the component. Again, this may be a result of a small and unrepresentative sample.

The initial stages of this component correspond, in Area One, to the physical stratum identified as Zone B, and in Area Two to Zone B-2a. Both these zones are marked by the presence of fragmented clam and mussel shell, but generally in lesser amounts than the following layers. The early aspects of this component are seen to represent a period of transition, or at least adjustment to a new subsistence pattern, and alongside the appearance of shell, there is a concomitant shift in technology.

Chipped stone artifacts, especially small quartz flakes at the lowest levels, continue to be present, but in very
small numbers. Unshaped sandstone abraders and whetstones appear early and their presumed function in the manufacture of bone tools is substantiated by the simultaneous appearance of such bone tool classes as awls and points; all persist throughout the sequence. It is of interest to note here that the large bone points which were separated into two groups for description, show a similar separation in their vertical distribution. Those heavier, flat bone points have an earlier occurrence than the more slender variety; a fact which is perhaps functionally significant in light of a transition from a period which seems to have emphasized hunting (and fishing) to a later period with greater emphasis on fishing and the collection of shellfish. Antler artifacts also appear early in this component, but they too are limited in number and may not be typical.

Some hearth features and fire-broken rock are recorded from the early levels of this component, and their numbers increase through time as do the amounts of faunal remains.

The initial period of this component represents a subclimax adaptive stage in which new tool traditions are introduced. These become increasingly important to the more intense and complex cultural system which develops mid-way through the component. In Area One the change to Zone C is quite apparent, but in Area Two it is less well-defined and
the Zone has been termed B-2b. Both Zones display complex stratigraphic profiles with large pockets of shell, concentrations of sea urchin spines, barnacles, etc., and lenses of ash and charcoal. It is throughout these zones, in both areas, that the peak of frequency of artifact groups and cultural features is reached. It is a period of increased cultural growth and intensity, and the artifact traditions which are typical of the late prehistoric and early historic periods on the Northwest coast make their appearance. It is the beginning of the efflorescence of the well-known Northwest Coast subsistence pattern of maritime resource exploitation and adaptation.

Three radiocarbon estimates have been obtained from Area One, and the results are indicated in Table 13. Each of the dated samples was associated with a hearth feature in the lower parts of the Zone C deposit.

Table 13: Radiocarbon estimates

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Estimate</th>
<th>Unit</th>
<th>Depth</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>GaK-3901</td>
<td>590 B.C. ± 120</td>
<td>D</td>
<td>150 cm</td>
<td>charcoal</td>
</tr>
<tr>
<td>GaK-4918</td>
<td>740 B.C. ± 90</td>
<td>J</td>
<td>120</td>
<td>charcoal</td>
</tr>
<tr>
<td>GaK-4917</td>
<td>950 B.C. ± 90</td>
<td>L</td>
<td>145</td>
<td>charcoal</td>
</tr>
</tbody>
</table>

(all estimates are calculated on the Libby half life of 'C-14, 5570 years)
It is impossible to directly correlate the depth of deposit with the length of time it took to accumulate. However, these estimates date cultural features roughly below the mid-point of the Port Hardy II component, and it is to be expected that the opening stages of the component are significantly earlier in time.

These dates closely parallel that time when the full assemblage is represented; that is, the beginning of the cultural climax at the site. There are no absolute dates from Area Two and although differences exist between the two areas, a similar cultural development is seen on the basis of stratigraphic and cultural comparisons. At this stage chronological similarity is assumed also.

With few qualifications, the Port Hardy II component can be placed into Hobler and Carlson's (1974) chronological sequence for the Central coast. The early aspect of the component falls within the later part of their Middle Period (4000 - 1000 B.C.) which is marked by the appearance of abraders, adzes/chisels and bone tools (Hobler and Carlson 1974:7). There are some tool types which are included for this period in their scheme (such as barbed harpoon heads) which do not appear as early in the EeSu 5 assemblage, but generally the correspondence is close, and the separation date of 1000 B.C. between Middle and Late agrees well with
the radiocarbon dates for the O'Connor Site.

The later stages of the Port Hardy II component appear to relate only to the early half of their Late Period (1000 B.C. - A.D. 400). This limitation is based on the absence of certain artifact groups from the known assemblage at EeSu 5. Pecked and ground stone implements such as mauls, hammerstones, circular stones and the proliferation of adze/chisel blades are held as particularly characteristic of the later part of the sequence, and are not recorded at the O'Connor Site. Neither is there evidence of decorated objects or trade goods which would further indicate a late prehistoric or historic period, yet it would be unwise to suggest that the A.D. 400 date marked the termination of site occupation.

