A PLACE WITH A VIEW:
GROSWATER SUBSISTENCE-SETTLEMENT PATTERNS IN THE GULF OF ST. LAWRENCE

SYLVIE LEBLANC

A PLACE WITH A VIEW: GROSWATER SUBSISTENCE-SETTLEMENT PATTERNS IN THE GULF OF ST. LAWRENCE

by
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ABSTRACT

In this research, I approach the reconstruction of Groswater subsistence-settlement patterns by examining the mobility patterns of the Groswater people in the Gulf of St. Lawrence area. Based on regional lithic and faunal resource distribution, a predictive mobility model is proposed. The model suggests that the acquisition of Cow Head cherts and the harp seal migration routes form the basis of Groswater mobility in the area. Data from seven sites are examined from the perspective of technological and intra-site spatial organization. The data support the proposed model.

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My last thank goes to Newfoundland, for its prehistory, the kindness of its people, and its beauty.

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CHAPTER 1

INTRODUCTION

The object of my M.A. thesis is to try to understand the subsistence-settlement system of the Groswater people within one geographical area: the Gulf of St. Lawrence. The Groswater subsistence-settlement system has been interpreted in different ways, in different environments, by different authors. To this day, no consensus has been reached on that matter and the general conclusions forwarded seem to be more speculative than really archaeologically substantiated.

I will be approaching the reconstruction of the Groswater subsistence-settlement system by trying to understand their mobility strategies within the area. Groswater mobility will be examined from two perspectives. The first one is predictive: based on regional lithic and faunal resources distribution in the study area. A hypothetical model of mobility will be presented. To assess the validity of this model, archaeological data will next be examined from the perspective of technological and intra-site spatial organization.

I will be looking more specifically at seven Groswater sites (Fig. 1): the Factory Cove, Phillip's Garden East and Cornick sites on the Newfoundland west coast; Saddle Island-Area F, in Southern Labrador; Blanc Sablon, Ile au Bois, and Wild Cove on the Quebec Lower North Shore.

The ultimate goal of this research is to try to elucidate the significance of the above mentioned sites within a regional context.

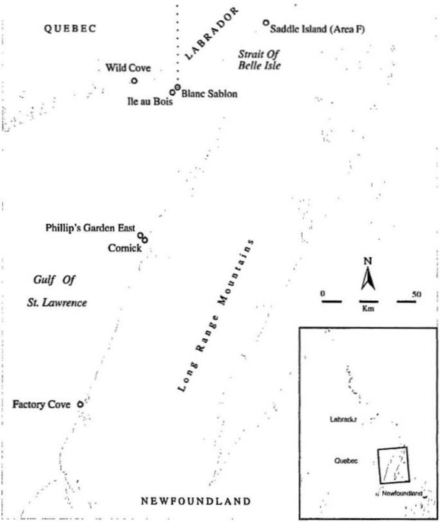

Figure 1. Site Locations in the Study Area.

CHAPTER 2

BACKGROUND

In the Eastern Arctic, the Palaeoeskimo sequence has been divided into two broad periods: Early Palaeoeskimo (ca. 4000-2500 B.P.; including the Pre-Dorset culture, 4000-3000 B.P.) and Late Palaeoeskimo (ca. 2500-650\500 B.P; Dorset culture). In Newfoundland, Labrador, and Quebec Lower North Shore prehistory, the Groswater culture is classified as the terminal manifestation of the Early Paleoeskimo or Pre-Dorset period (Fitzhugh and Tuck 1986:164) and is dated between 2800 and 2100 B.P.

Groswater people are known to have occupied virtually the entire Labrador coast, the island of Newfoundland and the Quebec Lower North Shore (Fig. 2). On the Labrador coast, most of the sites are concentrated around Groswater Bay, in Hamilton Inlet, and in the Nain area. In northern Labrador Groswater sites are less numerous, but a large component was identified at the northern tip of the Labrador Peninsula, at Nunaingok near Killinek (Archambault 1981; Fitzhugh 1980; Plumet and Gangloff 1991). Other sites have also been identified in Saglek Bay, Voisey Bay, Hebron, Okak and Postville (Cox 1977; Loring 1983; Loring and Cox 1986; Fitzhugh 1980; Tuck 1975). In Southern Labrador, Groswater sites are widely spread out along the coast, and Salmon Bay seems so far to be the westernmost Groswater location (Pintal 1994:157).

On the Island of Newfoundland, Groswater sites are found just about island-wide except for the Avalon Peninsula, which for some reason seems to have been generally avoided by prehistoric people. Groswater material is found on the northwest coast (Bishop

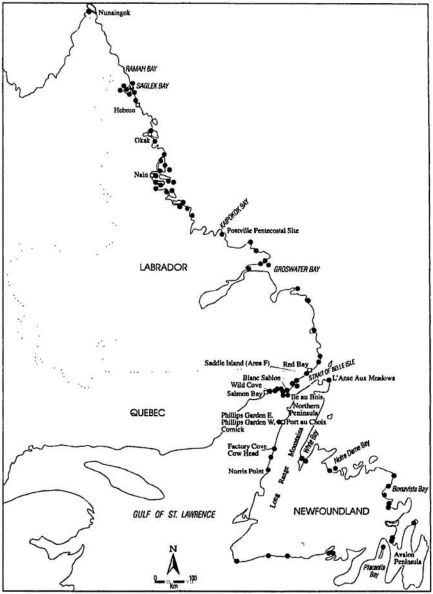

Figure 2. Groswater Sites in Newfoundland, Labrador, and Quebec.

1974; Renouf 1985, 1987, 1991, 1992, 1993; Tuck 1973, 1978, 1983a; Wallace 1990), the south coast (Linnamae 1975, Penney 1985), Placentia Bay (Linnamae 1971), Trinity Bay (Evans 1982, Robbins 1985), Bonavista Bay (Carignan 1975, 1977; Tuck 1983b; Sawicki 1983), Notre Dame Bay (Pastore 1982, Penney 1987), White Bay (Linnamae 1975, Thomson 1986).

The Groswater culture was first defined in the late 1960s by William Fitzhugh (1972:148-151) in the Groswater Bay area of central Labrador. There, seven sites dating from 2800 to 2200 B.P. led Fitzhugh to view Groswater as a distinct temporal and cultural unit on the basis of its technological tradition, site features, and settlement and subsistence patterns.

Following Fitzhugh's typological description, similar assemblages were identified in other parts of Labrador and in Newfoundland. In Newfoundland, Groswater material was first identified on the northwest coast at the Norris Point and Cow Head sites (Bishop 1974; Tuck 1973, 1978). Before that, most of the Groswater material went unrecognized and was often mixed with other Palaeoeskimo components, notably Dorset.

Before the present Groswater appellation was formulated, the Groswater concept went through a terminological imbroglio and was successively referred to as Groswater Dorset (Fitzhugh 1972), early Dorset (Bishop 1974, Tuck 1973), "typical Newfoundland Dorset" (Linnamae 1975) and, finally, Groswater without the Dorset (Fitzhugh and Tuck 1986). In the earliest years of research, as Groswater was believed to be historically linked with Dorset culture, the term Dorset was often used to describe the Groswater culture.

The Dorset label was dropped when it became evident that Groswater developed out of Pre-Dorset. Today, Groswater refers to the Newfoundland, Quebec Lower North Shore and Labrador expression of what Maxwell (1985:115-117) has called the transitional Pre-Dorset/Dorset.

As described by Fitzhugh (1972:148): "The entire lithic industry is microlithic and extremely varied in terms of the number of specific functional and typological tool types". The traditional Groswater lithic industry is characterized by plano-convex, box-based, side-notched endblades, circular and ovate sideblades, a large variety of bifaces, chipped and ground burin-like-tools, flared-end unifacial endscrapers and a large proportion of microblades (Figs. 3, 4, 5).

The typical raw materials used by the Groswater people are colourful fine-grained cherts. These high quality cherts often constitute more than eighty percent of the lithic assemblages and probably originate in the Newfoundland west coast Cambro-Ordovician deposits, which extend throughout the entire Cow Head area. Ramah chert and quartz crystal are also present in smaller quantities. Slate and soapstone fragments are also found at some sites.

Up to the 1970s, most of the Groswater collections were rather small, often consisting of no more than few dozen to a hundred artifacts (Renouf 1988:1) and no evidence had yet been found concerning Groswater architectural features. Loring and Cox's 1977 excavation at the Postville Pentecostal site, in central Labrador, revealed the first large Groswater component (about 2000 artifacts). At this site, two features were

Figure 3

First Row: Endblades
Second Row: Endblade Preforms
Third Row: Sideblades

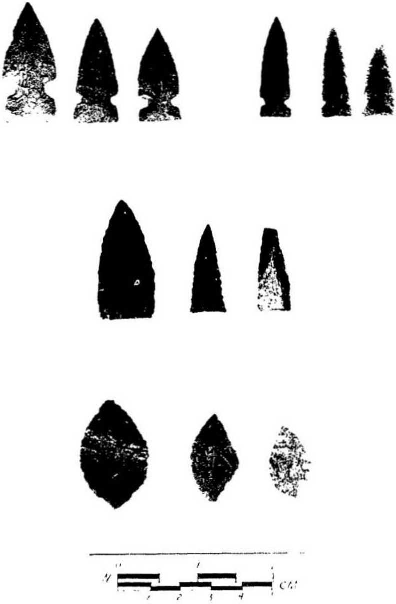

Figure 4

Bifaces


IN
CM

Figure 5
First Row: Burin-Like Tools
Second Row: Scrapers
Third Row: Microblades


IN.
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defined by stone slab pavement floors, both containing mid-passage structures and box-like hearths (Loring and Cox 1986). Additional mid-passage structures and box-like hearths were found. Mid-passage or axial hearth features made of stone slabs seem to be characteristic features of at least some Groswater culture sites (e.g. Postville Pentecostal site).

Subsequent research at the Factory Cove (Auger 1985) and the Phillip's Garden East and Phillip's Garden West sites (Renouf 1985, 1987, 1991, 1992, 1993) on the northwest coast of Newfoundland added to the understanding of the Groswater culture. Not only were these the largest Groswater sites ever found, they were also the first and so far the only Groswater sites with organic material preserved. These three sites also led to the discovery of a wider range of structure types. At Factory Cove, Auger excavated a possible bi-lobate structure, a tent ring and what he called a wind break (Auger 1985). At Phillip's Garden East and West, Renouf also described three circular dwellings, one of which was a well defined small depression that could possibly indicate cold-weather use (Renouf 1994).

The Groswater subsistence-settlement pattern is still not fully understood. Except for the few sites on the Newfoundland west coast, no faunal remains have been recovered and subsistence-settlement interpretations are generally based on site location and tool inventories. Fitzhugh (1972) provided the first discussion on the Groswater subsistence-settlement system. Based on his work in Hamilton Inlet, Fitzhugh interpreted the Groswater subsistence-settlement as a "modified maritime" system characterized by a predominantly coastal settlement pattern and a year-round exploitation of marine fauna (Fitzhugh 1972:161). Seal hunting at breathing holes and in open-water constituted the main subsistence activities. Caribou were an important source of clothing as well as a secondary food resource and they were hunted in the near interior. Fish and birds were also exploited seasonally. In general terms we have an inner bay/outer coastal subsistence-settlement pattern. Summers were spent at outer locations near the mouth of Groswater Bay, and winters in the more sheltered area of the Narrows.

Loring and Cox's (1986) excavation of the Postville Pentecostal site at the bottom of Kaipokok Bay in central Labrador, led to a different depiction of the Groswater subsistence-settlement system. Loring and Cox argued that the primary function of the Pentecostal site was to exploit interior caribou herds and some other land resources as well as harp seals as they enter the bay in their fall migration. Using Fitzhugh's settlement typology, Loring and Cox refer to the Groswater subsistence-settlement system in the Postville region as "interior maritime". This pattern still has a strong maritime component, but the economy is more mixed in nature and consists of a generalized winter adaptation to interior resources and a specialized maritime summer adaptation in the inner bay area. Winter settlements were to be found deep in the bays, fall and spring camps on the inner islands (Cox 1978:104). Summer months were presumably spent on coastal locations, in the inner bay area. In this model, the outer coastal zone does not seem to have been exploited. Consequently, for the Postville region, the model proposed is essentially an inner bay/inner island model.

This inner bay/inner island settlement pattern seems to have become the dominant model of the Groswater subsistence-settlement system (Tuck n.d:100). However, the data to support this model are rather ambiguous and the model was defined mainly on the basis of extrapolations from site location and resource availability evidence. It is also difficult to justify an inner bay/inner island model when we know that in the Postville area no sites were ever reported on any islands.

As pointed out by Kennett (1990:184), the Groswater subsistence-settlement system, at least for Labrador, seems to reflect more the state of the research than the cultural reality and seems to be closely tied to the interpretation of the Palaeoeskimo culture history of the area. When Groswater was believed to be linked with Dorset, the subsistence-settlement pattern was described as highly maritime oriented with use of the outer coastal zones. When Groswater people were later culturally affiliated with the earlier Pre-Dorset people, the subsistence-settlement pattern shifted to a more interior-adapted one.

This inner bay/inner island model is also proposed for most Newfoundland bays (Tuck n.d.:111), but looking more closely at site locations, both inner and outer locations were occupied (Fig.2). However, the Newfoundland northwest coast and the Quebec Lower North Shore present a singular pattern in which only outer coastal locations were used.

One such outer location is the Factory Cove site, on the west coast of Newfoundland, for which Auger suggests a "modified-maritime" subsistence-settlement pattern (Auger 1986: 114). The faunal data from the site show a major emphasis on seal hunting, but Auger also supposes that when seals were not available, people must have been secondarily dependant on terrestrial resources. Summer fishing could have occurred in the nearby freshwater rivers and the caribou herds of the Long Range Mountains could have been hunted during their fall migration to the south. Although Auger suggested that the site might have been occupied year-round, the faunal evidence for year-round occupation is lacking so this hypothetical model is not supported by data.

At the location of Port au Choix, the Phillip's Garden East and Phillip's Garden West sites have yielded both faunal and artifactual evidence and both sites have been interpreted as being seasonally specialized locations. Renouf (1994) has suggested that these sites were probably occupied during the spring for the primary purpose of exploiting the Gulf herd of the migratory harp seals.

On the Quebec Lower North Shore, Pintal (1994: 159) characterizes the Groswater subsistence-settlement pattern as focused on the seasonal exploitation of the coastal zone, including the islands. In this area, Groswater sites are found both on the mainland and on the adjacent islands. The faunal material is restricted to only two harp seal bones (1994 Pintal pers.comm.), but site function has been inferred both from geographical location and from the tool assemblages. Pintal suggests that the sites in this area were probably used from April to June, at a time "...when both adult and young seals were found in large numbers in the Strait of Belle Isle, in particular close to its north shore" (Pintal 1994: 159).

The history of research on Groswater subsistence-settlement exhibits two main trends. First, for the Labrador sites, hypothetical regional subsistence-settlement patterns were proposed, despite the lack of supporting evidence. The different subsistence-settlement patterns were then incorporated into a typological framework (modified-maritime, interior-maritime) in an attempt to generalize beyond the site or local level. Second, in the case of the most recently studied Groswater sites from the Newfoundland west coast and those from southern Labrador and the Quebec Lower North Shore, no one has really proposed a general subsistence-settlement pattern. Instead, most of the authors have worked at the site level, trying to get at individual site function. As yet, there has been no attempt to integrate the different Groswater sites within a general or more regional subsistence-settlement pattern.

This review of the main proposals concerning the Groswater subsistence-settlement patterns in Labrador, Newfoundland and Quebec Lower North Shore indicates that a consensus has not yet been reached. In any event, a general characterization of Groswater subsistence-settlement pattern may be inadvisable. Subsistence-settlement patterns are best defined at a sub-regional level in which local geographic and environmental variations can be incorporated. One of the primary goals of this research is to study individual sites within their regional contexts to define locally distinctive subsistence-settlement patterns rather than trying to characterize Groswater in terms of one very general pattern or adaptation type.

CHAPTER 3

MOBILITY STRATEGIES: PREDICTIVE MODEL

In this section, I generate a set of expectations for the Groswater mobility strategies in the Gulf of St.Lawrence area. These expectations link an hypothetical mobility model with the geological distribution of lithic raw materials and with the structure of food resources within the area.

Geological Context

For any cultural group who uses stone tools, the availability of suitable raw material is an important factor conditioning their mobility. From northern Labrador to southern Newfoundland, archaeological evidence suggest that the Groswater populations limited their use of raw material to only a few types: colourful fine-grained cherts, Ramah chert and a small quantity of quartz crystal. In most collections, fine-grained cherts clearly dominate and often account for more than eighty percent. A geographical boundary could however possibly be drawn from the Postville area and up, where both fine-grained cherts and Ramah cherts seem to have been used in more equal proportions (Loring and Cox 1986; Plumet and Gangloff 1991; Tuck 1975).

Ramah chert is found in the Ramah Bay area, northern Labrador, and the fine-grained cherts are believed to have originated from the Cow Head area, on the central west coast of Newfoundland. In Newfoundland and Labrador several other chert sources exist. Cherts are found in the Cape Mugford area, in northern Labrador (Gramly 1978; Lazenby 1980). In the Strait of Belle-Isle, cherts are present on the island of Belle-Isle in the Bateau (Botstock 1983:31) and White Point Formations (Botstock 1983:43). In the northeast portion of the Northern Peninsula, some cherts occur in the Hare bay area in the St-George Group (Williams and Smith 1983:115) and near Canada Bay in the Eddies Cove Formation (Cumming 1983:88). Some good chert locations are also found on the Port-au-Port Peninsula, in the Port-au-Port Group (Nagle 1985:91) and in Notre-Dame Bay in the Robert's Arm Group (Botstock 1988:22).

