# MOBILITY, MIGRATION AND PROJECTILE POINT DIVERSITY IN THE LATE PALEOINDIAN PERIOD OF THE FAR NORTHEAST

CENTRE FOR NEWFOUNDLAND STUDIES

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# MOBILITY, MIGRATION AND PROJECTILE POINT DIVERSITY IN THE LATE PALEOINDIAN PERIOD OF THE FAR NORTHEAST

by

© Michelle MacCarthy

A thesis submitted to the

School of Graduate Studies

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*Abstract*

The Late Paleoindian period, roughly dated 10,000 to 8,000 years BP, remains poorly understood in the Northeast. While the Early Paleoindian period is characterized by broad similarities in lithic technology across the region and much of North America, several different 'diagnostic' projectile point types have been identified as characteristic of the Late Paleoindian period in the Northeast. These include lanceolate points similar to contemporaneous specimens from the Great Lakes region, elongate parallel-flaked points, and basally thinned or partially fluted triangular points. What is lacking in the available literature is an attempt to understand, on a regional scale, how these different assemblages relate to one another. Although such an undertaking is hindered by the relatively small number of identified sites and a lack of radiocarbon dates, this paper re-assesses the available data for the period to examine possible cultural, functional, geographical and temporal explanations for the variety of Late Paleoindian ascribed assemblages in the archaeological record of the Northeast.

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# CHAPTER ONE

## The Late Paleoindian Period: Approaching the Problems

### *1.1 Introduction*

Human habitation of the far Northeast prior to the Late Archaic Period (beginning ca. 6,000 B.P.) is poorly understood. Although a few large and relatively well-dated sites represent the Early Paleoindian period in the region, the Late Paleoindian period (ca. 10,000 to 8,000 B.P.) remains one of the least well understood periods of regional prehistory in northeastern North America (Cox and Petersen 1997: 25). Furthermore, although the terms "Paleoindian" and "Archaic" are widely used, the boundaries between these periods are poorly defined.

For the purpose of this study, the term 'Northeast' is used to describe the region of northeastern North America including the Maritime Provinces of Canada, the Gulf of St. Lawrence area (including the Gaspé Peninsula of Québec and southern Labrador), and the New England States. While by no means uniform in climate or terrain either now or in the past, this region has often been treated as a relatively homogenous zone, having undergone generally similar glacial and postglacial processes and demonstrating similar archaeological toolkits across the region throughout much of prehistory.

### *1.2 Goals of Research*

The purpose of this thesis is to re-evaluate the archaeological record as it is currently available for the Late Paleoindian period in the Northeast in order to improve understanding of the intra- and inter-regional cultural variation which is evident, but largely unexplained, in this period. The archaeological evidence is the only source of information available to represent the lifeways and identity of prehistoric peoples. By examining several aspects of the Late Paleoindian toolkit, including comparison of tool types, morphology, and raw materials, it is hoped that new light will be shed on this poorly known era of prehistory, including settlement/mobility patterns and migration, subsistence behaviours, and the reasons for the increased diversity noted in the Late Paleoindian record as compared with the previous period. The way in which this will be achieved is outlined below.

### *1.3 Theoretical Approach*

The theoretical approach taken in this project is essentially culture historical. This is necessary in regions such as northeastern North America, where a detailed cultural chronology does not yet exist (Trigger 1989: 244). However, this will be attempted not merely as description of the artifacts recovered from the known sites in the region, but by looking at the context of each site on a regional scale, and by incorporating the available environmental data as mentioned above. This thesis approaches material culture in its "environmental, technological and behavioural context of action" (Hodder 1986: 153); that is to say, in terms of its larger cultural, environmental, and perhaps symbolic frame of reference. With this approach, this project hopes to add to the culture history of the region, but go beyond mere local chronology.

### *1.4 Methodology*

Several of the major Late Paleoindian and Early Archaic ascribed collections from around the region will be included in this study, including the Jones Site collection from northeastern PEI and material from the Magdalen Islands, the La Martre, Mitis and Rimouski Late Paleoindian sites on the Gaspé peninsula, the Pinware Hill and Cowpath sites in southern Labrador, the Varney Farm site, a single component Late Paleoindian site in Maine, and the Reagan site in northern Vermont. Where available, these collections will be examined in terms of tool forms and raw materials in the hopes of better understanding cultural affiliations between the peoples represented by Late Paleoindian and/or Early Archaic aged sites throughout the northern Atlantic region. The available literature provides supplementary information to this end.

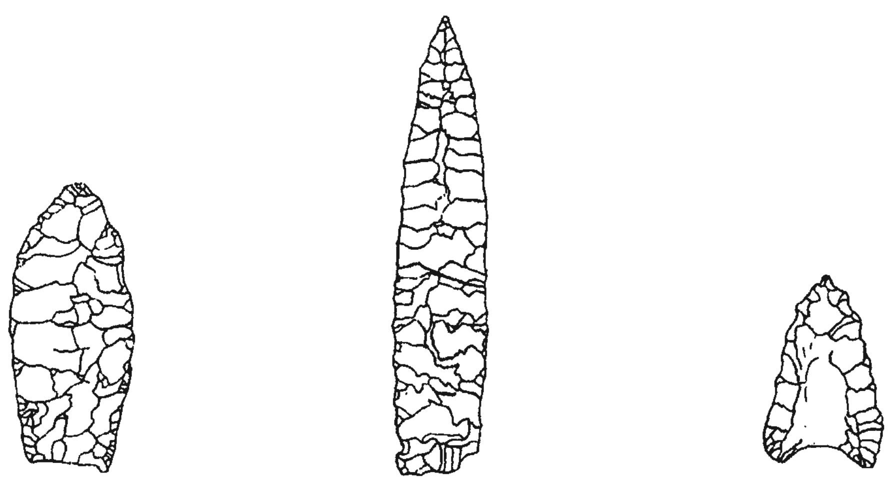
Environmental reconstruction will use all available data for the region, including recent work undertaken by the Bedford Institute of Oceanography. Several sediment cores were taken from St. Peter's Bay, Prince Edward Island, in the area of the Jones Site, and early analysis of these cores provides some useful new insight into the early Holocene environment in the Gulf of St. Lawrence. Data on glacial and post-glacial environments and sea level are also available for the Gaspé Peninsula (David and Lebuis 1985; Richard et al. 1997), the Maritimes (Grant 1972; Levesque et al. 1994; Shaw et al. 1993) and Maine (Bradstreet and Davis 1975; Oldale 1985; Schnitker 1982,), as well as for the Northeast as a whole (Davis and Jacobson 1985). Although faunal and paleoethnobotanical remains are rarely preserved in Paleoindian contexts, all such available data will be assessed (e.g., Asch Sidell 1999).

Projectile points are frequently considered *the* diagnostic tool to identify preceramic material in the Northeast (although ground stone tools are also highly diagnostic in the Archaic period), as this is the most distinctive tool form and the one that changes the most significantly over time. It is also the tool form most frequently recovered by surface collection, as it is clearly identifiable to even the most amateur of collectors. While it is recognized that a single tool should not define a 'culture,' it is the most visible marker of a given toolkit in the Northeast and as such it can be a useful means of studying Late Pleistocene/Early Holocene human activity. As it is beyond the scope of this study to examine closely every aspect of every toolkit assigned to the Late Paleoindian period in the Northeast, projectile points will be relied upon as the primary evidence upon which this thesis is built. However, the range of tools in the toolkit will also be considered. Aberrations of presence or absence of tool forms may also be useful in understanding the similarities and differences in Late Paleoindian sites across the Northeast.

At present, three distinctive projectile point types are associated with the Late Paleoindian period in the Northeast (Jones 1997: 74-75; Petersen et al. 2000: 116-117; Wilson et al. 1995: 32-34). These include:

1) lanceolate fluted, partially fluted and unfluted forms that appear to be closely related to Clovis-type fluted points;
2) elongate, parallel-flaked, often slightly lanceolate forms, both stemmed and unstemmed and of variable thicknesses; and
3) small, less precisely flaked triangular-shaped points with a flat or concave base (Petersen et al. 2000: 116).

Typical examples of these three types of points are found in Figure 1.1. The relationship between these different point types is presently not well understood. This thesis aims to re-evaluate the evidence for the Late Paleoindian period in the Northeast in hopes of better understanding the relationship between the various types of projectile points currently assigned to this stage of prehistory.



***A. Unfluted Lanceolate Projectile Point*** ***B. Elongate, Parallel-Flaked Projectile Point*** ***C. Small trianguloid Projectile Point***

**Figure 1.1. Typical examples of the three primary forms of Late Paleoindian projectile points identified in the far Northeast. Adapted from Petersen et al. 2000.**

### *1.5 Problems in Studying the Late Paleoindian Period*

Before continuing with the specific hypotheses to be examined in this thesis, a number of issues that limit our present understanding of this period in prehistory should be outlined. These problems, some of which will be dealt with in greater detail in the chapters to follow, are largely responsible for the stunted development of Late Paleoindian studies *vis à vis* most other periods in prehistory.

Historically, one problem limiting the available knowledge of the Late Paleoindian period has been related to research foci. Most field projects were much more interested in fluted point sites, which were identified early on as being significant to the peopling of the New World. Late Paleoindian points were less diagnostic and less interesting to early collectors. As the next chapter will detail, for many years it was simply assumed that a 'cultural hiatus' followed the fluted point Paleoindians, so that there should not be any cultural material relating to this period. This attitude did not begin to change until well into the 1970s.

Another major problem with the study of Late Pleistocene and Early Holocene cultural occupations in any coastal setting is the change in sea level. Again, this matter is dealt with in greater detail in Chapter Four (the Paleoenvironment), but the impact of this factor on limiting understanding of the Late Paleoindian period is summarized here. Sea level reconstructions such as in Sanger (1988) demonstrate that sea levels in the Gulf of Maine in the period between 10,000 and 8,000 years B.P. were at their lowest point in the period since deglaciation began. At about 9,000 B.P. sea levels were as much as 65 metres below present levels. This means that coastal occupations along the Gulf of

Maine during the Late Paleoindian period are now deeply submerged. Although less dramatic, sea level changes in the Bay of Fundy were also much lower than the present level, probably on the order of 37 m lower than modern sea levels (Seaman et al. 1993). This maximum low stand was reached between 9,500 and 7,000 B.P. This situation makes it impossible to test subsistence models that suggest that the Late Paleoindian period saw a shift from a specialized hunting strategy to a more generalized hunting-gathering-fishing subsistence strategy (e.g., Dumont 1981). A different situation obtained in the Gulf of St. Lawrence, where sea level changes since the Late Paleoindian period were not as dramatic; sea level was likely about 10 m higher than present at 8,000 B.P (Dumais 2000). Although these sea level changes were smaller, they still certainly impacted the geography and ecosystem along the Gulf's shores. This is the one area in the study region where we now find sites near the present coast that would have been related to the littoral in the early Holocene.

A third problem which frustrates the efforts of researchers seeking to understand the Late Paleoindian period is the lack of large single component sites, and of well-stratified multi-component sites. This is particularly true in the Maritimes region, where at this time it is not even possible to define the total toolkit of the Late Paleoindians. The Varney Farm site in Maine has only recently provided a single component Late Paleoindian site in Maine, where we now have a much better understanding of Late Paleoindian technology. However, because it is the only such site in the immediate area, it is difficult to know if this is a typical assemblage, or abnormal in some way due to specific site purpose (which is not well defined). Without several comparable collections, the degree to which activities and behaviours can be extrapolated from the evidence is limited. Again, the situation is better in the Gaspé region, where several large and well excavated collections are available.

A related issue is the lack of radiocarbon dates available for this period. For reasons unknown, there are rarely well-preserved hearths or other obviously cultural features preserved in Late Paleoindian sites, and datable material is not often recovered. Those samples that are recovered often prove to be contaminated, either as a result of more recent burned tree falls or root or rodent action. Many dates on sites seeming to be Paleoindian in cultural affiliation return dates that are considerably more recent. Further, some important sites, such as Reagan, were collected before the advent of radiocarbon dating, and no suitable materials were collected. Many sites, even large ones such as La Martre and Mitis, have been so disturbed by natural processes such as erosion, solifluxion and soil creep, as well as by human activities such as agriculture, that it is nearly impossible to find datable material with a certain association with artifacts. All of these factors contribute to the present situation, in which only a very few 'reliable' radiocarbon dates are available for this period. These will be dealt with in greater detail in Chapter Six.

Finally, another issue closely related to the two just described involves the lack of faunal and paleoethnobotanical remains. This is generally simply an accident of preservation; bones in particular do not tend to last very long in the acidic soils of the Northeast, so they are almost never recovered. When they are preserved, it is generally as tiny fragments of calcined bone (heated in a fire to a very high temperature, usually in excess of 600°C), which under these extreme conditions tends to shrink and fracture. These tiny fragments are usually not assignable to a particular species. Paleoethnobotanical remains are also rarely recovered. Although lake core sediments have been used to reconstruct the local environments and vegetation cover for the region throughout the late Pleistocene and early Holocene, as will be described in Chapter Four, there is very little information that can be related to the use of specific plant species by the former residents of a Late Paleoindian archaeological site. In the absence of information related to use of floral and faunal resources, our understanding of late Paleoindian subsistence strategies will remain very incomplete.

### *1.6 Hypotheses*

It has often been assumed that the increasing variety in point forms in the Late Paleoindian period is a result of regionalization (Wilson et al. 1995). This argument has been supported by analysis of lithic materials and the increasing use of local sources (Curran 1999). However, this is certainly an oversimplification, as many sites, such as Varney Farm, do not fit the expected pattern insofar as high quality exotic chert is still preferred. This thesis will examine in detail a number of possible contributing factors that may help explain the changes that mark the transition from Early to Late Paleoindian in the Northeast.

A number of working hypotheses are herein presented as possible explanations for the variation in the projectile points described above. They may represent a continuum of a single group, with the differences in point form being representative of a natural process of change over time. This can be referred to as the continuity hypothesis. Alternatively, the projectile points could represent regional variation created by the splintering off of small groups from a larger one and moving into different areas of the broader Northeast, or even different migrations into the area from further west, and/or differences related to cultural identity defining one group in the region from another. This possibility will be referred to as the cultural variability hypothesis. Finally, these differences might be assignable to functionality, that is, a particular tool kit (here represented by different projectile points) might represent a different subsistence focus developed in place from the original form. In this explanation, here called the functionality hypothesis, point form is directly related to the particular activities being carried out by the group. Of course, the reason for toolkit variation is not likely as simple as any one of these hypotheses, and certainly involves numerous factors. The goal is to use the available evidence to lend support or to cast doubt on each of these hypotheses in turn as a potential force shaping the archaeological record in the Northeast as it relates to the Late Paleoindian period.

This thesis will use several avenues to examine the question of the diversity of point forms in the Late Paleoindian period. Direct study and comparison of the collections available from the excavated sites, as well as some of the private collections compiled by amateur enthusiasts, will be carried out in order to highlight and hypothesize about the nature and degree of the differences within and between the different point types. Consideration will also be given to raw materials, as this can provide insight as to mobility and/or interactions between groups. It is hoped that this avenue of research may provide some insight pertaining to the cultural variability hypothesis. In addition, paleoenvironmental data will be employed in order to better understand the landscapes surrounding the known sites in the early postglacial, as this may suggest likely subsistence activities, which may assist in testing the functionality hypothesis. The few available dates on sites will also be reviewed, which may be useful in testing the continuity hypothesis.

It is also important to review in some detail the present archaeological record for the Late Paleoindian period in the study area, limited though it may be in comparison to other temporal periods. Chapter Two looks at the history of research in the region, while Chapter Three details the known sites which are of relevance to this thesis. Chapter Four looks at the paleoenvironmental history of the region, and the later chapters will seek to synthesize this information in conjunction with data on raw materials and tool comparisons in order to make some meaningful conclusions about the Late Paleoindian period in the Northeast.

# CHAPTER TWO

## History of Research in the far Northeast

### *2.1 Introduction*

The Late Paleoindian and Early Archaic periods are perhaps the least understood of all prehistoric periods, both in the Northeast and in North America in general. Indeed, much more is known of the Early Paleoindian period, from which the Late Paleoindian is assumed to have derived. As early as the 1920s and 1930s, a picture was beginning to emerge of the earliest peoples to inhabit the Great Plains of the United States. In the East, large sites such as Bull Brook, New Hampshire and Debert, Nova Scotia, were reported in the 1950s and 1960s respectively. Virtually nothing was known about the Late Paleoindian period in the study area before the 1990s. Only a small number of sites were assigned to the period, and their place in the regional prehistory was poorly understood.

### *2.2 Clovis and the Eastern Fluted Point Tradition*

Paleoindians employing fluted point technology, thought to represent large game hunting pioneers in the recently deglaciated North American continent, were first identified based on projectile point finds in the late 1920s at Folsom, New Mexico, and in the 1930s at Dent, Colorado and Blackwater Draw, New Mexico (Haynes 1980: 115). At Blackwater Draw, the stratigraphic separation of 'Clovis' points (as the Dent-type form became known) below 'Folsom' points permitted the initiation of the process of defining a chronology for 'Early Man' sites based on tool typology in North America (cf. Sellards 1952). The term Clovis is generally reserved for the earliest fluted point technology of the Great Plains, but these points have long been compared to the early fluted point technology in the East (Adovasio et al. 1988: 55). Indeed, because of the better provenience for many of the Western points, they often serve as a basis for comparison of points recovered from other parts of the continent.

For the first several decades after the identification of Clovis technology in the Great Plains, there was very little indication that fluted point technology comparable to the Clovis or Folsom points known from the West even existed in eastern North America. Early sites of the Eastern Fluted Point technology were first reported in detail in the 1950s (Byers 1954; McCary 1951; Ritchie 1953; Witthoft 1952). Fluted points considered to be Folsom variants were recovered in Virginia in the 1930s from several counties; systematic survey in the next decade led to the identification of the Williamson site in a farmer's field in Dinwiddie County (McCary 1951; for a recent re-examination of the site, see Hill 1997). Collection by the Archaeological Survey of Virginia, led by Ben McCary, yielded 33 fluted points, 174 endscrapers, 24 side scrapers, 16 knives with fluted basal ends (all broken), several possible gravers, many cores, and thousands of unutilized flakes. No faunal material was recovered.

The points are generally small, averaging about 45 mm in length, and are divided by McCary into two categories: "points which have straight sides from the base to within one-half to two-thirds of the distance to the tip, and points whose sides are concave just below the base and which become slightly to decidedly convex at or near the middle"

(1951: 11-13). The depth of the basal concavity averages 2.5 mm. Most tools are made on good quality, often translucent cherts as is characteristic of Paleoindian toolkits throughout North America.

In 1952, another Eastern fluted point site was reported, this time in southeastern Pennsylvania. The Shoop site was again identified by surface collection in a plowed field, collections of which were first made in the mid-1930s, but about fifteen years passed before the collections came to the attention of an interested researcher. By that time, several individuals had made collections of the site, but most of these were made available to John Witthoft, who reported on all of the available material from the site (Witthoft 1952). Again, the site was only surface collected, not excavated. The collection conforms closely with that of Williamson in site location, tool typology, and tool proportions, and is considered by Witthoft to be "practically identical" to Williamson (1952: 486). Witthoft (1952) regarded Shoop and Williamson as the earliest known manifestation of human occupation in the eastern United States. He named these early Eastern manifestations of fluted point technology the "Enterline Chert Industry" for the location of the Shoop site near Enterline, Pennsylvania.

Witthoft also mentions a few other fluted point sites east of the Mississippi that had been identified by the early 1950s. Considered to be a part of his Enterline Chert Industry, Witthoft refers to St. 4 in North Carolina, which was studied in detail by Joffre Coe (e.g., Coe 1964). Although the points from St. 4 were significantly cruder than those at Shoop and Williamson, Witthoft and Coe attribute this to the poorer local stone (Witthoft 1952: 487). It should be noted, however, that in most Paleoindian-age sites, local stone comprised only a very small percentage of the lithic assemblage, most of which was made on fine, exotic materials often carried over a great distance (e.g., Curran and Grimes 1989; Deller 1989; Ellis 1989; Goodyear 1979, 989; Haynes 1980: 118; Kelly and Todd 1988: 237; Ritchie 1957:11). Site St. 4 had only been preliminarily excavated at the time of Witthoft's report, and yielded both Paleoindian and Archaic material. The Paleoindian component contains a number of gravers, which Witthoft equates with those found at Shoop and Williamson, and also notes that some of the non-local cherts found at St. 4 were also recovered from Williamson.

Another known 'Early Man' site to which Witthoft compares the Shoop and Williamson site assemblages is the Parrish site in Kentucky, the only site in the broader East that had been excavated at this early date. In this case, Witthoft notes significant differences between this assemblage and that from Shoop and Williamson, and groups the Parrish site with the Reagan site in Vermont as probably later chronologically (discussed in greater detail below). He considers Parrish the type site for this later stage in the Paleoindian period, terming it the 'Parrish Industry.'

Finally, Witthoft also makes mention of the Quad site in central Alabama, reported by Frank Soday (1954). This site was also surface collected, and Witthoft notes the presence of both his Enterline Chert Industry (Early Paleoindian) and Parrish Industry (Late Paleoindian) artifacts. Archaic artifacts were also present at the site. He summarizes tentatively that his Enterline Industry may be to his Parrish Industry as Clovis is to Folsom further West, but he admits that this hypothesis is tenuous and should not be "considered seriously until we know something of many other fluted point sites in many areas" (Witthoft 1952: 492-493).

### *2.3 Identification of the Late Paleoindian Period in the Northeast*

As mentioned above, Witthoft makes reference to the Reagan site in Vermont, which he places in his "Folsom-like" Parrish Industry (i.e., Late(r) Paleoindian). The Reagan site in northern Vermont was the first Late Paleoindian site identified within the study area of this thesis, having been first collected in the 1920s, and analysed in the 1950s by William Ritchie, then the State Archaeologist of New York.

Ritchie agreed with Witthoft that the Reagan site was a Paleoindian site probably slightly more recent than the few other known fluted point Paleoindian sites nearby, namely Shoop, Pennsylvania, and Williamson, Virginia (Ritchie 1953: 256). The Reagan site collection contains a wide variety of point forms, one-third of which exhibit fluting, a characteristic attribute of Early Paleoindian technology, while others are basally thinned in a technique more akin to other Late Paleoindian sites. Present in this collection are both excurvate lanceolate points, and small triangular points (see Chapter Three for a detailed summary of the Reagan site).

Ritchie notes that the Reagan site appears to represent "another variation, in a new locality" of the better-represented Early Paleoindian evidence known throughout North America. However, he also makes reference to several assumed Archaic collections with which he sees parallels with the Reagan collection, including the Starved Rock Archaic site from Illinois and the Nebo Hill "probable Archaic" collections from western

Mississippi (Ritchie 1953: 256). Ritchie notes that these comparisons are often weak and are too random to afford much insight. It would be several decades before enough Late Paleoindian assemblages were collected from the Northeast to begin to understand where the Reagan site fit into the regional cultural history, a process that is far from complete today.

The Bull Brook site, located near Ipswich, Massachusetts, was reported in 1954 and proved to be a very large fluted point site attributed to the Enterline Chert Industry (Byers 1954: 345). The Bull Brook site once again relied on surface collections; no material was recovered *in situ*. The site was on a kame terrace over a salt marsh in an area from which sand and gravel had been removed, effectively destroying the site. Almost 1000 "implements" were recovered, however, including 35 fluted points and point fragments (Byers 1954: 345). Point sizes range from 49 to 68 mm in length and 21 to 25 mm in width; the shape is generally parallel-sided from base to midpoint, gradually tapering to the tip. Byers compares this shape with the Clovis points found with the Naco, Arizona (Haury et al. 1953), and notes the similarities in morphology with both Williamson and Shoop. Gravers, drills, endscrapers, sidescrapers, blades (knives), and retouched and utilized flakes round out the toolkit at Bull Brook. Byers does not compare the Bull Brook assemblage to that at the Reagan site, noting that the differences between these two assemblages are too great to place them in the same category. He does not offer an explanation as to what these differences might relate to, but does not deny that the Reagan site, too, "is related to the fluted point horizon" (Byers 1954: 351).

By the early to mid-1950s, then, the basic range of both Early and Late Paleoindian artifacts had been recovered from the Northeast, although their place in the larger scheme of early North American prehistory was not well understood. No absolute dates were available, nor was any faunal material available which might assist in understanding subsistence patterns. Soon, sites such as Debert in Nova Scotia (MacDonald 1968) and later Vail in Maine (Gramly 1982), both of which were extensively excavated, would add much to the picture of the Early Paleoindian period in the Northeast, including radiocarbon dates, although faunal and botanical material remained elusive. It would be nearly fifty years, however, before even partially undisturbed Late Paleoindian sites would be identified and excavated, and a picture would begin to emerge of the period from about 10,000 to 8,000 years ago in the Northeast.

### *2.4 The Last Twenty Years: Recent Research in the Northeast*

A 1985 article summarizing the known Late Paleoindian finds from Maine (Doyle et al. 1985) identified nine find locations in the state assigned to this period; most of these were heavily eroded and frequently inundated, and have no preserved cultural features. They are all considered Late Paleoindian in age based on the identification of small numbers of diagnostic morphological and technological attributes of projectile points and other lithic tools (Doyle et al. 1985: 1) in the absence of any $C_{14}$ dates.

Since 1985, a significant number of new Late Paleoindian sites have been identified, particularly in Maine (Cox and Petersen 1997; Petersen et al. 1992, 1998, 2002, 2002; Sanger et al. 1992; Spiess et al. 1998) and on the Gaspé Peninsula of Québec (Chalifoux 1999; Chapdelaine 1994; Dumais 2000, 2002), which have added much to the body of data available for this period. These are described in detail in Chapter Three. Unfortunately, evidence for the Maritimes has not kept pace. Whether this is a result of inadequate survey, drowned sites due to rising sea levels, or other factors, remains to be seen (for a discussion, see Tuck 1991).

### *2.5 The Place of the Late Paleoindian Period in the Regional Culture History*

There remains much uncertainty about the period between 10,000 and 8,000 B.P. in the regional prehistoric record. Some researchers (e.g., Kellogg 1991) place the starting date for the Archaic period at 10,000 B.P., thereby suggesting a new, non-fluted point using cultural group following the Early or Classic Paleoindian period. Most scholars, however, distinguish the Early Paleoindian period from the Late Paleoindian based on the "transition between Late Pleistocene and Early Holocene environments, roughly paralleling the change from open to closed forested conditions across much of the glaciated Northeast, with considerable local variation" (Petersen et al. 2000: 113).

In earlier interpretations of Northeast prehistory, the end of the Paleoindian period marked a dead end, with no descendant cultures. Until relatively recently, Early Archaic sites in the extreme northeast were virtually non-existent, suggesting "a real occupational hiatus" between the Paleoindian and the Late Archaic occupations of the Northeast (Fitting 1968: 443). Fitting assumed that a boreal forest environment followed the Early Paleoindian period, and that this environment was unproductive and could only support a very low population density (Fitting 1968). Paleoindians were assumed to have focused their attention on large game, and the introduction of an Archaic culture was seen to have brought about a shift in focus to a more diverse array of resources. As recently as 1978, Robert Funk was postulating that the Reagan site represented the terminal Paleoindian stage in the Northeast, while the Archaic peoples made their debut once postglacial climatic conditions were firmly established (Funk 1978: 19). Recent developments in the archaeology of this period have disproved such hypotheses, demonstrating continuity from the Paleoindian period through the Archaic. Further, many researchers have hypothesized a much more generalized subsistence strategy from the Early Paleoindian through to the Early Archaic period, rather than a sharp shift from big game specialization to hunting-fishing-gathering generalization as was previously thought (e.g., Meltzer and Smith 1986).

The definition of the Late Paleoindian period is based in large part on the identification of several point forms that appear to be the descendants of the Early Paleoindian fluted point form (e.g., Witthoft 1952; Ritchie 1953). Several identifiable point forms attributed to Late Paleoindian occupation are found throughout the Northeast. These include parallel-flaked, non-fluted points in both contracting lanceolate and elongate triangular lanceolate forms, and a shorter triangular form that appears to be more spatially restricted, occurring primarily in northern Maine and the Maritimes (Petersen 1995: 210), but also in southern Labrador (McGhee and Tuck 1975:24-25), possibly at the Reagan site in Vermont (Petersen 2000: 116), and as far south and west as the Plenge site, New Jersey (Doyle et al. 1985: 5). These points generally resemble fluted points in overall outline morphology, and are "clearly related to fluted forms on technological and stylistic grounds, minimally sharing a common biface reduction strategy and differing only in …relatively minor details" (Petersen et al. 2000: 115).

In the Early Paleoindian period, three fluted point manifestations have been identified, although these are much more similar to one another than are the different Late Paleoindian projectile point manifestations. The Early Paleoindian Eastern Fluted point tradition is often divided into the Bull Brook Phase, the Vail/Debert Phase and the Neponset Phase (Wilson et al. 1995). The Bull Brook points, named for the type site in Massachusetts, are moderate in size, exhibit their maximum width just below mid-point, have a basal concavity averaging about 5 mm, have flute scars extending over half the length of the point and were fluted by means of a "nipple" platform (Wilson et al. 1995: 17). Included in the Bull Brook Phase are Bull Brook, Bull Brook 2, Wapanucket and Whipple sites (Grimes et al. 1984). Additional points falling within the Bull Brook range of variation have been identified in Massachusetts, Vermont, New Hampshire, Maine and New Brunswick.