In summary, although the Port Hardy II component can be separated into an earlier and a later manifestation, it is here perceived as a single cultural unit. Sometime after ca. 3000 B.C. the component represents a culture of low intensity which has begun to exploit shellfish resources for the first time, and a general increased reliance on marine resources is evidenced in the artifactual and non-artifactual remains. Through time the cultural 'tempo' increases, and around 1000 B.C. the culture begins to approach the ethno-graphically well-known Northwest coast pattern of cultural development.
Intra-site relationships

The preceding remarks concerning the Port Hardy II component have generally applied to the site as a whole, and for the most part Areas One and Two are quite comparable. Table 10 indicated the distribution of artifacts from each area, and although there are some groups which are exclusive to one area, the differences are considered at this point to be most reasonably explained by the sampling bias and size. As mentioned, the temporal span for Port Hardy II is assumed to be similar in each area, but radiocarbon dates would be needed to accurately establish a chronological correlation. For the earlier Port Hardy I component, there is no artifactual evidence in Area Two, yet it may be represented there as well.

Faunal remains from unit G, Area One and from unit P, Area Two have been analyzed (Sheanh 1975). The relative percentages of mammal: fish: bird remains correspond closely in each area, but differences are shown in particular families or species represented in each unit. Although there is an apparent separation of land and sea mammal in the two areas, faunal remains from these two units alone cannot be considered as representative of the larger excavated areas, and the author is reluctant to attach much significance to the distributions of certain species without further analysis.

Limited analysis of soil samples from each area did not indicate any appreciable differences (J. Williams, pers.)
comm.), and the variation in the obsidian assemblage has been discussed previously.

It is not at all clear how the unit near the point relates to Areas One and Two, particularly because excavation there was not completed and it is not known whether the deposits were initially laid down on a bedrock formation as in Area Two or on gravels as in Area One. The only two ground slate points recovered were from Area One and unit F, however this may be fortuitous, and certainly proximity alone is not sufficient to establish a special relationship between the two.

For now, all areas of the site are considered to be culturally similar. It would be most worthwhile to conduct intensive analysis of both faunal and soil samples from each area for, aside from further excavation or radiocarbon dates, these are the sole means of identifying site-particular differences.
CHAPTER 6

SUMMARY AND CONCLUSIONS

In the study of a culture which was known to have utilized an enormous quantity of wooden artifacts and to have consumed much fish oil, rendered away from the immediate site of occupation, we are hampered in our archaeological inquiries (Hester 1969:33).

The data and information on prehistoric lifeways obtained from archaeological investigations are generally limited in several respects, and the Port Hardy investigations are no exception. Certainly the problems mentioned by Hester concerning the lack of preservation of some of the vital cultural 'ingredients' and the fact that many activities which were an integral part of the cultural system are not represented at a single site, are applicable to the present study. Add to this a small excavated sample of the already-limited cultural remains, and it becomes clear that the distinctive features of the culture and its particular adaptations will be only dimly reflected in the artifact inventory.

Yet another problem involved with the understanding and explanation of the cultural adaptation and specialization at one particular site is that a great many of the artifacts and features which do remain are ones which exhibit little change
either through time or space, and therefore are not particularly diagnostic or characteristic of that site. For example, it was noted in the previous chapter that abraders and a variety of bone tools appear early in the Port Hardy II component and persist unchanged through time but, this is not unique to the O'Connor Site. It is the general pattern for a good portion of the coast during that time since most cultures displayed similar adaptations to a maritime environment and resource exploitation.

Technology, economy and subsistence

Keeping these cautionary remarks in mind, we can now briefly sum up what is known, and what can be inferred, about the cultural activities at the O'Connor Site from the artifactual and non-artifactual record. Those tools and implements involved in food procurement are most numerous and clearly reflect the maritime resource exploitation of the later parts of the Port Hardy II component. The preponderance of bone points and bipoints were undoubtedly utilized as fish hook barbs and gorges; the larger specimens for cod and halibut, some of the smaller ones as trolling hooks for salmon, and still smaller ones as barbs for herring rakes. The harpoons in the assemblage may have been used for salmon, although their size suggests a more probable use for sea mammal hunting. Those items such as baskets or digging sticks which would have been used in the collection of shellfish or harvesting
sea-weeds, roots and berries are not preserved.

Tools for food preparation or processing are few. Hearths, concentrations of boiling stones and so forth, in association with fragmented and often charred shellfish remains present some evidence of preparation methods. The ground shell, and perhaps obsidian flakes, could have served as efficient cutting tools.

Manufacturing tools such as abraders for grinding and shaping bone tools, celts and incisor tools for carving bone, antler or woodworking, awls or perforators, and bone points which may have been utilized as drills are all well-represented at the site. Pendants are the sole items of personal adornment.