Although there are a number of potential chert sources in the study area, the Groswater people clearly preferred the chert available in the vicinity of Cow Head. This can be demonstrated because Cow Head cherts distinguished themselves from all the other chert types, chronologically and lithologically but particularly paleontologically.

Cherts found in the Cow Head area belong to the Cambro-Ordovician Cow Head Group (Coniglio 1987:813). These cherts formed during the Cambrian and Ordovician periods (570 to 430 million B.P.) and are easily identified because they contain radiolarians, deep-water planktonic animals that use silica to form their skeletons (Botsford pers.comm. 1995).

The geological history of the Cow Head Group goes back before 650 million years ago, at a time when the Canadian Shield and the Earth's other landmasses were part of the same super-continent. At about 650 million years ago, the super-continent started to break apart to create two separate landmasses: the North American plate and the Eurasian/African plate. The separation of these two landmasses created a large valley that was later filled with water to eventually become the Iapetus Ocean. At that time, the climate along the North American coast was tropical and in the warm waters of the Iapetus ocean abundant life forms started to develop (Burzynsky and Marceau 1995:20-26). Planktonic animals such as sponge spicules and radiolarians appeared at that time. These organisms lived, died and slowly rained down on the deep ocean floor of the Iapetus sea (Botsford pers.comm. 1995). Between 500 and 450 million years ago (Ordovician), the two continental plates started to move back toward one another, closing the Iapetus Ocean and forming another super-contintent, called Pangea. In reaction to these tectonic movements, sediments of the Iapetus ocean floor were then transported and pushed up on top of the North American continental sediments (Botsford pers.comm. 1995). These deep-water deposits rich in radiolarians are what we can see in the Cow Head area. Similar deposits have been reported in the Gaspé area (Botsford pers.comm.1995), around Quebec city (Codère 1995:79-99), and in the Temiscouata area (Chalifoux and Burke 1995:246). In Newfoundland and Labrador they are not reported in other areas.

Radiolarian cherts outcrop as beds throughout the whole Cow Head area (Fig.6). They go as far north as the Arches, south of Daniels Harbour, and southward to the Bonne Bay area. Most of the good beds are concentrated on the Cow Head Peninsula itself and around St-Paul's Inlet. North of Cow Head, many good exposures are also found around Parson's Pond and Lower Head. Down the coast, Western Brook Pond, Broom Point, Martin Point, Green Point, Lobster Cove Head are good deposits. Beds are also found at the bottom of the Bonne Bay and Bay of Islands fjord systems.

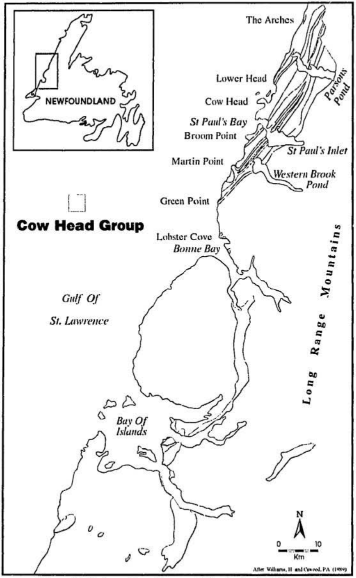

Figure 6. Outcrop Locations and Geological Setting of the Cow Head Group, Western Newfoundland.

At all these locations, the beds of chert tend to sit on top of limestone beds and are easily accessible at tide water from a number of shores. Around Cow Head, beds can be as thick as twenty, thirty and sometimes as much as forty centimetres (Botsford pers.comm. 1995). Cherts are found as pebbles, boulders or in primary position, in bedrock.

Cow Head chert is often stained with minerals that are found in deep ocean environment. Iron oxide will give reddish cherts; manganese black ones; copper oxide greenish ones; and glauconite blue-green ones.

Cow Head cherts are hard and display the conchoidal fracture which characterizes highly silicified cherts (1995 Botsford pers.comm.). The silica content (SIO^2) of these cherts can range from 65 to more than 90 per cent (ibid). They are relatively pure in texture with no internal fractures, which makes them fairly reliable and predictable to use. Cow Head cherts are brittle and break easily with a sharp edge. These cherts can easily be quarried directly from the bedrock; a mallet or a hammerstone will easily detach some fist-sized flakes (ibid). On the Cow Head peninsula itself, some of the chert does not even have to be quarried since the beaches are littered with boulders as large as footballs.

For a number of reasons the Cow Head area is certainly one of the best areas in Newfoundland for raw material acquisitions: (1) the high abundance of chert in the area; (2) the quality of the chert; (3) the thickness of the beds and the easy access to these beds. Thus quality, abundance and ease of procurement would have brought the Groswater people within the Cow Head area.

We can close this section with a summary definition of Cow Head chert: (1) highly silicified, (2) presence of radiolarians (3) color variations and chemical content indicative of a deep-water environment.

Animal Resources

Animal resources in the study area have been inventoried and described in great detail elsewhere (Kroll 1987; McGhee and Tuck 1975; Murray 1992; Pastore and Tuck 1985). In the study area, it is clear that sea resources were of the most importance to the prehistoric people. The rich sub-arctic waters of the Gulf of St.Lawrence provide an environment which supports a rich resource of crustaceans, fish and marine mammals. A great variety of sea birds and migratory fowl are found in the area, either year-round or seasonally. Between spring and fall, anadromous fish, such as salmon, sea trout, and arctic char are available as they run up the numerous brooks and rivers all along the coasts. Land resources are scarcer, but in Newfoundland the Long Range Mountains are home to a population of caribou which migrates in the coastal lowlands during summer and fall. On the Labrador side of the Strait of Belle Isle caribou are also seasonally available and at times moose.

The seasonal migration of the harp seal herd (*Phoca groenlandica*) into the area is certainly one of the major factors that could affect the mobility of prehistoric people. During their annual southern migration to their whelping grounds a great number of harp seals pass through the Strait of Belle Isle to enter the St. Lawrence Gulf.

Harp seals are exclusively a North Atlantic species. There are three distinct stocks of harp seals: one in the White Sea, north of Russia, one near Jan Mayen, southeast of Spitsbergen, and one off Newfoundland (Fig. 7A). The Newfoundland or the Northwest Atlantic population is the largest one and can be further divided based on breeding areas into the Front Herd and the Gulf herd. The Front herd breeds off the southern Labrador and the Newfoundland northeast coasts, the Gulf herd northwest of the Magdalenen Islands (Fig. 7B). An intermediate patch or patches may also form off the Mecatina Islands along the Quebec Lower North Shore. This Mecatina patch, also referred to as the northern Gulf patch, is yet not well understood and seems to be highly variable in terms of its existence and position (Share pers.comm. 1996). The Mecatina population can be absent in some years but in others can consist of as many as 50,000 animals (Stenson pers.comm. 1996). Census conducted in 1990 and 1994 established the number of pups born on the Mecatina patch at respectively 4,400 and 57,600 (Stenson et al. 1995:15). For the same years the Front herd averaged a little over 450,000 newborn pups and the southern Gulf herd numbered between 100,000 and 200,000 pups (ibid).

Harp seals are gregarious and migratory seals. They spend the summer in the Arctic waters of the North Atlantic. Large concentrations are found around Baffin Island, in the triangle formed by the Greenland's west coast, Jones Sound and the northern portion of Hudson Bay (Fig. 7A) (Bowen 1991:3). In the fall, well in advance of ice formation, seals start their southward migration along the Labrador coast to reach the entry of the Strait of Belle Isle by mid-December. At this point the original population

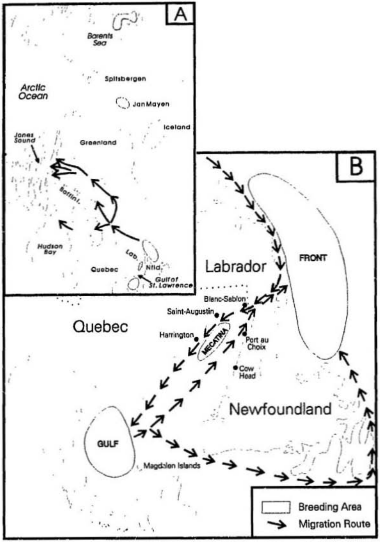

Figure 7. A) Three Breeding Populations of Harp Seals and Summer Feeding Grounds of the Newfoundland Population.
B) Migration Routes of the Newfoundland Population.

separates: a part of the population will stay at the Front, the other part will enter the Gulf of St.Lawrence following the Labrador and the Quebec Lower North Shore coast (Fig. 7B). At this time of the year, seals dispersed in "loose herds up to several hundred individuals" (Bowen 1991:3) and feed intensively before they gather for the whelping and breeding period, in late-February and March. After nursing the pups, seals will mate and then disperse to feed. Beginning in early April, for approximatively four weeks (Bowen 1991:4), the seals will once again gather on the pack ice to moult. Eventually, they will slowly migrate back to their summer feeding grounds in the Arctic. Some seals will exit the area from the southern portion of the Gulf to travel along the Newfoundland south and east coasts, the others will leave through the Strait of Belle Isle following the Quebec north shore and the Newfoundland west coast.

The understanding of the distribution and the movements of the harp seals in the study area is a complex process involving simultaneously a number of factors. As a way to break down this whole interactive system, I will discuss here in the form of a series of independent considerations some of the factors affecting the distribution and, more importantly, the availability of harp seals. Put together, these considerations will give some insights into the problems that needed to be solved for an efficient hunt.

As the harp seals enter the Strait of Belle Isle, between mid-December (and sometimes as early as late November) and mid-January, harp seals will generally travel in large number along the Labrador and the Quebec Lower North Shore (Stenson pers. comm; Lepage 1989:58; Beaucage 1968:102). In fact, on their fall migration harp seals will tend to follow a narrow migration corridor, less than two kilometres wide, along the shoreline (Lepage 1989:59). The reason for this behaviour is not well understood but it has been suggested that it could be related to water temperature and food movement (Stenson pers.comm. 1996). Another author mentioned that the clockwise motion of the Coriolis force carries the seals on the Quebec shore (Sergeant 1991:62). At this time of the year seals are feeding heavily in preparation for the whelping period and are entering the different bays to feed on herring (Rumbolt pers.comm. 1996).

There has been a traditional fall fishery on the Quebec Lower North Shore since the beginning of the eighteenth century (Lepage 1989:59; Sergeant 1991:94). Nets were set in the shallow waters of the different bays to intercept the seals as they were travelling between islands, close to shore. Between Blanc Sablon and Harrington Harbour, Baril and Breton (1984:55) have counted no less than 300 netting berths locations. In the fall, seals are accessible from virtually any shore on the Labrador side of the Strait of Belle Isle and a hunter could have positioned himself anywhere along the coastline.

On the Newfoundland west coast there is little evidence to support a fall hunt (Stenson pers.comm. 1996). In some years, seals have been taken off Port au Choix by local sealers (Ploughman pers.comm. 1995) but this is not of common occurrence: "these seals would be considered the odd ones" (Stenson pers.comm. 1996).

During the whelping and breeding season harp seals need an ice support. From late-February to late March seals will concentrate into large patches of winter pack ice that may extend anywhere from 20 to 200 square kilometres (Bowen 1991:4) to give birth to their pups. The survival of the pups is entirely dependant on this ice, since for about two weeks after birth the whitecoats cannot swim. Two weeks after birth the mothers usually abandon their pups and mate with males before they leave the patch and disperse. Between mid-April and mid-May the animals will once again haul out on the ice to moult.

Whelping and breeding patches usually form away from the coasts, in areas that will favour high concentration of thick and tight pack ice. On the patch itself, because of the different wind patterns that might sometimes blow the patch closer to the coast, seals will tend to whelp away from the edges of the patch, prefering somewhere in the middle (Sergeant 1991:38). In that way they avoid any risk of ice-rafting.

From a shore-based hunter's point of view, the important point to consider is access to the seals. Nowadays, large vessels are able to navigate their way through the pack ice to the whelping grounds, which are generally far at sea. However, for anyone on foot these patches might have been impossible to access. It is doubtful that any hunter would have been foolhardy (or reckless) enough to walk his way far into these patches: ice movement and wind conditions are so unpredictable that it can be a perilous adventure. Therefore, it could be suggested that it is unlikely that the Groswater people were hunting the harp seals between late February and early March during whelping and breeding or again between late-April and mid-May when they moult. It is more reasonable to believe that seals were hunted at some point along their migration routes. To that effect, a landsman said "you get the seals when they are on the *beat*" (Rumbolt pers.comm. 1996), meaning when they are moving around. Thus, that leaves us with: (1) a fall hunt, (2) a short period between mid-march and late-April, and (3) a late spring hunt, as they migrate back north.

Except for the whelping, breeding and moulting periods harp seals do not require ice. On the contrary, harp seals need open water or at least some open leads where they can feed. In fact, this whole migration process from the arctic to the sub-arctic waters of Newfoundland is "forced upon the harp seal by its necessity to stay at the ice-edge year-round" (Sergeant 1991:62). Seals need to go in areas where they will meet their needs: they need specific ice conditions to whelp, they need suitable waters to feed. To understand geographical distribution of Harp seals we therefore need to be able to localize the open water or leads where they feed.

Working from ice condition charts (Ice conditions 1985, 1987,1990,1992), ice formation and retreat in the Strait of Belle Isle and the Gulf area are summarized in figure 8. This model of ice movements into the study area is a summary and therefore remains general. Despite the fact that ice conditions are not exactly the same each year, the general pattern of ice formation and retreat occurs essentially in a similar manner year after year. From one year to another the main difference would be one of timing: ice formation and retreat might be delayed for two or three weeks either way.

From late-spring to about mid-January the Strait and the Gulf are free of ice (Fig. 8a). At this period of the year food for the seals is still largely available. Around mid-January, ice starts to form in the Strait area and extends from there into the Gulf (Fig. 8b).

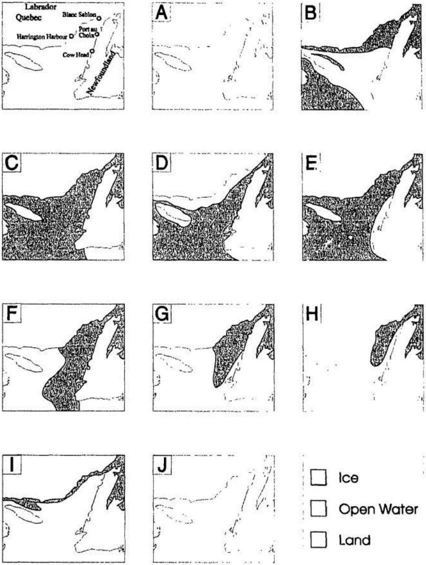

Figure 8. Ice Conditions in the Gulf of St. Lawrence.

Ice formation also occurs in the St. Lawrence estuary and around Prince Edward Island. These ice formations eventually meet and by mid-February the Gulf and the Strait are usually covered with close pack ice (Fig. 8c). After mid-February and for the best part of March, the ice coverage in the Strait and the Gulf averages between 90 and 100 per cent (Ice conditions 1985, 1987, 1990, 1992). At this particular period of the year, availability of food is not as critical since during the whelping and breeding periods harp seals rarely feed (Bowen 1991:4). During these two months however, there is usually a lead of loose ice or open water along the Quebec shore. Prevailing north-westerly winds at this time of the year "...keep open a band of water between the Quebec north shore and the newly-forming pack ice" (Sergeant 1991:94) (Fig. 8d). Change in wind directions, easterly winds for instance, will sometimes close this open-lead along the Quebec shore and open a band of water on the Newfoundland west coast (Fig. 8e). The latter situation is not of common occurrence since winter winds are usually north or northwesterly winds.

In the last part of March, ice usually retreats from the estuary first (Fig. 8f). By the end of March, the Quebec north shore west of Harrington Harbour is free of ice, as well as most of the western portion of the Gulf. The eastern portion of the Gulf, including the Strait of Belle Isle and the Newfoundland west coast, still remains covered with ice at 90 to 100 per cent. Later in April, the branch of the Labrador current travelling along the Newfoundland south coast will work its way up along the west coast, gradually opening a lead of open-water along the west coast (Fig. 8g). From then on, the retreat of the ice will proceed simultaneously eastward along the Quebec north shore and northward along the

Newfoundland coast leaving a tongue-shaped mass of ice in the centre of the Gulf (Fig. 8h). Seals usually feed on either side of this ice mass. Later in the spring, around May, south-westerly winds tend to push the remaining Gulf ice into the Strait, mainly on the Labrador side (Fig. 8i). For a few weeks the Strait will remain heavily blocked, preventing the seals from leaving the area. After that, the ice will gradually loosen up, and the Strait is usually well free of ice by June (Fig.8j).

Although harp seals eat many food species, capelin (*Mallotus villosus*) and polar cod (*Boreogadus saida*) are the most important fish species taken. Euphausiids (shrimp) and the northern shrimp (*Pandalus borealis*) are the "chief Crustacea taken in sub-arctic waters" (Sergeant 1991:65). Capelin spend most of their life at sea, approaching the coast only to reproduce in the summer (Carscadden 1993:3). Figure 9 shows their migration patterns within the Gulf of St.Lawrence. Polar or arctic cod live in the deep waters of the Gulf (Lear 1990:2-3) (Fig. 9). The northern shrimp are found at two specific locations in the study area (Parsons 1984:3) (Fig. 9). These species have in common that they live and feed in the deep waters of the Laurentian and Eskimau channels. They will particularly tend to move along the slopes edges of these channels where upwelling conditions result in highly productive areas. Along these slope edges, the best feeaing grounds will be more precisely found where the slope edges are sharp. As a general rule, the steeper the slope edges are, the higher the level of upwelling activity is, which results in nutrient-rich waters (Share pers.comm. 1996). In order to feed, harp seals also have to travel along these edges and tend to concentrate near the best upwelling zones (i.e near steep slope edges).