The Vail/Debert Phase points are characterized by their very deep basal concavity, averaging 8.6 mm at Vail (Gramly 1982: 25) and 11 mm at Debert (MacDonald 1968: 71). The fluting preparation is the same as that seen in Bull Brook points, and maximum width is here again attained just below mid-point. Flute scars in the Vail/Debert Phase tend to be less than half the total length of the point (Wilson et al. 1995: 18). This phase seems to be geographically limited to the northern part of the New England-Maritimes region.

The third Phase in Early Northeast Paleoindian points is the Neponset fluted point "type, " which is spatially restricted to the southern part of the New England–Maritimes region. These points exhibit moderately flaring basal ears, shallow to moderate basal concavities, and long flute scars, in some cases extending almost the entire length of the point (Wilson et al. 1995: 19). An additional characteristic is that tips were often blunted and ground, a characteristic not found on Bull Brook or Vail/Debert points but often on Barnes points from the Great Lakes. This has been interpreted as evidence that the performs were held in a vice of some sort for fluting (Deller and Ellis 1986: 45).

The relationship between these "Phases" has been explored by a number of researchers. Gramly (1982: 71-72) and Spiess and Wilson (1989) posit that the Vail/Debert points are developed out of the Bull Brook form, and thus are later in the regional chronology. Deller and Ellis (1986) suggest that the Vail/Debert points are contemporaneous and allopatric with Barnes Points (Parkhill Phase) in the eastern Great Lakes, while the Gainey points of the Great Lakes are considered analogous to the Bull Brook phase. Neponset points are also compared with Barnes points on stylistic terms (Wilson et al. 1995). Whether these regional variants are related to the increased differentiation in point forms identified in the Late Paleoindian period is a point which will be returned to in Chapter Seven.

New developments have suggested that in some cases, especially in the period between 9,000 and 8,000 B.P., the Late Paleoindian period seems to overlap temporally with Early Archaic assemblages, and it is often difficult to determine legitimate differences between these two rather arbitrarily divided periods. The Weirs Beach site is a good example of the difficulty often encountered in assigning some sites to either the Late Paleoindian or Early Archaic periods, since the toolkits of both of these periods are poorly understood, and radiocarbon dates are extremely problematic. This problem seems to support the now popular hypothesis that there is some degree of continuity between the two periods, rather than a complete replacement of the existing Paleoindian population by a new population with an Archaic technology in the early Holocene.

Such continuity is also evident in the selection of strategic riverine-lacustrine locations for sites in the Late Paleoindian through Archaic times, which suggests "evolutionary continuity between Early Paleoindian entities and those of the later Archaic period" (Cox and Petersen 1997: 44). These riverine settings provide likely places to intercept important resources, both large mammals (which could have been channelled or constricted by the waterways) and fish (Cox and Petersen 1997: 43). The shift away from the selection of sites on sandy soil, often away from an obvious water source, to riverine or lacustrine settings may represent a shift in subsistence activities resulting from increasing familiarity with regional resources and/or a stabilization of hydrologic systems and aquatic resources in the early Holocene, or, alternatively, the shift could signal that the Late Paleoindians were "letting go" of the settlement locations favoured by the region's colonizing groups (Wilson et al. 1995: 30). Cox and Petersen note the presence of at least one Late Paleoindian diagnostic artifact from the Vail site, a find that tentatively lends additional support to the theory of continuity between the Early and Late Paleoindian periods (1997: 43).

The transition to "Archaic" technology is characterized primarily by the introduction of notched bifaces in both the east and the west. A major distinction in the Northeast is also the introduction of pecked and ground stone tools, including rods, adzes, celts and gouges. While in the Early and Late Paleoindian periods biface production is a major industry, the use of bifaces seems to decline in use in some regions during the Archaic period, but fluoresce in other areas. Uniface technology continues, although often expedient tools take precedence over formal ones (Wilson et al. 1995). It has been suggested that "it may prove profitable to refer to Late Paleoindian and (at least) Early Archaic horizons within the broader context of an early postglacial period continuum" (Nicholas 1987:102). Only with the addition of considerably more well stratified, well-dated sites will the chronology become firmly established. However, using the methods described in Chapter One, it is hoped that some meaningful new conclusions about this difficult stage in the regional prehistory can be reached through a re-examination of the available data.

# CHAPTER THREE

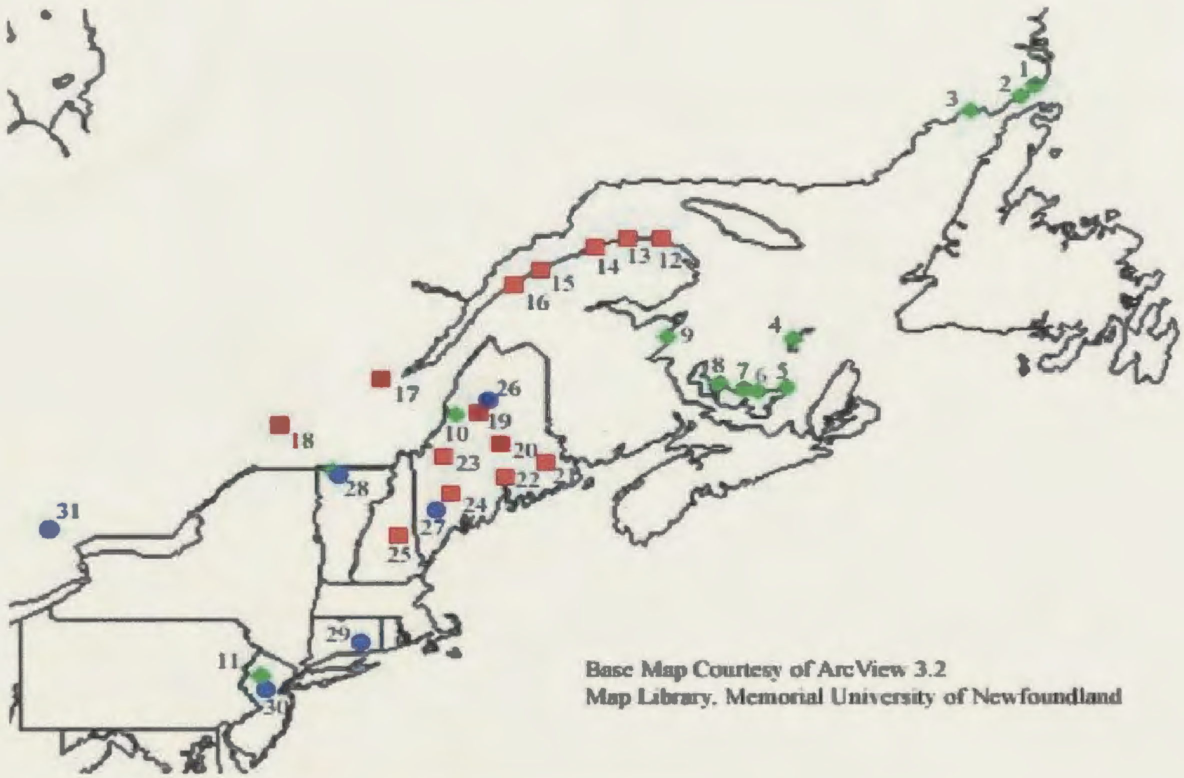
## Known Sites Ascribed to the Late Paleoindian Period in Northeastern North America

### *3.1 Introduction*

This chapter outlines the archaeological assemblages collected and/or excavated from the major Late Paleoindian sites identified within the study region. It includes a summary of the total range of tools collected, the dominant forms, significant absences, and a description of the projectile points recovered. It also provides preliminary information on the lithic materials represented, a consideration that is further explored in Chapter Five. Also considered are relevant surface finds which, although lacking the contextual information that makes archaeological data most useful, can still lend some insight into the distribution of particular point forms. Furthermore, when dealing with a time period for which so few sites are available, isolated finds become all the more important.

The sites are presented in geographical order, moving from the western limits of the study area east. Figure 3.1 depicts the geographical distribution of the major sites and surface finds discussed in the text. Some clear patterns arise in terms of the distribution of the identified Late Paleoindian point forms or 'traditions,' a topic that receives further attention in Chapter Six.

## Late Paleoindian Sites and Surface Finds in the Far Northeast




- ◆ Small, Triangular Projectile Points
- ■ Elongate, Parallel-Flaked Projectile Points
- ● Lanceolate Unfluted Projectile Points

1. Pinware Hill
2. Cowpath
3. Blanc Sablon
4. Magdalen Islands
5. Basin Head
6. Jones Site
7. Savage Harbour
8. New London Bay
9. Tracadie Estuary
10. Blackhawk Island
11. Turkey Swamp
12. Cap du Renard
13. La Martre
14. Ste. Anne des Monts
15. Mitis
16. Rimouski
17. Saint-Romuald
18. Thompson Island
19. Pittson Farm
20. East Branch
21. Grand Lake Thoroughfare
22. Blackman Stream
23. Vail
24. Varney Farm
25. Weir's Beach
26. Graveyard Point
27. Nicholas
28. Reagan
29. Hidden Creek
30. Plenge
31. Zander

### *3.2 Known Late Paleoindian Sites: New England*

#### *3.2.1 Reagan Site*

The Reagan site is located in northwestern Vermont, less than 10 km south of the Quebec border. It was first identified in the 1920s by two amateur archaeologists, William Ross and Benjamin Fisher, who collected hundreds of tools from a high, sandy bluff overlooking the Missisquoi River valley (Ritchie 1953: 249; Haviland and Power 1994: 19). The site was never professionally excavated, so there is a poor understanding of how the artifacts were distributed across the site. Thus, the value of this site for understanding the Late Paleoindian period is severely hampered by the lack of contextual information. All finds were surface collected, and subsequent test-pitting in the area did not reveal any cultural remains (Ritchie 1953: 250). No dates are available for the site, as radiometric dating techniques were not available at the time of the site's identification, and no material suitable for such testing still exists (Haviland and Power 1994: 24). Further, the collections have never been exhaustively studied; former New York State archaeologist William Ritchie made a partial study in the 1950s (Ritchie 1953), and Haviland and Power (1994) studied additional artifacts not included in Ritchie's discussion.

From the information available, it appears that there were several hearths represented at the Reagan site, as indicated by charcoal and firecracked rock. At least 230 stone tools were collected (Haviland and Power 1994: 20). Flakes were also abundant. Chert was the prominent raw material, and several different cherts have been identified in the assemblage, with rhyolite also well represented (over 20% of the tool assemblage) (Ritchie 1953: 250). Among the cherts, the majority material may be local Champlain Valley chert (Spiess and Wilson 1987); also present are Onondaga chert from New York and Pennsylvania jasper, the former of which is quite uncommon on Northeast Paleoindian sites (Wilson et al. 1995: 33). The rhyolite may be from the Mt. Jasper source near Berlin, New Hampshire (Haviland and Power 1994: 22; Spiess et al. 1998: 213). In all, there is a very wide range of raw materials represented at the Reagan site, both of local and non-local origin.

About 70 percent of the tools recovered were scrapers made on retouched flakes, and several additional flakes were used without additional retouch. Gravers, knives, and about fifty-five projectile points round out the flaked tool collection from the Reagan site. Unique to the Late Paleoindian period collections in the region are fifteen carved stone objects, three on soapstone and twelve on talc, which appear to be pendants or some other non-utilitarian artifact form, as most have a hole drilled through and some have incised decorations. No comparable finds are known from any other Paleoindian context in North America (Haviland and Power 1994: 22).

Placing the Reagan site within the regional context is not an easy task. As mentioned, no dates are available on the site and contextual information is unavailable. At the time of the original analysis of the Reagan site material in the early 1950s, few other sites had yet been identified to provide comparative collections, but even today, no Paleoindian sites have yielded comparable non-functional tools. In fact, the only other candidate for a non-functional Late Paleoindian artifact is a single, fragmented specimen on slate recovered from the Jones site in northeastern Prince Edward Island (David Keenlyside, pers. comm.). The age of the latter specimen is, however, somewhat questionable (see discussion of Jones Site below). Ritchie (1953: 256) compared the Reagan site most closely with the Williamson Site in southeastern Virginia and the Shoop site in southeastern Pennsylvania, although the Reagan site is considered to be slightly later than either Shoop or Williamson. The Nicholas site, detailed below, is a more recently discovered site with many similarities to the Reagan site.

One of the interesting features of the Reagan site is that the collection contains both parallel-flaked lanceolate points and smaller, triangular points with both straight and concave bases. In most other sites, one or the other of these types is identified, but not both. Chert seems to be the favoured material for the former type of point, representing 74% of the total points (23 of 31) in this category. The triangular points are not as consistently made on a single material; of the ten identified, 50% are on rhyolite, 30% on chert, and 20% on "trap rock" or basalt (Ritchie 1953: 253). Although once again, the lack of dates and context for the Reagan site materials hinders full interpretation of the site, the fact that both point types are found here may be useful in proving or disproving some of the hypotheses presented in Chapter One. The implications of this occurrence will be discussed in greater detail in Chapter Six.

### *3.2.2 Weirs Beach (NH 26-32)*

At some sites, such as Weirs Beach, New Hampshire, the basal cultural layers have been variously attributed to both the Late Paleoindian and the Early Archaic periods. Now believed to indeed represent a Late Paleoindian occupation (Maymon and Bolian 1992: 118), the earliest cultural layer underlies a quartz-dominated component, ascribed to the Early Archaic. The Late Paleoindian component consists of a tan quartzite biface fragment and a biface tip of the same material, as well as a chert biface section. One of these exhibits parallel-flaking, while the rest are non-diagnostic (Petersen 2000: 118). The dates obtained for the first two artifacts are problematic, since they both suggest a later association than the dates obtained on a feature above them. However, a charcoal sample from a pit feature stratigraphically, though not directly, associated with these artifacts yielded a radiocarbon date of 9,615 ± 225 B.P. (uncorrected, as are all dates herein; see appendix A for lab reference numbers of all radiocarbon dates referred to in text) may be generally representative of the time of initial occupation at Weirs Beach.

### *3.2.3 Varney Farm, Maine (ME 36-57)*

One rare example of a single component presumed Late Paleoindian site was recently discovered and excavated in western Maine. The location of the Varney Farm site is a typical location for a Late Paleoindian campsite as it sits on a Pleistocene glaciomarine-deposited dune overlooking the alluvial floodplain of the Nezinscot River, several kilometers to the west of the confluence of the Nezinscot and Androscoggin Rivers (Cox and Petersen 1997: 25-6). The site was identified in the autumn of 1993, and subsequent testing of the site area led to the recovery of a considerable amount of prehistoric material. Among the early finds was a near basal section of a parallel-flaked projectile point, a presumed diagnostic tool of the Late Paleoindian period (Cox and Petersen 1997: 30).


**Figure 3.2:**
**Two examples of parallel-flaked projectile points from the Varney Farm site (from Petersen et al. 2000)**

Extensive survey of the site area suggests that a single locus is present, in which a number of activities including tool manufacture may have been practiced (Petersen et al. 2000: 124). A total of 5,247 aboriginal artifacts were recovered from Varney Farm (Petersen et al. 2000: 122). As is the case with most Paleoindian sites, the vast majority of lithic materials consist of flakes (almost 5000), almost all of which appear to be of a single variably weathered chert attributed to the Norway Bluff outcrop in the Munsungun Lake region of Maine, about 250 km from the Varney Farm site (Petersen et al. 2002: 128; Petersen et al. 2000: 122). The cherts of the Munsungun Lake area were extensively used by Paleoindians, and have been found as far west as Vermont and as far south as Massachusetts (Petersen et al. 2000: 122). This degree of homogeneity in raw materials within a single site is rare, as most Late Paleoindian sites demonstrate greater diversity in the raw materials used. This degree of homogeneity supports the single occupation hypothesis asserted by Petersen et al. (2002: 137) for the Varney Farm site. Further, Late Paleoindians often relied much more heavily on local materials than did their predecessors, while at Varney Farm, nearly all tools appear to have been made on exotic, high quality materials.

Among the 326 tools and tool fragments identified, 47 are parallel-flaked projectile point fragments (representing nineteen total projectile points). Drills, scrapers, and biface fragments are also represented, although the endscrapers typical of many Paleoindian and later sites are curiously absent (Petersen et al. 2000: 124). Most materials were recovered to a maximum depth of 40 cm below ground level and thus within the disturbed plow zone. Only a few artifacts were recovered from the subsoil in a potentially undisturbed context. The projectile points are compared by Petersen and others (2000) to Cody complex projectile points from the Great Plains, but except one, the Varney Farm points do not exhibit stemming (Petersen et al. 2000: 123). They are generally thin in form and may have undergone extensive reworking.

Four features were identified from the Varney Farm site as being possibly cultural in origin. However, radiocarbon dating on organic material from Feature 1, deemed a likely candidate for a hearth of cultural origin due to the presence of a large number of lithic specimens and carbonized flora, returned an unacceptable date of just over 2,000 B.P. The anomaly suggests a naturally burned tree throw may have produced the discoloration (Cox and Petersen 1997: 42); this problem is common in Paleoindian sites and such natural features are often mistaken for cultural features (Wilson et al. 1995: 56-60). Features 2 and 4 have also produced carbonized fauna, but no radiocarbon dates are available. Feature 3 was located well below the base of the plow zone and contained nine lithic flakes, three calcined bone fragments (the only ones found at Varney Farm) and carbonized floral remains (Cox and Petersen 1997: 42). It was tentatively assigned to prehistoric cultural origin based on its position and contents. Six $C_{14}$ dates have been returned on floral samples from this feature; the first date 9,410 ± 190 B.P. was considerably older than the five subsequent dates, which ranged from 8,700 ± 60 B.P. to 8,380 ± 100 B.P. All six dates can be roughly correlated with other Late Paleoindian dates across the broader region (Cox and Petersen 1997: 43; Petersen et al. 2000: 128). The site's excavators favour the earliest date based on the assumed timing of Late Paleoindian occupation in the region. It is also noted, however, that the Rimouski site in Quebec, which has comparable parallel-flaked projectile points, was dated to just over 8,000 B.P. Thus, the more recent dates are not discarded, although if accurate, would suggest that Late Paleoindian and Early Archaic populations co-existed in the region for some time (Petersen et al. 2000: 130).

### *3.2.4 The Nicholas Site (ME 22-10)*

This site is a small, single component Late Paleoindian campsite in southern Oxford County, Maine. It was initially tested as a cultural resource management project in the area of construction of a Wal-Mart loading dock in 1993, with further excavation carried out in 1994. Although the site is one of very few probable Late Paleoindian sites in the region, it is not well reported in the literature pertaining to the period. Today, the site is located on a terrace 0.4 km away from the present-day Little Androscoggin River channel and floodplain. However, paleogeographic reconstruction suggests that at the time of Late Paleoindian occupation (estimated at 10,000 to 10,300 B.P. in the absence of radiocarbon dates), the river was actively downcutting and the campsite may have been located in much closer proximity to the Little Androscoggin River (Wilson et al. 1995).

Plow activity and rodent burrowing have disturbed the site, but four clearly defined loci were identified with artifact concentrations in their centres, diminishing in number towards the margins of the loci. These have been provisionally interpreted by the site's excavators as representative of four dwellings occupied by four nuclear families for a short period of time as a temporary campsite (Wilson et al. 1995). The four loci were roughly similar in size and in the number and types of artifacts recovered.

Thirty-nine bifaces were recovered from the Nicholas site, including six projectile points, twelve preforms and preform fragments, two expedient bifaces, and nineteen biface fragments. None of the points exhibits fluting, suggesting a Late Paleoindian rather than an Early Paleoindian affiliation. Several of the projectile points were extremely small in size, and are described by Wilson and others (1995) as 'miniature points.' Two of these are lanceolate in outline with a concave base, and are considered to be a very small version of an unfluted western Midland or Clovis point (Wilson et al. 1995: 85). Wilson and others also note similarities with the Holcombe points of the Great Lakes region and some Reagan site points. A 'miniature' and a larger point are parallel-sided with shallow basal concavities, and are generally similar in outline to points from the Jones Site in Prince Edward Island and the Magdalen Islands in the Gulf of St. Lawrence, although these points tend to have much more pronounced basal concavities.

Several other ‘miniature’ points recovered from the Nicholas site are excurvate in outline. Two of these were made on a flake; one has a straight base, the other a concave base. Both are characterized by shallow marginal retouch along the sides. A third specimen is missing its tip, but demonstrates a plano-convex cross section and convex sides expanding from a narrow base. A fourth specimen is a broken straight base, and demonstrates expanding sides. Wilson and others (1995: 87) note that the lateral edges are ground, a procedure more commonly associated with the Archaic period. However, in general outline and size they compare favourably with "Holcombe points, although they are not cognate forms, and also the unfluted triangular forms found at the Reagan site in Vermont and in eastern Pennsylvania, New Jersey and New York" (Wilson et al. 1995: 87). Visually and in terms of manufacturing details, the range of points recovered from the Nicholas site does seem to fit well within the range of points described for the Reagan site, suggesting that these two sites may be of comparable age, function, and/or group identity of the occupants. As for the ‘miniature’ points, Wilson and others (1995) suggest a possible ritual significance. They note that these points do not exhibit evidence of use, and that each was discovered not in a concentration of lithic debris, but rather on the outside edge of each locus, with one miniature point at each locus identified. They suggest that the intra-site patterning of the loci may indicate four dwellings placed in a semi-circle facing east, and that the miniature points were placed at the doors of each of the dwellings (Wilson et al. 1995: 87). This is purely speculation, however, and it is quite possible that these points were intended for a functional purpose. Indeed, in Locus 1, the miniature point was recovered from the south of the tool concentration, in Loci 2 and 3, they were recovered from the east of the tool concentration, and in Locus 4, to the southwest of the concentration. It is difficult to know how these placements may have been affected by post-depositional disturbances.

Unifacial tool forms are also well represented in the Nicholas site assemblage, including a variety of endscrapers, sidescrapers, perforaters, limaces, concave scrapers or spokeshaves, composite tools, expedient unifaces and denticulates. In total, 165 unifaces and uniface fragments were recovered, several of which refit to suggest a total of 141 specimens. Endscrapers dominated the formal tool assemblage at the site, represented by 31 complete and fragmentary specimens. These are all trianguloid in outline and trapezoidal or triangular in cross section, and once again are visually similar to endscrapers recovered from the Reagan site. These are generally well used and were probably discarded because of breakage or the completion of their use-life. It is notable that this tool form is conspicuously absent from the nearby Varney Farm site, described above, which is representative of the parallel-flaked elongate Late Paleoindian projectile point technology. The flaked tool assemblage is rounded out by a single *pièce esquillées*, none of which was recovered from the Reagan site but are common, though in low numbers, at Early Paleoindian and Late Paleoindian sites throughout the region.

The raw materials used for flaked tools at the Nicholas site tend to be good quality cryptocrystalline lithic materials, as is the case with most Early Paleoindian and, to a lesser degree, Late Paleoindian sites. The most abundant raw material is a rhyolite, probably originating at the Mt. Jasper lithic source near Berlin, New Hampshire (Wilson et al. 1995: 68). This material represents about 97% of the total assemblage by number and 94% by weight. Four minority materials are also represented in very small quantities in the Nicholas site assemblage. The first of these, Munsungun chert from northern Maine, is present in considerable quantities at the nearby Varney Farm site (Petersen 2000), and from many Early Paleoindian sites and isolated finds. Second, a banded pink volcanic material from an unknown lithic source was identified; it also appears in the early Paleoindian Hedden site in Maine (Spiess et al. 1994), and may be fashioned from the same material used for a late Paleoindian-ascribed point from Blackhawk Island, Maine (Doyle et al. 1985: 5). Quartz crystal, again of unknown source, is another minority material and has also been identified at Early Paleoindian sites in Maine including Adkins cache site (Gramly 1988), Dam site (Wilson and Spiess 1989), and Hedden site (Spiess et al. 1994), and the early Archaic Little Ossipee North site (Will et al. 1996). Finally, a few examples of a patinated gray-green chert are present, but these are of unknown origin and it is uncertain if this material is present in other Early Paleoindian, Late Paleoindian, or Early Archaic sites in the region (Wilson et al. 1995: 69).

The Nicholas site also contains several specimens relating to a coarse stone industry, including choppers, abraders, hammerstones, and unidentified pieces. These are primarily made on granite. Wilson et al. (1995: 120) assert that this industry is often ignored or underreported from Late Paleoindian sites, but similar tools are recorded at Varney Farm (chopper, hammerstones; Cox and Petersen 1997), at Rimouski (abraders, hammerstones, anvilstones; Chapdelaine 1994), and at La Martre ('grindstones;' Dumais 2000). The absence of a coarse stone industry at the Reagan site and other primarily surface collected sites in the region is more likely a lack of recognition of this industry at the time of collection than a true reflection of the breadth of technology represented.

Unfortunately, there are no convincing radiocarbon dates available from the Nicholas site. The one sample submitted for radiocarbon dating came from a feature in locus 4 that was suspected to have been a result of natural, rather than cultural, processes. The problem of tree throwing and natural forest burning resulting in features often confused as prehistoric hearths has already been mentioned. It is likely that the radiocarbon date of 6,600 B.P. returned on the Nicholas site sample is yet another example of this problem.

### *3.2.5 The Guzzle Site (ME 84-45)*

The Guzzle site is located on Flagstaff Lake in Stratton, Maine. The site location is submerged during part of the year, and was recognized as an archaeologically significant area by local collectors, who visited the area in the fall and early spring when surface collection was possible. The site was reported to the Maine Historic preservation Commission in the early 1990s.

Subsequent walkover surveys and excavation (a total of 7.25 $m^2$ were excavated) led to the collection of 109 artifacts (Will and Moore 2002). Over a quarter of these (n = 29, 27%) came from the surface or from recently deposited alluvium, with the remainder being recovered from the albic and spodic soil horizons, presumably intact soil horizons in an otherwise disturbed and often jumbled stratigraphic sequence (Will and Moore 2002: 4). Will and Moore note that in a small area raised above much of the rest of the site area, artifacts were recovered primarily from subsurface deposits, "presumably a preserved context" (Will and Moore 2002: 4).

The artifacts recovered from the Guzzle site include two bifaces, one uniface, 11 pieces of modified debitage and 95 pieces of unmodified debitage. One biface, which was surface collected less than a metre from the water's edge, is made on chert, possibly originating from the Munsungun Formation (Pollock et al. 1999). This biface is the midsection of a parallel-flaked, elongated lanceolate projectile point, and was refit with a biface tip recovered during a walkover survey by Dr. James Petersen in 1994. The refitted point fragment is 49 mm long, 18.5 mm wide, and 5.5 mm thick. This point is very similar to those recovered from the nearby Varney Farm site. The other biface was manufactured on quartz, and is a non-diagnostic edge fragment with retouch along one face. In addition to chert and quartz, other raw materials are present in the collection but are too weathered to be identified as to source.

The single uniface from the Guzzle site is fashioned on chert probably originating from the Munsungun Formation (Will and Moore 2002: 5). It is a probable distal portion of a steep-edged scraper. All recovered debitage is small in size, generally less than 1 $cm^2$ in area. No carbonized organic materials were recovered, so no radiocarbon dates are available. The site is placed within the late Paleoindian period based on the diagnostic flaking technique used in the production of the parallel-flaked projectile point.

### *3.2.6 Blackman Stream (ME 74-19)*

The Blackman Stream site, located along the Penobscot River in central Maine, contained "the first stratigraphically dated context of a recognizable late Paleoindian diagnostic artifact in the State of Maine" (Sanger et. al. 1992: 149). Identified at the turn of the century, the site was not professionally excavated until the mid-1980s. The diagnostic Late Paleoindian assemblage at Blackman Stream consists of a single parallel-flaked projectile point fragment with pressure retouch along the lateral edges found fully 217 cm below ground surface. The point is made on a weathered dark grey chert whose source is unknown. Although not directly associated with this biface, stratigraphically similar deposits yielded a collection of felsite flakes (Sanger et al. 1992: 151). Although the exact age of the basal cultural layer is not definitely known, it is located 1 m beneath a land surface that has been dated, based on three radiocarbon dates from charcoal samples, to about 8,000 B.P. (Sanger et. al. 1992: 149). This projectile point has been visually matched in terms of both form and material to bifaces from the Gaspé region of Québec (see below).

### *3.2.7 The Sandy Stream Site*

The Sandy Stream site is located near the confluence of Sandy Stream and Millinocket Lake, in north-central Maine. Three discreet artifact clusters have been identified at the site, one of which yielded a parallel-flaked projectile point fragment in 1988. Excavation of 32 $m^2$ revealed that the Late Paleoindian component at the site was discreet from the other loci, separated by about 100 m from the other prehistoric occupation areas identified at the site (Will and Moore 2002: 6). Over a thousand artifacts, primarily lithic debitage, were recovered in the course of excavation, most of which were concentrated in an area immediately adjacent to the stream margin. Two distinct concentrations were noted within this locus of activity (Will and Moore 2002: 6).