Another notable feature of Kwakiutl manufacturing was that the product had precisely pre-planned dimensions and functions....All of the objects of Kwakiutl manufacture, spoons, blankets, houseboards, canoes, boxes, baskets, fishhooks, fish traps, pack straps and so forth were,... standardized products. (Codere 1950:18)

The wide range of variation which was observed in artifact groups, particularly bone points and bipoints, would seem to contradict this statement. Boas indeed recorded very detailed descriptions of the precise manufacturing processes of such pieces as bone bipoints (Boas 1909:486), however there is little evidence of any standardization of dimensions in the EeSu 5 assemblage.

Although most raw materials used in the manufacture of
tools and other artifacts recovered at the site are readily available locally, there are a few exceptions. The ground shell artifacts are manufactured on *Mytilus californianus* which is found only in the intertidal zone on the open coast. Access to this resource however, would not have been difficult in light of the fact that there were trails to the west coast and that the adjacent waters of Queen Charlotte Strait were periodically crossed as noted in Chapter 2. Whale bone would not normally have been available in Hardy Bay, but this too could have been easily obtained from the west coast, or even occasionally recovered from a carcass washed ashore nearby. The most noteworthy 'exotic' material at the site which could only have been obtained through trade or indirect exchange, is obsidian and this has been discussed in an earlier section.

As mentioned previously, faunal analysis has been carried out on only two units, and at this stage no definite statements concerning preferential exploitation of particular species or groups can be made. The initial results do indicate clearly the greater reliance on fish as compared to mammals and birds; from the two units a total of 84.6% were fish (not identifiable as to species but ratfish, spiny dogfish and salmon were recognized), 12.20% mammal and 3.13% bird. Of the mammals, Blacktail deer and domestic dog are most well represented, followed by a variety of other land and sea mammals in lesser quantities. There has been no analysis of the shellfish
remains, but the midden matrices indicate without doubt that there was a primary orientation to the utilization of both fish and shellfish resources. The proportions of one to another are not established. Fladmark (1976:52) suggests a position for shellfish of 8 (out of 18) in ranked value of faunal resources for the whole coast. These place behind salmon, halibut, herring, 'other' fish, sea mammals, eulachon and bear respectively. More analysis is needed before these positions could be corroborated for the O'Connor Site.

**Seasonality**

Some suggestions can be made and some inferences drawn concerning the seasonality of the O'Connor Site. First, it is safe to assume that the site does not represent a winter occupation. There are no massive shell-midden deposits, structural remains or art/ceremonial objects which would provide archaeological indication for such a seasonal occupation.

Fish such as cod and halibut are generally available throughout the year, as are shellfish, mammals and seaweeds. The first salmon available in Hardy Bay are the creek or 'treaty' sockeye which appear around late April. Various species run through the summer into fall when there is often a Coho run as late as November in the Quatse River. Sheanh (1975:12) suggests that the presence of sea urchin remains may indicate a late spring occupation due to their ease of collection during the low tides that time of year.
There is no indication of the relative importance of berries as a food staple at the site, but a wide variety are abundantly available there in the latter part of the summer and the early fall.

In all, the question of seasonality must be left open. The site appears to have been occupied continuously, or repeatedly, on a presumed seasonal basis, anytime from late spring through to the fall. During that period all the fauna for which there is evidence at the site were available.

External relationships

Comparisons drawn throughout this thesis have been largely restricted to the Central coast region as defined in Chapter 2. The data base from the O'Connor Site is too sparse to make any conclusive statements regarding cultural affiliations on the Northwest Coast as a whole, nevertheless some problems and notes concerning certain relationships ought to be pointed out in summary.

The affiliations of the Port Hardy I component are the most difficult to establish. The component has been chronologically placed within a stage corresponding reasonably closely to Fladmark's pre-3050 B.C. 'Early Lithic Period'. Fladmark observes a north-south geographical division within
this period: to the north the period is recognized by the 'Early Coast Microblade Complex', and to the south by a 'Lithic Culture Type', (Mitchell 1971) and he states that

...these technological systems appear to be separated between Johnstone Straits and the south end of Queen Charlotte Sound.

(Fladmark 1976:259)

Hardy Bay opens onto Queen Charlotte Strait, in the middle of this rather extensive dividing line, and the O'Connor Site cannot therefore be associated with either group on a geographical basis alone.