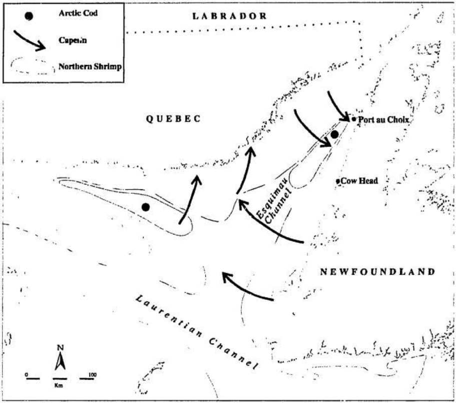

Figure 9. Eskimau Channel and Distribution of Capelin, Northern Shrimp and Arctic Cod Stocks in the Gulf of St. Lawrence.

This whole process is easily summarized as follows:

open-water » upwelling zones » nutrients » fish/crustaceans » seals » hunter

Now, from a shore-based hunter point of view, optimal hunting locations would be at places where these sharp slope edges are within a close distance to shore. In the Estuary and the Gulf of St.Lawrence such conditions are found at three places: in the estuary, near Les Escoumins and Pointe-des-Monts and, off the Point Riche Peninsula, in Port au Choix. At Port au Choix the upwelling zone is actually within one kilometer of so of the land. In fact, the slope edge at this location is so steep that a local fisherman mentioned that between the port side of his boat and starboard, the water depth drops from 20 meters to 100 meters (Rumbolt. pers.comm. 1996).

In their spring migration along the Newfoundland west coast the seals will travel along the Eskimau channel edges. This channel is far from the coast and remains inaccessible from just about any location along the west coast, except for the Point Riche Peninsula (Fig. 9). For instance, at Cow Head hunters would have to make their way about 60 kilometres into the pack ice or the open water before they could reach the edges of the Eskimau channel. It is therefore unlikely that a regular seal hunt would have occurred anywhere south of Port au Choix along this coast. Some years, with any luck, seals could have been taken when prevailing north-westerly winds shifting for easterly winds created an open-lead (Fig. 8d) along the Newfoundland west coast. However, as mentioned previously this would have been of very rare occurrence and totally unpredictable (Parsons, Fisheries and Oceans Officer at Cow Head, pers.comm. 1996). In the span of his lifetime at sea, between Cow Head and Port au Choix, a fisherman saw harp seals only once close to shore, south of Port au Choix (Rumbolt pers.comm. 1996).

All the considerations that have been discussed so far lead to the conclusion that even though harp seals are present in large numbers, from fall to late-spring, in various parts of the Gulf of St.Lawrence, the main question is not so much one of abundance but one of availibility. Hunters need to be at locations that will allow access to the seals. To find seals, open-water is one of the first conditions that needs to be met. Distance between the shore (where the hunter is) and the open-water (where the seals are) also have to be considered: the hunter wants to be at the floe-edge. Ice coverage also must be considered. Successful hunting depends on safe ice: heavy pack ice may be too dangerous to venture on, but safe landfast ice acts as a bridge to the floe-edge.

As a last consideration one unavoidable question remains: Is there some reason to believe that the migration patterns of the harp seals might have been different in the past ? This question can be answered in two points:

First, if radiocarbon dates can be trusted, and if middens can be associated with these dates, the large middens (over 75,000 bones) found at the Phillip's Garden East site at Port au Choix (Renouf 1994:169) clearly indicate that the harp seals were present when the Groswater people visited the site. One might also argue that climatic variations might have had an impact on seal distribution. If anything, harsh arctic conditions might have precipitated a southern migration so the seals could find suitable waters to feed. On the other hand, a warmer climate could have hastened the arctic ice break-up, then more ice would be coming south sooner. On the whole, climatic variations might have possibly affected the structure (larger or tighter) and the location (more north or south) of the whelping and breeding patches. They might also have interfered with the timing of ice formation and ice retreat (sooner or later) but there is little evidence that this whole process would have affected the migration routes per se. Since we know that prehistoric hunters were hunting seals in their migratory movements, the question whether the patches were more south and/or larger is irrelevant here.

To summarize, we have seen where the seals are, when and why. We know that in the fall they follow the Quebec North shore where they enter the bays to feed. At that time of the year, they are not found on the Newfoundland west coast. In the whelping, breeding and moulting periods seals remain inaccessible because they are far at sea. In heavy ice periods, we have seen that prevailing north-westerly winds almost always keep open a lead of open-water or loose ice on the Quebec north shore. For a short period of time in the spring when the ice is retreating through the Strait, the Quebec shore is blocked with ice and the seals are difficult to access. They become available again when the ice loosens.

On the Newfoundland side of the Strait, the best and almost only time seals can be exploited is in the spring as they travel along the Newfoundland west coast. On this coast, the only predictable location is the Point Riche Peninsula, Port au Choix.

Predictive Model

The foregoing discussion indicates that there are significant differences in resource availibility within the resource area. These local variations will require different acquisition strategies and therefore variations in mobility patterns. The seven sites considered here are located in different sub-regions. In the following section I will lay out a set of expectations for Groswater resource acquisition strategies and mobility in each of these sub-regions.

1. On the Labrador side of the Strait of Belle Isle seals are available for a longer period of time but the specific capture location might be difficult to predict.

In the Strait of Belle Isle we are dealing with a longer season of open-water than on the Newfoundland west coast and except for a few weeks in the whelping, breeding, and moulting periods seals are usually available, within reasonable distances, from December to June. Fall, however remains the best hunting season. On the Labrador side of the Strait, no particular location stands out; good sealing can be done from almost any shore. Because the resources are distributed more evenly in time and space the *raison d'être* of large seasonal settlements diminished. Instead, what we might find is a settlement pattern in which we have a large number of small sites distributed more or less evenly along the coast line. These sites were probably occupied briefly, each corresponding to a different hunting episode. If the sites were used in a similar manner (to hunt seals) we might expect some redundancy in the artifactual content.

This settlement type calls for an opportunistic resource acquisition strategy with an emphasis on search and encounter hunting tactics (Binford 1978:453). Unpredictability of resource locations means that there was no advance planning for the use of particular places. The mobility pattern puts more emphasis on frequency of movements than on coverage of a territory from a single place.

2. On the Newfoundland west coast, seals are available for a short period of time but the location and the timing for potential capture are highly predictable.

On the west coast of Newfoundland, the best and almost only location to hunt harp seals efficiently is the Point Riche Peninsula, at Port au Choix. It is therefore logical to expect a settlement aggregation at this extremely rich point of procurement.

- Because of the reliability of Port au Choix as a good seal hunting location we might expect a strong pattern of reoccupation (repeated use) of the sites.
- Harp seals being available for only a short period of time, we might not find evidence of long term stays, unless of course people were depending on storage.
- The artifact assemblages should exhibit a strong emphasis on hunting activities.
- The sites should display large artifact assemblages indicative of the intensity of use the site.
- The repeated use of the sites might give the site a "disturbed" aspect where specific activities areas might be difficult to distinguish.

Given the high predictability of seals off Point Riche both search time and settlement mobility are reduced, thus there might be more emphasis on logistically organized resource use from camps near Port au Choix. Resource predictability off Point Riche also means that activity function at Port au Choix was highly predictible, thus the Phillip's Garden East and Cornick sites should indicate some kind of intentional planning regarding site use.

3. In the Cow Head area, we have a situation where lithic resources are geographically specific and where subsistence resources are more evenly distributed in both time and space.

- The main reason that would have attracted prehistoric people at the Factory Cove site is the acquisition of raw material. Since the site is immediately adjacent to at least five chert beds and because the beaches surrounding the site are literally covered with large chert boulders we would expect to find some evidence of tool manufacturing.
- Because chert occurrence is so predictable at this site we might find evidence of reoccupations.
- Concerning subsistence, harp seals hunting and associated technology should not be as visible.

In terms of mobility, we are probably dealing with two types of adaptation at the Factory Cove site: (1) Since lithic resources are highly predictable at this location people were probably planning special trips into the area. In terms of mobility, this implies that people had to travel to this location. Once there though, raw material acquisition require little further movement; (2) Food resources not being spatially so predictable but rather more evenly distributed in time and space might have been exploited in a more opportunistic way while acquiring raw material.

The different expectations outlined in this section suggest the constraints and the possibilities regarding the mobility of the people in the Gulf of St.Lawrence area. In order to look at specifics, lithic assemblages and spatial organization of seven Groswater sites will be examined in section 5. Before that, section 4 provides the theoretical and methodological framework under which the specific data will be examined.

CHAPTER 4

METHOD AND THEORY

This section is concerned with the methodology and theory I will be relying on for the analysis of the archaeological data. In this research I will be examining two main sets of data: the lithic technology and intra-site spatial patterning. My goal is to examine the links between these two sets of data and Groswater mobility patterns within the study area.

Lithic Technology

The analysis of the lithic technology will be conducted at two levels. The first level is concerned with technological organization, with an emphasis on raw material use patterns. The second level focusses on the functional significance of the different tool assemblages at individual sites.

Many recent studies have associated technological organization with prehistoric mobility (Bamforth 1986, 1991; Binford 1976, 1979; Gramly 1980; Hood 1994; Kelly 1983; Kelly and Todd 1988; Lurie 1989; Myers 1989; Nelson 1991; Perles 1992; Shott 1986; Torrence 1983). Technological organization is defined here in terms of how people plan their use of raw material and tool technology in relation to different mobility conditions and resource distribution. Because hunter-gatherers generally move frequently, adapting to the different scheduling patterns related to the procurement of different kinds of resources, they also have to adopt technological strategies that will enable efficiency in both food procurement activities and manufacture and use of their lithic technology. The availability of suitable raw materials, transportation needs and functional needs are all factors that could affect the technological organization of a particular group. We might expect to find variability in assemblage composition because of the way the raw material is differentially procured, produced and distributed within a settlement system (Bamforth 1986:49; Binford 1979:255). One frequent assumption is that changes in technological organization, particularly changes in raw material use, should enable us to recognize changes in subsistence and mobility patterns (Myers 1989:91). For example, Binford (1979) claims that variability in raw material use is related to the scale of mobility. Bamforth (1986) argues that raw material use responds to the geographical distribution of lithic raw material sources.

The approach I am proposing in this research emphasizes (1) the differential use of various raw material types and, (2) the different stages of lithic reduction and their distribution among the different sites.

Raw Material

In trying to understand raw material use the first questions that need to be answered are: what are the raw materials used by the Groswater people in the study area and, where are these raw materials coming from? Therefore, the first step in the analysis will consist of establishing the frequency of raw material types for each site. The second step will be to assess the sources of the raw material.

To evaluate raw material type frequencies, both tool and debitage assemblages from each site were sorted, counted and weighed. Raw material frequencies were based on weight and expressed in weight percentages. For the larger Factory Cove and Phillip's Garden East sites only a 20% random sample of debitage was analyzed in each case.

It is generally assumed that the vast majority of the lithic raw materials used by the Groswater people in Newfoundland, Labrador and on the Quebec Lower North Shore is attributable to the same geological formation: the Newfoundland northwest coast Cambro-Ordovician beds referred to as the Cow Head Group (James and Stevens 1986). This assumption, however, has never been empirically investigated. Geologically, Cow Head chert presents a unique micro-fossil signature: a radiolarian that can be recognized microscopically (Botsford pers.comm 1995). To evaluate whether or not the fine-grained chert used at the different sites can formally be identified as Cow Head chert, every finished chert artifact was examined under a binocular microscope to identify radiolarian fossils.

Certain problems arose during the microscopic observations. The small size of artifacts often reduced the likelihood of observing radiolarians. For certain colours, especially black, dark grey, brown grey and grey the radiolarians remained invisible, but because discernable radiolarians cannot be identified does not necessarily mean that they are absent. Partial silicification and the organic richness of the various chert beds may affect the radiolarian content of the rock and therefore their visibility. (Botsford pers.comm 1995; Coniglio 1987:819; James and Stevens 1986:71).

Debitage Analysis

The different stages of lithic reduction will be examined by looking at inter-site variability in debitage patterns. The goal here is to determine if the distribution of lithic reduction stages at the various sites is conditioned by mobility in relation to source areas. Debitage analysis is designed to answer questions related to the movement of raw materials within the study area and possibly the function of each site within the settlement system.

Initially, three variables were chosen for the debitage analysis: the presence/absence of cortex, the frequency of bifacial thinning flakes and the flake size distribution. As the analysis was being conducted it became evident that the first two variables were not reliable and could not be used in comparing the different debitage assemblages.

The presence of cortex is usually indicative of the first stages of lithic reduction. Unfortunately, a consistent cortex definition was difficult to establish because of the different forms in which chert occurs in the area: outcrops, pebbles and large tabular cobbles. For example, at the Factory Cove site, where intensive biface manufacturing occurred, the cortex frequency was abnormally low. At this site most of chert occurs in large non-quarried tabular boulders found scattered over the surface. Besides internal differences in the degree of silicification, there is no visible cortex on these boulders.

Flake morphology was also misleading since bifacial thinning flakes (Btf) can occur during both the shaping of bifacial blanks and the maintenance of finished tools. Therefore a high Btf frequency can either be interpreted as indicative of tool manufacturing or tool maintenance and site function inferences become rather ambiguous.

Flake-size analysis is mainly conducted to document variations in flake size from one site to another, as a means to identify different stages in lithic reduction activities. For example, early stage manufacturing activities could be distinguished from tool maintenance activities. This first step, essentially descriptive, will lead to the next interpretative level where the different lithic reduction patterns will be interpreted in terms of technological organization, i.e. how the technology is organized within the settlement-system. At a third level, aspects of technological organization patterns expressed at each site will then be interpreted as indirect evidence for evaluating mobility patterns and site function.

This three-stage approach can be illustrated as follows. At the descriptive level, a highly skewed flake-size distribution consisting of only small flaking debris might indicate that only reduction activities related to tool maintenance occurred at a site. At the organizational level, this distribution could mean that the raw material was transported to the site in the form of more or less finished tools. At a broader interpretive level, the foregoing might imply that: (1) people were trading the raw material already shaped in the form of tools, (2) that people were acquiring their raw material directly from the lithic source; they were shaping the tools at the source and carrying them to other locations, or (3) that logistically organized groups of people were travelling light; carrying only finished tools to specific locations for the immediate conduct of a specific activity, a hunt episode for instance. One of the main goals in analysing the debitage is to try to detect this type of behaviour.

To permit inter-assemblage comparisons, the debitage for each site was sorted into 5 mm size classes. Interpretation of the flake size distribution was based on the following conventions. Flake sizes of <10mm were considered to represent mostly small retouch flakes resulting from tool maintenance, flakes from 10mm to 20mm might be indicative of late-stage manufacturing reduction, while flakes sizes > 20mm represent earlier manufacturing stages. Retouched and utilized flakes were included in the debitage category rather than in the tool category since it was difficult to determine whether the flakes were intentionally retouched or if the use-wear was natural, in which case they are indistinguishable from waste flakes.

Tool Assemblages

This part of the research will consist of evaluating the tool assemblages of each site to see if a pattern can be recognized related to the possible function of the sites. As a first step, the tool assemblages of each site were identified and classified into eighteen (18) morpho-functional categories: endblades, endblade preforms, sideblades, knives and biface fragments, scrapers, microblades, microblade cores, burin-like-tools, burin-like tool preforms, burin spalls, burins, adzes and axes, hammerstones, abraders, bifacial blanks 1, 2, 3, and 4. Unidentified lithic artifacts are not considered for comparitive purposes. Flake cores as well as retouched and/or utilized flakes are not included since no standardized definition could be applied. Also not included are the harpoon heads or any other organic artifactual remains found at the Phillip's Garden East site, since none of the other sites shared the same preservation conditions.

Discrepancies in tool categorization from the original site reports will be found since all the assemblages were completely re-classified and the tool classifications used here do not necessarily correspond with the classifications of other researchers.

Most of the researchers working with Groswater lithic assemblages have proposed endblade typologies based on size, lateral and basal treatment, and the presence or absence of side-notches (Auger 1985; Fitzhugh 1972; Kennett 1990; Pintal 1994; Renouf 1994). For the purposes of this research endblades have been divided into two sub-categories: endblades and endblade preforms. Endblade refers to all finished plano-convex, side-notched specimens. Endblade preforms are otherwise identical, but un-notched forms often described as triangular endblades or points by the different authors (Fig. 3 second row). This distinction became apparent when specimens bearing only one notch (Fig. 10) were found in the different collections and when evidence of notch enlargement was observed. The argument here is that only a few minutes are needed to make notches, it is highly likely that they could have been produced at the last minute, prior to being used. In doing so, not only is transport breakage risk reduced, but the flexibility of the tool is also increased since it is possible to fit these preforms with any harpoon head (your own or your companions') (Fig. 11).

The burin-like-tool category has also been divided into a finished and a preform category. Burin-like-tool preforms can be described as being made of high quality chert.

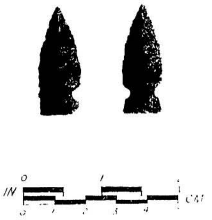

Figure 10. Endblade Preform with a Single Notch and Endblade.