Although there is some evidence for bioturbation at the site, the stratigraphy of the site generally suggests that "the landform has remained relatively stable for a considerable length of time" (Will and Moore 2002: 7). The artifacts are generally very weathered, but appear to be made on a fine-grained sedimentary stone, probably siltstone or chert. A small number of artifacts are assigned to the Munsungun Formation chert source, located 60-70 km north of the site. These specimens are all debitage flakes, and are reddish-brown in colour with an earthy to waxy lustre. The other primary material identified in the less weathered to unweathered specimens is a light grey to blue-grey material, also with an earthy to waxy lustre. The artifacts recovered include both bifaces and unifaces, and a number of the lithic flakes recovered are assumed to relate to biface manufacture based on their size, shape, and flake scars (Will and Moore 2002: 7). Among the bifaces recovered from the Sandy Stream site are three projectile points, two of which demonstrate the parallel-flaking technique considered diagnostic of the Late Paleoindian period. Both of these were broken during manufacture. One fragment is a distal portion of a point measuring 50 mm long, 19 mm wide, and 4 mm thick. The other is a proximal portion of a point refitted from two fragments, which together measure 26.5 mm long, 23 mm wide, and 4.5 mm thick. The latter point is generally wider and thicker than those recovered from the Varney Farm site, but falls within the range of most of the Gaspé Peninsula collections (see Chapter 6, p. 141 for a comparison of metric attributes of parallel-flaked projectile points).

The other projectile point recovered from the Sandy Stream site is a small, stemmed proximal fragment with a base measuring 12.5 mm long. The stem is narrow (6.5 mm) and formed by notches on the edges. Although generally, stemmed points are associated with the Archaic and Ceramic periods of prehistory in the far Northeast, their presence in Late Paleoindian assemblages is not unprecedented (eg., Cox and Petersen 1997: 36; Chalifoux 1999: 72; Chapdelaine 1994: 181). The site does not appear to contain later cultural components, and might be interpreted as a chronologically later Late Paleoindian site than many of the other identified sites in the region containing elongate, parallel-flaked projectile points.

Another significant find from the Sandy Stream site is a large, bipointed knife that has several known analogues in other Late Paleoindian collections in the region, particularly from several of the Gaspé Peninsula sites. This complete specimen measures over 160 mm in length and 70 mm in width at its widest point. Maximum thickness is 9.0 mm. Large flake scars generally terminate near the midline of the biface, and are crosscut by fine edge retouch (Will and Moore 2002: 8). Additional tools include a biface preform, apparently in the early stage of production, made from a large flake (85 mm long, 77 mm wide, and 14 mm thick), and three non-formal unifaces produced by edge retouch on a flake. No radiocarbon dates are available for the Sandy Stream site.

### *3.2.8 Maine Surface Finds*

A number of surface finds have been identified throughout the state of Maine (Doyle et al. 1985). These include one unfluted, excurvate lanceolate projectile point from Graveyard Point (ME 143-1), which has been compared to specimens from the Reagan site (Doyle et al. 1985: 5). This point is made on black chert, possibly originating from Munsungun. The specimen is broken, and consists of the proximal portion of the point. One surface find from Blackhawk Island (ME 130-12) in Maine is trianguloid in outline, with a well thinned, concave base. One surface exhibits a shallow flute, and grinding is evident on the lateral edges and the base. This point is smaller than most of the points of similar outline morphology recovered from the Maritime Provinces and the Magdalen Islands. It has been compared to specimens from Reagan site as well as the Plenge site in New Jersey (Doyle et al. 1985: 5). Also noted are similarities with points from southern Labrador, such as those from Pinware Hill, discussed below. The raw material for this point is a reddish yellow rhyolite, possibly from the Saugus rhyolite source in northeastern Massachusetts.

Several finds have been noted that fall under the parallel-flaked, lanceolate point tradition. These include a specimen from Blackhawk Island, two from Pittson Farm (ME 130-2b) on the Penobscot River, the Moose River (ME 117-17) point, the East Branch site (ME 106-23), the West Grand Lake Thoroughfare site (ME 94-10), the Leighton site (ME 13-3), and the Basin Island site (ME 13-25). These specimens are all finely parallel-flaked, although some are highly damaged. Doyle and others (1985) have compared these points to specimens from the Gaspé Peninsula of Québec and the Thompson Island site in eastern Ontario. Similarities are also noted with one point recovered from the otherwise Early Paleoindian Vail kill site 1 (Gramly 1982, 1984) and with the Weirs Beach site in New Hampshire (Maymon and Bolian 1992). Raw materials identified include cherts of unknown origin; green rhyolite probably from Mt. Kineo, Moosehead Lake, Maine; argillite, possibly from the Munsungun area; quartzite of unknown origin; and felsite, also of unknown origin (Doyle et al. 1985: 6-8).

Recently reported surface finds come from northwestern Maine (Will and Moore 2002). Site 129-05 is located on a small island in the south arm of Canada Falls Lake in an artificially impounded area of the South Branch of the Penobscot River. A 1996 survey by Archaeological Research Consultants, Inc. led to the surface collection of a parallel-flaked projectile point base from a gravel beach. In a nearby sandy beach area, four small, maroon-coloured chert flakes were collected, although no subsurface artifacts were recovered in the several test pits excavated in the immediate area of the finds. In the east arm of the same lake, surface collection yielded a bi-pointed biface "remarkably similar in morphology and flaking technology to the biface knife described for the Sandy Stream site" (Will and Moore 2002: 10). It is manufactured on a dusky red-brown fine-grained chert/siltstone, possibly originating from the Munsungun Lakes chert source. This specimen measures 137 mm long, 60 mm wide at its widest point, and 11.6 mm thick.

### *3.3 Known Late Paleoindian Sites: the Gaspé Peninsula*

Surveys on the Gaspé Peninsula have revealed 36 sites that are associated with Late Paleoindian activity, based on typological grounds (Chalifoux 1999: 70). The following section reviews several of the largest and best documented of these sites.

#### *3.3.1 Rimouski (DcEd-1)*

The Rimouski site is located on the north shore of the Gaspé Peninsula of Québec, 1.6 km from the St. Lawrence River and 1.2 km from the Rimouski River. The site is associated with a series of elevated marine terraces at altitudes reaching 135 to 140 m above sea level, which corresponds with the limits of marine invasion of the Goldthwait Sea (Dionne 1990). This characteristic is common to most Gaspé Late Paleoindian sites.


**Figure 3.3: Selected projectile points from the Rimouski Site (Chapdelaine 2000).**

The site was extensively excavated in the early 1990s (Chapdelaine et Bourget 1992; Chapdelaine 1994) to reveal Late Paleoindian occupation ascribed to the "Plano" tradition based on the parallel-flaked projectile points recovered at the site. The overall tool assemblage is very similar to that described below for the Mitis and La Martre sites. Radiocarbon dating of charcoal associated with cultural material at Rimouski suggests that the site was occupied at about 8,000 B.P. (Chapdelaine 1994: 122), although there is considerable variation among the dates obtained. Some researchers feel that even the oldest date obtained, 8,150 ± 130 B.P., is too recent (e.g., Petersen 2000: 118). This date fits very well, however, with other dates obtained on similar sites on the Gaspé Peninsula (see Chapter 6.5 for further discussion of chronology).

About 80% of the identified artifactual material was recovered from within the plow zone (Chapdelaine 1994: 247). Although no burned areas could be identified as possible hearths, Chapdelaine suggests that this probably does not represent the activities carried out at the site. He believes that the short duration of occupation of the site, or subsequent disturbance from recent agricultural activities, may have removed all traces of former hearths (Chapdelaine 1994: 170).

Three loci of activity were identified, and analysis of tool variation between the loci has been interpreted as representative of several activity areas. For example, the southwest area yielded a high number of unifacial tools, and Chapdelaine has suggested that this may represent hide working activities (1994: 218). These activities may indicate sexual division of labour, but may also be explained by seasonal variation (Chapdelaine 1994: 242). The many flakes and tools suggest that tool rejuvenation may have been a major activity at the site, particularly in the northernmost locus (Chapdelaine 1994: 221).

Initial reduction appears to be poorly represented, as indicated by the low frequency of large flakes and the absence of cortex on flakes.

It is difficult to determine the subsistence patterns of the inhabitants of the Rimouski site. As with most Paleoindian sites, no faunal remains were preserved. The presence of a high number of unifacial tools may be representative of hide working activities, as mentioned above, and this suggests use of terrestrial mammals. Blood protein residue analysis was carried out on a number of tools, and although no antiserum was available for marine species, the analysis suggested the use of a variety of terrestrial resources (Chapdelaine 1994: 250-251). It should be noted, however, that this technique is highly controversial. Based on the site's position on an ancient marine terrace, it is likely that marine species may also have played a role in the diet of the Rimouski site inhabitants. A generalized subsistence strategy has been hypothesized.

### *3.3.2 La Martre (DhDm-1)*

La Martre, a Late Paleoindian site on the northern shore of the Gaspé Peninsula, has yielded more than a dozen discreet prehistoric occupation areas since fieldwork began in 1997 (Chalifoux 1999; Dumais 2000). The La Martre occupations are located on a series of terraces at the mouth of the La Martre River. Most of the artifacts recovered came from disturbed contexts, either within the plow zone, or within a B horizon in which disturbance and mixing with the plow zone was evident, possibly as a result of tree falls (Chalifoux 1999: 71; Dumais 2000: 87). Large quantities of lithic material were recovered from the site, over 95% of which were debitage flakes. In total, more than 150,000 flakes and 1,500 tools and tool fragments were recovered from La Martre (Chalifoux 1999: 71). Several 'stations' of activity were identified, tested, and excavated. Most of the raw materials appear to be local in origin, although some, such as quartz, red quartzite, agate, and rhyolite, may be non-local. These exotic materials, however, represent less than 1% of the total assemblage (Chalifoux 1999: 71).

The assemblage recovered from La Martre includes a number of recognized diagnostic Late Paleoindian artifact forms, including parallel-flaked projectile points, excurvate lanceolate projectile points, and drill fragments. Plano tradition affiliations have been suggested based on the morphology of the parallel-flaked points, although this style is represented only by one complete and two fragmentary specimens (Dumais 2000: 88). A larger portion of the projectile points, seven in number, are associated with the Ste. Anne type defined by Benmouyal (1987) from the Sainte-Anne-des-Monts site, also in the Gaspé (Dumais 2000: 89). These points are slender and nearly parallel-sided, with delicate parallel pressure flaking scars on both faces. This type of point was also identified at Varney Farm. Another identified point form is a larger excurvate lanceolate-shaped point which is compared wit those found at some other Late Paleoindian sites in the Gaspé region, but also demonstrate similarities with points recovered further south, at Weirs Beach, New Hampshire and Graveyard Point, Maine (Chalifoux 1999: 72).

Very few of the flakes were modified to create functional expedient tools. The high concentrations of waste flakes, found at densities of 800 to 1,000 flakes per square metre, are considered indicative of intensive lithic reduction of local raw materials (Chalifoux 1999: 72). The high proportion of blanks and performs at the site supports this hypothesis. In 1998, a lithic quarry was identified near the site, making La Martre almost certainly a site centred on lithic procurement and reduction, but this does not preclude the possibility that domestic activities took place at the site as well.

### *3.3.3 Sainte-Anne-des-Monts (DgDo-4)*

The Sainte-Anne-des-Monts site is located near the centre of the North Shore of Gaspé Peninsula on the highest terrace in the region, about 38 to 45 m in altitude. The site is one kilometer from the current banks of the St. Lawrence River. Unfortunately, the archaeological context of this site has been highly disturbed by a century of construction and other human activity, particularly the removal of sand and gravel used in road work. As a result of such activity, a large portion of the site had disappeared before the commencement of archaeological recovery work.

The site was originally located on a mildly sloped terrace measuring about 100 m wide. Nearby are a variety of cherts in outcrop form that were used by the native inhabitants of the site, and the excavator has suggested that the proximity of good chert sources may have been a major attraction to this particular site (Benmouyal 1987: 94). Surface collection begun in 1972 yielded 77 tools and more than 4,500 flakes. Salvage excavations undertaken in subsequent years led to the ultimate recovery of 826 tools and nearly 28,000 flakes from a total excavated area of 327.25 square metres.

Benmouyal (1987: 101) identifies five distinct flake concentrations at Sainte-Anne-des-Monts, which he suggests may represent distinct tool making and/or manufacturing areas. The biggest of these concentrations was located in a depression 20 cm deep and contained over 3,000 flakes, mostly of black chert, and two dozen unutilized preforms and tools of the same material. This is interpreted as a brief toolmaking event in which preforms were brought from the nearby chert outcrops and fashioned into tools on the spot. Cores are absent, suggesting initial roughing out into preforms was done at the lithic source rather than at the site (Benmouyal 1987: 101).

Benmouyal (1987: 102) notes that activities other than tool manufacture and maintenance likely took place at the site as well. He observes the presence of finished and utilized tools and utilized flakes, which may represent domestic activities such as cutting soft materials for food. He thus interprets the site as a short-term campsite used while obtaining raw material from nearby sources, probably occupied for a single season (Benmouyal 1987: 106), although it seems not at all improbable that a site so well situated in terms of both lithic and food resources might be reused on a short-term basis at least over several seasons, if not generations. The radiocarbon date of 5,960 ± 100 B.P. obtained on charcoal from the site is considered too recent to relate to the earliest human occupation of the site.

A number of fragments of Plano-like points were recovered from Sainte-Anne-des-Monts. They are symmetrical and lanceolate in outline, and exhibit a delicate pattern of parallel pressure flaking on both faces (Dumais 2000: 89). Bases range from concave to straight to lightly convex, and are all bifacially thinned. Benmouyal estimated that the complete points were long and thin with mean dimensions of about 125 mm long by 20 mm wide by 5 mm thick (1987: 110). If these estimations are correct, the Sainte-Anne-des-Monts forms are generally considerably longer than those from other parallel-flaked projectile point sites in the study region such as Rimouski and Varney Farm. However, because of the fragmentary nature of most of the Sainte-Anne-des-Monts projectile points, this estimate may be too high. In any case, in terms of general morphology, flaking characteristics and raw material selection, the Sainte-Anne-des-Monts points are in most regards very similar to other parallel-flaked point sites on the Gaspé Peninsula.

### *3.3.4 Mitis (DdEa-1 and DdEa-3)*

The Mitis sites, located about 150 km from La Martre on the North Shore of the Gaspé Peninsula, are represented by two discreet areas of prehistoric activity. The sites are, like most others in the region, located on raised marine terraces on both banks of the Mitis River, at elevations of 65 to 75 m. The site on the left bank presents a similar pedological context to the La Martre site, with most artifacts recovered from contexts disturbed by agricultural activities and natural processes. The site on the right bank, however, appears to be relatively undisturbed, and thus the archaeological remains are considered representative of their original deposition when the site was abandoned.

The lithic materials recovered form the Mitis sites have only been preliminarily analyzed, but the assemblage appears to be very similar to others along the Gaspé Peninsula, with a dominant bifacial industry and similar overall tool morphology (Dumais 2000: 95). One significant difference, however, is in the raw material selection at the Mitis sites. Over 95% of the tools recovered are made on a dark grey mottled chert originating in the north Gaspé coast, but there is no presently known outcrop in close proximity to the sites. Other raw materials are of unknown source, and a few tools were fashioned on what is probably local quartz and quartzite (Dumais 2000: 95). Projectile points here again include narrow and slender Ste. Anne style points and larger lanceolate (or lozenge-shaped, in Dumais' terminology) points. One recovered projectile point from Mitis has been compared to the "Hell Gap" type, known from the Great Plains. Such point types have also been identified in Maine (Spiess 1992b). The tool assemblage is rounded out by bifaces, a few unifaces, grinding stones, flakes, and a single drill. No radiocarbon dates are available, as no suitable samples were recovered in the course of excavation.

### *3.4 Known Late Paleoindian Sites: the Gulf of St. Lawrence*

#### *3.4.1 The Magdalen Islands (ChCl-4, ChCl-5, ChCl-9)*

A 1988 survey of the Magdalen Islands, located in the Gulf of St. Lawrence, has suggested a probable Late Paleoindian presence in the archipelago. The Magdalen Islands are situated in the Gulf of St. Lawrence, less than 100 km offshore from both the Gulf Shore of Prince Edward Island, and Cape Breton Island, Nova Scotia. Lithic artifacts considered diagnostic of the Late Paleoindian and/or Early Archaic period were recovered from several sites (McCaffrey 1986; 1992: 2). Three triangular, concave-based projectile points were surface collected at different sites; very little subsurface testing has yet been done on the Islands, and as yet no *in situ* deposits considered to date to the Late Paleoindian period have been identified. The morphology of the points, however, suggests a close relationship between their makers and the peoples represented by similar tools found in the Maritime Provinces, and particularly those found at the Jones site in much higher numbers (Keenlyside 1991; 2001, pers. comm.).

The earliest evidence for use of the Magdalen Islands may date to 8,000 B.P. (McCaffrey 1992: 2), although this date is based purely on typological grounds. The projectile points recovered closely resemble other surface collected points from various locations in the Maritime Provinces such as the Jones Site, Basin Head, and Savage Harbour, Prince Edward Island, and Tracadie Estuary, New Brunswick (Keenlyside 1991). The points are very similar in outline morphology and in manufacturing details, and in both areas, Ingonish (Cape Breton) rhyolite is the dominant raw material. Unfortunately, due to a lack of contextual information for all of these specimens, little can be said about accompanying tools in the toolkit, subsistence activities, settlement patterns, or relative temporal placement of the individuals represented by this technology.


**Figure 3.4: Projectile Points from ChCl-5, Magdalen Islands. Photo courtesy of Moira McCaffrey, McCord Museum, Montreal.**


**Figure 3.5: Projectile Points from ChCl-9, Magdalen Islands. Photo courtesy of Moira McCaffrey, McCord Museum, Montreal.**

### *3.4.2 The Jones Site (CcCq-3)*

The Jones site represents the only late Paleoindian site yet identified in the Maritime Provinces. The existence of a broad emergent landmass joining the island to the mainland in the late glacial period has been documented (Keenlyside 1985; Bonnichsen et al. 1991: 22; Josenhans and Lehman 1999; see also Fig. 4.2), and thus the island would have simply been part of the larger landmass of the extreme northeast in the early Holocene. The site is on the northern shore of St. Peter's Bay on a slightly elevated headland, which has seen a great deal of erosion over the centuries. It is located within the Prince Edward Island National Park – Greenwich. The site contents have been protected in part by capping through sandstorm activity in the 1920s. As a result, a series of deposits has been preserved at this multi-component site, several of which are prehistoric. Thousands of artifacts have been surface collected at the site, although the excavated assemblage is small. Recent excavation suggests that there may no longer be an intact Late Paleoindian occupation level at the site (MacCarthy 2002a, 2002b, 2002c).

Surface finds were first retrieved from the area of the Jones site in the 1960s by local collector Mr. Roland Jones. Although the site was formally located during a 1980 survey, its significance was not realized until the collection came to the attention of David Keenlyside of the Canadian Museum of Civilization and Anna Sawicki of the University of Prince Edward Island, who carried out initial testing and excavation of the Jones site in 1983. Each of the archaeological levels is thin, so that the total artifact assemblage from the site is quite small.

The basal layer, which is of interest to this discussion, begins at about 80 cm below the surface. The only sample from the excavations of the 1980s submitted for radiocarbon dating, a wood charcoal sample, yielded a date of 1,255 ± 280 B.P., which is considered unacceptable based on the depth of this layer and the overlying prehistoric occupation levels (Keenlyside 1991: 70). Root activity has been cited as the probable cause of the unreliable results (Bonnichsen et al. 1991: 23). Recent fieldwork (MacCarthy 2002a, 2002b, 2002c) has added three new radiocarbon dates, which unfortunately yielded very similar results to the previous radiocarbon samples. The dates obtained, all on wood charcoal free of any obvious contaminants, were 1,840 ± 90 B.P., 700 ± 50 B.P., and 330 ± 50 B.P. (see Appendix A for details), and were not in stratigraphic order, suggesting considerable mixing of layers and disturbance at the site. In addition, the recovery of historic artifacts (several wrought nails) from depths of over 90 cm below the surface and in association with lithic artifacts supports the contention that the site no longer contains a discreet Late Paleoindian horizon. Optically stimulated luminescence (OSL) dating was also carried out on several samples of buried sands from the two deepest cultural levels at the site, but these results are not yet available.

The excavated sample from the site is minimal. In fact, the only diagnostic Paleoindian artifact actually excavated from this level is a single basal section of a projectile point. In close proximity lay a fragmentary, engraved, thin piece of slate, a find that has not been replicated at any other Paleoindian site in the Northeast (Bonnichsen et al. 1991: 23). A complete projectile point was found on the beach nearby, located "at the weathering edge of the basal stratum where in intersected with the beach surface and appears to have been very close to an *in situ* position" (Bonnichsen et al.

1991: 23). Including surface finds, nearly 50 projectile points from the Jones site appear to date to the Late Paleoindian period (Keenlyside 2002, pers. comm.). Jones site projectile points tend to be triangular in outline, with well-thinned bifacial trimming. Basal indenting is variable and basal thinning tends to be strong, and pronounced barbs are common. There is no fluting on these points as is characteristic of the Early Paleoindian period; they are considered to be Late Paleoindian in form despite overall morphological similarities to Early Paleoindian projectile points from the Debert site in Nova Scotia. Similarities have also been noted between a number of the P.E.I. finds and a projectile point from the Whipple site in New Hampshire (Keenlyside 1991: 172). Point sizes range from less than 30 cm in height to over 70 mm. No features appearing to be cultural in origin were identified at the site.

**Fig. 3.6: Jones site projectile point. Photo courtesy of David Keenlyside, Canadian Museum of Civilization.**

Fieldwork undertaken by the author during the summer of 2001 added to the total excavated area of the site, but did not yield any diagnostic Late Paleoindian specimens. The discovery of European materials in the form of several pieces of wrought iron nails from the basal stratum illustrates the problem of vertical disturbance at the Jones site. Only a very few artifacts that could be considered diagnostic of any period were recovered; these included a quartzite projectile point tip, a quartzite biface which may be the bottom half of a contracting stem projectile point; and a chert thumbnail endscraper, all recovered from the basal stratum from depths of 80-100 cm below datum and all assumed to be considerably more recent than Late Paleoindian in age, most likely dating instead to the Middle Woodland period. As the site is steadily eroding, it appears that any former Late Paleoindian culture-bearing levels are no longer intact.

Projectile points similar to those identified at the Jones site have been surface collected from various other areas of Prince Edward Island, but no other sites have been identified. Specimens from Basin Head, Savage Harbour, New London Bay, and the St. Peter's Bay area demonstrate notable similarities with the Jones site specimens, both in terms of morphology, flaking characteristics, and raw material selection. Two points from the Tracadie River estuary in northeastern New Brunswick are also very similar in form.

Several other Late Paleoindian projectile points have also been surface collected in Nova Scotia, including two points that have been compared to Holcombe points common in the Great Lakes region during the Late Paleoindian period (Erskine 1998); one is from the Geganisg site on Ingonish Island, Cape Breton, while the other was recovered from the Gaspereau Lake area. The latter point, referred to as the Melanson point, is pictured below in figure 3.7. Further, several fragments of parallel-flaked points, a form generally characteristic of Québec and northern New England in the Late Paleoindian period, have also been recovered from the Maritime provinces, from sites such as French Lake, New Brunswick; Little Narrows, Cape Breton Island, Nova Scotia; and from Gaspereau Lake (Keenlyside 1984). The significance of these points will be returned to in Chapter 7.

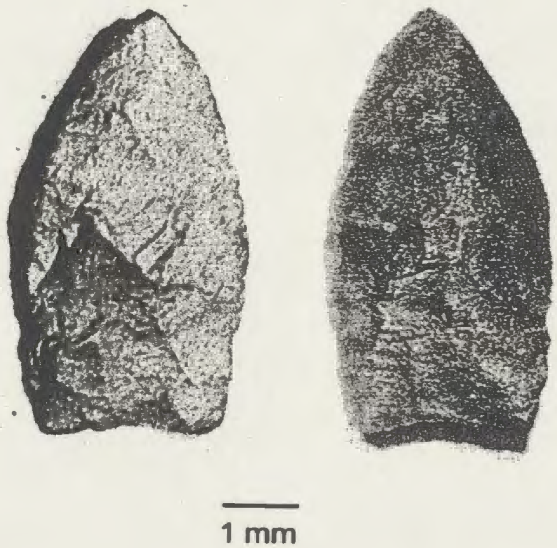



**Figure 3.7: Melanson Late Paleoindian Projectile Point, Gaspereau Lake, N.S.**

The paleogeography of this region is still not firmly established, and thus it is difficult to situate the Jones site in terms of the ancient shoreline. Keenlyside (1991) suggests that 10,000 years ago, sea levels in this region may have been 20-30 m lower than today. In this case, the site might have been located on a river channel or saltwater estuary, or perhaps the current St. Peter's Bay might have then been an inland lake or brackish pond (Keenlyside 1991: 170). However, the distance of the site from the coast at 10,000 to 8,000 B.P. probably would not have been so great as to preclude the use of marine resources by the site's inhabitants. Recent sea bed cores from the Gulf of St. Lawrence have added some insight into the ancient environments of the region (Josenhans and Lehman 1999; Shaw and Gareau 2001; see also Fig. 4.2).

Keenlyside suggests that the Jones site is representative of "a major focal point of human activity…(and that) given conditions similar to that of today, fishing and/or marine mammal hunting were probably key activities" (Keenlyside 1991: 170). The material remains of the site do not offer much in terms of clues or support for this contention. The only possible candidate for such tools at the Jones site are barbed points that Keenlyside likens to those used by Northwest Coast sea mammal hunters. He contends that in an East Coast context, these tools would have been well suited for hunting marine mammals, such as seal or walrus (Keenlyside 1991: 170). It must be remembered, however, that these points were surface collected and at this time can be only tentatively assigned to the Late Paleoindian occupation of the site. Further, the site was almost certainly not located on the coast during the Early Holocene, further calling into question the assertion that the Jones site may represent an early marine adaptation in the Northeast.

Almost all projectile point finds known from Prince Edward Island are made from a single lithic source: a fine-grained material variously referred to as silicious shale, rhyolite or chert (see Chapter Five) whose primary source is on Ingonish Island, off Cape Breton Island, Nova Scotia (Keenlyside 1991; Bonnichsen et al. 1991). This preference may result from the flaking characteristics of this material, which permits "easy flake removal of large primary flaked during perform preparation and subsequent reduction stages in the knapping process" (Keenlyside 1991: 169).

### *3.4.3 Blanc Sablon (EiBg-7E)/ Pinware Hill (EjBe-10)/ Cowpath (EjBe-7) Sites*

All three of these sites are located in close proximity to one another, are at similar elevations and have very similar assemblages ascribed to the Late Paleoindian and/or

Early Archaic periods, and are thus considered together here. Blanc Sablon is located on Québec's Lower North Shore of the St. Lawrence River, just on the border with Labrador. The Cowpath and Pinware Hill sites are located in the Strait of Belle Isle region in southern Labrador, within 50 km of Blanc Sablon and less than 5 km from each other. All of the assumed earliest projectile points from these sites are small and triangular in outline and are roughly made on quartz and quartzite.

In the area of Blanc Sablon, several sites have yielded such points. These sites tend to be on or near present beaches, and although the sea level was somewhat lower at 9,000 B.P., the sites would have been located in proximity to the sea during the Early Holocene. In fact, it is suggested that if, indeed, the triangular projectile points represent a Late Paleoindian occupation of the area, the sites' residents would have had to rely heavily on marine resources, as the recently deglaciated environment probably would not yet be well populated by terrestrial mammals (Pintal 1998: 40). Currently, the area is rich in marine resources, including seals, whales, birds, molluscs, and fish. However, in the Early Holocene, Pintal (1998: 40) suggests that with the lower sea levels caused by the trapping of water in glaciers, the cold waters of the Labrador Current that now influence the marine life in the Lower North Shore region may not have been present, making water temperatures considerably warmer at the time of Late Paleoindian and Early Archaic occupation of the region. This would certainly affect the marine life present in the Strait of Belle Isle.

Excavations in the Blanc Sablon area have yielded, in addition to the projectile points described above, endscrapers, sidescrapers, *pieces esquillées*, drills, utilized flakes, and numerous debitage flakes as well as cores and preforms. All are fashioned on quartz and quartzite of local origin. At site EiBg-7E, the oldest level of occupation was situated at a depth of about 1.2 m below surface, and had two later occupation levels superimposed upon it. The basal level yielded two loci, interpreted as a habitation area and a specialized activity area or workshop based on the differences in the tool assemblages recovered from each area (Pintal 1998: 44). No projectile points were recovered among the 57 flaked tools recovered from this occupation level. A few calcined bone remains were recovered from a feature identified as a hearth, an uncommon occurrence in Late Paleoindian sites. Among those identified to species, red fox, porcupine, seal, and birds are represented (Pintal 1998: 44).