During this pre-3050 B.C. Lithic period, sea levels in the northern area were higher than at present and the diminished land resources are reflected by a cultural adaptation which emphasized sea mammals and fish with a well-developed microblade technology and little emphasis on bifacial flaking. To the south, lower sea levels and a consequent exploitation of land and littoral resources are evidenced by heavy bifacially chipped points and no microblades (Fladmark 1976). In terms of the present artifactual evidence the O'Connor Site has closer affiliations with the 'Lithic Culture Type' of the southern inner-coast; however, the relative proportion of fish and sea mammal bone as compared to land mammal bone in the Port Hardy I component may shed some doubt on such a south coast association and link it more strongly with the partially similar Namu assemblage which is included in the northern area. The Namu sea-level curve reflects an inter-
mediate position (Fladmark 1976:168) as do the artifactual and non-artifactual early assemblages there. In the absence of data on sea-level changes for the Queen Charlotte Strait area and without a larger representation of the Port Hardy I component, statements about early cultural affiliations or relationships cannot be made.

In terms of the Port Hardy II component, most artifact types can be directly matched in midden assemblages from the southern Northwest coast at the Ozette site and Puget Sound/Strait of Georgia areas, northward to Prince Rupert Harbour and southwestern Alaska. It would serve no point to reiterate or to list new examples of specific similarities throughout the region. Nevertheless it should be noted in conclusion that in spite of the overall similarities in assemblages, the frequency with which specific artifact forms are encountered at any one site varies according to the particular resource or resources which were being exploited.

**Future research**

Despite the fact that archaeological research on the Central coast has progressed rapidly since 1968, the number of excavated archaeological assemblages is still relatively small, especially on the north end of Vancouver Island. Some sites and some localized areas have well-established
temporal sequences (e.g. Namu, Kwatna Bay), however no comprehensive regional cultural/chronological sequence has been formulated. One of the immediate priorities for the area should simply be to increase the data base through more excavations. Subsequent detailed description and chronologic placement of the additional artifactual and non-artifactual assemblages would then permit accurate suggestions to be made with regard to cultural relationships, both temporal and spatial, within the area.

The specific directions which future investigations take will undoubtedly vary according to individual research interests. Throughout this particular project several problems, some site-specific and others of a more general nature, have emerged and brief consideration of a few of these may shed light on directions for future work in the area.

Several years ago Conover (1972: 303) stated in conclusion to a discussion of settlement reconstruction at Namu, that

...the immediate goal should be resolution of the vague status of the region's most ancient, and probably non-shell, deposition....

This problem of the 'status' of the earliest cultural components on this part of the coast has, as yet, not been satisfactorily solved. It would be of interest to focus attention on the Namu area southward to Queen Charlotte Strait/Johnstone Strait, in an attempt to identify the early affiliations of the sites
in this apparently intermediate region. The location of sites similar to Namu where the oldest deposits are raised well above the present water table would be advisable in order that the problems encountered with the wet basal deposits at the O'Connor Site might be avoided. If such sites are excavated, and well-dated, the southern extent of the microblade tradition associated with the northern aspect of Fladmark's Early Lithic Period might also be determined.

Midden investigation in other areas, notably California, over the past twenty-five years has developed various sampling and analytic strategies directed particularly toward the environmental/ecological understanding and interpretation of past cultures. In many ways the Bella Bella Project took direction from these studies, incorporating some ideas, innovating others. Their research design provides a good basis for work in the area, mainly through sampling procedures and the fact that, to date, it is the only excavation in the area which has produced a thorough analysis of major non-artifactual site constituents. The excavations at Namu emphasized site stratigraphy as the primary indicator of habitation patterns (Conover 1972, Luebbers 1971), and their suggestion for midden sampling was to locate two main trenches, one following the long axis parallel to the shore through the centre of the midden, and a second cross-cutting it on the short axis or width. This would appear to be a highly efficient means of obtaining a variety of data, and depending
on the dimensions of the trenches as large a sample as is deemed necessary can be obtained. There are other equally important advantages of such a system, not the least of which is that these trenches would provide the best exposure and stratigraphic information on the physical and cultural depositional history of the site. This is not a suggestion that all middens should be excavated in this manner, for certainly logistic restrictions or the specific problems and questions at hand will determine the method of sampling at any one site. It is, however, an effective sampling design and worthy of consideration for future use.

For a major part of the prehistoric period on the Northwest coast the economy was based on a seasonal exploitation of resources similar to that of the ethnographic pattern. If a variety of sites in several different locales or micro-environments were to be excavated, it might prove possible to identify and isolate specific seasonal occupations. One would expect that the local distribution of these sites will reflect the actual resource utilization. It would be valuable to note any differences in frequencies of certain artifact types from site to site as they too may provide a key to seasonality.

The problems and questions issued from the excavations at the O'Connor Site and this research may be unique, or may
be characteristic of the area as a whole; they will, however, be settled only with further excavation. Research on the north end of Vancouver Island must be hastened though, for commercial and industrial development is rapidly eliminating archaeological resources there.
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