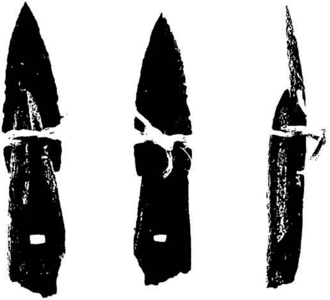

Figure 11. Endblade Lashed to Harpoon Head.

They are rectangular or trapezoidal in shape, often showing some sign of grinding. At this stage, the hafting element is yet not visible.

The Factory Cove site remains provided evidence for a biface manufacturing sequence. In order to understand the different production stages, the bifacial blanks were classified into four categories. This classification was based on visual observation (Fig. 12) and on the clustering patterns expressed by the relative width/thickness of the blanks (Fig. 13).

Blank 1: Blank 1 is generally thick, angular, plano-convex in cross-section and more or less lozenge shaped. At this stage, the blank is asymmetric and the cutting edges are not apparent. The large flake scars indicate direct hard hammer percussion was used at this early stage of the reduction sequence. Mean relative width/thickness: 54 mm/22 mm.

Blank 2: Blank 2 are generally smaller and thinner. At this stage the form becomes symmetric so the biface is now clearly defined. Lateral edges are still not worked and direct hard hammer percussion is still used. Mean relation width/thickness: 51 mm/14 mm.

Blank 3: Blank 3 is smaller and thinner. The bifacial shape is more refined. The distal end can now be distinguished from the proximal end. The cutting edges are still not functional, but an attempt is made at this stage to obtain regular lateral edges. At this stage pressure flaking starts to be used. Mean relation width/thickness: 43 mm/9 mm.

Blank 4: If retrieved on any archaeological site these blanks would be considered as bifaces. The blanks are thin, the cutting edges are now functional. Thinning of the lateral edges by pressure flaking is used extensively. At this stage the only thing missing is the

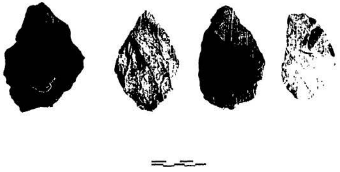

Figure 12. Four Stages of Biface Manufacturing Sequence.

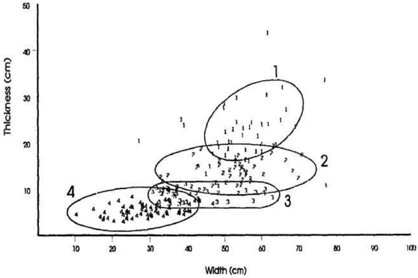

Figure 13. Bifacial Blanks Relative Width/Thickness

hafting element. Mean relation width/thickness: 29 mm/6 mm.

After the different morpho-functional artifact types were defined and established, the artifacts were classified into four activity or functional categories: (1) procurement, (2) processing, (3) maintenance, and (4) manufacturing.

(1) Procurement: This category includes all the artifacts directly associated with hunting activities: finished endblades and sideblades.

(2) Processing: includes all the artifacts involved in animal processing (hide and meat): scrapers, knives and biface fragments and microblades.

(3) Maintenance: refers to tool types which have not yet reached the finished state but require subsequent modifications or reduction before they can become fully functional: endblade preforms, burin-like-tool preforms, microblade cores. Burin-like-tools, burins and burin spalls as tools and/or as by-products associated with the production and maintenance of the organic technological system are also considered here (see below). For certain sites, bifacial blanks are also included in this category (see below).

(4) Manufacturing: This category refers to the artifacts related to stone tool manufacturing: bifacial blanks, hammerstones, abraders, adzes and axes.

The classification of the different tool types into functional categories is for general comparative purpose. However, the classification of certain tool types into specific functional categories raised some problems. This was particulary the case for bifacial blanks, burin-like-tools and burins. The positioning of blanks in a specific functional category became problematic when it was evident that function could not be dissociated from context. When a large quantity of bifacial specimens in various degrees of completion, a large amount of debitage and many hammerstones are found in an assemblage, it would seem reasonable to assume that an on-site bifacial manufacturing sequence was present. On the other hand, an association of thin, well-defined bifacial blanks with small flaking debris at a site distant from any lithic source, may not be interpreted the same way. In each of these cases we are dealing with different behavioral phenomena and according to the context of a site a given tool type might not necessarily represent the same activities. Blanks found at a manufacture site should be interpreted as the result of a manufacturing activity: they were quarried, formed and discarded at the same location. These blanks never left the manufacturing context and therefore were never integrated into a circulation system. Blanks found at sites beyond the point of their manufacture implies that they were transported for projected needs at these future locations. The latter are "bifacial blanks to go", the former "bifacial blanks that never went". Once bifaces leave the manufacturing context for the next point in the system, for instance a hunting site, there is a shift in their functional significance in that they are no longer evidence for manufacturing but rather tool forms designed for anticipated use. Thus, for the reasons mentioned above, the blanks recovered in a manufacturing context, such as the one described at Factory Cove, were assigned to the manufacturing category whereas blanks found at sites beyond the point of their manufacture were classified into the maintenance category as un-finished type of tools intended to be used.

Burin-like-tools and burins were also difficult to classify within a specific functional category. As end-products of a lithic reduction sequence, these tools have a place in a lithic organization system. Functionally, however, burin-like-tools and burins are generally associated with an organic tool production system: implements made out of wood, antler, bone or ivory. This organic system involves an entirely different form of organization: raw material procurement, tool manufacture and toolkit management. Unfortunately, because of the organic nature of this type of technology, this system also remains invisible in most archaeological contexts. Given this functional and organizational ambiguity, for the purpose of this research it might be better to consider burins and burin-like-tools as tools used to "maintain" the organic tool system and therefore to classify them in the maintenance category.

Another problem arose from the inevitable over-representation of the processing functional category, since microblade numbers are inflated by the multiplication of broken fragments. To overcome this problem a minimum number of microblades (MNM) was established by counting only the specimens with proximal ends. Unfortunately, data on tool portion were not collected on all collections; the Quebec collections were returned before the MNM problems was raised. However, for all the collections for which data on tool portions were available the percentage of proximal fragments was about 60%. This percentage was then applied to the Quebec sites to determine their MNM figure. For each site, it will be mentioned whether the MNM was established on specimen counts or using a 60% average figure.

Site Structure

Within a subsistence-settlement system, sites are not equal. We might expect to find variation among them according to their specific roles within the system. For instance, some sites might have been occupied for a long period of time in a more or less permanent manner. Some might have been used once for the conduct of a specific activity, others might have been visited repeatedly year after year. Furthermore, different kinds of occupation produce different patterns of internal site structure as exhibited in the arrangement of feature types and activity areas.

Features at a special-purpose camp should be relatively few and of the same type if the site was used in the same manner (Chatters 1987:342). At a hunting camp, for instance, features might consist of hearths, hunting blinds, and possibly wind-breaks. On the other hand, sites occupied on a more permanent basis may include features such as dwelling structures, storage pits, different types of hearths and organized middens.

In a long-term occupation, the partitioning of activity space should be greater than at a site used for the conduct of a short-term specific activity, where the activities are likely to occur around the same and possibly only hearth. At a site used for a long period of time we should see a greater organization of the activity areas. For instance, maintenance and food extraction activities which could be messy, such as butchering, fish cleaning, etc., are likely to be carried out at specific locations on the site, so as not to interfere with the other daily activities at this camp (Chang 1988; Carr 1984:130). Storage and refuse areas are also expected to have been spatially separated from the immediate habitation area (Carr 1984:130; Chatters 1987:346). The reoccupation of such sites may, however, present some interpretation problems since distinct activity areas might become blurred by the palimpsest effect of the multiple reoccupations. What we might find instead, are amorphous activities areas resulting from overlapping occupations (Carr 1984:130).

People using a location for a short period of time might not be as concerned with spatial organization and it is likely that the debris will be simply left were it is dropped. At a special-purpose camp most of the activities are likely to occur around a central location, a hearth for instance. Thus, the limitation and the mixing of debris around a central location or a hearth might indicate a short stay (Binford 1978b; Chatters 1987:346). A model characterized by a decreasing slow gradient of artifact density from a central area outward is proposed for this type of camp (Carr 1984:130).

However, the reoccupation of the same site for short periods of time may once again lead to misinterpretations. Binford (1978a:491) argues that hunter-gatherers reoccupying the same location for the same purpose have a tendency to set up their installation away from the preceding ones. Therefore, discrete clusters of redundant activities should be indicative of a short stay. Thinking in those terms, Kelly and Todd (1988:236) also suggest that a site structure indicative of short-term occupations consists of a "number of small, separate concentrations of debris, rather than continuous, undifferentiated scatters".

Returning to the problem at hand, in the next chapter I will evaluate the function of each Groswater site by analyzing its internal spatial organization as expressed in the distribution of feature types, activity areas and artifacts. I will look at the distribution of cultural materials in terms of the density of deposits, their association with different types of features, their degree of concentration or dispersal around features and the degree of overlap between different distributions[1]. These distinctions are interpreted in relation to the length of occupation, the possibilities of reoccupation and the repetitive and/or non-repetitive nature of the activities.

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[1] Site mapping and artifact plotting was computerized using the Geographical Information System (G.I.S.) called Spansmap, which allowed the analysis and interactive display of spatial information.

CHAPTER 5

MOBILITY STRATEGIES: ARCHAEOLOGICAL DATA

In this section, I examine the lithic assemblages and spatial patterning of seven Groswater sites: The Factory Cove, Phillip's Garden East and Cornick sites on the Newfoundland west coast; Saddle Island Area F site, in Southern Labrador; Blanc Sablon, Ile au Bois, and Wild Cove sites on the Quebec Lower North Shore. These sites have been selected as they present essentially unmixed Groswater assemblages which have been well described and because of their potential functional differences.

To reiterate the archaeological data is examined to answer questions related to the mobility strategies of the Groswater people in the Gulf of St.Lawrence area.

The presentation of the archaeological data basically follows the organization of the previous section. For each site raw material distribution is first discussed. Debitage and tool assemblages are examined next. The total artifact inventory is presented for each site but only the identified lithic artifacts are used in the analysis. The discussion of intra-site spatial patterning follows. Finally, a summary interpretation for each site is given.

Factory Cove: DlBk-3

Radiocarbon dates:
2700±140 B.P (Beta 4047) (Feature 14)
2530±280 B.P (UQ 413) (Feature 7)
2270±100 B.P (UQ 409) (Feature 12)
2100± 60 B.P (Beta 4046) (Feature 5)

The Factory Cove site is situated at the western tip of the Cow Head Peninsula, on the central west coast of Newfoundland. The site is located on a wide grassy terrace rising between 7.5 and 11 meters above sea level (Auger 1985:34). A total of 160 m^2, distributed over four areas, were excavated during the summers of 1976, 1978 and 1981. The excavation yielded a total of 1584 lithic artifacts as well as over 87,000 flakes (Auger 1985:62). The geological setting in the immediate vicinity of the Factory Cove site makes this particular location a prime location for raw material acquisition since only a few metres from the site, along the shoreline, at least six chert beds (beds 9 to 14) have been identified (James and Stevens 1986:69-73). The beaches surrounding the site are literally covered with large tabular boulders of brownish-black-grey chert.

Raw Material

Cow Head chert (99.10%) clearly dominates the artifact assemblage. Ramah chert (0.10%), quartz and quartzite (0.80%) are present in small proportions. Debitage raw material composition is quite similar: 99.77% Cow Head chert, 0.01% Ramah chert, 0.22% quartz and quartzite[2].

2 Pink quartzite constitutes most of this percentage. This pink quartzite is easily found as cobbles on many beaches around Cow Head. The cobbles were probably used as hammerstones/abraders.

From visual inspection there is a clear dichotomy expressed in the use of Cow Head chert at the Factory Cove site. In the tool category, some bifaces and all the bifacial blanks are made from a coarser brown-grey-black chert. All the other tools (endblades, sideblades, scrapers, microblades, burin-like-tools) are made of very fine-grained cherts, which are not immediatly available at the site. In the debitage category very few examples of fine-grained cherts were observed. Rather, most of the debitage (over 95%) is made of the same dark brown-grey-black coarser type of chert, the same type of chert from which the bifacial blanks are made.

Some 832 lithic artifacts were examined for radiolarians. Radiolarians were clearly identified on 588 specimens (70.67%), observed as shadows on 122 artifacts (14.66%), and not seen on another 122 specimens (14.66%).

Debitage Analysis

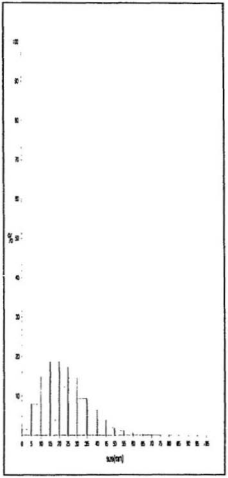
The debitage analysis was conducted on a 20% random sample. A total of 13,968 flakes was analyzed. At the Factory Cove site the flake size distribution is characterized by a fairly even distribution rather than one composed predominantly of primary waste or just small flakes (Fig. 14). In fact, small retouch flakes (< 10mm) and larger flakes (>40mm) represent only a small proportion of the debitage assemblage. Instead, the majority of the flakes is distributed evenly between 10mm and 30mm.

This distribution suggests that initial raw material reduction did not occur directly at the site. Chert blocks were probably initially trimmed at the outcrop locations, at the nearby beach, and were then brought to the site where they were further reduced. Final

Table 1. Factory Cove Flake Size Distribution.

Size(mm)	N	%
0-5	225	1.61
5-10	1114	7.97
10-15	2078	**14.88**
15-20	2612	**18.70**
20-25	2421	**17.33**
25-30	2047	**14.65**
30-35	1320	9.45
35-40	907	6.49
40-45	558	3.99
45-50	288	2.06
50-55	175	1.25
55-60	96	0.69
60-65	54	0.39
65-70	33	0.24
70-75	18	0.13
75-80	9	0.06
80-85	4	0.03
85-90	2	0.01
90-95	2	0.01
>95	5	0.03
	13,968	100

Figure 14. Factory Cove Flake Size Histogram.



tool reduction and tool retouching were not conducted here as indicated by the low proportion of small flakes. The broad distribution of flakes in the medium size categories (between 10mm and 40mm) suggests that middle stage reduction activities occured.

Several features of the lithic assemblage indicate that bifaces were shaped at the site: (1) the presence of a large number of bifacial blanks in different stages of manufacturing (blanks 1 to 4); (2) the broad range of flakes within the medium-size category, and (3) both the bifacial blanks and most of the debitage assemblage are made out of the same coarse brown-grey-black chert. The near absence of small flakes suggests that these bifacial blanks were probably transported to other locations for further reduction.

The fine-grained chert used to produce the flake technology (endblades, scrapers, sideblades, burin-like-tools), and the blade technology (microblades) was probably obtained at some other location in the area. This, plus the lack of retouch flakes of fine-grained chert, suggests that these formal tool classes were not made at the site.

Tool Assemblage

Factory Cove Total Artifact Inventory: n= 1584

99 endblades, 58 endblade preforms, 25 sideblades, 120 knives and biface fragment, 44 burin-like-tools, 10 burin-like-tool preforms, 4 burin spalls, 115 scrapers, 420 microblades, 43 microblade cores, 3 cores, 4 adzes, 22 unidentified, 77 hammerstones, 7 abraders, 200 blanks and debitage 1,143 blanks 2, 193 blanks 3, 97 blanks 4.

Table 2: Factory Cove Tool Categories

Tool Category	N	%
Endblades	99	7.07
Endblade Preforms	58	4.14
Sideblades	25	1.78
Knives and Biface Fragments	120	8.56
Scrapers	115	8.21
Microblades (420)	262*	18.70
Microblade Cores	43	3.06
Burin-like-tools	44	3.14
Burin-like-tool Preforms	10	0.71
Burin Spalls	4	0.28
Blanks and Debitage 1	200	14.27
Blanks 2	143	10.21
Blanks 3	93	6.64
Blanks 4	97	6.92
Adzes	4	0.28
Hammerstones	77	5.50
Abraders	7	0.50
Totals	1401**	99.97

* Microblades MNM counted on proximal ends (62.38%).

** Modified count by the standardization of microblades number.

The interpretation of the functional meaning of the tool assemblage at the Factory Cove site is not an easy task since we are probably dealing at the same time with a combination of workshop and habitation site The main difficulty is that two different processes of assemblage formation are present: deposition of manufacturing debris and post-use deposition of tools. These two processess are probably independent, but found together can "...yield patterns interpretable as site utilization" (Magne 1985:43). The ability to isolate these two depositional processes is difficult, thus site functionnal interpretation is problematic.

However, looking at tool functional categories, tool production (44.32%) was obviously the main activity conducted at the site. The workshop component of the site is undeniable given the large amount of debitage (over 87,000 flakes), at least four stages of bifacial production, and a large collection of different sizes of hammerstones (for details on size, see Auger 1985:68-70). Direct percussion by means of hammerstones (n=77) was obviously a common practice at the site. Even though proportionaly less, the other tool types suggest a wider range of activities such as hunting (8.85%), processing (35.47%) and maintenance (11.33). Together, hunting and processing activities are represented by over 44.32% of the implements at the site. This is somewhat surprising considering the previous discussion of subsistence resources in the Cow Head area, in which I established that the food resources are not so predictable but rather more widely dispersed in both time and space. Harp seal hunting is highly unpredictable and the resources that are the most likely to have been directly exploited from the site are caribou, found near the coast in the summer, non-migratory seal species, especially harbour seals in a small nearby colony, in St-Paul's Inlet, and various birds and fish resources.