The next level, separated from the basal level by 40 cm of Aeolian sand, yielded one projectile point of the type described above. Again, two activity areas appear to be represented, one with a single hearth, the other with two. Again, differential activities are suggested, including domestic activities and/or butchering, and secondary stage tool manufacturing (Pintal 1998: 57). Pintal notes that the tools recovered from this occupation level are very similar in form and function to those from the basal level, but are present in different proportions; while the lower level was dominated by endscrapers (n = 24), utilized flakes (n = 12) and *pièces esquillées* (wedges: n = 0), the upper layer demonstrated a much more even distribution of tool types, the most numerous flaked tool being knives (n = 4). The total flaked tool count for this level is eighteen. Local quartz and quartzite are the exclusive raw material used. Cores and preforms are once again present. Several other sites from within a few kilometers of EiBg-7E yielded similar assemblages, in form if not in relative abundance.

In southern Labrador, seven points from the Pinware Hill site and 25 from the Cowpath site were divided into two categories, which were named for the sites (McGhee and Tuck 1975). All points are small and triangular in shape with bifacial flaking and edge retouch and sharp to slightly rounded shoulders (McGhee and Tuck 1975: 24-25). The Pinware Hill form also exhibits "basal thinning by the removal of several flakes from one or both faces, occasionally producing what might almost be termed a 'fluted' point" (McGhee and Tuck 1975: 24). There is no such 'fluting' on the Cowpath form, but some unifacial and rarely bifacial thinning is noted (McGhee and Tuck 1975: 25). All points are made on a whitish vein quartz or brown quartzite. The Pinware Hill form, based on the greater emphasis on basal thinning, is considered the earlier form out of which the Cowpath form developed (McGhee and Tuck 1975: 25). Also included in the assemblage at both sites are scrapers, bifaces, *pièces esquillées*, hammerstones (one at each site), retouched flakes and fragments, and a large number of debitage flakes. Two possible gravers and a possible adze were also identified. One of the radiocarbon dates on the Pinware Hill site fits within the expected antiquity of the site (8,850 ± 100 B.P.), but several others are in the 6,000 to 7,000 B.P. range (Morlan 2001). The Cowpath site returned a date of 8,500 ± 325 B.P., a date considered accurate for the earliest inhabitants of the site (Renouf 1977: 37).

All three of these sites, however, are included here with caution. Radiocarbon dates on the Blanc Sablon site tend to be far too recent to comfortably situate them within the Late Paleoindian period; most date to near 7,000 B.P. The problems with reliable radiocarbon dating on Late Paleoindian sites have already been mentioned. These points are virtually identical to those recovered for the Pinware Hill and Cowpath sites, each of which yielded one radiocarbon date within the expected range, but also several others in the 6,000 to 7,000 B.P. range. This is interpreted as representative of an *in situ* development of point styles spanning a long period of time, and Tuck and McGhee (1975) have developed a chronology from these sites potentially spanning from the Late Paleoindian to the localized Maritime Archaic tradition, representing several thousand years of prehistory in the Strait of Belle Isle region.

McGhee and Tuck (1975: 104) note that several characteristics of the Cowpath and Pinware Hill forms, such as heavy basal grinding and thinning of the projectile points, as well as the overall assemblage represented, share some very general similarities with projectile points from Early Paleoindian sites such as Debert. It is worth noting that in 1975, when this report was published, virtually nothing was known of the Late Paleoindian period in the Northeast. Although morphologically distinct, more recently recovered points, including those from the Magdalen Islands, Prince Edward Island, New Brunswick and Nova Scotia, show at least a general similarity to these points, although they are far from identical. Another similar point was recovered from the (usually inundated and badly eroded) Blackhawk Island site, located in western Maine (Doyle et al. 1985: 5). These similarities, and their implications, will be examined in greater detail in Chapter Six.

***Summary***

As compared to other time periods in the region, the number of sites and the information available from them is quite limited for the Late Paleoindian period in the Northeast. The site descriptions in this chapter provide an overview of most of the sites hitherto identified in the region that may have a Late Paleoindian component. What is lacking in the literature is an understanding of how these sites relate to one another on a broad regional scale, as most attempts to synthesize the available data are done on a sub-regional scale (i.e., Wilson et al. 1995; Dumais 2000) and do not really address the issue of point diversity beyond a general suggestion of regionalization (Wilson et al. 1995).

As mentioned in Chapter One, it is possible to classify these sites into three general categories based on projectile point morphology:

1) a lanceolate, Holcombe-like projectile point group;
2) an elongate, parallel-flaked Plano-like projectile point group; and
3) a triangular, Dalton-like basally-thinned group.

Some sites, such as the Reagan site in northern Vermont, contain points belonging to more than one of these categories. The question of projectile point morphology will be returned to in Chapter Six, as this has implications for understanding regional interrelationships. Raw materials, paleogeographical setting, and site organization will be returned to in Chapter Five, again towards a greater understanding of how these sites relate to one another on a broad regional scale.

# CHAPTER FOUR

## The Paleoenvironment

### *4.1 Introduction*

In early North American prehistory, individual and group behaviours were by necessity largely shaped by the environment and the resources available in a given region. For this reason, it is not possible to understand Late Paleoindian lifeways without having some understanding of the climate, vegetation, marine and terrestrial environments and resources prevalent in the region at the time of their occupation. This chapter provides an overview of the processes shaping the natural landscape inhabited by the Late Paleoindians in the Northeast. The implications of the natural environment on subsistence and mobility are discussed in Chapter Five.

### *4.2 Glaciation and Deglaciation*

The late Pleistocene and early Holocene environments of the study area were largely shaped by the process of deglaciation. The Wisconsin glaciation began about 120,000 years ago with a significant cooling trend, which left much of North America covered in great ice sheets. This big freeze and the resulting isostatic rebound as well as regional tectonic factors contributed to lower sea levels to about 100 m below the present level (Bonnichsen et. al. 1991: 10). The ice remained until about 45,000 years ago, when temperatures began to rise. The result of this warming trend was glacial retreat and a rapid rise in sea level as water previously locked in the great ice sheets was released. At about 25,000 B.P., another cooling trend took hold, reaching its maximum at 18,000 B.P.

At this time, the Laurentide ice sheet extended over a huge area extending from the Atlantic seaboard, across the Great Lakes, and as far west as southern Alberta; current interpretation suggests that the Laurentide ice sheet was comprised of several independent ice sheet centres, termed, from west to east, the Keewatin Sector, the Baffin Sector, and the Labrador Sector (Fulton and Prest 1987). The Laurentide ice sheet was met or nearly met by the Cordilleran ice sheet, spanning from the West Coast to the Rockies. By about 13,000 B.P., the Champlain Sea separated the main body of the Laurentide ice sheet from the ice cover of northern New England and the Maritime Provinces, and as the ice sheets dissipated, the newly exposed land surfaces were opened to pioneering plant, animal, and eventually human populations (Bonnichsen et al. 1985). Although there is some disagreement concerning the actual date of the first human presence in the far Northeast (e.g., Adovasio et al. 1988, 1999; Kelly 1987; Mead 1980), it is generally agreed that the ice was a limiting factor and penetration into the region could not take place until deglaciation was well underway.

The Pleistocene-Holocene transition is generally placed at about 10,000 B.P. By 11,000 B.P., only a few relic ice caps remained over northern Maine and the highlands of central Nova Scotia (Stea and Mott 1998: 18), although recent data suggest that there may still have been ice sheets in the central Gaspé Peninsula at 10,500 B.P (Richard et al. 1997). Dubois and Dionne (1985: 125) suggest that the ice retreated much earlier in eastern Québec and southern Labrador than in central Québec.

Recent results of lake coring, studied in terms of stratigraphy, pollen, chironomids, diatoms, and AMS radiocarbon dating, have disproved earlier models of vegetational change in the region in which a tundra-woodland-forest continuum was thought to have occurred "without major hesitation or reversal" (Davis and Jacobson 1985: 341). In fact, at about 10,800 B.P. a cooling trend known as the Younger Dryas event brought about a short reversal from closed boreal forest to shrub-tundra in the southern Maritimes and northern New England, and in more northerly latitudes (i.e., central and northern New Brunswick and northern Nova Scotia), caused shrub-tundra to be replaced by herb-tundra (Mayle and Cwynar 1995; Miller 1996; Stea and Mott 1998: 18). In the Gaspé Peninsula, this cooling event stalled the afforestation of the area until about 9300 B.P. (Marcoux et Richard 1995: 93). The Younger Dryas event, noted first in the European paleoenvironmental record, is considered to have been "broadly synchronous" across the entire North Atlantic region (Mayle and Cwynar 1995: 820). The extent of the re-advance of ice during this period, which lasted until 10,000 B.P., is not well agreed upon (Stea and Mott 1998: 18), but likely caused at the very least increased ice caps or ice fields in highland areas (Mayle and Cwynar 1995: 820), and an attendant change in both the flora and fauna available in the region.

### *4.3 Sea Level Change in the Atlantic Region*

After 10,000 B.P., the trend was once again towards warmer temperatures. The land, which had been depressed by the weight of the ice, rebounded; a parallel result of these warmer temperatures was that water formerly locked into ice melted rapidly, causing a rapid rise in sea level (Sanger 1988: 84). Sanger suggests that in the Gulf of Maine the evidence for the earliest occupation of the coastal zone could be up to 60 m under water

(1988: 84). This makes it exceedingly difficult to develop an informed model of the lives of the early inhabitants of the East Coast. In the western Gulf of Maine, marine transgression (rising sea levels) over the depressed shores raised the Atlantic Ocean by up to 100 m (Sanger 1988: 84). Crustal rise resulting from the unloading of ice then caused rapid shoreline regression; at about 10,500 B.P. sea level in this region stood at about 50 m below present levels (Oldale 1985: 145), then reached a maximum of 70 m below present levels in some parts of the Gulf of Maine at about 9000 B.P. (Sanger 1988: 84). For southern New Brunswick, data show sea levels dropping in concert with deglaciation, dropping below current sea levels by 10,500 B.P. and reaching about 37 m below present levels by 7000 B.P., when sea levels began to rise (Seaman et al. 1993: vi). Rates of crustal rise reached approximately 19 m per century for the central Maine coast and 5-6 m per century in Massachusetts and New Hampshire (Oldale 1985: 146). After 9000 B.P., isostatic rebound virtually stopped and ice melting and minor crustal depression caused by the return of seawater to the Gulf raised sea levels to their present positions. Subsidence continues at a rate higher than most other parts of the North American coasts (Schnitker 1974: 493).

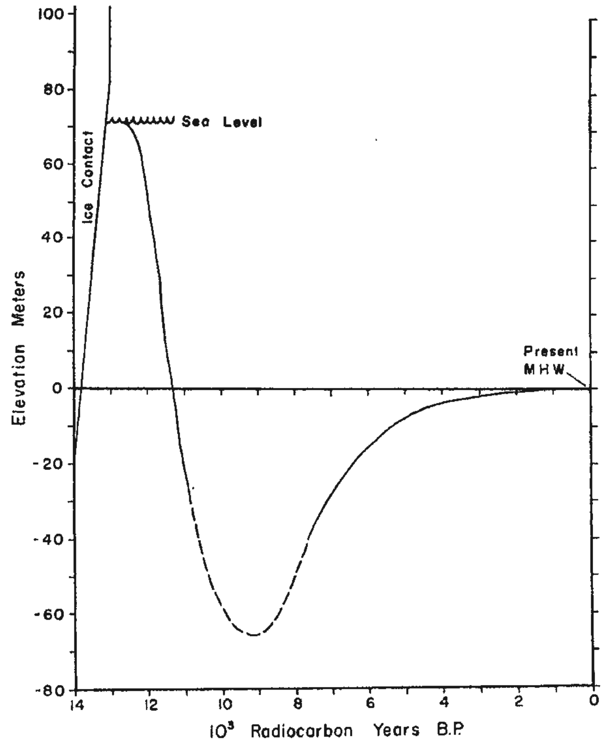



**Figure 4.1: Relative Sea Level Curve for Gulf of Maine.**
**(from Sanger 1988: 85)**

Along the Atlantic coastline of Nova Scotia, the sea level is estimated at 40 m below the present level at 10,000 B.P., with the most rapid rise between 8,000 and 6,000 B.P. (Shaw et al. 1993). After this time, the rate of sea level rise tapered off considerably. The rapid rise in sea level in the several millennia after 10,000 B.P. caused the creation of freshwater, salt-marsh and estuarine sediments which can now be located on the inner coastal shelf. The differences in sea level changes on the Scotian Shelf and the Bay of Fundy can be accounted for in large part by the restricted shape of the Bay of Fundy as compared to the open Atlantic along the southern shore of Nova Scotia (Shaw et al. 1993).

The images in Figure 4.2 depict changing sea levels in the far Northeast from 12,000 B.P. to 6,000 B.P., by which time all traces of Paleoindian occupation are gone from the archaeological record. These models of sea level change were generated based on sediment cores taken from St. Peter's Bay, Prince Edward Island, and the Gulf of St. Lawrence, a project undertaken by the Bedford Institute of Oceanography (Josenhans and Lehman 1999; Forbes et al. 2000). In the period between 10,000 and 8,000 B.P., Prince Edward Island was simply part of the mainland, and the Magdalen Islands were close enough to the mainland at 9,000 B.P. that in the absence of watercraft technology, Late Paleoindian hunter-gatherers in search of resources could have simply walked across the ice. However, a marine resource-based subsistence, at least for some part of the year, must have been the focus of the Magdalen Islands hunter-gatherers, as it is unlikely that terrestrial resources would have lured them to the archipelago. Although the is no direct evidence to support the presence of watercraft in the Northeast at this early date, it seems likely that dugout canoes or skin boat technology may have been developed by the Late Paleoindian period to permit more effective exploitation of marine resources.


**Figure 4.2: Sea level change in the Northeast from 12,000 to 6000 B.P. Images from Shaw and Gareau 2001.**

The situation is somewhat different in parts of the St. Lawrence estuary, however. The Gaspé Peninsula sea levels were much higher than the present level, with the maximum marine limits reaching over 100 m higher than present levels in some areas (Dumais 2000: 84). Isostatic rebound, although rapid, was not as dramatic as in the Gulf of Maine. Uplift caused the sea levels to fall by over 2 m per century from 13,000 to 11,000 B.P. and 1.5 m per century until about 8,000 B.P. for the middle of the Peninsula (Dionne and Coll 1995: 371). Sometime between 7,000 and 5,000 years B.P., the sea levels had dropped to about the present-day levels, then rose an additional 8 m sometime before 4000 B.P., finally receding once again to reach present levels (Dionne and Coll 1995). The Late Paleoindian site of Mitis, for example, is located on a marine terrace located at 65 to 75 m above present-day sea level, and 3 km inland from the shore of the St. Lawrence estuary (Dumais 2000: 82).

### *4.4 Climate*

Much of the paleoenvironmental reconstruction of both marine and terrestrial conditions in the late glacial and post-glacial stages in the Northeast is based on lake and marine cores. These have been collected and analyzed throughout much of the study area. Also used to understand late glacial and post-glacial environments are model predictions based on the collection of data on sea-surface temperature, sea level, sea-ice extent, land albedo and ice-sheet topography for areas of glacial cover undertaken in the CLIMAP project (CLIMAP 1976). Although there are biases and margins of error inherent in both of these methods of predictive modeling, they can be used to recreate roughly Late Pleistocene and Early Holocene climatic conditions.

One of the major factors influencing climate in the Early Holocene is related to the cyclic variations in the earth's position in relation to the sun, which varies in terms of the earth's orbit, the axial tilt of the earth, and the precession of the equinoxes (McWeeney and Kellogg 2001). The first of these variables, the variation in the eccentricity of the earth's orbit, has an effect on the amount of sunlight reaching the atmosphere. The effect of the variation in the earth's tilt varies by latitude; the tilt or obliquity of the earth varies over a period of 41,000 years between about 22 and 25 degrees, and at 9,000 B.P., the earth's tilt was approximately at its maximum (McWeeney and Kellogg 2001: 190). This means that in northern latitudes, seasonal contrasts in climate were increased as compared to present conditions. Finally, at 9,000 B.P. the equinox precession was reversed from present day, such that the earth was closest to the sun during the northern hemisphere summer. McWeeney and Kellogg (2001: 194) suggest that the climate of the Atlantic coast was moist at the beginning of the Holocene (10,000 B.P.) but became drier with ice sheet retreat and increased solar warmth at 9,000 B.P., a date that likely represents maximum seasonal contrasts.

Paleoenvironmental reconstruction models for northern New England developed by Webb et al. (1987) and Kutzbach (1981, 1983), among others, suggest that at 9000 B.P. July radiation was about seven to eight per cent greater than today, resulting in mean temperatures for that month of 1° to 2°C higher than today, except directly along the coast and along the ice-sheet border (Webb et al. 1987: 452). Interior areas would have been warmed by this increase in radiation much more so than coastal zones. January temperatures, however, were near or lower than present values, with radiation decreased from present values for that month.

These models demonstrate that the two factors that most influenced the changing of atmospheric circulation were the retreat of glacial ice and the changing seasonal cycle of solar radiation (Webb et al. 1987: 460). The effects of changing climate impacted on both the terrestrial and marine environments, as outlined below.

Multiproxy or supporting data can be obtained from lake and seabed cores, which can be used to support these models. In New Brunswick, for example, chironomid (midge) assemblages in lake cores suggest that during the Younger Dryas, summer surface water temperatures were approximately 12°C cooler than present values (Levesque et al. 1994). The chironomid data complement the pollen data, which indicate that species adapted to cooler temperatures readvanced into the Northeast in this interval.

In the Gulf of St. Lawrence, de Vernal and others (1993) report on four cores taken from the Cabot Strait, which is located between the Island of Newfoundland and the Maritime Provinces (see Fig. 4.3). Paleoclimatic reconstruction is based on dinoflagellate cyst assemblages, which can be used to estimate regional sea surface temperatures, and pollen and spore assemblages, which assist in reconstructing the vegetation cover on adjacent land surfaces, thus suggesting climatic conditions. The evidence available for the Cabot Strait suggests that prior to 10,000 B.P., surface waters were considerably colder than at present, perhaps in the range of 4-10°C in August, and with seasonal ice cover extending as much as eight months a year (de Vernal et al. 1993: 172). A cooling trend between 11,000 and 10,500 B.P. is recognized, and is associated with the Younger Dryas event. At about 10,000 B.P., de Vernal and others (1993: 177) note a sudden increase in the abundance of Gonyaulacales, indicating a shift towards more modern conditions. They estimate summer surface temperatures of about 16°C, about two months of ice cover per year, and increased salinity (1993: 177). In the terrestrial regions in the southern portion of the Gulf of St. Lawrence (i.e., the Maritimes), this warming trend was soon accompanied by the development of spruce forest, while in the northern part of the Gulf (i.e,. Quebec's Lower North Shore, southern Labrador), it appears that the vegetational response to climate change was delayed, possibly as a result of cool, dry conditions created by catabatic winds (de Vernal et al. 1993: 178). The afforestation of the region is discussed in greater detail below.

### *4.5 The Terrestrial Environment*

The terrestrial environment was in a state of flux at the Pleistocene/Holocene boundary, and these changes were both rapid and time transgressive. Tundra prevailed over the northeast beginning around 14,000 B.P., following glacial recession. The resident plant species included sedges (family Cyperaceae), willows (*Salix* sp.), grasses (family Gramineae), sage (*Artemisia* sp.) and other composites, alders (*Alnus* sp.) and birch (*Betula* sp.), as well as possibly some poplars (*Populus* sp.) as early as 14,000 in the more southerly areas of the Northeast (i.e., Massachusetts, southern New Hampshire and Vermont); it was overall a less shrubby tundra than that in northeastern Canada today (Davis and Jacobson 1985: 353). By 12,000 B.P., only the western two-thirds of Maine was a tundra zone and by 11,000 B.P. tundra was restricted to only the northernmost areas of Maine and adjacent areas of eastern Canada. As the tundra retreated, poplar and mixed wood forests appeared, first in New England and southern Maine, then spreading along the coastal region before spreading west and north between 12,000 and 11,000 B.P. (Bonnichsen et. al. 1991: 11).

Davis and Jacobson (1985: 348-349) have grouped tree taxa into four categories based on their arrival during the forestation process: advanced invaders (poplars) arrive first, followed by primary invaders (spruce (*Picea* sp.), paper birch (*Betula papyrifera*), and jack/red pine (*Pinus banksiana/Pinus resinosa*)), secondary invaders (ash (*Fraxinus* sp.), balsam fir (*Abies balsamea*), larch (*Larix laricina*) and elm (*Ulmus* sp.)) and finally tertiary invaders (oak (*Quercus* sp.), maple (*Acer* sp.), white pine (*Pinus strobus*) and hemlock (*Tsuga Canadensis)*). Beech (*Fagus grandifolia*), hickory (*Carya* sp.) and chestnut (*Castanea dentata*) were the last to arrive, sometime after 9000 B.P. (Davis and Jacobson 1985: 349). By the early Holocene and the arrival of Late Paleoindians, forest was prevalent in all but the northernmost areas (Bonnichsen et. al. 1991: 11).

Very limited floral subsistence remains have been recovered from Paleoindian contexts. The Michaud site, dating to the later part of the Early Paleoindian period (about 10,200 B.P.), yielded a charred berry seed of indeterminant species from one feature, which might be blueberry, crowberry, bilberry or cranberry, e.g., Family Ericaceae (Spiess and Wilson 1987: 83). At the Hedden site, flotation of soil samples yielded spruce and fir needles, fleshy fruit seeds including *Rubus* (blackberry etc.), *Vitis* (grape), and *Aralia* (wild sarsparilla) (Spiess et al. 1998: 223-224; Asch Sidell 1999: 197). The Hedden site is radiocarbon dated to approximately 10,500 B.P. (Spiess et al. 1998: 237). Finally, the Early Archaic Little Ossipee North site in southwestern Maine, radiocarbon dated to 9,350 ± 90 B.P. and 7,980 ± 100 B.P., provides the earliest evidence for beech in Maine but did not yield any fruit or nut remains (Asch Sidell 1999: 202).

There is not a great deal of data from which one might reconstruct the available fauna from this period. Bonnichsen and others (1991: 11-12) and Snow (1980: 117-122) list the specimens which have been recovered from a late glacial-early post-glacial context. The list includes evidence for horse (*Equis* sp.), bear (*Ursus* sp.), beaver (*Castor canadensis)*, bison (*Bison* sp.), elk (*Cervus elaphus*), muskox (*Ovibos* sp.), mammoth (*Mammuthus* sp.) and mastodon (*Mammut americanum*). There is also possible evidence for caribou (*Rangifer tarandus*) in the form of calcined bone, in Maine (Spiess et al. 1984/5) and in southern New Hampshire at the Whipple site (Curran 1984). Evidence for mastadon was recovered in 1936 in Hillsborough, New Brunswick. The age of the specimen is not certain, as radiocarbon dates have suggested ages ranging from 13,600 ± 200 B.P. to 51,500 ± 1270 B.P. (Seaman et al. 1993: 64). In Maine, mammoth remains were recovered in the town of Scarborough in 1959. These and additional remains recovered from the backdirt of the original excavations were radiocarbon dated in the 1990s to 12,200 ± 55 B.P. (molar root) and 12,160 ± 50 B.P. (tusk) (Bourque 2001). Megafaunal species such as mammoth and mastadon were extinct by Late Paleoindian times, however; the estimated date for their demise is 10, 800 B.P. (Mead and Meltzer 1984). The most recent radiocarbon date on mastadon bone in the Northeast is from an artifact recovered from the Hiscock site in New York state, dated to 10,990 ± 100 B.P. (Laub et al. 1996).

Some faunal remains are available from Early Archaic sites in the region, although such deposits are neither common nor large. At several early Archaic sites in Rumford, Maine, identified as part of the Rumford Archaeological Project, sites at least 9,000 years old produce evidence for nut-bearing trees, large mammals, and, curiously, and abundance of turtle (*Chelydra* sp.) (Bourque 2001: 39). At the Wadleigh Falls site, an Early and Middle Archaic period site in southeastern New Hampshire (Maymon and

Bolian 1992), identified faunal material included evidence for birds, white-tailed deer (*Odocoileus virgineanus*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), black bear (*Ursus americanus*), unidentified large mammal and, once again, turtle (Spiess 1992a: 183). At the Sharrow site in Milo, Maine (Petersen et al. 1986), identified faunal remains from the Early Archaic period ascribed deposits include muskrat, unidentified fish, and turtle (Spiess 1992a: 185). Certainly, based on differences in technology, Archaic peoples in the far Northeast may have practiced a different subsistence strategy than their Late Paleoindian predecessors, but these sites do provide some additional insight into the species available for consumption and non-food products at an early date. The significance of the abundance of turtle in Early Archaic faunal deposits is unknown.

Indirect evidence, based on environmental reconstructions and inference of probable resident species, suggests the presence of such tundra-associated species as lemmings (*Dicrostonyx torquatus* and *D. hudsonius*), hares (*Lepus* sp.), wolf (*Canis lupus*), ermine (*Mustela erminea*), masked shrew (*Sorex cinereus*), red-backed vole (*Clethrionomys* sp.), marten (*Martes americana*), otter (*Lontra canadensis*), wolverine (*Gulo gulo*) and red fox (*Vulpes vulpes*). These species may also have inhabited the adjacent woodlands, which dominated the landscape by Late Paleoindian times (Dumais 2000: 85; Bonnichsen et al. 1991: 11-12).

### *4.6 The Marine Environment*

As with terrestrial fauna, there is limited physical evidence available to determine which marine species were present in the waters of the Northeast during the early Holocene. In New Brunswick, there is some evidence for marine mammals from Pleistocene and Holocene deposits. In fact, no less than seven species of marine mammals have been reported from Quaternary deposits, but only two, walrus (*Odobenus rosmarus*) and narwhal (*Monodon monoceras*), have been positively identified (Seaman et al. 1993: 23). Three specimens of walrus and one of whale (probably minke, *Balaenoptera acuturostrata*) have been radiocarbon dated to between 12,600 and 9,300 B.P. (Seaman et al. 1993: 23).

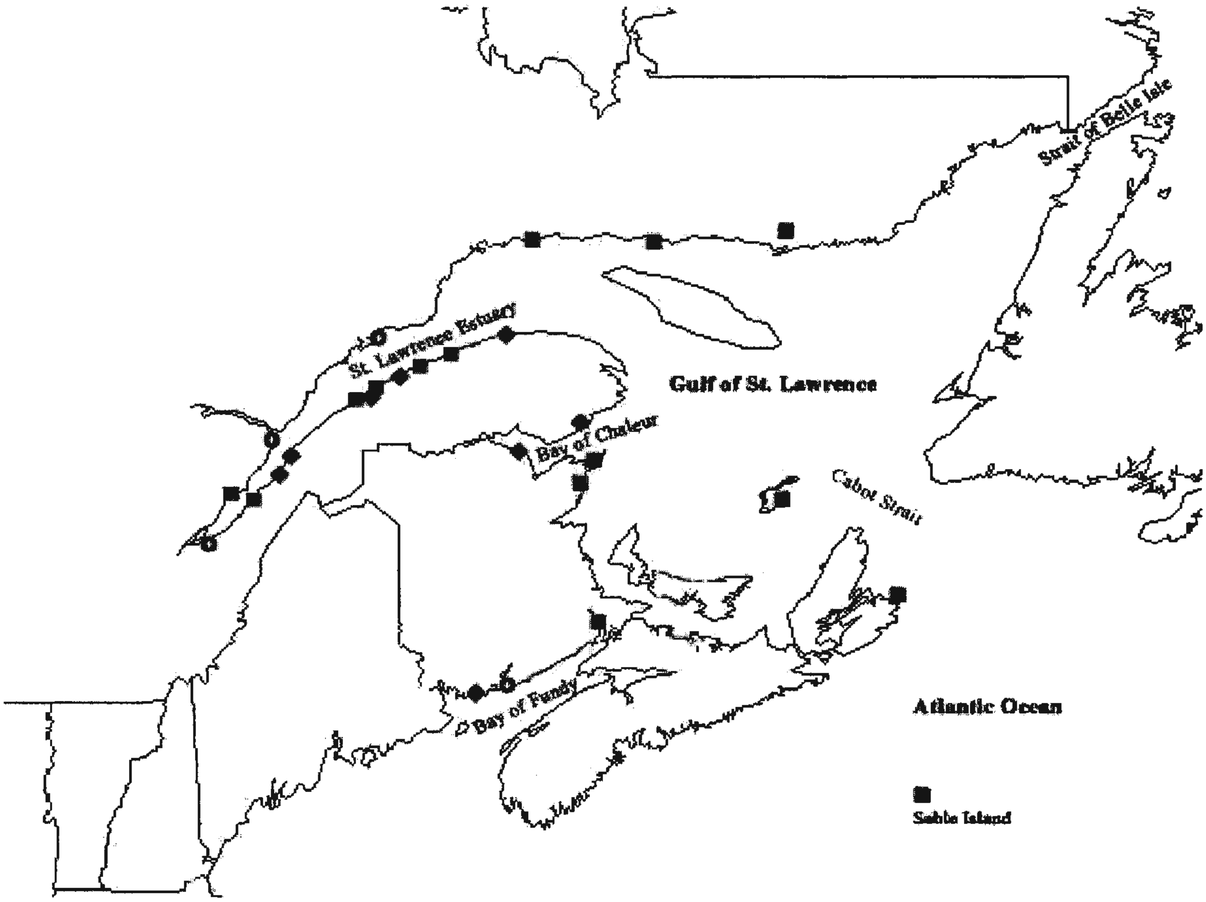
Also available are a few late glacial deposits in clays in the Saint John region, which contained evidence for marine invertebrates such as brittlestars (*Ophiura sarsi*), sea urchins (*Strongylocentrotus droebachiensis*), and barnacles (*Balanus balanoides*). Most of the marine mollusc species identified in these deposits are boreal species; absent are warmer water species such as oysters (*Crassostrea* sp.) and scallops (*Placopecten* sp.) (Seaman et al. 1993: 55), which are not well-documented in the region until the Late Archaic period (e.g., Sanger and Sanger 1986). Analysis of mollusc deposits suggests that by the early Holocene, warmer conditions were present and these warmer water species may have arrived by the time of Late Paleoindian habitation of the region. Various ichthyological and avian species were also surely present, although evidence for this is not preserved in Paleoindian-aged deposits. Dincauze and Jacobson (2001) have even suggested that during the Early Paleoindian period, hunter-gatherers may have been lured eastward into New England and the Maritime Provinces in large part due to the rich array of avian species that would have been available. Their model is highly speculative, but the Early Holocene environment would surely also have been a suitable environment for many waterfowl and nesting birds and these would have presented yet another subsistence opportunity for Late Paleoindian hunter-gatherers in the Northeast.