Bone preservation at the Factory Cove site is generally poor but faunal remains found in Area 1 (403 bones) and Area 3 (973 bones) indicate that seals (mainly harp and harbour) and caribou were the most commonly represented species (Cumbaa, in Auger 1985:226). A small number of spring and summer birds were also recovered. The presence of harp seals in the bone assemblage is intriguing. On rare occasions harp seals might have been available from the site in the spring, but according to all the informants interviewed, this situation could have happened one particular year and never repeated itself for another five years. Therefore, their presence in the Factory Cove might be the result of a "lucky" year hunt or they could also have been transported there.

The Factory Cove endblade assemblage is peculiar, in that within the endblade category (endblades and endblade preforms) there are two types of endblades: one broad (Fig. 3, left) and the other narrow and more gracile (Fig. 3, right). As functional differences were suspected between these two forms, a small sample of endblades was sent to a archaeological laboratory, in New Jersey, specializing in lithic fractures. The analysis of fracture patterns (Cresson pers.comm. 1996) suggests that the smaller gracile examples were used for soft target hunting and may have been used for jabbing or impaling. The broader form shows an impact angle suggesting a solid hit supporting spear or harpoon hunting at a distance. If indeed these differences can be explained in functional terms it could mean that at the Factory Cove site different hunting techniques were used and/or different preys were hunted. Of course, the limited size (n=10) of the sample examined does not allow any generalization but the analysis of fracture patterns is certainly a topic that deserves more investigation.

The presence of many endblade preforms (n=58) at the site is also difficult to interpret. Were these endblade preforms intended to become functional (by being notched) and used at the site or, were they produced at the site or at a nearby location and therefore are evidence for anticipated use at other sites, close or further away?

Site Structure

At the Factory Cove site Auger (1985) has described twelve hearth features, three possible storage features and five possible habitation structures (Fig. 15). Structures B and D were interpreted as bilobate dwellings with mid-passage hearths (hearths 14 for Structure B; Auger does not give the precise location of the mid-passage hearth for structure D). Structure C is believed to be a semi-subterannean structure, Structure A, a tent ring with a central hearth (Feature 1) and Structure E a "lean-to" type of dwelling with a central hearth (Feature 12). Most hearths are found scattered in and out of the dwelling structures. Features 4, 8 and 10 were considered as storage features.

The diversity of the architectural remains at the Factory Cove site suggests that the site could have been used at any time of the year. The tent ring (Struc. A), the lean-to dwelling (Struc. E) and the numerous open-hearths suggest a warm period occupation. If Auger's interpretation of Structure C as a semi-subterannean structure (Auger 1985:112) is correct, it might also indicate a colder month's occupation. The dismantled or the disturbed nature of most of the architectural structures as well as the numerous hearth features distributed throughout the site suggests that the site was reoccupied on a number of occasions.

The overall artifact content of Areas 1 and 2 is quite similar and there is no strong evidence for functional distinctions between these two areas (Fig. 16). The different tool types are equally represented in both areas but if there is no strong organizational pattern in Area 2, most of the processing implements (bifaces, scrapers, microblades) in Area 1 appear to cluster outside the different dwelling structures (Structures A and B). This is not unexpected and it is reasonalble to believe that processing activities were actually performed outside the habitation. The spatial distribution of artifacts associated with manufacturing (hammerstones and bifacial blanks 1 to 4) in these two same areas (Fig. 17), inside and outside, the dwelling structures could alternatively mean that (1) manufacturing activities occurred inside the dwellings, which is unlikely, or that (2) manufacturing activities took place at a time when the dwellings were not occupied and therefore are not contemporaneous with dwelling occupation.

While Area 3 does not seem to have been as intensively occupied, the limited sample also contains both domestic and manufacturing tool types.

Structures A and E are interesting as they both share some architectural similarities. Each of these features has an area covered with larger rocks (Fig. 15). In both cases, a storage feature (Features 4 and 10) was found directly adjacent to these rock concentrations. Also, in both cases, a fireplace is located immediately in front of the rock concentration. In addition, the spatial distribution within and around Structure A, for both formal tool assemblages (Fig. 16) and manufacturing associated implements (Fig. 17), shows that there are very few artifacts where the large rocks are laid, most of the artifacts are distributed on the opposite side of the fireplace and outside, all around the structure. Even though few artifacts are found associated with Structure E, the same pattern is reproduced as most of the artifacts are found on one side of the hearth, the side opposite to the rock concentration.

To summarize, there seem to be no distinctions between areas where domestic and manufacturing activities took place at the Factory Cove site. This might reflect the lack of concern for spatial organization by the site inhabitants or it might simply reflect the fact that six hundred years of shifting intermittent occupations have obliterated any evidence of spatial organization.

Site Interpretation

Over 99% of the raw material found at the Factory Cove site is Cow Head chert. As mentionned, there is a clear dichotomy in the use of the chert at the site: the formal tools are made of fine-grained Cow Head chert whereas some bifaces and all the bifacial blanks are made of a coarser-grained brown-grey-black weathered chert. This latter type of chert is found in the immediate vinicity of the Factory Cove site in place, in five chert beds, or in the form of large tabular boulders scattered on the beach. In the debitage category over 90% of the flakes are made of this same coarser type of chert.

A bifacial manufacturing process is represented by the large amount of debitage, four stages of bifacial blanks and a variety of different sizes of hammerstones. The debitage size distribution indicates that primary reduction as well as the final stages of manufacturing process did not occur at the site. Primary reduction was probably conducted directly at the outcrop or on the beach. The suitable raw materials were then brought to the site to be shaped into bifacial blanks. Bifacial blanks seem to have left the manufacturing context before they were formal bifaces and further modification was certainly occuring at other locations. Thus, Factory Cove seems to be a specialized biface manufacturing site.

At the same time, the number of dwelling structures, hearth features, subsistence related tools and the faunal remains all point to a more domestic function for the site. Consequently, the site can be described as a workshop/habitation site that is a site "in which stone-tool manufacturing was the major activity" (Stevenson 1985:63).

Different possibilities can be forwarded related to site-use: (1) the site was used as a workshop and daily routine subsistence activities were conducted while acquiring raw material; (2) the site could have been a workshop and a base camp from where parties were leaving for other locations for the conduct of specific activities, for instance caribou hunting or fishing; (3) it could also have been a workshop and a base-camp that served as an intermediary or transitory location before people were moving on to other locations. This possibility is the one I prefer and it would maybe explain the high number of endblades preforms at the site; (4) the site could have been used occasionally for quarrying but on other occasions for domestic activities. In this case, quarrying and domestic activities are not assumed to be necessarily contemporaneous. Each of these alternatives is probable, the question now is: how can they be distinguished in the archaeological record?

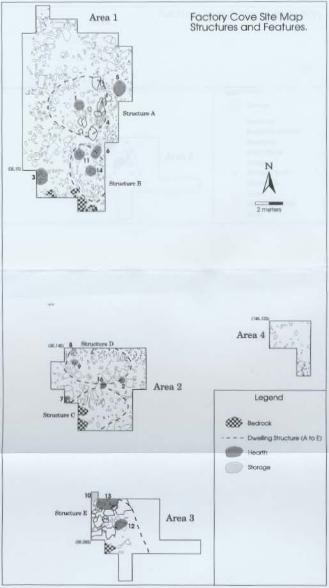

Factory Cove Site Map
Structures and Features.
Area 1
Structure A
Structure B
Area 2
Structure C
Structure D
Area 3
Structure E
Area 4
N
2 meters
Legend
Bedrock
Dwelling Structure (A to E)
Hearth
Storage

Figure 15.

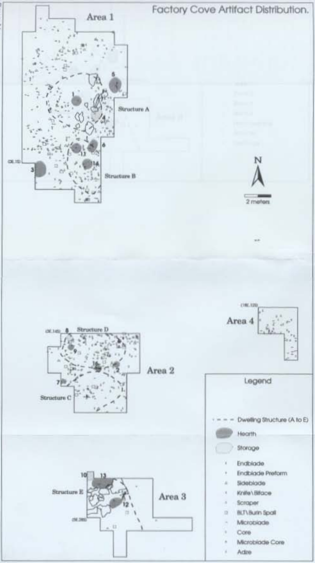
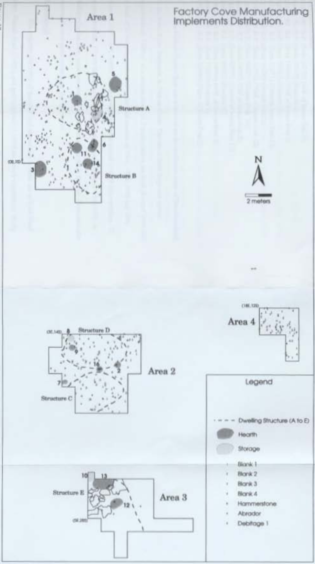

Factory Cove Artifact Distribution.
Area 1
Structure A
Structure B
(0E,15)
1
3
4
5
6
11
14
N
2 meters
Area 2
Structure D
Structure C
(0E,145)
2
7
8
9
16
Area 3
Structure E
(0E,265)
10
12
13
Area 4
(18E,120)
Legend
Dwelling Structure (A to E)
Hearth
Storage
Endblade
Endblade Preform
Sideblade
Knife\Biface
Scraper
BLT\Burin Spall
Microblade
Core
Microblade Core
Adze

Figure 16.



Factory Cove Manufacturing Implements Distribution.
Area 1
Structure A
Structure B
(0E,15)
N
2 meters
Area 4
(18E,125)
Area 2
Structure D
Structure C
(3E,140)
Legend
Dwelling Structure (A to E)
Hearth
Storage
Blank 1
Blank 2
Blank 3
Blank 4
Hammerstone
Abrador
Debitage 1
Area 3
Structure E
(5E,285)

Figure 17.

Phillip's Garden East: EeBi-1

Radiocarbon dates:
2760± 90 B.P. (Beta 23979) (NW of house Feat.2)
2660± 70 B.P. (Beta 15375) (Feature 1)
2510± 90 B.P. (Beta 19086) (Wall of house Feat.2)
2500± 60 B.P. (Beta 50021) (Feature 55)
2420± 110 B.P. (Beta 42971) (Outside house Feat.12)
2370± 160 B.P. (Beta 19089) (House Feat.2)
2350± 100 B.P. (Beta 42972) (Wall of house Feat.12)
2350± 90 B.P. (Beta 50023) (House Feat. 12)
2320± 100 B.P. (Beta 19087) (SW of house Feat.2)
2310± 90 B.P. (Beta 42970) (Centre of house Feat.12)
2260± 70 B.P. (Beta 50022) (Feature 53)
1910± 150 B.P. (Beta 19088) (NW of House Feat.2)
1930± 140 B.P. (Beta 19085) (Feature 1)
1730± 200 B.P. (Beta 23980) (Floor of house Feat.2)

The Phillip's Garden East site is located on the northwest coast of Newfoundland, on the Point Riche Peninsula, in Port au Choix. The site is fairly large and covers approximately 1500 m² of a terrace about 12.5 metres above sea level (Renouf 1994:169). A total of 127m² were excavated in the field seasons of 1984, 1986, 1990 and 1991 (Renouf 1987, 1991, 1992). The excavations yielded a total of 2510 lithic artifacts, 72 organic artifacts, 35,000 flakes and over 75,000 animal bones (Renouf 1994:169). At Phillip's Garden East, bone preservation is excellent and as yet is the only Groswater site known where organic technology was recovered.

Raw material

The majority (96.80%) of the lithic tool assemblage is made out of Cow Head chert. Ramah chert (2.04%) and quartz crystal (1.16%) are poorly represented. In the debitage category, Cow Head cherts constitute 98.83% of the assemblage, Ramah chert 0.95% and quartz crystal 0.22%

Out of a total of 2256 chert specimens examined, radiolarians were clearly identified on 1689 (74.87%) specimens. Possible radiolarian shadows were observed on 252 (11.17%) specimens, and 315 (13.96%) dark grey and grey specimens exhibited no trace of radiolarians.

Debitage Analysis

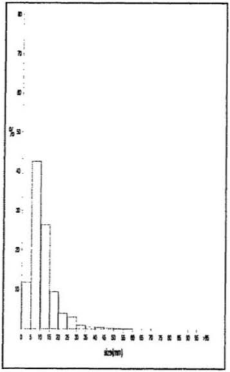
A total of 75,000 flakes were recovered at the site. Debitage analysis was conducted on a 20% random sample. However, within this sample only the flakes from the areas uncovered in 1990 and 1991 were considered. Intra-site spatial analysis has shown (see below) that the area excavated in 1984 and 1986 was disturbed by the construction of a Dorset house. Consequently, the distinction between Dorset and Groswater debitage material could not be made with certainty.

At the Phillip's Garden East site the flakes do not exhibit a size distribution range as broad as the Factory Cove site. Small retouch flakes (<10mm) constitute over 54.0% of the debitage assemblage. The remaining 46.0% of the flakes are larger, with a concentration in the 10mm and 20mm categories.

Table 3. Phillip's Garden East
Flake Size Distribution.

Size(mm)	N	%
0-5	334	11.89
5-10	1197	42.61
10-15	741	26.38
15-20	267	9.50
20-25	113	4.02
25-30	86	3.06
30-35	28	1.00
35-40	16	0.57
40-45	12	0.43
45-50	7	0.25
50-55	3	0.11
55-60	3	0.11
60-65	0	0.00
65-70	1	0.03
70-75	1	0.03
	2809	99.99

Figure 18. Phillip's Garden East
Flake Size Histogram.



This flake-size distribution indicates that a great proportion of the flakes are the result of tool maintenance and retouching. The relatively high proportion of larger flakes within the 10mm-20mm size category also suggests that the last stage of manufacturing reduction occurred at the site.

Tool Assemblages

Total Artifact Inventory: n= 2582
246 endblades, 70 endblade preforms, 73 sideblades, 230 knives and biface fragments, 228 scrapers, 1323 microblades, 12 microblade cores, 133 burin-like-tools, 1 burin-like-tool preform, 10 burin spalls, 97 blank 4, 9 adze and axes, 76 unidentified, 2 probable netsinkers, 14 harpoon heads and fragments, 1 haft, 2 foreshafts, 2 needle fragments, 2 awls, 5 flaking punches, 10 expedient points, 36 pieces of cut and/or worked bones.

Table 4. Phillip's Garden East Tool Categories.

Tool Category	N	%
Endblades	246	13.01
Endblade Preforms	70	3.70
Sideblades	73	3.86
Knives and Biface Fragments	230	12.17
Scrapers	228	12.06
Microblades (1323)	781*	41.32
Microblade cores	12	0.63
Burin-like-tools	133	7.04
Burin-like-tool Preforms	1	0.05
Burin Spalls	10	0.53
Blanks 4	97	5.13
Adzes and axe	9	0.48
Totals	1890**	99.98

* Microblades MNM counted on proximal ends (59.03%).
**Modified count by the standardization of microblade number.

Hunting (16.87%) and processing (65.55%) were the most important activities at the site. Tool maintenance (17.08%) was also conducted and there is very little evidence for tool manufacturing (0.48%). Over 22.0% of the endblades are preforms (endblades without the notches). In the bifaces category, 30% of the bifaces are bifacial blanks. This high proportion of preforms and biface blanks probably means that these forms were brought to the site in an unfinished shape and then completed at the site.

Site Structure

At the Phillip's Garden East site, two principal areas were excavated (Fig. 19): one to the north (1984-1986), the other to the south (1990-1991). In this discussion of intra-site spatial analysis, only the southern area will be considered. In the northern portion of the site, I believe the Groswater occupation floor was disturbed by the subsequent construction of a Dorset dwelling feature (Feature 2). Feature 2 is a small, circular, well-defined depression about three metres in diameter, 20 to 25 cm deep (Renouf 1994:170). The floor of this feature is virtually free of artifacts except for a handful of implements, mainly microblades (Fig. 20). As mentioned by Renouf (1994:170) " the stratigraphy in this part of the site indicated that the house had been excavated through an already existing cultural deposit, which was then thrown to one side to form a layer of debris ...". Figure 20 clearly shows that Renouf was correct in her interpretation and there is an obvious concentration of artifacts on the left side of the house. Most of these artifacts belong to the Groswater culture so it appears that this feature was excavated through an existing Groswater cultural deposit.

Feature 2 is believed to be Dorset for a number of reasons: (1) its architectural similarity with Dorset houses; (2) it is virtually free of artifacts and the few implements (mostly microblades) found within the house are non-diagnostic; (3) fourteen out of the nineteen Dorset artifacts recovered at the Phillip's Garden East site were found around this feature; (4) all the soapstone fragments found at the site are associated with this feature; (5) all the ground slate fragments found at the site were exclusively recovered in this area (Renouf 1991:38); (6) the most recent dates (1910±150; 1930±140; 1730±200 B.P.) for the site are associated with this feature; (7) Feature 2 is located less than 30 metres away from the easternmost Dorset house of the large Phillip's Garden Dorset site. For all these reasons, and because of the obvious disturbed nature of this portion of the site it will not be included in the spatial analysis.

In the southern portion of the site, Renouf (1992:10) identified Feature 12 as a circular tent ring. This feature measures a little over 5 metres in diameter and has an area to the side covered with large rocks (Fig. 19). Feature 12 is interesting as it shares some similarities with Structures A and E of the Factory Cove site. These three structures have roughly the same dimension, they all have an area to the side covered with larger rocks. Feature 12, like the Factory Cove Structure A and E, also have hearth features (Features 19 and 29) in front of the large rock concentration. Figure 21 shows a schematic representation and two possible interpretations for this type of dwelling. This could be a characteristic Groswater dwelling type.

The southern portion of the Phillip's Garden East site is liberally scattered with artifacts, bones, flakes and fire-cracked rocks. Most of the features in this area are not well defined. Fire-cracked rock concentrations (Feature 22, 25, 30, 37) occur throughout the site. Feature 38, 41, 49, 52, 53, 55, were interpreted as possible storage features (Renouf 1991, 1992). These latter features all contained bones and charcoal, most of them also had fire-cracked rocks. Thus, they could also be interpreted as dismantled hearth features. Features 39 and 40 are possibly post holes (Renouf 1991:35-37). Features 19, 29 and 33 are interpreted as hearth features (Renouf 1991).

The number of features at the site as well as the disturbed nature of these features suggest that the site might have been reoccupied on a number of occasions, each occupation obliterating the preceding ones. The random spatial distribution of the different artifact types throughout this same area (Fig. 20) also reinforces this interpretation, as there is no strong evidence for functionally distinct activity areas. However, not unlike dwelling Structures A and E of the Factory Cove site, most of the artifacts tend to concentrate on one side of the house Feature 12; the side opposite to the rock concentration.

Site Interpretation

Cow Head chert (over 97.0%) clearly dominates both the tool and the debitage assemblages. The debitage analysis suggests a dual pattern with a good proportion of small flakes indicating pressure retouch work and a proportion of larger flakes which can possibly be associated with some of the latest stages of bifacial blank reduction. If a link can be made between the fine retouch flakes and the high proportion of endblade preforms present at the site, it would be reasonable to believe that the endblades were carried un-notched and that notching occurred at the site.

The same type of behaviour can be observed in the biface category; almost one third of the bifaces reached the site as bifacial blanks (blanks 4). One possible interpretation for that type of behaviour, is that many tools entered the site in an incomplete shape as a way to prevent breakage in transportation. Another explanation, which does not exclude the previous one, could be that people were coming to the site with a full knowledge of their tool function requirements and replacement needs (Binford 1979:268). As part of a "gearing up" (ibid) strategy, people had anticipated their functional needs and moved with a large supply of "ammunition", well prepared for the seal hunt. A time-related factor may also be considered. Many items were brought to the site in an unfinished condition so they could be completed when hunters had time on their hands, for instance waiting for the game.

In conclusion, the lithic organization at the Phillip's Garden East site expresses an anticipatory component in the use of the site. The only tent ring feature and the lack of well defined spatial organization at the site suggest that the site was probably re-occupied for short periods of time, on a number of occasions. The site was probably visited in the spring for the purpose of Harp seal hunting. The great number of young seals in the faunal collection also reflects a spring hunt (Kennett 1990).

Finally, if my interpretation of Feature 2, as a Dorset habitation feature is correct, and if the 1900 and 1700 radiocarbon dates can be associated with this feature, the time range of the Groswater occupation in the province of Newfoundland is back to where is has traditionally been, that is between 2800 and 2100 B.P.

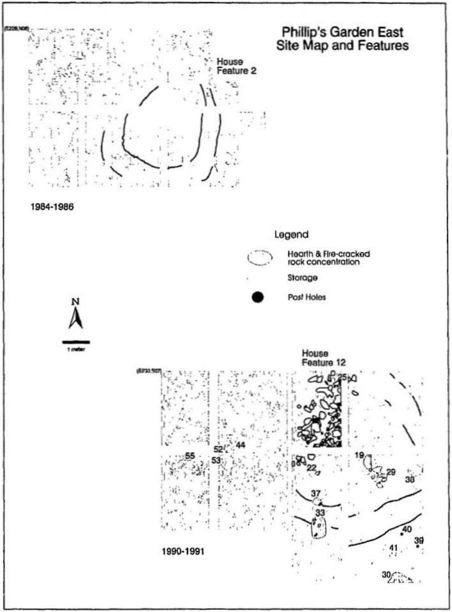

Phillip's Garden East
Site Map and Features
House
Feature 2
1984-1986
Legend
Hearth & Fire-cracked rock concentration
Storage
Post Holes
N
1 meter
House
Feature 12
25
52
44
55
53
22
19
29
38
37
33
40
39
41
30
1990-1991

Figure 19

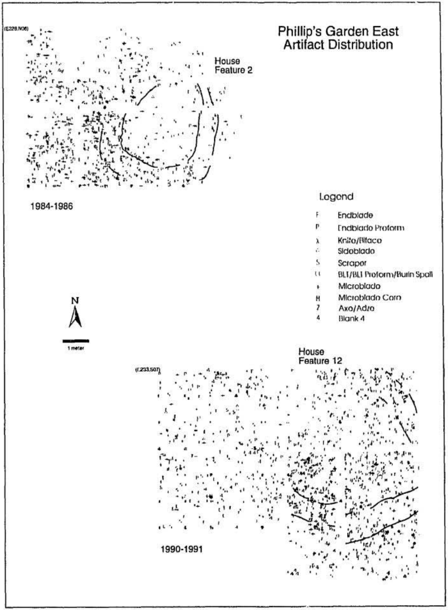

Phillip's Garden East
Artifact Distribution
(E228,N06)
House
Feature 2
1984-1986
Legend
Endblade
Endblade Preform
Knife/Biface
Sideblade
Scraper
BLT/BLT Preform/Burin Spall
Microblade
Microblade Core
Axe/Adze
Blank 4
N
1 meter
House
Feature 12
(E233,S07)
1990-1991

Figure 20

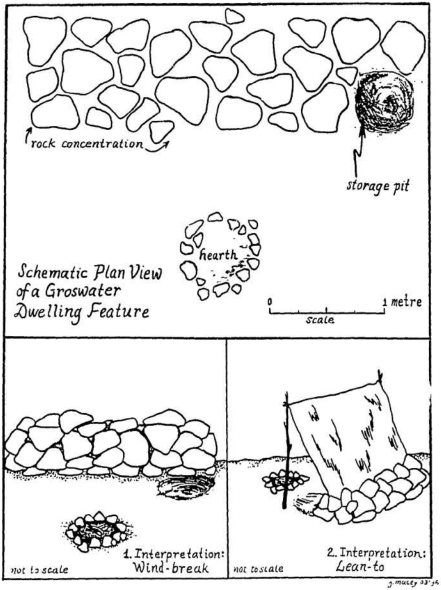


Figure 21. Schematic Plan View of a Groswater Dwelling.

Cornick Site: EeBi-29

No radiocarbon dates

Excavation of the Cornick site was a salvage archaeology project conducted in 1988 on a house construction site. The site is located in the community of Port au Choix on the eastern portion of the Point Riche Peninsula on the narrow band of land that joins with the Port au Choix Peninsula and separates the old Port au Choix and the new Port au Choix harbours. The site is situated at the base of a hill on a small knoll of land surrounded by a bog. Data concerning the elevation of the site are not available. Most of the area was disturbed and artifacts were recovered by screening the back dirt pile from the excavation of the house foundation. The cultural material did not seem to extend beyond the boundaries of the house foundation. The Cornick site produced a total of 390 artifacts, 2400 flakes and a few hundred bones.

Raw Material

The vast majority (98.08%) of the lithic tool assemblage is made out of Cow Head chert. Ramah chert (0.86%) and quartz crystal (1.06%) are poorly represented. In the debitage category chert constitutes 97.62% of the assemblage, Ramah 0.25% and quartz crystal 2.13%. High quality chert dominates both artifact and debitage assemblages.

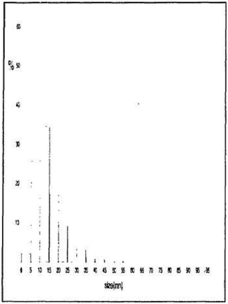
Out of a total of 360 chert specimens, radiolarians were positively identified on 231 specimens (64.17%). Probable radiolarian shadows were seen on 43 specimens (11.94%). No radiolarians were observed on 86 (23.86%) lithic artifacts, all of which were composed of grey chert.

Debitage Analysis

Table 5: Cornick Flake Size Distribution.

Size(mm)	N	%
0-5	49	2.04
5-10	616	**25.66**
10-15	830	**34.58**
15-20	410	**17.08**
20-25	225	9.37
25-30	138	5.75
30-35	78	3.25
35-40	30	1.25
40-45	14	0.58
45-50	5	0.21
50-55	5	0.21
55-60	5	0.02
	2400	99.99

Figure 22. Cornick Flake Size Histogram.



A total of 2400 flakes were recovered from the site. Small retouch flakes (those <10mm) are present in a good proportion (27.7%), but flakes larger than 10 mm. (72.3%) constitute most of the debitage assemblage. This distribution suggests that tool maintenance was carried out to a certain degree at the site, but that the last stage of manufacturing reduction was also conducted here. This pattern is consistent with the one observed at the Phillip's Garden East site.

Tool Assemblage

Total Artifact Inventory: n= 390
31 endblades, 10 endblades preforms, 9 sideblades, 23 burin-like-tools, 3 burin-like-tool preforms, 27 knives and biface fragments, 9 blanks 3, 10 blanks 4, 62 scrapers, 192 microblades, 5 unidentified, 6 slate fragments, 3 cut bones.

Table 6. Cornick Tool Categories.

Tool Category	N	%
Endblades	31	10.30
Endblade Preforms	10	3.32
Sideblades	9	3.00
Knives and Biface Fragments	27	8.97
Scrapers	62	20.60
Microblades (192)	117*	38.87
Burin-like-tools	23	7.64
Burin-like-tool Preforms	3	0.99
Blanks 3	9	3.00
Blanks 4	10	3.32
Total	301**	100.01

* Microblade MNM counted on proximal ends (60.94%).
** Modified count by standardization of microblade number.

The Cornick collection contains a high proportion of processing tools (68.44%). Procurement (hunting) (13.30%) and maintenance (18.27%) were also important activities conducted at the site. There is no evidence for tool manufacturing at the site. Almost 25% of the endblades are preforms (endblades without notches). A little over 40% of the bifaces are bifacial blanks. Like the Phillip's Garden Est site there is an anticipatory component in the use of the Cornick site.

Site Structure

Because of the disturbed nature of the site, artifact location was not recorded and no features could be clearly identified. The presence of burned fat, charcoal and fire-cracked rocks could, however, indicates hearth features.

Site Interpretation

Cow Head chert (over 97.00%) was by far the most important raw material at the Cornick site. The functional and the lithic organizational patterns expressed at the Cornick site are quite similar to the ones observed at the Phillip's Garden East site.

EiBg-43A: Blanc Sablon

Radiocarbon dates:
2590 ± 70 B.P. (Beta 40350) (Structure 1)
2420 ± 60 B.P. (Beta 19637) (Structure 3)

The EiBg-43A site is located at the mouth of the Blanc Sablon river on a sandy terrace about 8 meters above sea level (Pintal 1994:148). Excavations were conducted in the summers of 1984 (Groison et al.1985), 1987 (Pintal 1987) and 1990 (Pintal 1991). Approximately 65 square meters were uncovered. The stratigraphy at the site is simple: the cultural layer is found resting on the beach sand under a peat layer about 10 cm thick (Pintal 1987). The collection consists of 91 artifacts and 5387 flakes.

Raw Material

In the tool category, Cow Head chert is represented at 80.30%, Ramah at 4.79%, quartz crystal at 6.49%. Nephrite (8.43%) is also represented in one adze. Over 97.97% of the debitage is fine-grained Cow Head chert, 0.67% Ramah chert and 1.35% quartz crystal. Out of a total of 74 chert artifacts examined for radiolarians, 68 (91.89%) clearly belong to the Cow Head group. Possible radiolarian shadows were observed on 3 (4.05%) specimens, and only 3 (4.05%) specimens exhibited no trace of radiolarians.

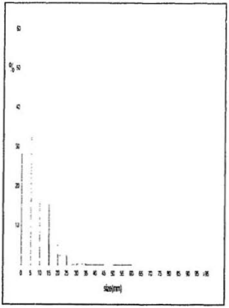
Debitage Analysis

A total of 5387 flakes were recovered at the site. The highly skewed flake-size distribution clearly indicates that maintenance reduction activities were important at the site (Fig. 23). Tools were obviously brought to the site already shaped and were simply retouched when necessary.

Table 7: EiBg-43A Flake Size Distribution

Size(mm)	N	%
0-5	1511	**28.05**
5-10	2594	**48.15**
10-15	829	**15.39**
15-20	271	5.03
20-25	130	2.41
25-30	33	0.61
30-35	12	0.22
35-40	4	0.07
40-45	1	0.02
45-50	0	0.00
50-55	1	0.02
55-60	1	0.02
Total	5387	99.99

Figure 23. EiBg-43A Flake Size Histogram.



Tool Assemblages

Total Artifact Inventory: n= 91
5 endblades, 5 sideblades, 5 burin-like-tools, 1 burin, 4 burin spalls, 21 knives and biface fragments, 1 blank 4, 10 scrapers, 29 microblades, 1 microblade core, 3 cores, 1 adze, 4 abrader, 1 unidentified.

Table 8. EiBg-43A Tool Categories

Tool Category	N	%
Endblades	5	6.94
Sideblades	5	6.94
Knives and Biface Fragments	21	29.17
Scrapers	10	13.89
Microblades (29)	18*	25.00
Microblade Cores	1	1.39
Burin-like-tools	5	6.94
Burin Spalls	4	5.55
Blanks 4	1	1.39
Adze	1	1.39
Abrader	1	1.39
Total	72**	99.99

* Microblade MNM established at 62.0%.
** Modified count by standardization of microblade number.

Hunting (13.88%) and processing (68.06%) were by far the most important activities at the site. Tool maintenance (15.27%) was also conducted. The presence of an adze and an abrader reflects some manufacturing activities (2.78%).

According to the functional categories, the EiBg-43A site is similar to the Port au Choix sites (Phillip's Garden East and Cornick), with a strong emphasis on seal hunting. The EiBg-43A site, however, is distinguished from the former sites by a tool assemblage consisting mostly of finished tools, and by the small size of its debitage.

Site Structure

Six features were identified at the EiBg-43A site (Fig. 24), all of which were interpreted as hearth features (Pintal 1994:151). Associated with Features 1, 2, and 3 were fire-cracked rocks and a small amount of charcoal (Pintal 1994:151). Features 4, 5 and 6 were larger features consisting of thin, but dense layers of charcoal almost completely buried in rocks (Pintal 1994:151; 1991:39). In Feature 5 a number of stone slabs surrounding a concentration of ashes and fire-cracked rocks suggests the presence of an axial feature (Pintal 1994:151).

The non-overlapping distribution of hearth features 1, 2 and 3 as well as the clustering of artifacts (Fig. 25) and flakes (Fig. 26) around each of these features could suggest three distinct occupations. The redundancy observed in the artifact types occuring around each of these features further reinforces this point.

The southern portion of the site is more difficult to interpret. Although a possible axial feature and high densities of charcoal were noted in this area (Pintal 1994:151), the limited excavation of the area makes it difficult to evaluate its functional significance. Features 4, 5 and 6 could very well represent three distinct occupations, but without knowing where their actual limits are it is difficult to see if they are connected or independent from one another. Feature 6 contains no artifacts. The artifact content of Features 4 and 5 is quite similar: they both have microblades, bifaces and sideblades. In their artifactual content these two features are the same as the three features in the northern portion of the site, which also have tools associated with hunting and processing.

To summarize, Features 1, 2 and 3 might be the result of three distinct short-term occupations. The articulation of the activities around Features 4, 5, and 6 is still yet not possible to identify with any degree of certainty.

Site Interpretation

Over 87.0% of the raw material found at the EiBg-43A site came from the Newfoundland west coast. Most of the tools must have been brought to the site in a finished state. The site structure suggests at least three distinct occupations. The site was probably used by different groups of seal hunters for short hunting episodes.

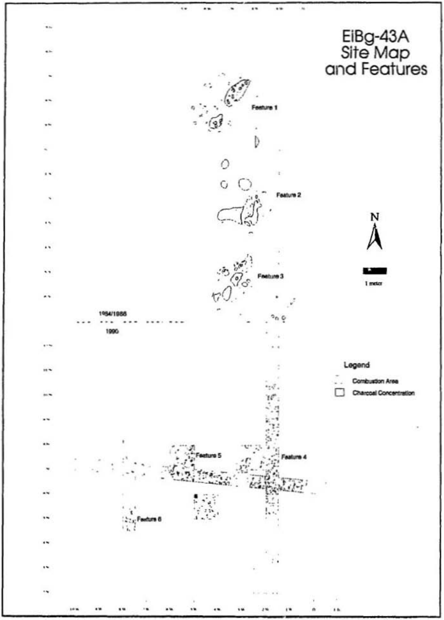

EiBg-43A
Site Map
and Features
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
1 meter
1984/1988
1990
Legend
Combustion Area
Charcoal Concentration

Figure 24

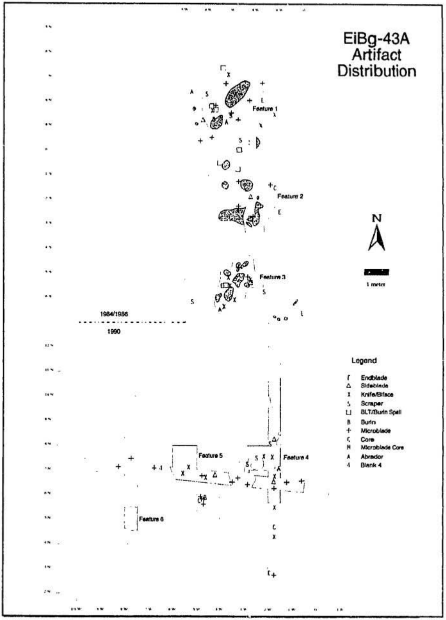

EiBg-43A
Artifact
Distribution
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
N
1 meter
1984/1986
1990
Legend
Endblade
Sideblade
Knife/Biface
Scraper
BLT/Burin Spall
Burin
Microblade
Core
Microblade Core
Abrador
Blank 4

Figure 25

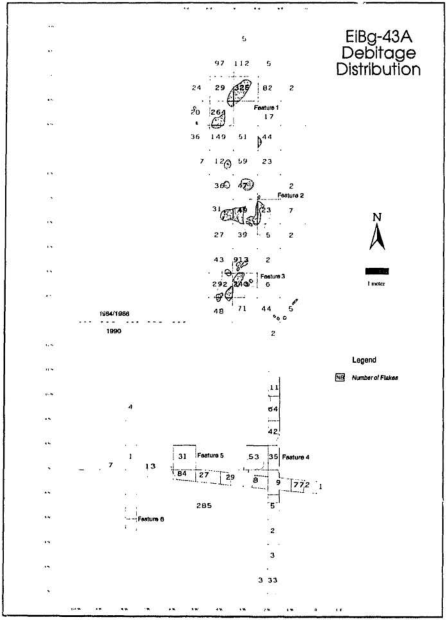

EiBg-43A
Debitage
Distribution
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
N
1 meter
1984/1986
1990
Legend
NB Number of Flakes

Figure 26

EiBg-29: Ile au Bois

Radiocarbon dates:
2430 ± 80 B.P. (Beta 23004)
2300 ± 150 B.P. (UQ 1753) (N-22)

The EiBg-29 site is located on the north west point of Ile au Bois, an island about a kilometre offshore from the community of Lourdes-de-Blanc Sablon, on the Quebec Lower North Shore. In the summers of 1984 and 1989, a total of 15 m² was excavated. Site elevation is 6.50 meters above sea level (Plumet et al. 1994:95). The stratigraphy is straightforward: (1) a thirteen to fifteen centimetre vegetation and peat layer, (2) a thin sand layer where most of the cultural material is found, and (3) subsoil (Plumet et al. 1994:96). The collection consists of 36 lithic artifacts and 580 flakes.