Further useful information about Late Pleistocene/Early Holocene marine mammal life in the study area is available from Champlain Sea deposits. The Champlain Sea existed between about 12,400 and 9,300 years ago, and covered the area from Québec City to Lake Ontario. Some sea mammal specimens have also been recovered from marine deposits in the eastern approaches to the Champlain Sea, from the Gulf of St. Lawrence, the St. Lawrence Estuary, the Atlantic coast and the Bay of Fundy (Harington and Occhietti 1988).

The formerly isostatically depressed areas east of Quebec City were occupied in the late glacial period by the Goldthwait Sea (LaSalle and Chapdelaine 1990). The broad area described provided a home for a number of species of whales. The vast majority (80%) of the specimens recovered from marine deposits dating to the Late Pleistocene and Early Holocene epochs represent white (beluga) whales (*Delphinapterus leucas*). Also represented are humpback (*Megaptera novaeangliae*), bowhead (*Balaena mysticetus*), and finback whales (*Balaenoptera physalus*), found throughout the former Champlain Sea as well as from the St. Lawrence estuary near the known Late Paleoindian sites, from the Bay of Chaleur and from the Bay of Fundy.

Harbour porpoise (*Phocoena phocoena*), narwhal (*Monodon monoceras*), and harp, bearded, ringed and harbour seal specimens (*Phoca groenlandica, Erignathus barbatus, Phoca hispida,* and *Phoca vitulina* respectively) have also been recovered from throughout the study area (Harington and Occhietti 1988: 45). Walrus specimens were recovered from areas in the eastern approach to the Champlain Sea, including the Gulf of St. Lawrence, the Bay of Chaleur, the Atlantic Ocean near Cape Breton and Sable Island, and the Bay of Fundy. Several walrus specimens were recovered from deposits near the Rimouski site and other Gaspé Peninsula Late Paleoindian sites, as were a number of whale specimens (Harington and Occhietti 1988: 52). A walrus specimen was also recovered from just off the Magdalen Islands. A wide variety of fish species was also represented in deposits throughout the study area (Harington and Occhietti 1988: 48). Figure 4.3 depicts the location of sea mammal deposits in the far Northeast.

## Sea Mammal Deposits in the Approaches to the Champlain Sea




Base Map Courtesy of Arc View 3.2
Memorial University Map Library

**Legend:**

■ **Walrus** ◆ **Whale** ⊙ **Seal**

**Figure 4.3: Deposits of Walrus, Whale and Seal in Marine Deposits in the Northeast. Adapted from Harington and Occhietti 1988**

The most abundant specimens in the Champlain sea deposits are those adapted to cool inshore conditions (i.e., beluga whale) and to pack ice conditions (harp and bearded seal) or land-fast ice (ringed seal). To the east, in the Gulf of St. Lawrence and in close proximity to many of the Late Paleoindian sites referred to in this paper, as well as in the Atlantic waters off Nova Scotia, were found additional species adapted to deep arctic waters, such as narwhal and walrus. Many of the available radiocarbon dates are near 10,000 B.P. (Harington and Occhietti 1998). It is thus probable that many if not all of these species would have been available to Late Paleoindian hunters in the region.

The Champlain Sea deposits also reveal considerable data on the fish species of the Pleistocene – Holocene transition. Fossilized fish in carbonate nodules obtained from Green Creek, near Ottawa, have been dated to 9,960 ± 820 B.P. (Gadd 1980; Harington and Occhietti 1988: 48). The species represented include capelin (*Mallotus villosus*), three-spined stickleback (*Gasterosteus aculeatus*), grey trout (*Salvelinus namaycush*), smelt (*Osmerus mordax*), lake herring (*Coregonus artedii*), longnose sucker (*Catostomus catostomus*), Atlantic cod (*Gadus morhua*), tomcod (*Microgadus tomcod*), sculpin (*Myoxocephalus thompsoni*), and lumpfish (*Cyclopterus lumpus*). Capelin, which prefer highly saline waters, are the species most frequently identified (Harington and Occhietti 1988: 48). The evidence for these deposits, of course, only represents the presence of these species at the time of Late Paleoindian occupation in the far Northeast, but as no remains have been recovered from an archaeological context, it cannot be asserted with certainty which of these species, if any, were exploited by the Late Paleindian inhabitants of the littoral in the region.

### *4.7 Human Occupations at the Pleistocene-Holocene Boundary*

Both the ice position and the marine limits were important factors affecting the timing of plant, animal and human colonization of the Northeast (Bonnichsen et al. 1991: 9; Richard et al. 1997: 163). It has been noted that the late Pleistocene sequence in the extreme northeast is more complicated than that elsewhere on the continent, owing to factors of climate and relief (MacDonald 1968: 12). Based on the evidence from the Early Paleoindian site at Debert, Nova Scotia, MacDonald has suggested two main avenues through which early peoples may have reached the Maine-Maritimes region: they may have traveled over the then-exposed Grand Banks of Newfoundland (from the north) or, alternatively, along the New England coastal fringe (from the south) (MacDonald 1968: 121). Questions of migration patterns and their implications are examined in greater detail in Chapter Six.

Bourque (2001) has outlined three options available to Early Paleoindians as environmental changes led to extinction of large mammals and the arrival of new species such as bear, deer, moose, and smaller animals. The first option was to follow caribou herds into northern Canada; the second was to retreat to a former homeland, possible because of continued communication and connection between populations over time; and the third option was to remain in the region and adapt to the changing landscape, which would mean developing new hunting techniques and taking advantage of such newly available resources as fish and shellfish.

Although the Late Paleoindian archaeological record in the region is sparse and incomplete, it challenges the first two options, which suggest that the study area was virtually unoccupied for the periods known as Late Paleoindian and Early Archaic. An issue of much debate in the Late Paleoindian record is the degree to which marine resources were exploited. Keenlyside (1991: 171) contends that the Atlantic coast provided the major avenue of entry, followed by a gradual spread up the major river systems to take advantage of the interior lakes. He sees the postglacial environment of the Maritimes as virtually ideal for the "evolution of a primarily land-based people to one with a greater reliance on coastal and marine resources" (1991: 172). This adaptation by necessity brought about technological changes to facilitate exploitation of this new environment. Some researchers (e.g., Loring 1980) have even suggested early fluted point-using Paleoindian groups exploited marine resources regularly, especially around the Champlain Sea, although most researchers support a terrestrial game-hunting or a generalized Early Paleoindian subsistence pattern that may have included fishing and plant gathering.

By 7,500 B.P., there is evidence from the southern Labrador coast of an extensive and elaborate sea mammal hunting technology (Tuck and McGhee 1975: 80), which to Keenlyside suggests a considerably earlier developmental stage (1991: 172). This developmental period may have also been particularly significant around the more resource-rich bays of the Maritime Provinces and New England, as the inhabitants learned of the bounty of the sea's resources and found methods by which to harvest these new sources of food and other valuable materials. This may have involved the development of both improved watercraft technology and methods and tools for hunting sea mammals. Indeed, watercraft technology and marine resource use are implicated in the recovery of Late Paleoindian projectile points in the Magdalen Islands which, as Fig. 4.3 shows, was separated from the mainland even at the lowest sea level stand.

Dumais (2000: 86) suggests that Late Paleoindians probably did not have a very sophisticated marine mammal hunting technology, but may have made use of fortuitous circumstances in which whales became stranded. They may also have taken advantage of sea mammal behaviours that did not require advanced tool and watercraft technology, such as taking seals or walrus on ice or land, or capturing belugas when they congregate in shallow estuaries during the summer (Dumais 2000: 86).

### *4.8 Food Value in Terrestrial and Marine Resources*

Marine resources are often unfavourably compared with terrestrial resources as a basis for the prehistoric diet. Most researchers, including Oldale (1985) and Sanger (1988), posit a significantly reduced level of marine productivity until about 6,000 B.P. in the Gulf of Maine. The Gulf of Saint Lawrence, however, may have been more productive at an earlier date, based on the findings of Harington and Occhietti (1988) in deposits from the former Champlain Sea.

Yesner (1980) has noted the high food value available in a number of marine species, particularly sea mammals. These animals have a high fat content (important in cold environments such as that of the Early Holocene winter months), are a good source of calories, and supply a number of important vitamins when the meat is eaten raw (Yesner 1980: 733). Fish and shellfish are excellent sources of calcium, iodine, electrolytes and other minerals, although these foods must be supplemented with other resources because of their low calorie content (Yesner 1980: 733). The "cost" of marine exploitation based on the amount of energy needed to obtain these resources has been variously estimated; some consider it more productive than strategies aimed at terrestrial resources, while others consider it less productive. However, Yesner supports the contention (Oldale 1985) that the biological productivity of the northeast coast was too poor to support extensive marine resource exploitation until well into the Holocene, when sea levels stabilized (1980: 734).

The location of sites along the former coasts of the Champlain Sea in the present Gaspé Peninsula, and the recovery of Late Paleoindian projectile points from the Magdalen Islands, suggest that marine resources, though likely not the exclusive dietary source of Late Paleoindians, probably were exploited for at least part of the year, supplementing terrestrial resources in the Late Paleoindian diet. Although the evidence precludes an assertion that Paleoindians were an exclusively marine-focused people, it should not be ruled out that such activities might have been part of a seasonal round more diverse than has been supposed, at least by Late Paleoindian times. Kellogg (1991: 214) notes that the mixed-energy zone of the coast contains the greatest diversity of potential marine and coastal resources, as well as access to terrestrial resources. He asserts that the possibility of Paleoindian use of coastal resources should not be discounted based on negative evidence, since it is known that they ranged over the coastal zone (Kellogg 1991: 218).

In the absence of faunal remains directly associated with evidence for human occupation in the Late Paleoindian period, it is unfortunately necessary to rely heavily on speculation when considering the subsistence patterns of the Early Holocene residents of the Northeast. As this chapter has demonstrated, there is evidence that a variety of both terrestrial and marine resources would have been available to Late Paleoindians in the region, and any combination of these may have been included in their diet. It is suggested that Late Paleoindians, who must have had a reasonably good understanding of their environment after living in the Northeast for several millennia of ameliorating climatic conditions, probably practiced a generalized subsistence strategy that took advantage of a variety of plant and animal species. In light of the (present) absence of large sites suggesting repeated re-use of choice locations, it is likely that they did not practice a regular, annually repeated seasonal round, but rather moved frequently from place to place as their subsistence needs dictated. Also a necessary factor in settlement decisions must have been access to lithic raw material sources. The question of Late Paleoindian mobility based on all of these basic needs is explored in detail in Chapter Five.

# CHAPTER FIVE

## Lithic Raw Material Use and Implications for Late Paleoindian Mobility

### *5.1 Introduction*

The raw materials used in stone tool production can often offer valuable insights into Paleoindian behaviours, particularly in terms of mobility and relationships between groups. Indeed, it is often the only material available for archaeologists to study in very early hunter-gatherer sites, as wood and bone do not preserve well in the acidic soils of northeastern North America. In recent decades, many more researchers have turned to raw materials as a source of valuable information about how eastern Paleoindians lived, moved, and interacted, resulting in an entire volume published on the topic in 1989 (Ellis and Lothrop, 1989)

It is not always clear what mechanisms are at work to cause the movement of raw material over large distances, as is characteristic in nearly all Early Paleoindian and some Late Paleoindian assemblages; this may be a result of whole group mobility, of logistically-oriented task groups who leave the larger group to secure specific resources (Binford 1980), or trade or exchange between groups. However, based on the extremely limited sources of information available to researchers studying Late Paleoindian behaviours and activities, lithic raw materials are a valuable resource that can be used to make inferences about how and why particular groups chose the materials they did, and the behaviours implied in their use.

Most of the models that have been explored to relate raw materials in assemblages with settlement patterns and exchange behaviours relate to Early Paleoindian sites (e.g., Curran and Grimes 1989; Ellis 1989; Kelly and Todd 1988; Spiess and Wilson 1989). Other models are implied to be relevant for the entire Paleoindian period, and may be useful for helping to understand Late Paleoindian mobility and exchange, but are geared more specifically towards the characteristics of Early Paleoindians (e.g., Goodyear 1989; Meltzer 1989; Deller 1989). Most of these models, however, are of at least some relevance to the present discussion of Late Paleoindian behaviours. Other models, such as Binford's (1980) description of "mapping on" and "logistical" subsistence-settlement patterns are meant to provide a "Middle Range Theory" that can be applied to all archaeological assemblages. While such theories are certainly not without their detractors, mobility models can provide a useful means of looking at the available archaeological data and trying to make some inferences about how those data reflect group organization and activities.

### *5.2 Raw Materials Used by Northeast Late Paleoindians*

A large number of the raw materials that reappear frequently in the Late Paleoindian assemblages of the Northeast have been identified to a source area, although a resource with full descriptive details of most of these source materials is lacking (Curran 1999: 17). In most cases, a simple visual match with a major source area is possible; in only a few cases have thin sectioning and other microscopic sourcing techniques been used (i.e., Pollack et al. 1999). The cryptocrystalline lithic sources used by Paleoindians tend to be distinctive enough in colour, lustre and/or texture to be differentiated to a general bedrock source with the use of a hand lens (Spiess et al. 1998: 239). It is usually possible to determine from the shape and texture of the cortical surface whether cobble or outcrop sources were used. Glacial cobble cortex is rarely identified in Late Paleoindian assemblages, suggesting that bedrock sources were favoured as locations of extensive raw material procurement (Meltzer 1989: 18). The Plenge and Reagan sites do, however, yield some evidence of use of cobbles alongside materials from bedrock sources.

The best-quality lithic raw materials available in the study area are cryptocrystalline cherts, which, when relatively free of impurities, fracture conchoidally and allow the creation of a sharp edge with relative ease (Goodyear 1989: 7). The Munsungun Lake Formation cherts are perhaps the most widely used in the study area throughout the Paleoindian period. These Ordivician deposits range in colour from greyish red to greenish grey to greyish black, often with mottling/banding and exhibiting a variety of grain sizes (Curran and Grimes 1989: 48). Cherts are also found in the Champlain Valley of Vermont, including the Hathaway formation near St. Albans and Mt. Independence cherts from further south. These cherts tend to be black, brown or waxy lustre blue-grey in colour (Spiess et al. 1998: 239). Black cherts have been sourced to the Hudson Valley area of New York, and Onondaga chert from New York is also sometimes identified in far Northeastern Late Paleoindian assemblages. Further north, the Des Landes chert fomation of the north Gaspé coast yields dark grey mottled chert or siliceous siltstone, which outcrops at Sainte-Anne-des-Monts, Cap-au-Renard, l'Anse-au-

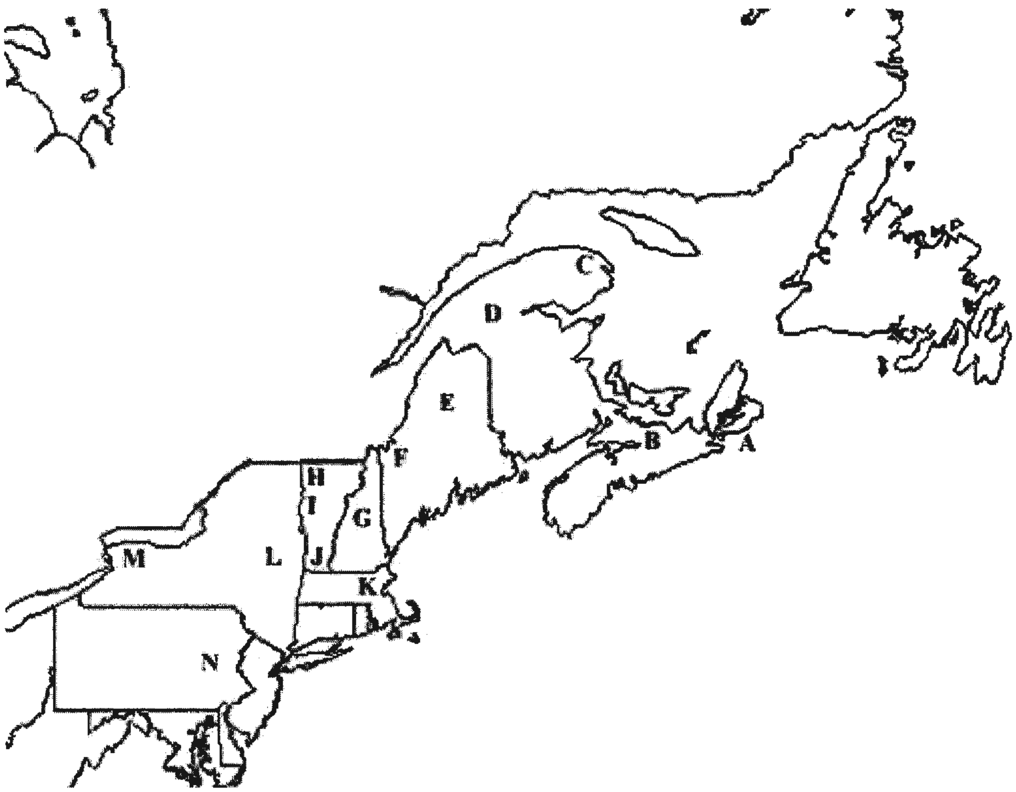
Griffon, and La Martre, among others (Chalifoux 1999; Dumais 2000). It is usually not possible to distinguish materials from a particular outcrop.

Jasper is considered a non-technical designation for fine-grained or cryptocrystalline siliceous materials in red or yellow hues (Curran and Grimes 1989: 48). Pennsylvania jasper has been identified in Late Paleoindian sites. Gravel jasper sources may also be available from northern Maine, and at a bedrock source in Surrey, New Hampshire (Curran and Grimes 1989: 48).

Quartz (both vein quartz and crystal quartz) is generally available throughout the study region, but is much less desirable as a raw material due to its poorer flaking qualities; it is brittle and breaks and powders easily (Curran and Grimes 1989: 50). A variety of quartzites was also readily available for Late Paleoindian toolmakers, although some sources, such as the Cheshire Formation quartzites of southern Vermont, were favoured. Cheshire quartzite is sugary in texture, and is generally a semi-translucent light grey colour (Spiess et al. 1998: 239). Knapping on quartzite tends to produce short, broad flakes with duller edges than those provided by cryptocrystalline materials. Because they tend to be more locally available, however, they may have represented a trade-off in terms of energy expenditure necessary to acquire the higher-quality materials from further afield. Quartz and quartzites are used much more frequently in the Archaic period.

A number of felsic volcanics, especially rhyolites, are also found throughout the study region, although they are not ubiquitously distributed. Those sources of good quality identified in the Northeast include the distinctive blue-grey to greenish Kineo

**Raw Material Distribution**




**A) Ingonish Rhyolite; B) Nova Scotia Chalcedony; C) Des Landes Formation Cherts; D) Cabano Formation Cherts; E) Munsungun Chert; F) Ledge Ridge Formation Chert; G) Mt. Jasper Rhyolite; H) Champlain Valley Chert, Hathaway Formation; I) Champlain Valley Chert, Mt. Independence Formation; J) Cheshire Quartzite; K) Lynn-Mattapan Volcanic Series (includes Saugus "Jasper" or Rhyolite; L) Normanskill and Coxsackie Hudson Valley Cherts; M) Onondaga Chert; N) Pennsylvania Jasper**

**Figure 5.1: Approximate Locations of Primary Known Lithic Raw Material Sources in the Northeast.**

felsite of north-central Maine; the glassy, flowbanded Mt. Jasper rhyolite from the Berlin area of New Hampshire; Saugus "jasper" or rhyolite, a pink to maroon felsite from Massachusetts; and Ingonish rhyolite or siliceous shale, often blue-grey in colour, originating from quarry sources in eastern Cape Breton, Nova Scotia (Curran and Grimes 1989; Bonnichsen et al. 1991; Spiess and Wilson 1998). A number of other raw materials have not yet been identified to a source location.

The question of direct procurement vs. indirect procurement (exchange, trade, or gift-giving) has been examined for the Northeast Paleoindian case (Goodyear 1979, 1989; Meltzer 1989). I support the contention of both Goodyear (1989) and Meltzer (1989) that the vast majority of exotic raw materials used in Paleoindian sites are the result of direct procurement, whether the result of task groups or large group movement. Despite some arguments to the contrary (e.g., Petersen 1995: 212-213), this researcher does not believe that the ethnographic data supports an hypothesis that posits large-scale trade of finished goods amongst a population with such low density as the Late Paleoindian case represents. Although mechanisms such as gift-giving may have been practiced between groups, this is unlikely to provide the quantities of exotic lithic materials as is seen in sites such as Varney Farm, where nearly all of the raw materials used came from the Munsungun Lakes area of Maine, a source 250 km distant from the site. How lithic procurement fits into the mobility pattern of Late Paleoindians in the Northeast has been debated, and this discussion is taken up below.

## *5.3 Hunter-Gatherer Mobility Models*

### *5.3.1 "Forager" Systems – "Mapping On" to Resources*

Foragers tend to move seasonally among resource "patches," and gather food daily rather than storing food (Binford 1980: 5). The San of the Kalahari Desert are an example of foragers. Gathering is done on an "encounter" basis; foragers go out daily to look for food without a specific mission and return to the residential base the same day. Under this strategy, mobility has been termed "circulating;" that is, characterized by frequent residential moves from one seasonal camp to another in a pattern of circular annual movement (Lieberman 1993: 600). Foraging rarely takes place further than a comfortable day's walk away from the residential camp.

There may be considerable variation amongst foragers in group size and the number of moves to new residences every year, and in the total area covered in a given year. In large, homogenous patches, moves may be frequent but of short distance; when resources are scarce and dispersed, it may be more profitable to divide up into small groups scattered over a large area (Smith 1983: 634; Horn 1968; Winterhalder 1981).

For very mobile foragers, which likely includes Late Paleoindians, we expect low visibility in the archaeological record due to the minimal accumulation of debris that is expected from a small group over a very short period of time. The degree of visibility may also be affected by whether or not the same sites are used over a number of years. Specialized work parties may venture out in search of game or other resources and erect temporary camps away from the primary residential base, and specialized activities that are rarely carried out at the residential base camp, such as butchering or primary lithic reduction, may be undertaken.

The archaeological remains of such a strategy are likely to appear in two main forms. The first represents the residential base camp, the hub of subsistence activities and the area where most processing, manufacturing and maintenance activities take place. Variation in group size and mobility will be reflected in the archaeological assemblage left behind. The greater the repeated use of the same location, the more visible the site is likely to be. The second type of assemblage likely to result from a foraging settlement-subsistence strategy is a procurement *location*. This represents a site where extractive tasks take place – these tend to be "low bulk" procurement sites (Binford 1980: 9). This means that the sites are representative of procurement of small amounts of resources over a short period of time. Exhaustion and abandonment of tools is relatively rare, so very few tools may be preserved in such an assemblage, making these areas difficult to recognize as distinct "sites." It may be very difficult to accurately identify and interpret such dispersed activities.

To summarize, then, foragers tend to be highly residentially mobile, have low-bulk inputs, and procure food on a daily basis. The contents of a site will be reflective of the different seasonal activities, if these exist, and the different lengths of occupation. "Functionally specific" sites will be few and difficult to identify. It can be said that foragers "map on" to resources by generally moving the group to facilitate resource exploitation.

### *5.3.2 A "Collector" Strategy: Logistical Organization*

Collectors, on the other hand, practice quite a different strategy. Logistically organized collectors exploit specific resources by depending on specially organized task groups. These task groups and the storage of food for at least part of the year are the basic characteristics of collectors. The Nunamiut Inuit are an example of such a strategy.

As Binford puts it, "logistical strategies are labour accommodations to incongruent distributions of critical resources or conditions which otherwise restrict mobility" (1980: 10). In such a situation, when collectors are close to one important resource, they are far away from another. In order that all the necessary resources can be obtained, special task groups venture out to selected localities, often quite distant from the base camp, to obtain these necessary resources. These groups tend to be small and consist of experienced and knowledgeable individuals. They are not on an "encounter" mission, but rather seek a specific resource in a specific location. This has been referred to as a "radiating" mobility strategy, in which longer-term base camps are connected to seasonal camps located near important resources (Lieberman 1993: 600).

Again, the strategy is expected to produce an identifiable archaeological assemblage. Binford (1980: 10) suggests that collectors leave behind several other site types in addition to those identified for foragers: these include the field camp, the station, and the cache. A field camp is a temporary operational centre. It is where the task group eats, sleeps, and carries out necessary activities while away from the residential base. Stations are sites where task groups may engage in information gathering, such as the observation of game movement. They may represent ambush locations or hunting stands. Caches are common to collectors, as the bulk of resources procured at one time are often too great to process and return to the residential base at once. Special facilities may be constructed to store extra food resources, or they may be stored in lakes.

It is noted that the collector-forager distinction is not a dichotomy, or an evolutionary "yardstick," but rather a continuum from more simple to more complex subsistence-settlement strategy. As Chatters (1987) has suggested, hunter-gatherer adaptation is multidimensional and varies along multiple independent axes. Systems that employ both a "mapping on" and a "logistic" strategy are the most complex and the most common in observed and inferred ethnoarchaeological data. Binford concludes that, "other things being equal, we can expect greater ranges of intersite variability as a function of increases in the logistical components of the subsistence-settlement system" (1980: 12). That is to say, the more logistical activities a group engages in, the greater the variability in the types of assemblages that will be produced.

### *5.4 What Determines Mobility?*

What reasons may stand behind a group's decision to move towards one end or the other of the forager-collector continuum? Under what conditions is a group likely to "map on," and what conditions are conducive to a logistic strategy? Binford's theory is based on environmental determinism, such that factors like growing season and predictability and distribution of resources determine in large part the toolkits and subsistence activities of a group.

The way hunter-gatherers move is often considered to be closely related to the resource structure and availability in a given environment (Kelly 1983). A mapping on strategy is only useful if all of the critical resources a group needs are located within foraging range of the residential base (Binford 1980). If resources are spatially incongruous or very dispersed, a residential move will not alleviate the problem, as proximity of one resource comes at the expense of another resource. Under these conditions, the logistically organized task groups may be the only way to ensure that all necessary resources can be accessed. Drying or freezing and food storage (caching) are techniques employed to counteract temporal incongruity – that is, to expand the time utility for a resource beyond its natural availability. The more storage is used by a group, the more logistically organized they are going to have to be, as cache locations are likely to be highly dispersed.

Binford (1980: 15) suggests that the more unstable the environment, the greater will be the number of critical resources as each resource will be less dependable. The more critical resources a group depends on, the greater is the likelihood of wide dispersal over the landscape. Thus, the greater seasonal variability in temperature, the greater will be the role of logistical mobility or "positioning" strategies. As was discussed in the previous chapter, Paleoindians in the Northeast lived in a very unstable environment, and this point comes to bear on most models of Paleoindian mobility (cf. Kelly and Todd 1988; Spiess and Wilson 1989).

An equatorial environment in which there are essentially continuously available food sources within a day's walk of the residential base will tend to lead to a foraging subsistence strategy. Conversely, in temperate and arctic settings, the length of the growing season is reduced, resulting in periods of greater scarcity. Steps must be taken to ensure adequate food resources in times of resource stress. In general, the degree of storage is expected to vary with the length of the growing season (shorter the season, greater the storage). There is expected to be a decrease in residential mobility as dependence on storage increases. An exception to Binford's expected behaviour patterns is noted in the case of the Copper Eskimo, for example, whom he terms "cold-environment foragers" (1980: 17). They are categorized as specialists who practice residential mobility to position the group near a particular prey species at an identifiable and predictable phase in the animal's seasonal cycle.

Anthropological data relating mobility to "effective temperature" (hereafter ET - a measure of solar-radiation intensity and length of growing season) suggests that semi-nomadism is the most common hunter-gatherer mobility strategy, and "dominate(s) the mobility pattern in higher-latitude settings" (Binford 1990: 131). Unfortunately, it is not possible to determine an exact ET for Northeast Late Paleoindians, as the palaeoenvironmental data are not fine-grained enough to determine length of growing season or the precise annual range in temperatures. It is suggested, as mentioned, that solar radiation was as much as eight percent more intense in the summer months at 9,000 BP, although winters were likely colder than at present (McWeeney and Kellog 2001: 194). Certainly, the ET of Early Holocene Eastern North America would be categorized in the cool to very cold range of temperatures, suggesting an ET of less than 12 (Bailey 1960).