Raw Material

Of the lithic artifacts, 82.57% are made out of Cow Head chert, 10.32% of Ramah chert and 7.11% of quartz crystal. In the flake category, Cow Head chert constitutes 83.51% of the assemblage, Ramah 7.02%, quartz and quartzite the remaining 9.47%.

A total of 27 artifacts were examined for radiolarians, which were clearly recognized on 24 (88.88%) artifacts. Radiolarians were indistinct on one specimen (3.70%) and were not seen on two grey specimens (7.41%).

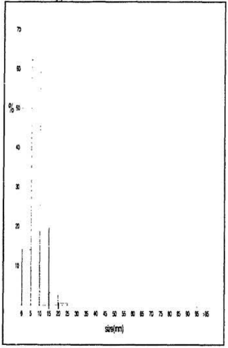
Debitage Analysis

A total of 580 flakes were recovered from the EiBg-29 excavation. The flake-size distribution is unimodal and skewed towards small flakes. Tools probably entered the site in a finished state and were only retouched and resharpened as needed.

Table 9. EiBg-29 Flake Size Distribution

Size(mm)	N	%
0-5	82	**14.14**
5-10	363	**62.41**
10-15	114	**19.65**
15-20	19	3.27
20-25	3	0.52
Total	580	99.99

Figure 27. EiBg-29 Flake Size Histogram.



Tool Assemblage

Total Artifact Inventory: n= 36
5 endblades, 2 sideblades, 2 scrapers, 1 burin, 6 burin-like-tools, 1 burin-like-tool preform, 3 burin spalls, 14 microblades, 2 unidentified.

Table 10. EiBg-29 Tool Categories

Tool Category	N	%
Endblades	5	17.86
Sideblades	2	7.14
Scrapers	2	7.14
Microblades (14)	8*	28.57
Burin-like-tools	6	21.42
Burin-like-tool Preforms	1	3.57
Burin Spalls	3	10.71
Burin	1	3.57
Total	28**	99.98

* Microblade MNM established at 57.14%.
** Modified count by the standardization of microblade number.

Hunting (25.00%) and processing (35.71%) were important activities at the site. Tool maintenance (39.27%) activities are well represented but no manufacturing activities are present. This pattern is different from the other sites on the Quebec and Labrador side of the Strait (Table 16). At EiBg-29, processing does not seem to have been as important as at all the other sites in the Strait. Most of the processing perhaps occurred at a nearby location at the site, not yet excavated. Or maybe the hunters were travelling back to the mainland with their entire catch and were processing them there. On the other hand, the small size of the archaeological assemblage might well be responsible for this functional difference.

Site Structure

The activities at the EiBg-29 site seem to be articulated around two major hearth features (Fig. 28) one to the north and one to the south. In the northern portion of the site, the flake (Fig. 29) and artifact (Fig. 30) distributions indicate that activities were concentrated around a central hearth. This pattern is reproduced in the southern portion of the site, even though the artifact density is less. The two areas appear to be spatially distinct. Although the excavation of the area between the two locations might show continuity between the two, the decreasing artifact and flake densities from the core of the hearths outward could indicate that the two areas were independent. The redundant assemblage composition in both areas reinforces this idea; both areas contain more or less the same tool types and frequencies. The site structure at Ile au Bois therefore seems to be the result of two distinct occupations.

Site Interpretation

Once again most of the raw material used at the EiBg-29 site came from sources on the Newfoundland west coast. The debitage and tool assemblages indicate that tools were brought to the site in a finished state. The site structure suggests that two distinct hunting episodes were carried out at the site.

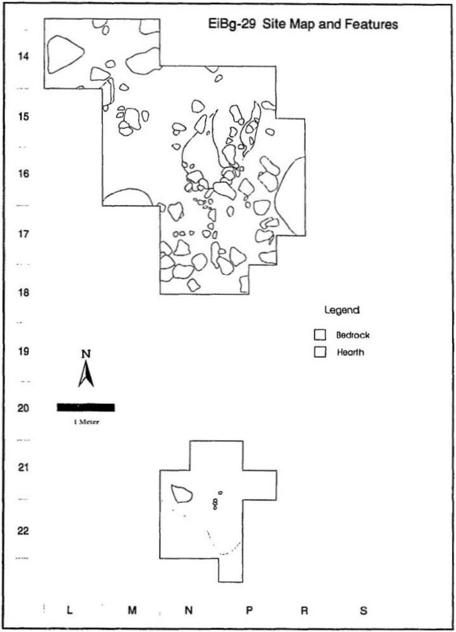

EiBg-29 Site Map and Features
14
15
16
17
18
19
20
21
22
N
1 Meter
Legend
Bedrock
Hearth
L
M
N
P
R
S

Figure 28

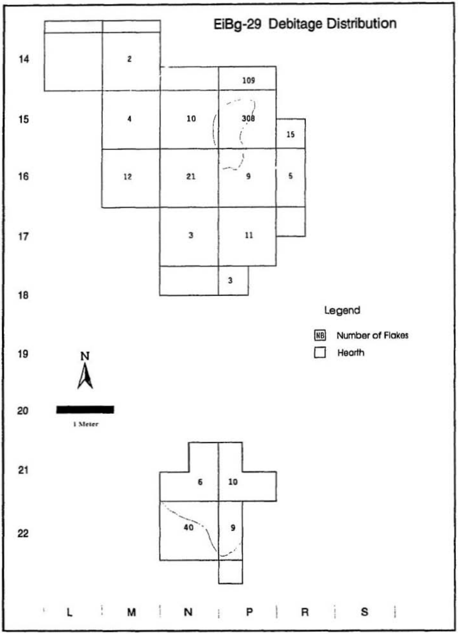

EiBg-29 Debitage Distribution
14
15
16
17
18
19
20
21
22
2
109
4
10
308
15
12
21
9
5
3
11
3
6
10
40
9
Legend
NB Number of Flakes
Hearth
N
1 Meter
L
M
N
P
R
S

Figure 29

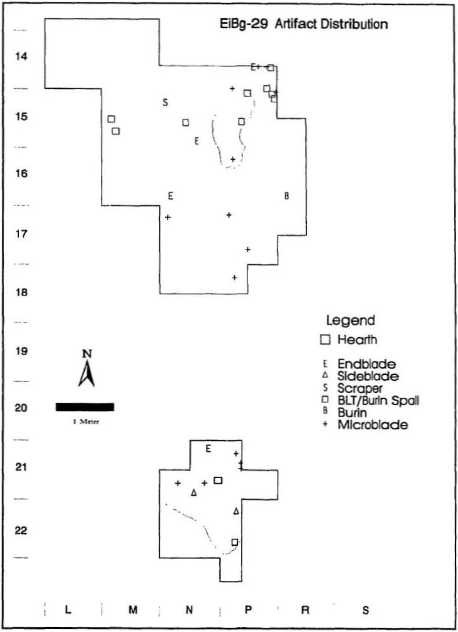

EiBg-29 Artifact Distribution
14
15
16
17
18
19
20
21
22
L
M
N
P
R
S
N
1 Meter
Legend
Hearth
E Endblade
Δ Sideblade
S Scraper
□ BLT/Burin Spall
B Burin
+ Microblade

Figure 30

EiBj-4: Wild Cove

No radiocarbon dates

The Wild Cove site is located west of Blanc Sablon near Salmon Bay. So far, the Wild Cove site seems to be the westernmost Groswater location ever found. The site was investigated in 1972 by Charles Martijn as part of a salvage archaeological project. The site in itself was a surface deposit covering an area of 250m by 160m, on a sandy terrace about 12 meters above sea level (Martijn 1973:7). No features were observed. The collections consists of 65 lithic artifacts and 1039 flakes.

Raw Material

Cow Head cherts constitute 86.41% of the lithic artifacts, Ramah 0.87% and quartz crystal 12.72%. Cow Head chert (76.18%) also dominates the debitage assemblage, while Ramah (6.86%), quartz and quartzite (16.79%) and a small amount of nephrite (0.17%) are also represented.

A total of 55 chert specimens were examined for radiolarians, which were clearly identified in 89.09% of the items. Radiolarian shadows were observed on five specimens (9.09%). One grey specimen (1.82%) did not have any radiolarians.

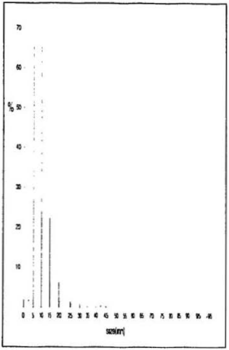
Debitage Analysis

A total of 1039 flakes were recovered at the site. The flake size distribution clearly reflects an emphasis on the last stages of stone tool working (Fig. 31). Tools probably entered the site in a finished state and were retouched and maintained at the site.

Table 11. EiBj-4 Flake Size Distribution

Size(mm)	N	%
0-5	18	1.73
5-10	698	**67.18**
10-15	231	**22.23**
15-20	64	6.16
20-25	15	1.44
25-30	8	0.77
30-35	2	0.19
35-40	0	0.00
40-45	3	0.29
Total	1039	99.99

Figure 31. EiBj-4 Flake Size Histogram.



Tool Assemblages

Total Artifact Inventory: n= 65
5 endblades, 1 endblade preform, 2 sideblades, 8 knives and biface fragments, 1 scraper, 40 microblades, 1 microblade core, 2 burin-like-tools, 3 burin spalls, 1 burin, 1 core.

Table 12. EiBj-4 Tool Categories

Tool Category	N	%
Endblades	5	10.42
Endblade Preforms	1	2.08
Sideblades	2	4.16
Knives and Biface Fragments	8	16.66
Scrapers	1	2.08
Microblades (40)	24*	50
Microblade Core	1	2.08
Burin-like-tools	2	4.16
Burin Spalls	3	6.25
Burin	1	2.08
Total	48**	99.97

* Microblades MNM established at 60%.
** Modified count by the standardization of microblade number.

Processing (68.74%) and hunting (14.58%) were obviously the most important activities at the site. Maintenance (16.65%) occurred to a certain degree, but tool manufacturing was absent. The tool assemblage for this site is once again rather small and for that reason the classification of only one item in a particular functional category might have inflated the importance of that category.

Site Structure

All the material at the EiBj-4 site was surface collected and no features were observed, so internal site structure cannot be evaluated.

Site Interpretation

The pattern of occupation at the Wild Cove site is comparable to the one observed at all the other Quebec Lower North Shore sites. The raw material was coming from Newfoundland and the strong skewing of debitage towards the smaller size categories indicates that only finished tools reached the site. The tool assemblage reflects an emphasis on seal hunting and the small size of the assemblage is probably the result of a short hunting episode. In all probability, the site was used in an opportunistic way when the seals were passing by this particular location.

Saddle Island-Area F: EkBc-1

No radiocarbon dates

Saddle Island Area F site is located on the southeast end of Saddle Island, a small island facing the inner harbour of Red Bay, in southern Labrador. This island is well known for its Basque occupation. In the summer of 1981, 128 square meters were uncovered and the Groswater materials were found underneath a deposit of fragmented Basque roof tiles and artifacts. The Groswater finds occurred within the first five centimetres of the gravel and sand beach and the Groswater component seems to have been occupied when the beach was not yet covered with vegetation. No features were discovered and no reliable charcoal was found. A total of 117 Groswater artifacts and 1541 flakes were uncovered at the site.

Raw Material

Of the lithic tool assemblage raw materials, 79.68% was made out of Cow Head chert, while Ramah chert (2.64%) and quartz crystal (17.67%) were also represented. The high percentage of quartz crystal is accounted for by only two microblade cores. In the debitage category, Cow Head chert constitutes 97.75% of the assemblage, Ramah chert 0.81% and quartz and quartzite the remaining 1.44%.

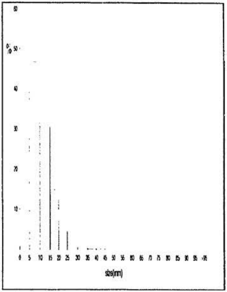
Out of a total of 98 chert artifacts, radiolarians were clearly identified on 86 specimens (87.75%). Possible radiolarian shadows were observed on 7 tools (7.14%). No radiolarians were seen on 5 grey specimens (5.10%).

Debitage Analysis

Table 13: Saddle Island Area F
Flake Size Distribution

Size(mm)	N	%
0-5	11	0.71
5-10	721	46.79
10-15	471	30.56
15-20	229	14.86
20-25	70	4.54
25-30	28	1.82
30-35	5	0.32
35-40	2	0.13
40-45	3	0.19
45-50	0	0
50-55	1	0.06
	1541	99.98

Figure 32. Saddle Island Area F
Flake Size Histogram



The flake-size distribution indicated that most of the flakes are the result of the final stages of tool shaping, sharpening and retouching. The relatively high proportion of flakes in the larger 10-15 and 15-20 categories might be accounted for by the working of bifaces, which were found at the site.

Tool Assemblage

Total Artifact Inventory: n= 117
6 endblades, 2 endblade preforms, 4 sideblades, 19 knives and biface fragments, 63 microblades, 4 microblade cores, 4 burin-like-tools, 2 burin spall, 1 burin, 5 blanks-3, 1 blank-4, 1 adze, 1 hammerstone, 4 unidentified.

Table 14. Saddle Island-Area F Tool Categories

Tool Category	N	%
Endblades	6	6.82
Endblade Preforms	2	2.27
Sideblades	4	4.54
Knives and Biface Fragments	19	21.59
Microblades (63)	38*	43.18
Microblade Cores	4	4.54
Burin-like-tools	4	4.54
Burin Spalls	2	2.27
Burin	1	1.14
Blanks 3	5	5.68
Blanks 4	1	1.14
Adze	1	1.14
Hammerstone	1	1.14
Totals	88**	99.99

* Microblades MNM counted on proximal ends (60.32%)
** Modified microblade count by the standardization of microblade numbers.

Hunting (11.36%) and processing (64.77%) were the main activities conducted at the site. The maintenance category (21.58%) is well represented at the site accounted by the presence of preforms and biface blanks. A small amount of manufacturing activities (2.28%) occurred at the site, as indicated by the adze and hammerstone.

Site Structure

No features were observed at the Saddle Island site, but the debitage (Fig. 33) and artifact (Fig. 34) distributions indicate that most of the activities seem to be concentrated on the eastern portion of the site. Taking a closer look, the spatial distribution of the site seems to be divisible into three or four occupational zones. There is a clear concentration of activities in the northeast portion of the site (zone 1). The debitage distribution and to a lesser extent the tool distribution suggest that three other activity zones may be distinguishable: zones 2, 3 and 4. Zone 2 is problematic because it is hard to know if it could be an extension of either zone 1 or zone 3 or if zones 1, 2 and 3 could together be interpreted as a continous distribution. However, the decreasing artifact and debitage density between each of these zones might be an indicator of their independence. Zone 4 seems to be autonomous.

There is no strong evidence for functionally distinct activity areas within zones 1, 2 and 3 since the composition of the tool assemblages within these concentrations is similar. However, the association of zone 4 artifacts with the scattered microblades and bifaces lying west of this zone might suggest that this part of the site was used exclusively for animal processing. If this hypothesis holds true, zone 4 could be interpreted as the processing areas for all or any of the three other zones.

Site Interpretation

The vast majority of the lithic raw material used on Saddle Island originated from the Newfoundland west coast. The tool assemblage indicates a strong emphasis on hunting and processing. The presence of preforms and bifacial blanks in the assemblage adds a slight anticipatory component to the use of the site. Perhaps because the site is located on an island, the hunters were going to the site prepared, avoiding having to go back to the mainland for tool replacement. Also because of its geographical location, right at the mouth of the Strait of Belle Isle, the site could have been a more predictible location for the interception of Harp seals entering or leaving the area.