If ethnographic trends can be used as predictors of the behaviours of ancient peoples, it is highly likely that Northeastern Late Paleoindians indeed practiced a semi-nomadic mobility strategy, wherein the winter house sites were used for a longer portion of the year than the temporary camps common during warmer periods (Binford 1990: 122). Based on the ethnographic data, Binford's argument for semi-nomadism in environments similar to that of the Early Holocene Northeast depends on the presumed need for storage to protect against the lean times in a cold or highly variable environment, and there is no evidence for storage in the Late Paleoindian archaeological record. It is possible that storage methods may have been used that leave no discernible trace. It seems unlikely, though, that Late Paleoindians were highly dependent on storage since this method of resource use generally constrains or obviates the need for movement over a large territory, as is implicated by raw material use patterns (Ellis 1989: 161). It is also notable that Late Paleoindian sites yield no platforms, tent rings, post holes, or any other physical evidence of dwellings aside from artifact concentrations. Even hearths are rare. This seems to suggest a very low level of investment in housing, indicating very high mobility. It is likely in the forested environment of the Northeast Late Paleoindians that local materials were largely used in construction, except perhaps for skins, which may have been carried from site to site.

Also based on the effective temperature (ET) arguments, it is suggested that it would have been adaptively advantageous for Late Paleoindians in the Northeast to include marine resources in their diet. Binford notes that based on the collection of anthropological data on nearly two hundred historically documented hunter-gatherer groups, those in low ET environmental settings, such as the early Holocene in the Northeast, are highly likely to use marine resources for some portion of their caloric intake. If Northeastern Late Paleoindians did in fact live in an environment whose ET was approximately 11 or 12, ethnographic analogy suggests that between forty and sixty percent of the Late Paleoindian diet may have been comprised of aquatic resources (Binford 1990: 135).

### *5.5 Late Paleoindian Mobility*

Binford's theories of subistence-settlement strategies have been employed in several models aimed at specifically predicting Paleoindian behaviour (Spiess and Wilson 1989; Kelly and Todd 1988). The primary differences that require a reworking of the models designed for Early Paleoindians are related to climate and to the fact that while Early Paleoindians were true pioneers, entering previously unoccupied territory (in the absence of unequivocal proof for pre-Clovis occupation of the New World), Late Paleoindians had lived in the region for several millennia, and by this time must have developed a better understanding of the geography and resources of the region. Dincauze (1996) suggests that the large Early Paleoindian sites in the Northeast such as Bull Brook, Vail and Debert may have been the "marshalling camps" of large groups of pioneers who used these locations to obtain information about the new and unfamiliar territory before breaking up into smaller groups. No sites of equivalent size have been identified for the Late Paleoindian period, which may support Dincauze's hypothesis. Sites such as Reagan and Plenge, which exhibit some fluted points and some points of presumed Late

Paleoindian association, can be suggested to represent *in situ* development from the pioneering populations into smaller bands adapting to regional conditions in the Early Holocene.

Changes in climatic conditions during the terminal Pleistocene and Early Holocene may have prevented large mammals from forming regular migratory patterns that would remain constant for more than a few decades, such that human responses to the resources on the landscape would have to be very fluid (Spiess and Wilson 1987: 154). As most sites do not appear to have been reoccupied regularly, giving them low visibility on the landscape, Northeastern Paleoindians may not have formed a regular seasonal round of activities, at least not a round that was retraced year after year producing large and highly visible sites near key resource areas.

Kelly and Todd (1988: 235) hypothesize that because Paleoindians lived in an environment in which they had not yet obtained intimate knowledge of the territory and its resources, they may have used the landscape in a short-term and redundant fashion. If the instability of the environment persisted into the Late Paleoindian period, the same characteristics may obtain. The first locations used in a region may have been used repeatedly even if they were not the best of all possible locations in the region, simply because they became known. There is evidence of differential site selection in the Late Paleoindian period from the Early Paleoindian period, however; Early Paleoindians favoured placing their camps in areas of well-drained, sandy soil often overlooking low-lying areas and a water source, while Late Paleoindians seemed to more frequently camp directly beside a river or large body of water. This fact does not dispute Kelly and

Todd's basic hypothesis, although clearly Late Paleoindian populations must have had a greater understanding of the environment than their predecessors.

Kelly and Todd, like Spiess and Wilson, argue that Paleoindians probably employed tactics characteristic of both foragers and logistically-organized collectors. Kelly and Todd (1988: 239) argue that Paleoindians were "technology oriented" rather than "place oriented," meaning that because the changing environment meant that they could not, like most modern hunter-gatherers, obtain intimate knowledge of the region itself, they had to rely instead on a generalized knowledge of animal behaviour to ensure survival.

It is clear in the Northeast Paleoindian case, however, that new inhabitants were not long in the region before finding and exploiting high-quality lithic sources, such as the Munsungun Lakes chert. The lithic assemblages at "marshalling camps" such as Bull Brook, Vail and Debert are dominated by Champlain Valley cherts (Bull Brook), Nova Scotia chalcedony (Debert), and various other materials including Munsungun chert, Normanskill chert, and yellow jasper (Vail) (Spiess et al. 1998). This suggests that Early Paleoindians became quickly acquainted with the valuable resources, both lithic and biotic, the region had to offer. It is not easy, then, to understand why lithic selectivity decreased in the Late Paleoindian period, when knowledge of source areas surely was not lost. The most likely explanation is decreased mobility as a result of changing settlement and subsistence patterns. This suggestion is further discussed in Chapter Seven.

### *5.6 Raw Material Use in the Late Paleoindian Period*

Perhaps the most useful starting point in examining Late Paleoindian raw material use and its implications is to look at several fairly large, well-reported assemblages as examples of Late Paleoindian lithic material use. Whether or not these sites are truly the best representatives of the whole is not certain, but based on the few large, unmixed sites available for study, they are the best representatives available. Here, we will use the Reagan site and Nicholas site collections to represent the unfluted lanceolate, Holcombe-like point form. The Varney Farm assemblage and the Rimouski site are considered representative of the Plano-like manifestation of the Late Paleoindian in the Northeast. The Jones site collection as well as two sites from outside the immediate study area, e.g., the Turkey Swamp and Plenge sites in New Jersey, will be used to represent the trianguloid point group, as this type is poorly represented within the study region.

#### *5.6.1 Case Study I: Unfluted Lanceolate Raw Material Assemblages*

The best representatives of this point form known from within the study region are Reagan site and Nicholas site, in northern Vermont and southern Maine, respectively. Both of these sites have a rather varied tool assemblage and Reagan demonstrates a much greater variety in the raw materials used than is found at any of the parallel-flaked point sites described above (Ritchie 1953). The Nicholas site follows more closely the pattern noted in both the parallel-flaked point tradition and the Early Paleoindian period in its selectivity of a single raw material for the vast majority of the tools produced at the site (Wilson et al. 1995).

Despite some efforts to source the materials recovered from the Reagan site, many of the materials in this collection have not been identified to source location; indeed, the initial and largely unsuccessful efforts of Ross and Fisher to source the materials in the 1950s have not been matched in more recent decades. Ten artifacts of the total 179 collected from Reagan were identified as "closely resembling" Onondaga chert from New York (Ritchie 1953: 250). An unknown number of specimens were visually matched to the Mount Jasper rhyolite source (Haviland and Power 1994: 22; Spiess et al. 1998: 213). Much of the material has been identified as Champlain Valley chert (Spiess and Wilson 1987; Wilson et al. 1995). Also identified from Reagan is Pennsyvania jasper (Wilson et al. 1995).

Fortunately, many of the materials from the Nicholas site collection have been better identified. All lithic specimens from the site were sorted in the lab according to macroscopic and microscopic characteristics, and samples were sent to a variety of archaeologists and geologists familiar with raw material sources throughout the region.

The most common raw material at the Nicholas site (97% by number, 94% by weight) is rhyolite, which was divided into several groups based on differences in colour and/or structure. A number of samples from the Nicholas collection were thin-sectioned; the results suggested that all of these materials probably originated from the same general source, and possibly the same immediate outcrop (Wilson et al. 1995: 68). The most likely source area for this material is identified as the Mt. Jasper locality in Berlin, New Hampshire, a source also identified in the Reagan site collection.

Only four other raw materials collection in addition to the Mt. Jasper rhyolite were identified from the Nicholas site, and these materials together comprise just three percent of the total lithic assemblage by number (Wilson et al. 1995). The first of these is a pink volcanic with flow banding, whose source is unknown. Wilson et al. (1995) note that a similar material appears in the Hedden Paleoindian site (Spiess et al. 1994), and may have been used for a late Paleoindian point recovered from Blackhawk Island, Maine (Doyle et al. 1985). A few specimens made on Munsungun chert were also present in the Nicholas site collection. These materials tend to be dark red in colour, with a waxy lustre. Quartz crystal is another minority material at the site, and although the source for this material is not definitively known, a suggested source is the pegmatite formations along the Androscoggin River valley in Maine (Wilson et al. 1995: 69). The final minority material is a pale grey-green chert of unknown origin, with no known comparable specimens from other Paleoindian or Early Archaic sites in the region. The quartz crystal and pink volcanic are considered the "raw material stash" of the Nicholas site residents, as a core of each of these materials was present (Wilson et al. 1995: 70).

The inhabitants of the Nicholas site were certainly much more selective of raw materials than were the inhabitants of the Reagan site. Table 5.1 demonstrates the selectivity of raw material for each tool form at the Nicholas site, and Table 5.2 shows the selectivity of raw materials for the Reagan site assemblage. The graphs in Figures 5.2 and 5.3 depict this visually. The latter is based on the rough and often uncertain raw materials identified by Ritchie (1953), but it does permit a picture of the general pattern of raw material use at the site to emerge.

**Table 5.1: Proportion of tool forms made on each of the raw materials in the Nicholas site collection (after Wilson et al. 1995)**

| Tool Form | *Rhyolite (Mt. Jasper)* | *Pink Volcanic* | *Munsungun Chert* | *Crystal Quartz* | *Green Chert* | *Patinated* | *Other* | *Total* |
|---|---|---|---|---|---|---|---|---|
| Biface | 37 | 1 | | | | 1 | | 39 |
| Uniface | 150 | 4 | 2 | | 6 | 3 | | 165 |
| *Piece Esquillee* | | | | 1 | | | | 1 |
| Core | 15 | 1 | | 1 | | | | 17 |
| Flake | 2623 | 11 | 10 | 4 | 5 | 34 | 3 | 2690 |
| Microflake | 2408 | 13 | 10 | 1 | 13 | 20 | | 2465 |
| **Number** | 5233 | 30 | 22 | 7 | 24 | 58 | 3 | 5377 |
| % | 97 | <1 | <1 | <1 | <1 | 1 | <1 | |

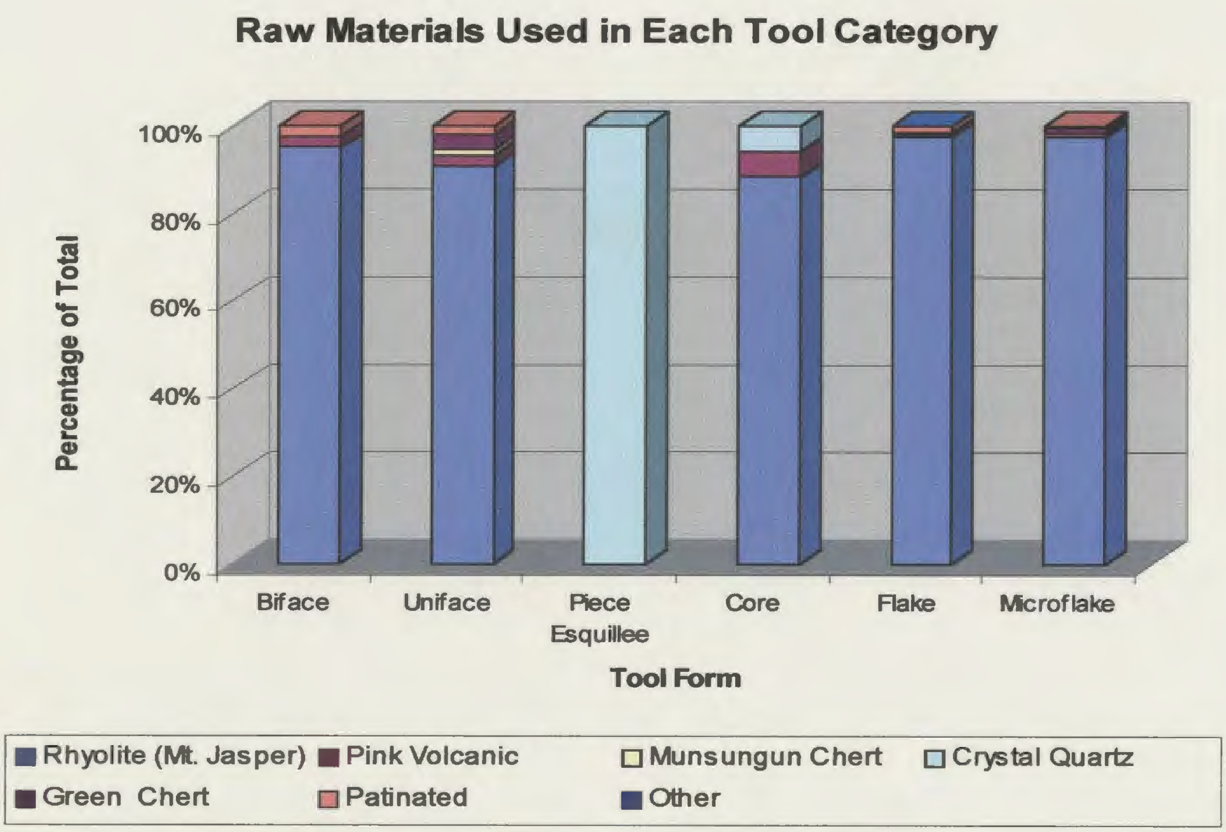



**Figure 5.2: Proportion of tool categories made on each raw material at the Nicholas site.**

**Table 5.2: Proportion of tool forms made on each of the raw materials in the Reagan site collection (after Ritchie 1953)**

| REAGAN SITE RAW MATERIAL USE | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Chert* | | *Rhyolite* | | *Jasper* | | *Chalcedony* | | *Felsite* | | *Quartzite* | | *Basalt* | | *Talc* | | *Unknown* | |
| **Artifact Type** | n = | n = | % | n = | % | n = | % | n = | % | n = | % | n = | % | n = | % | n = | % | n = | % |
| Projectile Point | 47 | 28 | 60 | 11 | 23 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 4 | 4 | 9 | 0 | 0 | 1 | 2 |
| Endscraper | 47 | 28 | 60 | 16 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sidescraper | 31 | 17 | 55 | 8 | 26 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 3 | 10 |
| Graver/ Spokeshaver | 4 | 4 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flake Knife | 18 | 18 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bifacial "Knife" | 11 | 10 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 0 |
| Unidentified Bifaces | 8 | 5 | 63 | 1 | 13 | 1 | 13 | 0 | 0 | 1 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pendants | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 100 | 0 | 0 |
| **Total** | 179 | 110 | | 36 | | 2 | | 1 | | 1 | | 5 | | 7 | | 13 | | 4 | |

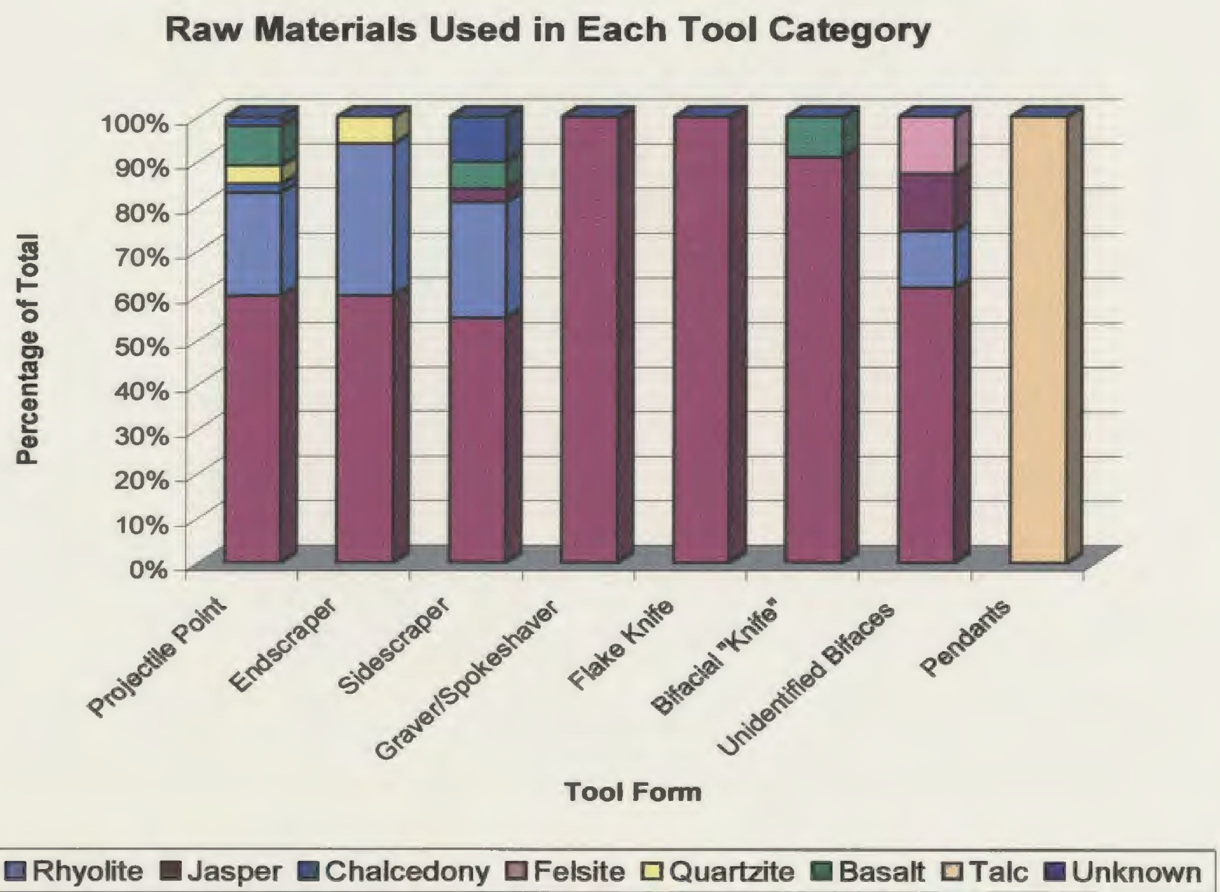



**Figure 5.3: Proportion of tool categories made on each raw material at the Reagan site.**

It is clear from these graphs that a high degree of selectivity was used in choosing raw materials for most of the flaked stone tools at both sites. The apparent dominance of quartz crystal for the use of *pièce esquillées* at the Nicholas site may be misleading, however, as the sample size (n) is only 1. The Reagan site assemblage is dominated by a variety of cherts and, to a lesser degree, rhyolite. The pendants, an artifact category not found at other Late Paleoindian sites, are made on soapstone and talc. Although a much wider range of raw materials are present at the Reagan site than at the Nicholas site and most other Late Paleoindian sites in the region, the toolmakers at the Reagan site still practiced selectivity in choosing certain raw materials for specific tool forms.

Wilson et al. (1995: 69) note that the Mt. Jasper source is a logical one for the Nicholas site inhabitants, located "strategically" near the terminus of two major topographic corridors: the Connecticut River Valley, a major north/south corridor, and the Androscoggin River valley, a major east/west corridor, both of which have a documented Paleoindian presence in the form of numerous identified archaeological sites along the valley margins of both of these rivers. The Mt. Jasper source is about 70 km northwest of the Nicholas site, but the actual travel distance along the Androscoggin River valley is much greater. The Munsungun Lake chert source is approximately 280 km distant from the site (due north). There is no direct valley corridor to the Munsungun lithic source (Wilson et al. 1995: 70). In terms of the direct vs. indirect procurement debate, this material, from a distant and relatively inaccessible source and in very small quantities, makes a much better case for trade, exchange or gift giving as a factor in lithic distribution than does the case of the Varney Farm site, discussed below. The quartz crystal could have been obtained from within 40 km of the Nicholas site. The green chert is suggested to be from a more distant source (Wilson et al. 1995: 70).

The selection of a single dominant raw material source of good flaking quality at Nicholas parallels the expected pattern for Early Paleoindian sites, and also parallels the raw material use at Varney Farm, where Munsungun chert was highly preferred. The Reagan site demonstrates a much wider range of raw material use, a pattern more akin to the Archaic period collections in the region, although the Reagan site is likely earlier chronologically (see section on Chronology in Chapter Six). It is of interest that the Mt. Jasper lithic source was not favoured by Early Paleoindians living in close proximity to the outcrop, such as at Vail and Adkins sites (Gramly 1982, 1988). However, the material is present in the collections from Bull Brook, Massachusetts and is dominant at the Neponset Site in Massachusetts, which contains Parkhill-like projectile points. This material is not documented for any Late Paleoindian parallel-flaked point collections (Wilson et al. 1995).

### *5.6.2 Case Study II: the Plano-like (Narrow, Parallel-Flaked) Raw Material Assemblages*

Chert is by far the dominant lithic material at both the Rimouski and Varney Farm sites, representing approximately 99.9% of the assemblage at the former and 99.5% at the latter. At Rimouski, these cherts come in a variety of colours, from beige to grey to green to black. Chapdelaine (1994: 132-134) identifies a number of chert sources in the vicinity of the Rimouski site, including the large Des Landes formation, which comprises a number of outcrops such as the Cap-Bon-Ami formation and Ste-Anne-des-Monts cherts, as well as Temiscouta cherts from Québec. He notes the difficulty in assigning specific artifacts to one or another of these sources, even with the aid of a microscope. Cap Chat is identified as a likely source of some of the cherts in the Rimouski assemblage, but it is not possible to determine what percentage; the outcrop is located about 150 km distant from the Rimouski site. Chapdelaine suggests, based on the variety in cherts used at the Rimouski site, that the occupants of the site were highly mobile and probably participated in an interaction network along the Gaspé Peninsula (1994: 142). Also identified in the Rimouski site assemblage is one projectile point made on green rhyolite that probably originates somewhere in northern Maine (Chapdelaine 1996: 285). This strengthens the hypothesis that the Plano-like point using groups of the Northeast were highly mobile and interacted or moved over a large area.

The Varney Farm raw materials are very homogeneous, with virtually all chert ascribable to the Norway Bluff locale, part of the Munsungun Lake chert source in northern Maine. The Norway Bluff outcrop is 250 km distant from the Varney Farm site. Other raw materials, present in minute proportions, include rhyolite, granite, quartz, and some unidentifiable materials. Tables 5.1 and 5.2 summarize the raw materials of tools and flakes at each site. The graphs in Figures 5.2 and 5.3 show the selectivity of raw materials for each tool form at the Rimouski and Varney Farm sites, respectively. Chert is clearly used almost exclusively at both sites for all chipped stone tools, the only exceptions being one sidescraper of quartz at Varney Farm and one endscraper of quartzite at Rimouski. Nearly all flakes are also on chert. Harder but less flakeable materials are used for non-chipped tools such as hammerstones, choppers and abraders.

**Table 5.3: Raw Materials by Artifact Category at Varney Farm (VF) and Rimouski (R) Sites**

| | CHERT | | QUARTZ | | QUARTZITE | | SLATE | | SANDSTONE | | GRANITE | | UNKNOWN | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Artifact Type** | VF | R | VF | R | VF | R | VF | R | VF | R | VF | R | VF | R |
| | n = | n = | n = | n = | n = | n = | n = | n = | n = | n = | n = | n = | n = | n = |
| Projectile Point | 16 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biface/ Preform | 38 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Drill | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sidescraper | 10 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Endscraper | 0 | 8 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Modified Flake | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Utilized Flake | 19 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Core | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerstone | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 1 | 0 |
| Chopper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| Abrader | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Notched Pebble | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| | | | | | | | | | | | | | | |
| **Total** | 121 | 157 | 1 | 0 | 0 | 1 | 0 | 4 | 0 | 4 | 3 | 1 | 2 | 0 |

**Table 5.4: Flakes Made on Each Raw Material at Varney Farm (VF) and Rimouski (R) Sites**

| | CHERT | | RHYOLITE | | CHALCEDONY | | QUARTZ | |
|---|---|---|---|---|---|---|---|---|
| | VF | R | VF | R | VF | R | VF | R |
| | n = | n = | n = | n = | n = | n = | n = | n = |
| **Flakes** | 2,345 | 20,968 | 5 | 0 | 0 | 1 | 1 | 2 |

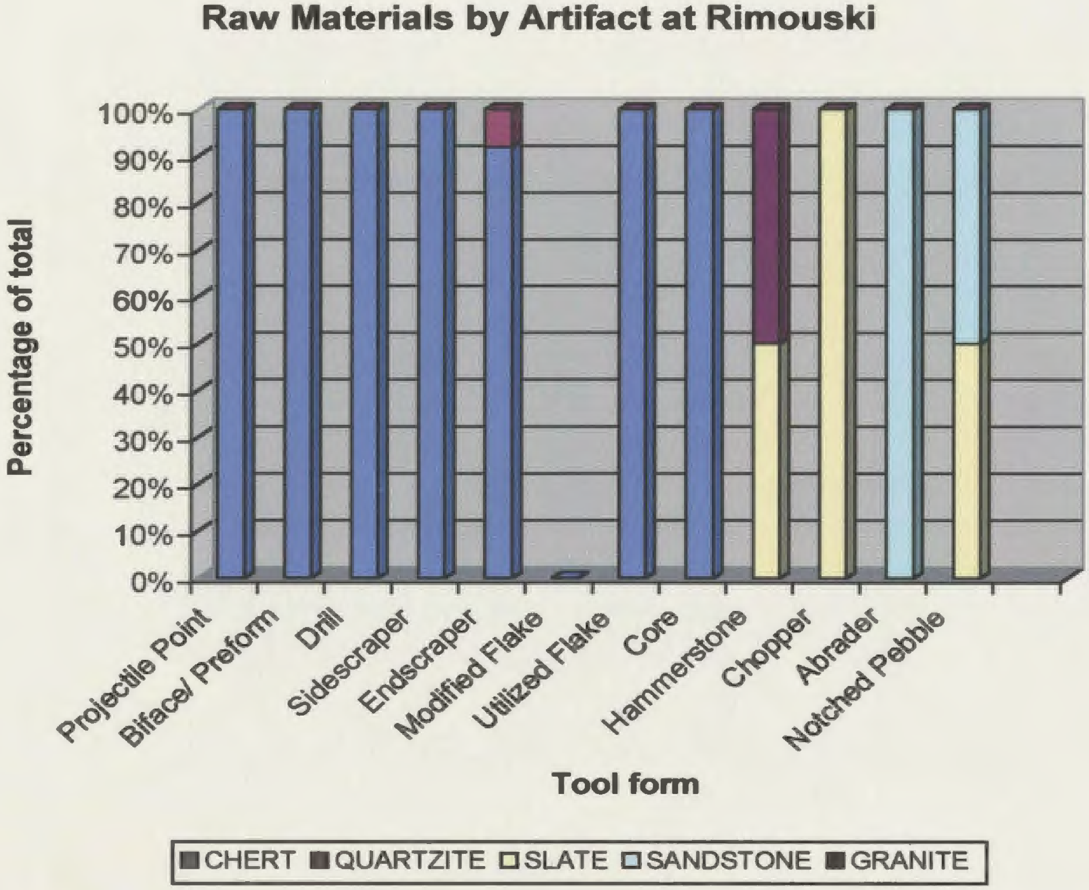



**Figure 5.4: Proportion of tool categories made on each raw material at the Rimouski site**

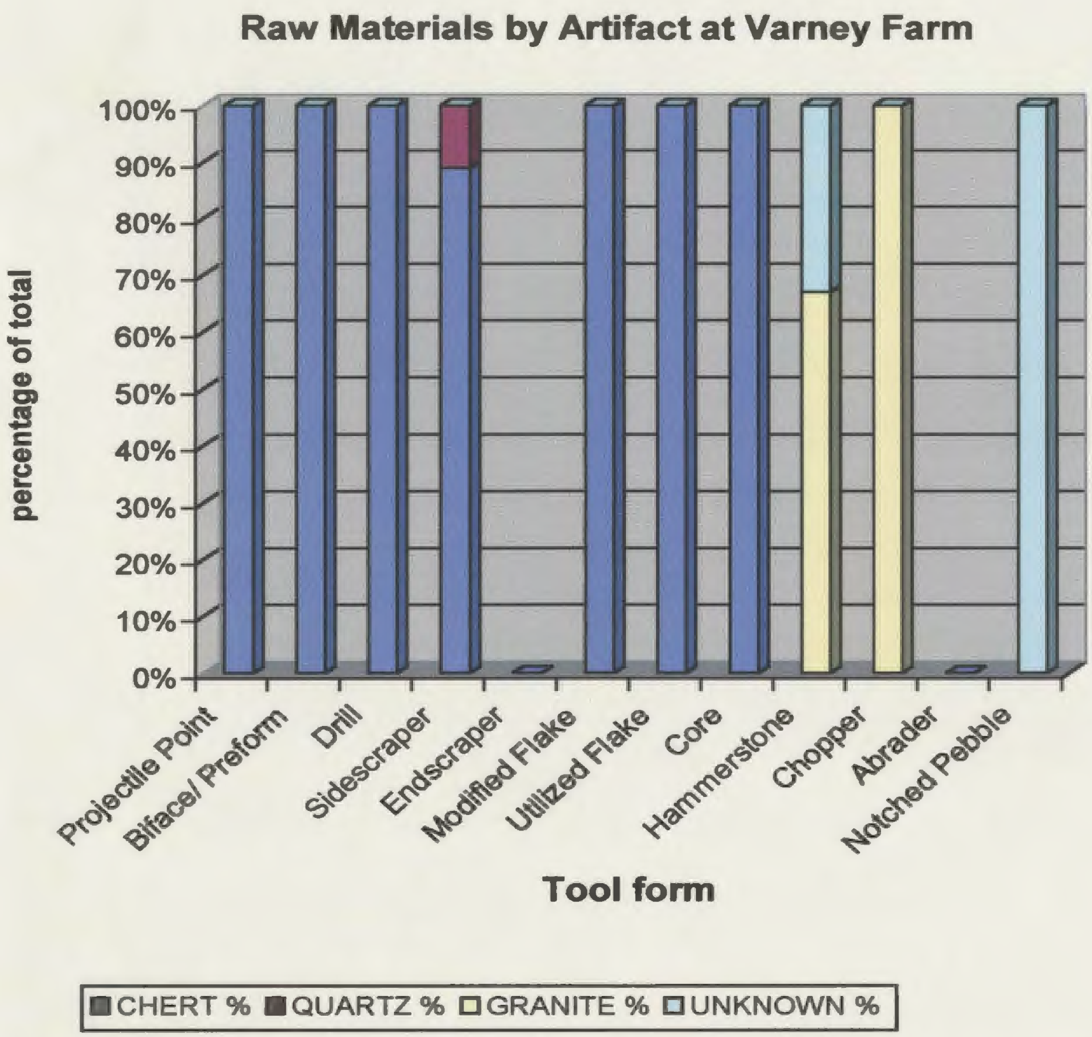



**Figure 5.5: Proportion of tool categories made on each raw material at the Varney Farm site**

The La Martre Late Paleoindian site on the Gaspé Peninsula is a lithic workshop located 4 km from a bedrock chert source, and is a good candidate for a Late Paleoindian quarry site (Chalifoux 1999: 74). At the quarry itself were a number of preforms, blanks, cores, and tools, and these are often nearly identical to tools found at Late Paleoindian sites throughout the Gaspé Peninsula. The amount of lithic debitage at the La Martre site is large – over 150,000 flakes and nearly 1,500 tools – so it seems likely that this site was used repeatedly by groups accessing the nearby chert quarry. The range of tools represented includes parallel-flaked projectile points, excurvate lanceolate projectile points, drills, bifacial knives, sidescrapers, endscrapers and gravers. A high proportion of the tools recovered (over half) were unfinished or fragmentary, and the number of preforms and blanks was high. With flake densities of 800 to 1000 flakes per square metre, the site obviously functioned as a lithic workshop. What is more difficult to determine is whether or not the site was also used for a range of domestic activities. A number of the lithic tools recovered from the site were submitted for potential identification of animal protein residues, a controversial method of linking tools with their use on a particular species. What is relevant to this discussion, however, is not so much which species were being used (although if available would be very useful information), but the fact the protein material was recovered from twelve tools. This suggests that some domestic activities were being carried out at the site, although it is nearly impossible to discern from the archaeological record whether this represents repeated occupation by a small task group over many lithic procurement forays, or use by an entire band as part of the seasonal round.