No clear pattern emerges from the spatial organization at the Saddle Island site. The three distinct occupational zones (zones 1,2,3) could suggest three independent occupations. At the same time, zone 4 can be interpreted as a possible processing zone for zones 1,2 and 3.

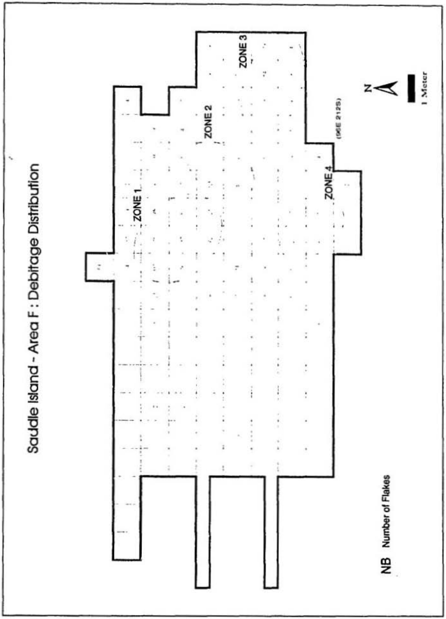
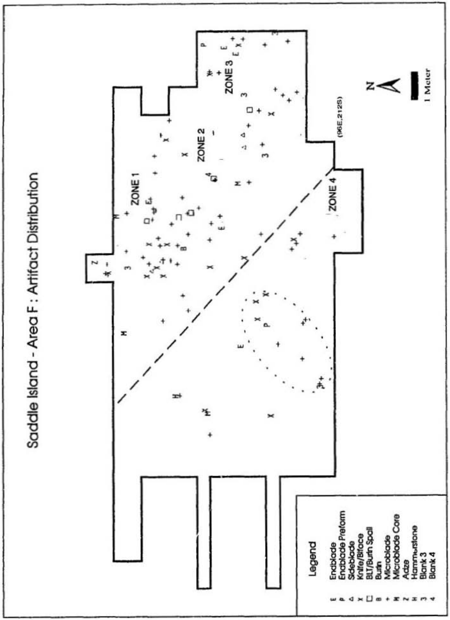

Saddle Island - Area F : Debitage Distribution
ZONE 1
ZONE 2
ZONE 3
ZONE 4
N
1 Meter
NB Number of Flakes

Figure 33.



Saddle Island - Area F : Artifact Distribution
ZONE 1
ZONE 2
ZONE 3
ZONE 4
(96E,212S)
N
1 Meter
Legend
E Endblade
P Endblade Preform
Δ Sideblade
X Knife/Biface
□ BLT/Burin Spall
B Burin
+ Microblade
M Microblade Core
Z Adze
H Hammerstone
3 Blank 3
4 Blank 4

Figure 34.

CHAPTER 6

SUMMARY, DISCUSSION AND CONCLUSION

Summary of Archaeological Data

The lithic data clearly indicate that Cow Head chert dominates both tool and debitage asssemblages in the study area. Ramah chert, quartz crystal and nephrite were also used in limited quantities. The raw material distribution is shown in Table 15. Looking more closely at the raw material distribution in both tool and debitage categories, there is a slight decreasing pattern in the use of Cow Head chert as we move away from the Cow Head area. On the Newfoundland side of the Strait of Belle Isle, Cow Head chert comprises more than 96.00% at each site. On the Labrador and Quebec side of the Strait, Cow Head chert use ranges between 76.00% and 97.00 %. This differential raw material distribution is probably distance-related and sites located on the Labrador side of the Strait of Belle Isle generally contain more Ramah chert.

Three general patterns are expressed in the flake size distribution. (1) At the Factory Cove site, the generally larger size of the flakes and the broader size distribution indicate that manufacturing occured at the site. (2) At the Port au Choix sites, Phillip's Garden East and Cornick, we have a flake size distribution suggesting both the last stages of manufacturing and retouching activities. For these sites I suggested that many of the tools were brought in an unfinished state and completed at the sites. (3) In southern Labrador and on the Quebec Lower North Shore the flake size distribution is unimodal

Table 15. Summary Raw Material Distribution.

	Tools				Debitage			
	C. Head	Ramah	Qtz.	Nephrite	C. Head	Ramah	Qtz.	Nephrite
F. Cove	99.10	0.10	0.80		99.77	0.01	0.22	
PGE	96.80	2.04	1.16		98.83	0.95	0.22	
Cornick	98.08	0.86	1.06		97.62	0.25	2.13	
EiBg-43A	80.30	4.79	6.49	7.09	97.97	0.67	1.35	
EiBg-29	82.57	10.32	7.11		83.51	7.02	9.47	
EiBj-4	86.41	0.87	12.72		76.18	6.86	16.79	0.17
EkBc-1	79.68	2.64	17.67		97.75	0.81	1.44	

and skewed towards small flakes. Tools probably entered these sites in a finished state and were only retouched and resharpened as needed.

Three different patterns are also expressed in the tool assemblages. (1) At the Factory Cove site, a direct bifacial manufacturing sequence is represented by four stages of bifacial blanks and a large number of different sizes of hammerstones. Domestic activities are also suggested by the large number of artifacts associated with procurement and processing activities. Endblade preforms are numerous at this site; their functional significance remains unclear and whether they were produced at the site or brought there to be used in hunting activities is unknown. Finished endblades at the Factory Cove site are of two types: one generally larger and the other smaller and more gracile. This dichotomy could suggest differences in both function and prey type. (2) At the Port au Choix sites, the tool assemblages suggest a strong emphasis on procurement and

Table 16. Summary of Functional Categories.

	Hunting	Processing	Maintenance	Manufacturing
Factory Cove	8.85	35.47	11.33	44.32
Phillip's Garden E.	16.87	65.55	17.08	0.48
Cornick	13.3	68.44	18.27	0
EiBg-43A	13.88	68.06	15.27	2.78
EiBg-29	25	35.71	39.27	0
EiBj-4	14.58	68.74	16.65	0
EkBc-1	11.36	64.77	21.58	2.28

processing activities. The high proportion of unfinished tools at these sites is interpreted as evidence for intentional planning regarding site use. People were travelling to these sites with a full knowledge of their functional needs; they were bringing in bifacial blanks and endblade preforms ready for use with a minimum of retouch. (3) On the Labrador and Quebec side of the Strait of Belle Isle the different tool assemblages also suggest a strong emphasis on procurement activities. The lack of bifacial blanks and endblade preforms at these sites, however, does not suggest the same sort of "planning" as that seen at the Port au Choix sites.

Another important distinction between the different assemblages is the size of the collections. At the Factory Cove and Phillip's Garden sites we have large components consisting of more than a thousand artifacts. On the Quebec/Labrador side the collections are generally smaller.

The internal spatial structure of the different sites suggests three distinct patterns of site use. (1) The diversity and the number of architectural features at the Factory Cove site may suggest prolonged occupations. The dismantled or disturbed nature of the same features and the random spatial distribution of artifacts show a pattern of intense re-occupation. The spatial distribution of both manufacturing and subsistence related artifacts indicates that these two activivites occurred together at the site. The Factory Cove site can be defined as a workshop/habitation site. (2) At Port au Choix, the little evidence for substantial housing and the overall lack of distinct activity areas at the Phillip's Garden site suggest multiple overlapping short occupations. (3) In Southern Labrador and Quebec Lower North Shore, the spatial patterning indicates brief non-overlapping occupations.

Groswater Mobility Patterns in the Gulf of St.Lawrence

When the archaeological data are examined in terms of mobility, it becomes obvious that Groswater settlement mobility in the Gulf of St.Lawrence area cannot be discussed in terms of a single or a general mobility pattern. Instead, Groswater people appear to have adopted different types of mobility strategies in order to adapt to the spatial and temporal structure of the resources within the local area.

When resource availability could be predicted spatially and temporally, the Groswater people adopted a logistical type of mobility, where people moved at particular times to specific locations of procurement (Binford 1980). For example, the reliable and highly aggregated availability of harp seals in the spring of the year at Port au Choix would have favoured a spring concentration at this rich point of procurement. The Phillip's

Garden East and Cornick sites are examples of settlement locations used repeatedly for the acquisition of a specific resource.

In Southern Labrador and on the Quebec Lower North Shore the reduced ability to predict the spatial occurrence of game may have favoured the adoption of a more opportunistic type of mobility involving frequent changes in locations imposed by the necessity to adopt an encounter hunting type of strategy (Binford 1980). On the Labrador side of the Strait of Belle Isle we have a system in which settlement location reflects a broader use of the landscape.

In the Cow Head area, we have a situation in which both logistical and opportunistic mobility strategies may have been employed. The geographical concentration of high quality chert in this specific area would have favoured special trips into the area. As the subsistence resources in this area are not specifically localized in space, they might have been exploited on a more opportunistic or encounter basis.

This type of Groswater land use has the characteristics of both what Binford (1980) has called the forager and the collector type of strategies. In the former case we have a type of mobility involving frequent changes in locations, little emphasis on specific places, and an emphasis on search and encounter type of hunting tactics. In the other case we have a type of mobility which emphasizes the use of a larger territory, greater distances to cover, and an emphasis on the repeated use of specific procurement locations (Kelly and Todd 1988:239).

This brief summary of Groswater mobility strategies in the Gulf of St. Lawrence area should make it clear that a single Groswater mobility model is inappropriate and that mobility in this case was always a "...local solution to basically local conditions" (Binford 1983:334).

Groswater Subsistence-Settlement System in the Gulf of St.Lawrence.

Some suggestions can be made regarding the Groswater subsistence-settlement system in the Gulf of St.Lawrence from the different mobility patterns expressed in the archaeological record.

Before a regional subsistence-settlement model can be proposed, the first point to consider is whether the Labrador and the Quebec Lower North Shore and the Newfoundland west coast are two different subsistence-settlement systems independent of one another or if they are part of the same subsistence-settlement system.

The predominant use of Cow Head chert on the Labrador side of the Strait of Belle Isle is a clear indication of some communication between the two areas. Whether the raw material was acquired directly by small groups of people travelling to Newfoundland or whether it was passed down the line through a trade system is difficult to assess, hence this issue was not evaluated in this study. For subsistence purposes the two areas could, however, have been independent of one another as they essentially share the same resources. Groswater people on either side of the Strait of Belle Isle could have exploited the same resources; the main difference between the two areas would have been one of scheduling and mobility strategies.

My general impression is that sites on both sides of the Strait of Belle Isle were used occasionally by the same people. The "marine oriented" Groswater people must have had some sort of watercraft with which they could easily have crossed the Strait of Belle Isle, which is less than fifteen kilometers at its narrowest point, in the open-water season. The Cow Head area clearly served as a regional center for the acquisition of lithic raw material. Blanks and preforms were made at the different quarry sites in the area and were transported to be used at other locations. As many of the chert outcrops in this area are accessible at low tide it is reasonable to believe that procurement would have occurred in a non-winter period. In addition, tool manufacturing itself is certainly more easily carried out in the warmer periods of the year (so you don't freeze and hurt your hands).

From late spring to fall, the Groswater people presumably occupied the coastal zone where a great variety of fish (capelin, salmon, sea trout, etc.) and birds could have been exploited at the mouth of the different bays and possibly from outside islands. Non-migratory seal species such as harbour seals were probably also exploited. Caribou may have been occasionally taken since they often come close to the coast in the summer time.

Fall and early winter usually bring a decline in the marine resources. Besides migratory fowl hunting, the Groswater people may have made short forays inland to tap into the fall caribou migration as the animals move to their winter grounds in the interior plateaus. On the Quebec/Labrador shore, the beginning of the harp seal migration through the Strait of Belle Isle certainly constituted the focus of the activities. In the fall, harp seals are not yet available in Newfoundland, it is not inconceivable that some groups from the

Newfoundland west coast might have crossed the Strait of Belle Isle for the purpose of seal hunting.

The winter months are more difficult to account for. One possibility is that the Groswater people were relying on stored supplies for a few months. However, this scenario would have some archaeological implications including possibly more permanent types of settlement and large storage features. The archaeological data do not suggest this type of behavior. Another possibility is that the Groswater people moved inland, to the interior plateaus where the caribou spend their winters, although, again, no such sites are known.

In the spring, harp seal hunting was certainly the major activity on both sides of the Strait. In Quebec/Labrador, seal hunting could have been conducted from about any shore. On the Newfoundland west coast, the different Groswater groups would have had to focus their activities in the Port au Choix area. This spring hunt might have provided the necessary resources until summer food resources became available again.

In summary, the Groswater subsistence-settlement system in the Gulf of St. Lawrence involved a high degree of mobility with an intensive exploitation of the coastal zone. Some aspects of the Groswater subsistence-settlement system are not visible and as yet there is no archaeological evidence for any winter or interior adaptation. It is conceivable that the Quebec/Labrador sites represent a fall occupation and the Newfoundland sites a spring/summer occupation of the same people.

Groswater Technological Organization and Mobility.

The Groswater degree of mobility can be best appreciated and understood by looking specifically at their technological organization. The Groswater lithic industry is basically divided into three industrial types: a flake industry, a microblade industry and a biface industry. These three kinds of industries are often associated with high mobility strategies because they share the potential for minimizing the use of raw material and maximizing the potential yields. Flakes travel well and with little modification can easily be reduced to functional tool types. From a single microblade core one can obtain a maximum of cutting edges (Nelson 1991:68-69) and bifaces, when made from high quality raw material, can have a fairly durable sharp edge that can constantly be resharpened (Kelly and Todd 1988:237). Thus, Groswater lithic technology is highly portable.

A high degree of mobility is also implied in Groswater tool production and management strategies. Groswater lithic production is a staging system. Tools seem to be leaving the manufacturing area sites in an unfinished state and final tool production occurs in the context of use. For instance, many biface blanks and endblade preforms were transported in an unfinished state and then completed at the hunting locations of Port au Choix. Binford (1979:268) argues that "staging in production may well correspond to transport junctures; that is, items would be partially processed, transported, further processed, and transported again". This production strategy is not surprising if one takes into account the fragility of finished tools; this would have eased the transportation and diminished the risk of breakage.

The Groswater lithic production system also put an emphasis on the anticipatory manufacture of more reliable and flexible tool types. For instance, the advance production of biface blanks and endblade preforms is not only a solution to transportation problems, it also facilitates maintainability since these forms can rapidly be shaped into functional tool types with a minimum of retouch (Nelson 1991:69). The same blanks and preforms are also characteristic of a reliable type of technology as they permit precise and secure fitting (Bleed 1986, Nelson 1991:69) with individual and different hafting devices.

At a greater geographical scale, the almost exclusive use of Ramah chert and Cow Head cherts throughout the entire Groswater "territory" is in itself indicative of a high degree of mobility. Considering the great distance between the two source areas one wonders why the Groswater people were making the effort to obtain lithic raw material from such long distances. Obviously, the Groswater people were practising a high acquisition cost strategy. In most archaeological contexts, high procurement cost is correlated with a raw material use pattern involving reuse and recycling of artifacts (Bamforth 1986, Binford 1976, 1979). However, in the different tool assemblages examined in this study, there is no evidence for the recycling of artifacts beyond their normal use-life. Tools seem to have been used and then abandoned when broken. Therefore, the Groswater raw material use does not seem to be tied with acquisition cost. Instead, what would seem to be the case here is that the quality of the raw material would have offset the high acquisition cost (Perles 1991:230).

High quality raw materials are more reliable and more predictable to use. The more reliable and predictible the raw materials are, the easier is the control in the knapping process (Kelly and Todd 1988:237) and less raw material is needed. Thus, the Groswater lithic procurement strategies seem to put the emphasis on high quality raw materials to create a flexible and portable technology and in that sense the Groswater lithic procurement strategies can be interpreted as strategies that will allow them to move.

The next question now is: why would the Groswater people want to be so mobile? An element of the answer might be found in the fact that the Groswater lithic technology exhibits very little typological variability. Except for the unfinished forms such as the biface blanks and endblade preforms, which we have seen are more related to organizational decisions than they are to function per se, all the sites share the same tool types. In fact, all the Groswater sites from Northern Labrador to southern Newfoundland always contain the same tool types. It is almost as if specific procurement goals are expressed in the Groswater lithic technology. Could the Groswater culture be a cultural adaptation to the exploitation of a specific resource—namely harp seal? If this is the case, it might be no coincidence that wherever the Groswater or the Groswater-like-cultures are found in Eastern Arctic (Newfoundland, Labrador, Quebec Lower North Shore, Northern Ungava, Southampton Island, Greenland) they always appear to be associated with the migration routes of harp seals. A close examination of other Groswater-like-cultures in Eastern Arctic may help to verify this hypothesis.

From a technological point of view, Groswater mobility can easily be compared with the one observed with the Paleoindians. Like the Paleoindians, Groswater people were relying on a portable technology, they were using high quality raw material (Kelly and Todd 1988). Like the Paleoindians, Groswater people also seem to have a more specialized type of economy and tend to move according to the availability of few specific species.

In conclusion, the migratory patterns and the availability of harp seals seem to be the most influencial factors behind Groswater mobility in the Gulf of St. Lawrence area. In different areas different mobility strategies were necessary in order to respond to the availability of harp seals. This high degree of mobility was supported by the use of high quality raw materials that allowed a portable and adaptable technology that provided for easy maintenance. This, in turn, allowed mobility and flexibility in the pursuit of harp seals.

Finally, this study has shown that in order to move beyond individual sites, the understanding of subsistence-settlement systems should be looked at from a more technological perspective rather than restricting it to questions of faunal and functional analysis. These two levels of analysis might be explanatory at some level but lack the capacity to discriminate among diverse organizational or decisional factors peculiar to human behavior.

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