Unfortunately, no Late Paleoindian quarry sites near the Munsungun Lake chert source has yet been found, although two small Early Paleoindian sites, Windy City and Fluted point, have been identified. However, whether mobility or trade accounts for the wide dispersal of Munsungun Lake cherts across the Northeast, someone must have been at the site to obtain the materials. It is clear that the archaeological record as it reflects the Late Paleoindian period in the study area is far from complete.

### *5.6.3 Case Study III: Triangular Projectile Point Raw Material Assemblages*

This category of Late Paleoindian projectile points is by far the most difficult to describe by raw material, as it is the least well documented and is not represented by any *in situ* deposits excavated from within the study region. As a result, this case study will have to depend on surface collected "assemblages" and excavated sites from beyond the study region; namely, Turkey Swamp and Plenge sites, New Jersey. These latter sites have been compared to presumed Late Paleoindian specimens from the Magdalen Islands and Prince Edward Island (Keenlyside 1985, 1991).

The Jones site collection is comprised of nearly 50 projectile points in total that are assumed to be of Late Paleoindian age. Most of these belong to Rollie Jones, an avid collector for whom the site is named. Keenlyside (2002, pers. comm.) notes that approximately 80% of the projectile points collected from the Jones site area are fashioned on a fine-grained material, black to grey to buff in colour. This material has been variously called a rhyolite, a 'siliceous shale,' or a chert (Keenlyside 1985, 1991; Nash and Stewart 1986). The primary source of this material is identified as Ingonish

Island, Cape Breton. This source is approximately 120 km east of Prince Edward Island. Minority materials include a black andesite, possibly from the Antigonish area, and some other rhyolites of unknown source, as well as four possible specimens on Ramah chert from northern Labrador (Keenlyside 2002, pers. comm.) As some of these specimens are fragmentary, assignment of some of these points to the Late Paleoindian period is not unequivocal. The points made on Ramah chert are of note; this material comes from northern Labrador and would have been difficult to access at this early stage in the regional prehistory.

Clearly, the Jones site collection follows the Early Paleoindian pattern, continued in Late Paleoindian sites such as Varney Farm and Nicholas, of selective use of a single raw material for the majority of tools produced at a site. Until there are more sites of similar age and characteristics identified in the region, it is difficult to judge whether this pattern of lithic procurement was more commonly the rule, or the exception. It is interesting to note that the Ingonish source is considerably further east than the Jones site location, which seems to suggest some reverse migration (assuming a general west-to-east movement in the Early Paleoindian period), although trade could also account for this movement of raw materials.

There is little evidence for Late Paleoindian habitation sites Cape Breton near the lithic source, or on the Nova Scotia mainland. At present, the evidence is limited to a single-fluted projectile point recovered from the primarily Archaic period Geganisg site (CeCc-4) on Ingonish Island in Cape Breton, a site possibly representative of a quarry and/or workshop site for the local lithic material (Nash 1976, 1978). This point is noted as significantly different from the Debert Early Paleoindian fluted points in the absence of a deeply indented base and lateral grinding; Nash (1978: 136) suggests a Paleoindian manifestation post-dating Debert and "perhaps transitional between late Paleo-Indian and the early Archaic Stage." The Geganisg point has been compared by Erskine (1978: 12) to the Holcombe form known from the Great Lakes region, and its presence at Ingonish Island seems to lend support to the above suggestion of reverse (east-to-west) migration after initial penetration to the eastern edges of the Maritime Provinces by Late Paleoindian times.

A similar point was recovered from the Melanson site in Kings County, Nova Scotia. This point is made on red (Munsungun?) chert, is basally thinned and fluted on one side (Erskine 1998), possibly representing either a late Early Paleoindian or an early Late Paleoindian association. In both cases, these are single finds and are not associated with an intact Late Paleoindian assemblage.

The Turkey Swamp site (Cavallo 1981) is located in Monmouth County, on New Jersey's coastal plain. Seven complete or nearly complete basally thinned trianguloid projectile points have been recovered from the basal culture-bearing level at the site, which is radiocarbon dated to about 8,000 B.P. (Cavallo 1981: 8). Cavallo (1981: 9) compares these specimens with several of the projectile points recovered from the Reagan site. Unfortunately, the source materials of the Turkey Swamp collection are not reported (Cavallo 1981). A number of high quality cryptocrystalline cherts are present in the collection, however, and these were likely selected for their flaking characteristics. It is not known if these materials are of local or exotic origin.

There is, fortunately, more information available for the raw material assemblage at the Plenge site, located in Montague, Sussex County, New Jersey (Kraft 1973). The Plenge site tool assemblage is not unlike that found at Reagan site, with both unfluted lanceolate points and smaller trianguloid points. Kraft (1973: 62) reports that over 76% of the Paleoindian artifacts from the Plenge site are of brown, yellow and red jasper, much of which is "probably derived from the open quarries at Vera Cruz, Macungie, Durham, or other sources in Bucks and Lehigh Counties in Pennsylvania." These sources are located approximately 50 to 80 km from the Plenge site. Kraft suggests that the reddish jasper is coloured by heat alteration, evidenced by pot-lid fractures and an interior brown or yellow colouring on broken specimens (1973: 62). A fine-grained black chert is noted, which could be of either distant or local origin. The remainder of the raw materials present in the Plenge site assemblage "consist of local black flints, Onondaga and Normanskill cherts from New York State; chalcedony, probably from the Ordovician shales in Lehigh County, Pennsylvania, and some materials that are as yet unidentified" (Kraft 1973: 62). Many of the artifacts and debitage at Plenge exhibit smooth surface cortex, suggesting that pebble flints and/or jaspers may have been transported to the site vicinity by the Musconetcong River, which may have made it unnecessary to go directly to the outcrop location in all cases.

At the Plenge site, then, we see a lower level of selectivity of a single, high-quality lithic source than is common at most Early Paleoindian and many Late Paleoindian sites in the Northeast. However, this may be representative of a pattern of lithic use more common in the mid-Atlantic region than in the far Northeast; in the mid-

Atlantic and Southeast United States, most Paleoindian sites are located near a quarry source with lithic assemblages dominated by expediently produced flake tools on local stone (Anderson 1996: 46; Wilson et al. 1995: 74). This greater reliance on local stone and a near absence of cores have been taken as evidence of lower mobility in the forested Southeast than in the formerly glaciated southeast (Gardner 1983; Meltzer 1988). However, Wilson et al. (1995) note that often at least some exotic raw material is identified in these collections, which may indicate that mobility was not necessarily as low in the Paleoindian Southeast and mid-Atlantic as many scholars have surmised. More recent explanations of lithic resource use in this region propose that two lithic organization strategies were used, one dependent on local stone for expedient tools and another dependent on exotic stone for formal, curated tools (Inashima 1992; Childress and Vogt 1994).

### *5.7 Mechanisms for Obtaining Distant Raw Materials*

It has been demonstrated in this chapter that in many cases, Late Paleoindians, like their Early Paleoindian predecessors, were obtaining vast amounts of raw materials from sources very far distant from their sites. At the Varney Farm site, for example, nearly all of the lithic materials present in the assemblage can be sourced to the Norway Bluff locale, 250 km from the site. One of several mechanisms must account for the movement of this material over such a large area. Spiess and Wilson (1989: 95) posit three possible means by which this could be achieved:

1) it could represent the movement of the group en masse from a location near the quarry source;

2) it could represent exchange facilitated by the gathering of several related bands; or,

3) it could represent the activities of a logistically-organized task group who obtained, transported and distributed the material.

Ellis (1989: 156) and Stothers (1996) also include a fourth possible explanation, that of movement of people between different social units, or "personnel exchange" (Stothers 1996: 174), with raw materials being transported with the individuals as they moved to join a new group.

As mentioned above, because Paleoindians are not considered socially and economically complex, or territorial because of the need for flexibility in a fluctuating environment, trade is assumed to have played a relatively minor role in distribution. Spiess and Wilson (1989) employ Binford's categories of hunter-gatherer mobility to determine that in the late Pleistocene in the far Northeast, critical resources must have been dispersed geographically and temporally. This, they argue, would necessitate a logistically-organized collecting adaptation, in which lithic procurement is "embedded" within the task-group movements of the population.

Some scholars have assumed that where high quality lithics comprise the majority of tools at Paleoindian sites, raw material procurement must have been an integral feature of a seasonal round of activities. In fact, some (e.g., Moeller 1984; Gardner 1977) have gone so far as to suggest that lithic procurement was the determining factor in settlement patterns, such that Paleoindians relied on resources that could be found in proximity to important outcroppings of lithic material. Such theories have been referred to as "lithic determinism" (Petersen 1995: 212). This might explain why the Rimouski site inhabitants chose their location, but the Varney Farm site does not fit very well within this model.

Others suggest that quarry sites were visited as part of the seasonal activity cycle as raw material stores were used up and new materials were needed. In this case, initial gross reduction was probably done at the quarry site, with further reduction and some finished tool production at the workshop site. Spiess and Wilson (1989) argue that if lithic procurement was part of the seasonal round of a foraging group (in which the entire group moves to resources), a large, multi-functional habitation site near the quarry would be anticipated. In contrast, in logistically-organized collectors, a small task group would obtain materials for the larger group while undertaking subsistence and/or social pursuits, with no extensive tool replacement activities at the reduction stations. Certainly, the archaeological record does not support a hypothesis dependent on the presence of large foraging groups seasonally congregating around preferred lithic sources. The latter possibility seems the more likely in the Northeast Late Paleoindian case.

Anderson (1996) argues the seasonal aggregation is necessary in very low population density environments as a means of maintaining group ties. In his opinion,

> *The need to find and exchange mates in a landscape characterized by extremely low numbers of people, it is argued, is the critical factor shaping Early Archaic as well as earlier Paleoindian settlement systems in the Eastern Woodlands.* Social interaction leading to marriages between groups, which had as a direct by-product the maintenance and growth of local and regional population levels, was, I believe, of far more importance to the survival of these peoples *in the*

> *long run* than where lithic raw material sources were on the landscape or where food resources were abundant…(Anderson 1996: 44; italics his)

Although speaking more specifically of the Southeast, Anderson's observations about the importance of group ties and exchange of marriage partners likely holds true for the Northeast as well. However, lithic resources clearly played a greater role, perhaps culturally as well as technologically, in the far Northeast than in the region to the south and west.

Ellis (1989) discusses the possible reasons why Paleoindians practiced the lithic procurement strategies evidenced in the archaeological record. The first of these is related to historical factors; that is, that groups new to an area would not be aware of the full range of lithic resources available, and would thus gravitate towards known sources, which would dominate the lithic assemblage. This explanation was first offered by Witthoft (1952) in explanation of the abundance of Onondaga chert from New York at the Shoop site, Pennsylvania. Considering that Late Paleoindians likely had ancestors in the Northeast for at least a millennium, this is not a convincing reason for their lithic choices.

The second reason cited is based on technological and/or ulititarian factors, as suggested by Goodyear (1979, 1989). This hypothesis posits that specific high quality cryptocrystalline lithics were favoured because such material allowed for the creation and maintenance of a highly flexible and portable toolkit, necessary for very mobile populations. With highly predictable flaking properties, good quality cherts reduced the risk of error in tool manufacture and minimized waste (Ellis 1989: 149). They also were conducive to retouch and resharpening, thus extending a tool's use life. A complete toolkit could be transported under these conditions with considerably less bulk than would be necessary with lower grade materials. Although this argument is not without merit, Ellis (1989: 150-153) points out several limitations of this line of reasoning. For example, it does not explain why bedrock sources were usually preferred over cobble sources. It also does not explain why a single source was so often favoured, when there may have been equally or nearly equally good quality materials at some other point in the group's annual range, which, as has been demonstrated, must have been very large. Ellis suggests that in fact, the use of a wider range of materials would be the more efficient practice for a highly mobile group of hunter-gatherers, such that a single material would not have to be transported for such huge distances (Ellis 1989: 152).

Finally, Ellis cites social factors as a possible reason for Paleoindian procurement patterns, and argues that this is the reason that best seems to fit the data available (Ellis 1989: 154-156). In this explanation, it is assumed that "material culture items can function not only in the techno-utilitarian sphere but also, via stylistic characteristics, can serve to signal social identity" (Ellis 1989: 154). Indeed, this phenomenon is documented ethnographically (i.e., Hodder 1978, 1982; Weissner 1984; Wobst 1977). Ellis notes that among egalitarian groups (as Paleoindians most likely were) there are limited social identities that might be expressed through stylistic aspects or attributes (1989: 154). The most likely are group affiliation or sub-group (i.e., age, sex) identification. In the Paleoindian case, the former seems the more probable, and this explanation presents two possible contexts within which style can function: as signals of group affiliation visible to those in other like groups, and/or as signals to members within a group of shared identity (Ellis 1989: 154). Ellis (1989: 156) argues that

> ...the restricted use of only one or a very few sources by all members of a particular Paleoindian group indicates that these raw materials were serving as a stylistic indicator of homogeneity in identity to that group's members. By symbolically deemphasizing within group social differences or boundaries, this practice facilitated the flow and exchange or "pooling" of information, services and goods within the group. In doing so, style could have served the ultimate or adaptive function of maintaining the group in relation to environmental variables as is suggested among ethnographically known groups.

This explanation does seem to offer a more compelling reason for selection of a single raw material source at the expense of others, but this pattern of lithic resource use is not universal across Late Paleoindian sites. For example, while this explanation may well suit the case of the Varney Farm site, it does not fit the example of the Reagan site. Indeed, in this line of reasoning, it should be expected that nearly 100% of the raw materials in a given assemblage, at least for formal tools, should be on a single type of raw material. Further, Ellis (1989: 157) observes that for this argument to be compelling, the raw materials used should be very visually distinctive. This is not always the case in Late Paleoindian assemblages; at Nicholas site, the rhyolites that dominate the assemblage could only be grouped together as coming from the same general source based on thin sectioning (Wilson et al. 1995), and the Munsungun cherts, for example, exhibit a wide range of colours from reds to greens to greys to blacks (Pollack et al. 1999). Clearly, although symbolic meanings may have played a role in raw material selection, Ellis' explanation alone is not sufficient to explain raw material selection in the Late Paleoindian period.

Ellis' argument might, however, be usefully extended to take into account the range of variation noted within the Late Paleoindian projectile point forms; namely, the unfluted lanceolate form, the elongate, parallel-flaked form, and the trianguloid form. As suggested in one of the hypotheses outlined in Chapter One, the group identity or cultural variability hypothesis, this may, perhaps in conjunction to some degree with raw material preferences, account for the increased range of variation in projectile points evidenced in the Late Paleoindian record as compared with the Early Paleoindian period. This could be the result of increased territorialism, as was also hypothesized at the outset. Although population densities surely remained low, perhaps even lower than in the Early Paleoindian period if the comparative paucity of archaeological data are reflective of populations, groups could have migrated into specific territories within which they developed distinctive projectile point forms *in situ*. It is probable, however, based on raw material distributions, that high mobility persisted, and contact between groups is nearly assured. Whether these contacts were amicable or hostile is impossible to tell.

In summary, it has been possible to make some informed suggestions about the nature of Late Paleoindian mobility and behaviour based on an analysis of lithic raw material use. It is nearly certain the Northeast Late Paleoindians were highly mobile, and in many cases exhibited a strong preference for a particular lithic material for the majority of their tools within individual site assemblages. This may be explained in part by the need for a highly portable and efficient toolkit, in part by historically acquired knowledge of particular good-quality resources, and in part by an expression of group identity in the use of particular materials that serve to symbolically separate one group from another. In the next chapter, examination of the lithic assemblages of the Northeastern Late Paleoindian sites will be expanded to the metric attributes of the tools in the three "traditions" of projectile point-using groups here described. It will also look at external relationships; that is, how do the various "traditions" of Late Paleoindian toolkits in the Northeast compare with those of similar age outside the region, to the west and south of the study area? This examination will provide an additional source of information and means of inference on the variation within and between these groups in order to assess further the hypotheses presented to explain the nature of the Late Paleoindian archaeological record in the Northeast.

# CHAPTER SIX

## Lithic Analysis: The Great Divide in Northeastern Late Paleoindian Projectile Points

### *6.1 Introduction*

In this chapter, the physical characteristics and metric attributes of the projectile points and some other tools of the Late Paleoindian period in the Northeast are examined, with the goal of better understanding the nature of the relationships within and between the identified point groups or "traditions." First, however, the Late Paleoindian collections from the far Northeast are examined in terms of external relationships, or how these points may be related to those from outside the study region, with implications for migration and diffusion of technology and *in situ* development. As is the case with any comparative study of metric attributes, limitations arise in terms of what attributes are recorded, and how. It was not possible in all cases to examine the collections personally, so where necessary, the measurements and observations of other researchers have been used. In most cases, some information as to how the measurements were taken is provided, so that it is possible to compare data from different sites.

The major Late Paleoindian sites in the Northeast have been described, and Figure 3.1 (page 26) demonstrates the geographical distribution of the various Late Paleoindian point categories or "traditions" as have been described in this thesis. Clear patterns emerge from this figure, wherein the parallel-flaked Plano-like points are generally confined to a more northerly distribution, while the concave-based, trianguloid points are found in the more easterly, and often coastal, areas of the study region. The unfluted lancolate points are fewer and more centrally located, being much more common in the Great Lakes area, west of the study region.

It is supported herein that the concave base trianguloid points generally developed out of the Debert-style Early Paleoindian points in what is now Maine and the Maritime Provinces (see Keenlyside 1985, 1991). The trianguloid points found at sites such as Reagan and Plenge may be related to this development, although the trianguloid points at Plenge site are, to this researcher, different enough to be categorized quite separately from those points found along the Gulf of St. Lawrence coast of Prince Edward Island. The trianguloid points at Plenge site may simply be the result of rework of damaged fluted points, as they are few in number and generally small in size. The Late Paleoindian projectile points recovered from the Maritime Provinces demonstrate many similarities in overall morphology to the Vail/Debert Early Paleoindian point "phase." It is unfortunate that no convincing radiocarbon dates are available to support this contention.

Of course, it is important to note when studying tools as a means of gaining insight into cultural affiliations and functional indicators of activities performed at a site that projectile points and other tools are morphologically dynamic (see Andrefsky 1998). They are recovered at a particular stage in their use-life, which is not necessarily representative of the entire picture of a given tool's history. A projectile point may be resharpened many times, or may be modified after breakage or other damage into an entirely new tool form, such as a scraper or drill. Frison (1993: 244) has observed that most Paleoindian projectile points were fashioned with a strictly preconceived "mental template" of how the points should look, but once damaged, they would be reworked with concern for functionality over aesthetics. As Andrefsky (1998: 39) observes, "it is important to view individual stone tools as morphologically dynamic articles of a material culture system." With this in mind, it is possible to proceed to an examination of the differences in projectile points and overall toolkits in the Late Paleoindian assemblages of the far Northeast.

### *6.2 Extra-Regional Comparisons*

The trianguloid points of the far Northeast have been compared to the roughly contemporaneous Dalton manifestations of the Southeast United States (Goodyear 1982; Keenlyside 1985: 83; Wilson et al. 1995: 19). Dalton points have also been compared to Hi-Lo points from the Great Lakes, which are considered essentially contemporaneous, although they are not absolutely dated (Ellis and Deller 1982, 1990). Dalton points have been recovered from as far north and east as central New Jersey (Stanzeski 1996, 1998). The Dalton horizon is often considered a transitional Late Paleoindian – Early Archaic form (Tuck 1974), dated to 10,500 to 9,900 B.P. (Goodyear 1982: 382). It seems very possible that this technology may have persisted later in the far Northeast, especially if the small triangular points recovered from the Strait of Belle Isle region are considered part of the same general tradition. Many of the Dalton points are indeed very visually similar to the trianguloid points recovered in the Maritimes, exhibiting the same deeply concave bases and slightly convex lateral edges, although Dalton points lack the distinctive asymmetric bases of the far Northeast. At the Taylor site in South Carolina

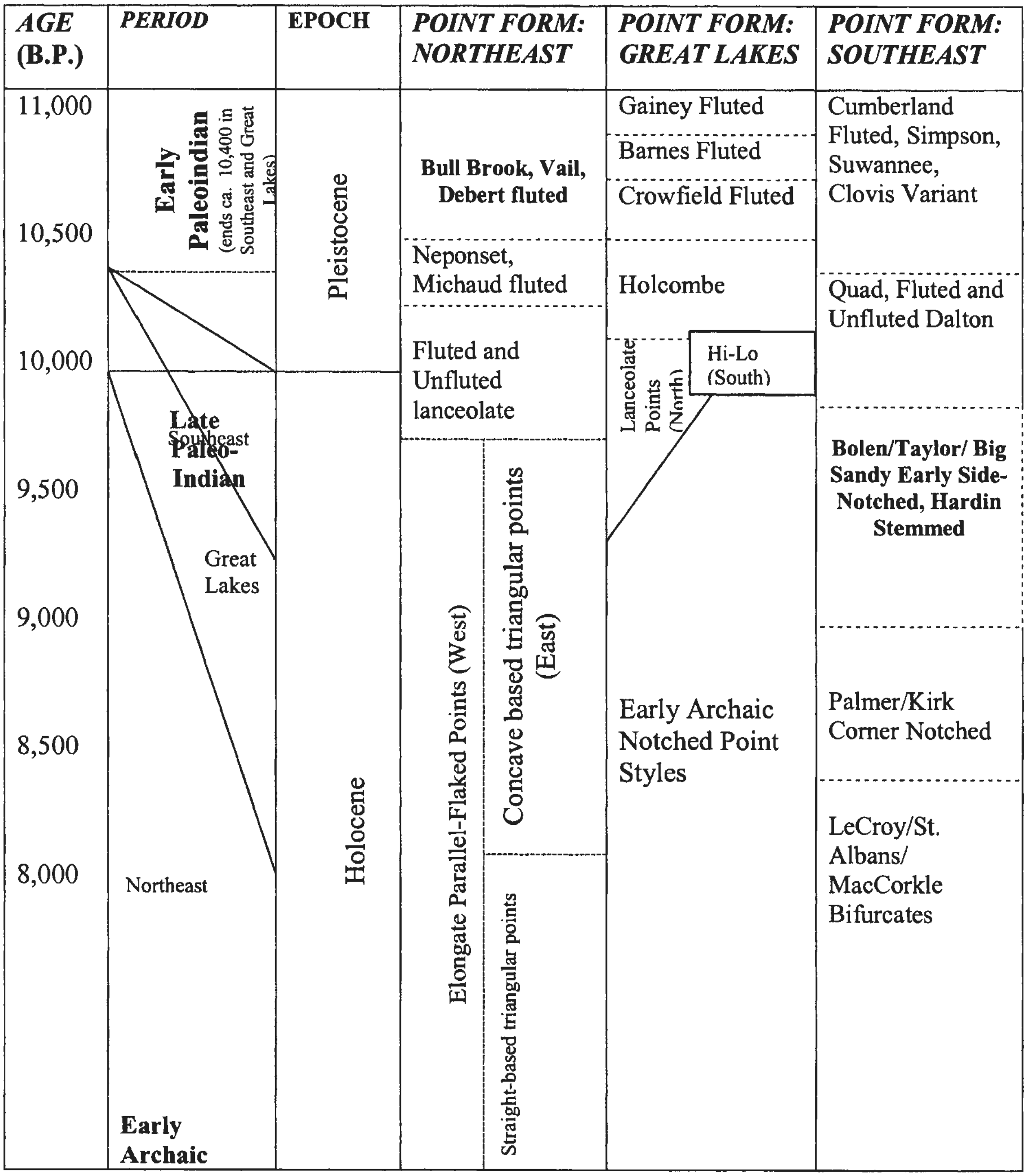


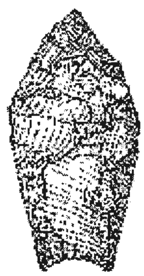

**Figure 6.1: Comparison of Paleoindian and Early Archaic Projectile Point forms in the Northeast, Great Lakes, and Southeast Regions. Note that the Late Paleoindian period begins at ca. 10,500 B.P. in the Southeast and Great Lakes, ending ca. 10,000 B.P. in the former and ca. 9,000 B.P. in the latter (marking the transition to Early Archaic). The far Northeast Late Paleoindian begins 500 years later and continues until ca. 8,000 B.P.**

(Michie 1996), for example, many of the Dalton points recovered might be indistinguishable from the Jones site specimens, save for differences in raw material. It should be noted, however, as it has been in the Southeast (e.g., Ledbetter et al. 1996: 285), that these small trianguloid points are often morphologically similar to Woodland period forms, and in the absence of an excavated context, may be misidentified.

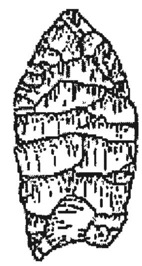
The Dalton horizon may simply be an analogous development, but it seems also possible, based on the large areas over which other earlier and contemporaneous point forms and raw materials were distributed, that direct influence of one region on the other at this stage of prehistory was possible. By this time, both of these regions were forested areas where similar technologies may have been useful. The often coastal or near coastal settings of Late Paleoindian sites in the Northeast also suggests that marine resources may have been exploited to some extent, as was discussed in the previous chapter. A general similarity can be noted in outline morphology of many of the Maritime Provinces Late Paleoindian projectile points with (much later, and smaller) Dorset endblades found further north; the Dorset subsistence pattern was highly dependent on marine mammal exploitation, especially seal (e.g., McGhee 1990). Although obviously, because of temporal and geographical differences, no direct influence can be hypothesized, but the similarities in point morphology may be suggestive of some similar functional use. As was made clear in Chapter Four, a variety of seal, whale, and other marine mammal species were likely readily available in the Early Holocene environment of the far Northeast.

The similarities often noted between the Maritime Provinces Late Paleoindian points and the Early Archaic or Late Paleoindian points recovered from further north and east from sites such as Pinware Hill and Cowpath, southern Labrador, and Blanc Sablon, on the Lower North Shore of Québec, may be warranted. I concur with Keenlyside (1985: 83) that the differences noted in these points, such as their generally smaller size, less rounded edges, and lack of a pronounced basal concavity, may be a result of the evolution of this point style over a period of several thousand years. It seems likely that the Maritime Provinces may have been the starting point for the Maritime Archaic manifestations common in the Strait of Belle Isle region of Southern Labrador beginning by at least 7,000 B.P., and possibly as early as 9,000 B.P. (McGhee and Tuck 1975; Tuck and McGhee 1975; Renouf 1977). The presence of endscrapers and *pièces esquillées* not unlike those from Paleoindian assemblages to the south further supports the contention of a derivative relationship of the Southern Labrador collections with the Early and Late Paleoindian manifestations in the Maritimes.

The unfluted lanceolate points show clear similarities with the Late Paleoindian ascribed Great Lakes points, which are likely roughly contemporaneous. The Zander site, located to the south of Lake Simcoe (Stewart 1984), is an example of a Great Lakes region site with both lanceolate fluted and unfluted projectile points not unlike the Reagan site. The presence of both fluted and unfluted lancolate projectile points at both Reagan and Plenge sites clearly seems to suggest a very late Early Paleoindian and/or a very early Late Paleoindian association; indeed, the difference in one association over the other is probably just a question of semantics. As Wilson and others (1995: 165) have pointed out, the terms Paleoindian, Late Paleoindian and Archaic have "become so overloaded with meaning that more weight has been placed on the divisions than may actually be present in the data." Both Holcombe points (e.g., Fitting 1970) and Crowfield points (e.g., Storck 1984) demonstrate clear affinities to the Plenge site and especially to the Reagan site lanceolate points. However, while Holcombe assemblages also contain notched points, these are not present in the Northeastern Late Paleoindian assemblages, where notched points are characteristic of the Archaic period.



**Crowfield Fluted Point**



**Holcombe Point**

**Figure 6.2: Examples of Great Lakes points similar to those in New England. (London Chapter of the Ontario Archaeological Society, n.d.)**

There are two primary means by which the elongate, parallel-flaked point tradition found in much of the Northeast may have developed. In the first scenario, this form may represent the arrival of a new migratory group whose ultimate homeland is found in western North America. This suggestion is based on the similarities often noted between Late Paleoindian parallel-flaked points in the Northeast, and those from the Great Plains, especially the Agate Basin type and Cody Complex points such as Alberta, Eden and Scotsbluff (e.g., Petersen et al. 2000: 123). The Cody complex points are indeed visually and technologically very similar to points from northern Maine and the Gaspé Peninsula, exhibiting exceptional quality in terms of the skill required in their manufacture and the consistency with which they were produced (Bradley 1993: 260). Although this scenario of a new, large scale migration from the Great Plains is possible, it seems more likely that the eastern parallel-flaked projectile point tradition was an analogous development. There are notable differences between the western and eastern parallel-flaked points, such as the absence of stemming on the latter.

In the second scenario, this form may have developed within the region from the fluted to unfluted lanceolate point form. These points are often slightly lanceolate in outline, and parallel flaking is evident on several of the Reagan site points (Haviland and Power 1994: 25). The Reagan site may have been utilized over a long time span, with much of the original artifact assemblage destroyed by shifting sands (Ritchie 1953: 250). Both finely made parallel-flaked points and excurvate, lanceolate or "lozenge-shaped" projectile points have been recovered at some Gaspé Peninsula sites, such as La Martre (Dumais 2000). Furthermore, the similarity in overall morphology and flaking characteristics of the parallel-flaked points found at the Varney Farm site in southern Maine and the many identified sites in the Gaspé Peninsula suggests a close relationship between these sites. It is the contention of this author that, despite the current discrepancies in the available radiocarbon dates, these sites were probably occupied contemporaneously and may have been part of a large band "territory."

### *6.3 Migration and Movement*

Migrations of groups in prehistory is not often considered in a systematic and theoretically-based manner by archaeologists, because

> their apparent unpredictability and the difficulty of identifying them archaeologically… [mean] migration has been avoided because archaeologists lack the theory and methods that might allow them to incorporate migration into the explanation of culture change, not because migration is regarded as unimportant (Anthony 1990: 895).

Migration involves the directional movement of an individual or group, which differs from mobility in that mobility is often patterned and/or cyclical and is an integral part of a settlement-subsistence strategy, while migration implies a permanent move to a new region (larger scale movement), a decision that may be influenced by both external (e.g. environment, population pressure) or internal (cultural) constraints (Trigger 1991). It is a structured process that includes initial reconnaissance, colonization, and, eventually, regionalization (Wilson et al. 1995). Communication is generally maintained with the homeland and any remaining population there, such that additional migrants may later follow the initial group (migration streams), or pioneers may return to the place of origin (reverse migration) (Anthony 1990).

It may be difficult to distinguish archaeologically between evidence for migration and evidence for mobility. In the Paleoindian record in the far Northeast, both of these mechanisms of movement certainly affect the archaeological record, which may confuse interpretation of the expansion process and well as of regional settlement pattern analysis (Wilson et al. 1995). Migration can be expected to have generally followed natural corridors such as coastlines or river valleys, and such movements may have been strongly mediated by cultural traditions (Wilson et al. 1995: 171). Anthony (1990: 908) argues that "cultures" as a whole do not migrate, but rather a narrowly defined, goal-oriented subgroup of that culture, and that this group will tend to behave in a broadly predictable manner. By looking at the patterning of the archaeological record, it should be possible to make some informed speculation about migration as well as mobility in the Late Paleoindian record.

Wilson and others (1995: 172) have suggested the possibility that several distantly related "bands" may have moved into the far Northeast at different times and from different homelands during the Paleoindian period. Although arcaheologically similar in terms of the Paleoindian toolkit, these groups, they posit, may have in fact been separated from each other and their "cultural centre" for generations. The implications for this model are more restricted interaction spheres than have been assumed in this thesis, with maintenance of ties to the "central places" of each band for perhaps centuries after the Paleoindian period ended. Although I do not discount the possibility of a number of distinct "bands" or groups within the region, possibly from different "staging areas" or homelands and different migration routes, I do not feel that the evidence supports isolation of groups within the region. This is based in large part on patterns of raw material use, which suggest very large interaction spheres throughout most of the Paleoindian period. A greater degree of isolation or, at least, increased regionalization may have occurred at the terminus of the Paleoindian period and may be more characteristic of the subsequent Archaic period than for the Late Paleoindian period.

It is generally agreed that the "parallel-flaked horizon" (Doyle et al. 1985: 11) reached the Gaspé Peninsula and northern Maine by means of a migration route from the

Great Lakes area and proceeding west to east along the St. Lawrence River (LaSalle and Chapdelaine 1990; Wilson et al. 1995: 34; Chapdelaine 1996), although Dumais (2000) prefers the hypothesis that the Plano-like migration kept to the north of the Upper Great Lakes to the Upper Ottawa Valley and towards the Montreal Plain, then south towards the Hudson River Valley. I think the former hypothesis is the more likely, based on the location of sites with Plano-like tools along the St. Lawrence such as Brohm and Cummins sites, Ontario (MacNeish 1952; Julig 1994), and Thompson's Island, eastern Ontario (Gogo 1961; Wright 1972; Storck 1984; Ellis and Deller 1990), where points virtually identical to those from the Gaspé Peninsula sites and Varney Farm were recovered.


**Figure 6.3: Projectile Points from Thompson's Island (Chapdelaine 2000).**

Another probable "staging area" for migrations into the far Northeast is the mid-Atlantic region. This contention is supported by the similarities noted above between Dalton projectile points and those from the Maritime Provinces, as well as by raw material distribution. The most common exotic lithic materials in the far Northeast during the Paleoindian period are Normanskill chert and Pennsylvania jasper, while Munsungun chert has been found as far south as New Jersey (Spiess et al. 1998: 248). The latter phenomenon suggests reverse migration and continued contact with the place of origin. Spiess and others (1998) see the Mid-Atlantic region as a "crossroads" where multiple middle and late Paleoindian point styles have been identified. They note that "if staging areas, located in central, ecologically rich districts, grew into centres of contact and communication as migrants stayed in touch with relatives, this is exactly the pattern we would expect to see" (Spiess et al. 1998: 248).

The argument for a Mid-Atlantic homeland based on raw material distributions is also explored by Curran (1999). She suggests that early exploratory movements by individuals or small scouting parties extended along the Atlantic coastal plain, reaching as far as Northern Maine at an early date via the Penobscot and Aroostook River drainages. Such a route, it is argued, would also allow for the hunting of seasonally migrating animals such as caribou (Curran 1999: 19). As for the first groups reaching the Maritime Provinces, Keenlyside (1991: 171) suggests that the initial avenue of entry was along the coast, followed by a spread up the major river systems into the interior lakes. Again, it is likely largely because of a lack of systematic survey that more sites have not yet been identified to fill in both the geographical and temporal gaps now present in the archaeological record of this period.

Spiess et al. (1998: 249) argue that long-distance migration was an integral feature of Paleoindian culture. They posit that the characteristic features of the Paleoindian pattern came to an end once the extent of the far Northeast had been colonized and no "unchartered territory" remained. They argue that the end of the Paleoindian period is better marked by the end of large group migrations into new and previously unoccupied land than by the end of the Plesitocene period and the concomitant changes in the environment (Spiess et al. 1998: 249). Although movement over large areas, both in terms of mobility and migration, was obviously a significant aspect of the Paleoindian way of life, I am not sure that this should be seen as *the* defining characteristic of the entire period. Further, if migration into previously unknown territory was such a priority, why not move at this early date further into Labrador and even the island of Newfoundland? Labrador and Québec's Lower North Shore in particular would in fact have been quite accessible from the Gaspé region. It seems unwise to this researcher to emphasize this aspect as the factor marking the transition to the Archaic period as an alternative explanation to that which sees environmental change and subsequent adaptations to changing resources. I do not argue that the reasons for the adoption of a new technology and a lower degree of migration and mobility is based entirely on environmental factors, as surely deeply ingrained cultural attitudes must have played a major role in determining the course of change over time. However, in a hunter-gatherer group, it seems foolish to discount the potential impact a major environmental shift as is documented for the Pleistocene/Holocene transition, however gradual in terms of an individual life span, on the settlement and subsistence behaviours of a given population.

## 6.4 Metric Attributes of Northeastern Late Paleoindian Projectile Points

The first part of this chapter examined the external relationships and possible means of movement of the technologies represented in the Late Paleoindian archaeological record of the far Northeast. In this section, we turn to the internal variation in the stone tool assemblages at several of the major known sites representative of each of the three identified "diagnostic" projectile point forms attributable to the period. In looking at the metric attributes of the projectile points discussed in this thesis, it is clear that there is a high degree of uniformity within each of the northeastern Late Paleoindian "traditions" of point manufacture. Here again, it is useful to turn to the case studies as were used in the preceding chapter to discuss raw materials. In this instance, each case can be examined in terms of the degree of internal similarity and external differences, both in terms of projectile point morphology and in terms of the tool assemblage as a whole, where applicable.

### *6.4.1 Case Study I: Unfluted Lanceolate Point Associated Assemblages*

This "tradition" of point technology is the least uniform in the northeast Late Paleoindian assemblages; these points are rarely the only point form found in such an assemblage, and they have been found in association with both parallel-flaked points and, more commonly, concave-based triangular points. Such is the case at both the Reagan site and the Nicholas site, as well as at the Plenge site from further south and west.

Unfortunately, metric attributes are not available for the Reagan site assemblage. These details were not recorded in published sources on the site (Ritchie 1953; Haviland

and Power 1994), and although this researcher was able to view several of the Reagan site specimens, the collection is widely dispersed and it was not possible to make measurements of a representative sample of Reagan site projectile points. The Hidden Creek site in southeastern Connecticut did not yield any complete projectile points from which measurements could be obtained (Jones 1997). Thus, this Case Study will have to rely on published measurements of the Nicholas site specimens (which number only three for this point form). More information is available on the overall tool assemblages, at least in terms of presence and absence of the various tool forms identified, although once again information on metric attributes is, in most cases, lacking. It is postulated that this point form may have been shortlived in the far Northeast, having been brought to the region from the Great Lakes but quickly developing into the two very distinctive later forms found in the study region between 10,000 and 8,000 B.P.

The metric attributes for the three unfluted lancolate projectile points recovered from the Nicholas site are found in Table 6.1. These points are generally small in size and are very shallowly basally concave. Based only on very rough estimations from scaled photos of the Reagan site artifacts, it can be estimated that the points of similar morphology from Reagan range from about 29 mm to over 50 mm in length, and thus are quite similar in this regard to the Nicholas site specimens. In terms of width, very rough estimations suggest that the Reagan site points range from about 13 mm to 25 mm in width at the widest point, and 11mm to 19 mm in width at the base. In this case, we see a greater range in widths than is evident on the Nicholas site specimens, but the sample size is too small to suggest that this is a meaningful difference. However, there are badly broken specimens from Reagan that suggest that some specimens in this collection might have originally been much larger. Concavities on the bases of the Reagan site points tend to be very shallow, as is the case with the Nicholas site specimens.

**Table 6.1: Metric Attributes of Unfluted Lanceolate Projectile Points from the Nicholas Site, Oxford, Maine. Numbers in brackets indicate estimations. (Wilson et al. 1995: 87).**

| Cat # | Length (mm) | Width (mm) | Thickness (mm) | Basal Concavity | Maximum Width | Lateral Grinding | Basal Grinding |
|---|---|---|---|---|---|---|---|
| 816 | (26.2) | (27.3) | (5.7) | 0.5 | N/A | Yes | Unknown |
| 1941 | 43.4 | 21.3 | 4.3 | 0.5 | 24.8 | Yes | Unknown |
| 4006 | (52.6) | 25.6 | 7.0 | 1.0 | 39.1 | Light | No |
| **Mean** | **40.7** | **24.7** | **5.7** | **0.7** | **32.0** | | |

The overall assemblages at the Reagan and Nicholas sites are also broadly similar. The variety of tool types represented at the Reagan site includes simple and stemmed endscrapers; sidescrapers; gravers/spokeshaves; retouched flake knives, and knives described as "single shoulder," "lanceolate type," and "ovate type;" trianguloid points, some with ears; lanceolate, lanceolate pentagonoid and pentagonal points; and several stemmed points (Ritchie 1953). Also noted are chipped artifacts of indeterminate form and the unique pendants, unknown from any other Late Paleoindian context.

The Nicholas site assemblage includes a variety of bifaces, including six projectile points, two of which are parallel-sided and four of which are excurvate in outline; a wide variety of unifaces, including endscrapers, perforators or awls, sidescrapers, spokeshaves (here called concave scrapers), and composite tools, among other designations; *pièce esquillées*; cores; and a coarse stone industry including abraders, choppers, and hammerstones (Wilson et al. 1995). The latter three components of the assemblage at the Nicholas site are not found at the Reagan site, but, particularly in the case of cores and coarse stone implements, this may be a matter of recovery techniques rather than a true representation of the original site assemblage.

In terms of percentages of the total assemblage, Table 6.2 summarizes the representation of the various tool types at each of these two sites. A graphic representation of these data is included as Figure 6.1. In the case of both sites, some artifact division used by the sites' excavators have been "lumped" when these are not necessary for the purpose of this comparison. However, in the case of the Nicholas site unifaces, perhaps more specimens could be lumped under the endscraper and sidescraper category, but when uncertain these have simply been left in the "other uniface" category.

**Table 6.2: Comparison of tool assemblages at Reagan site and Nicholas site. N.B.: percentages may not add up to 100 due to rounding error.**

| | Reagan Site | | Nicholas Site | |
|---|---|---|---|---|
| **Artifact Type** | n = | % | n = | % |
| Projectile Point | 47 | 26 | 6 | 3 |
| Other Biface | 37 | 21 | 33 | 15 |
| Endscraper | 47 | 26 | 41 | 18 |
| Sidescraper | 31 | 17 | 19 | 9 |
| Other Uniface | 4 | 2 | 105 | 47 |
| Core/Core Fragment | 0 | 0 | 17 | 8 |
| *Pièce Esquillées* | 0 | 0 | 1 | <1 |
| Pendants | 13 | 7 | 0 | 0 |
| **TOTAL** | 179 | 99 | 222 | 100 |

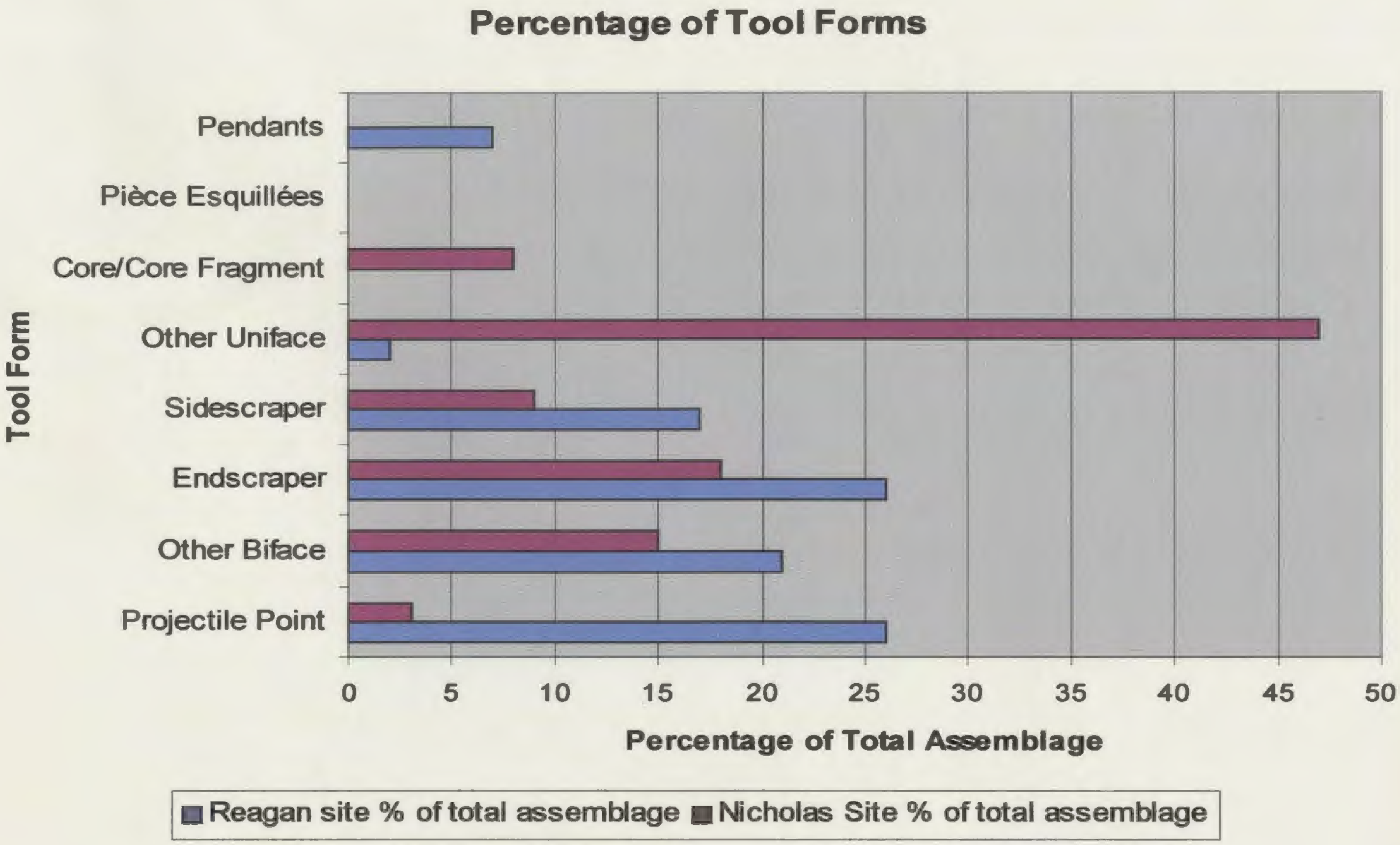



**Figure 6.4: Proportion of tool forms represented at Reagan Site and Nicholas Site**

The obvious differences between these two assemblages are in the preponderance of projectile points, which is much higher at the Reagan site, and the prevalence of unifaces, which is considerably higher at the Nicholas site. It should also be emphasized once again that while the Reagan site contained both fluted and unfluted points, the Nicholas site contained only unfluted points. This seems to suggest a later date for the Nicholas site than for the Reagan site, which could be cited as a reason for the difference. However, a functional argument may be more applicable. The Reagan site was located in an area with views to the east, south and west and the absence of a coarse stone industry, drills, awls and *pièce esquillées* suggests that the full range of domestic activities represented at many Late Paleoindian sites may not have taken place here (Snow 1980: 143). Instead, the site may represent a hunting station, suggested by the high proportion of projectile points. The Nicholas site, on the other hand, is interpreted as a campsite where a variety of domestic activities was carried out (Wilson et al. 1995). This may have included considerable hideworking and, to a lesser degree, woodworking activity, based on the dominance of scrapers and the presence of awls, spokeshaves and "expedient tips."

### *6.4.2 Case Study II: Elongate, Parallel-Flaked Point Associated Assemblages*

In this case study, we again turn to the sites with the best documentation. The best data are available for the Rimouski site, which is well published (Chapdelaine 1994), and the Varney Farm site, which the author was able to examine and measure. Additional information is contributed from sites such as La Martre (Chalifoux 1999; Dumais 2000) and Ste-Anne-des-Monts (Benmouyal 1987) where useful. The metric attributes of the complete and nearly complete projectile points from the Varney Farm site are found in Table 6.3, and those from the Rimouski site in Table 6.4.

**Table 6.3: Metric Attributes of Varney Farm Projectile Points.**

| Varney Farm Projectile Points | | | |
|---|---|---|---|
| **Catalogue No.** | **Length (mm)** | **Width (mm)** | **Thickness (mm)** |
| 36-57, 120-1 | 40.0 | 15.8 | 3.6 |
| 36-57, 171-6 + others | 104.4 | 19.5 | 4.4 |
| 1294-1, 1000-1, 991-2 | 58.7 | 15.5 | 3.7 |
| 470-1 | | 15.6 | 4.0 |
| 257-1, 1210, 1204, 26-1 | | 16.5 | 4.5 |
| 582-1, 359-1 | | 17.8 | 4.1 |
| **Mean** | 67.7 | 16.8 | 4.1 |
| **Range** | 40.0-104.4 | 15.5-19.5 | 3.6-4.5 |
| **Standard Deviation** | 33.1 | 1.6 | 0.4 |

**Table 6.4: Metric Attributes of Rimouski site Projectile Points (from Chapdelaine 1994: 183).**

| Rimouski Projectile Points | | | |
|---|---|---|---|
| **Catalogue No.** | **Length (mm)** | **Width (mm)** | **Thickness (mm)** |
| 105 | 31.3 | 17.9 | 4.9 |
| 118 | 30.9 | 15.1 | 6.5 |
| 121 | 52.4 | 23.6 | 7.3 |
| 127 | 52.8 | 16.7 | 6.1 |
| 131 | 78.5 | 21.9 | 7.9 |
| 132 | 25.0 | 20.0 | 5.0 |
| 172 | | | 6.6 |
| 174 | | 16.5 | 2.4 |
| 1174 | | | 4.8 |
| 1196 | 29.8 | 19.2 | 7.2 |
| **Range** | 25.0--78.5 | 15.1--23.6 | 2.4--7.9 |
| **Mean** | 43.0 | 18.9 | 5.9 |
| **Standard Deviation** | 19.3 | 2.9 | 1.6 |

Unfortunately, only three specimens from the Varney Farm collection are complete enough to get an accurate measurement of length. These show a wide range of variation, which is likely attributed to the stage of use-life of the point; the smallest one, for example, may be considerably later in its use-life and may have been reworked and resharpened several times. Considerable tool maintenance would be expected at a site located at such a distance from its preferred lithic source, found 250 km to the north at Munsungun Lake, Maine. This suggestion is supported by the lithic debitage attribute analysis undertaken on the 1994 sample from the Varney Farm site, which revealed that less than 1% of the flakes in the sample can be attributed to primary reduction activities, such that over 99% of the flakes represent secondary and tertiary reduction. Fully 98% of the flakes are 3 cm or less in maximum dimension (Petersen et al. 2000: 127). No information is available on the number of flakes exhibiting cortex, but it is likely a very small proportion of the total.

The Rimouski site points are generally shorter and more consistent in length than those from Varney Farm. This may once again be related to proximity to raw material source, as the Rimouski site is relatively closer to its raw material sources than is the Varney Farm site. Point widths are similar at the two sites, and in both assemblages, the points are very thin and delicate, especially so at the Varney Farm site where the points are very consistently 4.5 mm or less in thickness.

The Ste-Anne-des-Monts points (Benmouyal 1987) have estimated average dimensions of 125 mm long by 20 mm wide by 5 mm thick, placing them close to both of the above assemblages in terms of width and thickness. The length estimate, based on fragments, may be too high. If accurate, these points are notably longer than those at any comparable assemblage in the region. The projectile point samples from La Martre, and Mitis are too small and fragmentary to be useful for comparison.

The same general range of tools is represented at both the Varney Farm and Rimouski sites, with a few exceptions. As mentioned, endscrapers are conspicuously absent at Varney Farm, and modified flakes are not recorded at Rimouski (although it is unlikely that flakes were not modified for use as expedient tools). A comparison of the tool forms and their percentages identified in each assemblage is found in Table 6.5. Due to notable differences in the assemblages recorded at the three identified loci of activity at Rimouski site, these are recorded separately. The Varney Farm assemblage, however, is considered a single locus site (Petersen et al. 2000: 119). A graphical representation of this comparison is found in Figure 6.5.

**Table 6.5: Artifacts (n and percentage) by category at Rimouski (Southeast, Southwest, and North loci) and Varney Farm.**

| Artifact | Varney Farm | | Rimouski SE | | Rimouski SW | | Rimouski N | |
|---|---|---|---|---|---|---|---|---|
| | n = | % of tools | n = | % of tools | n = | % of tools | n = | % of tools |
| Projectile Point | 16 | 13 | 5 | 11 | 3 | 3 | 2 | 7 |
| Point Preform | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 4 |
| Biface | 38 | 30 | 21 | 45 | 39 | 44 | 10 | 37 |
| Biface Preform | 0 | 0 | 1 | 2 | 3 | 3 | 3 | 11 |
| Drill | 3 | 2 | 1 | 2 | 2 | 2 | 4 | 15 |
| Uniface scraper (sidescraper) | 11 | 9 | 0 | 0 | 11 | 13 | 1 | 4 |
| Endscraper | 0 | 0 | 2 | 4 | 4 | 5 | 2 | 7 |
| Modified Flake | 34 | 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| Utilized Flake | 19 | 15 | 16 | 34 | 19 | 21 | 4 | 15 |
| Hammerstone | 3 | 2 | 0 | 0 | 2 | 2 | 0 | 0 |
| Chopper | 1 | 1 | 0 | 0 | 2 | 2 | 0 | 0 |
| Abrader | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 |
| **Total** | **125** | **99** | **47** | **100** | **89** | **99** | **27** | **100** |

| | Varney Farm | | Rimouski SE | | Rimouski SW | | Rimouski N | |
|---|---|---|---|---|---|---|---|---|
| | n = | % of total assemblage | n = | % of total assemblage | n = | % of total assemblage | n = | % of total assemblage |
| Flakes | 2351 | **95.0** | 6244 | **99.3** | 12192 | **99.3** | 2535 | **99.0** |

As the chart and the graphs below demonstrate, bifaces are well represented at all loci, consisting of between 30% and 45% of the total assemblage. The major difference in this regard is the absence of preforms at Varney Farm. Non-chipped tools, including hammerstones, choppers and abraders, are noted only at Varney Farm (lacking abraders) and Rimouski Southwest. Chapdelaine (1994: 201) attributes the rarity of hammerstones at Rimouski to the probable preference for softer materials for this purpose, likely wood and/or mammal long bones. Both Rimouski Southwest and Varney Farm have much higher percentages of sidescrapers than the other loci. At Rimouski, this has been interpreted as possibly representative of distinct and contemporaneous activity areas at the site, in which the Southwest locus was used for intensive hideworking activities and, based on the extremely high number of flakes in this locus, tool maintenance (Chapdelaine 1994). Varney Farm is most likely representative of a camping site and/or hunting station, based on the site location in the Nezinscot River drainage, which may have been used to channel game or for fishing (Cox and Petersen 1997: 43), and based on the high percentage of projectile points and bifaces. The presence of flake tools and a coarse stone industry suggests that at least some domestic activities were carried out at the Varney Farm site.

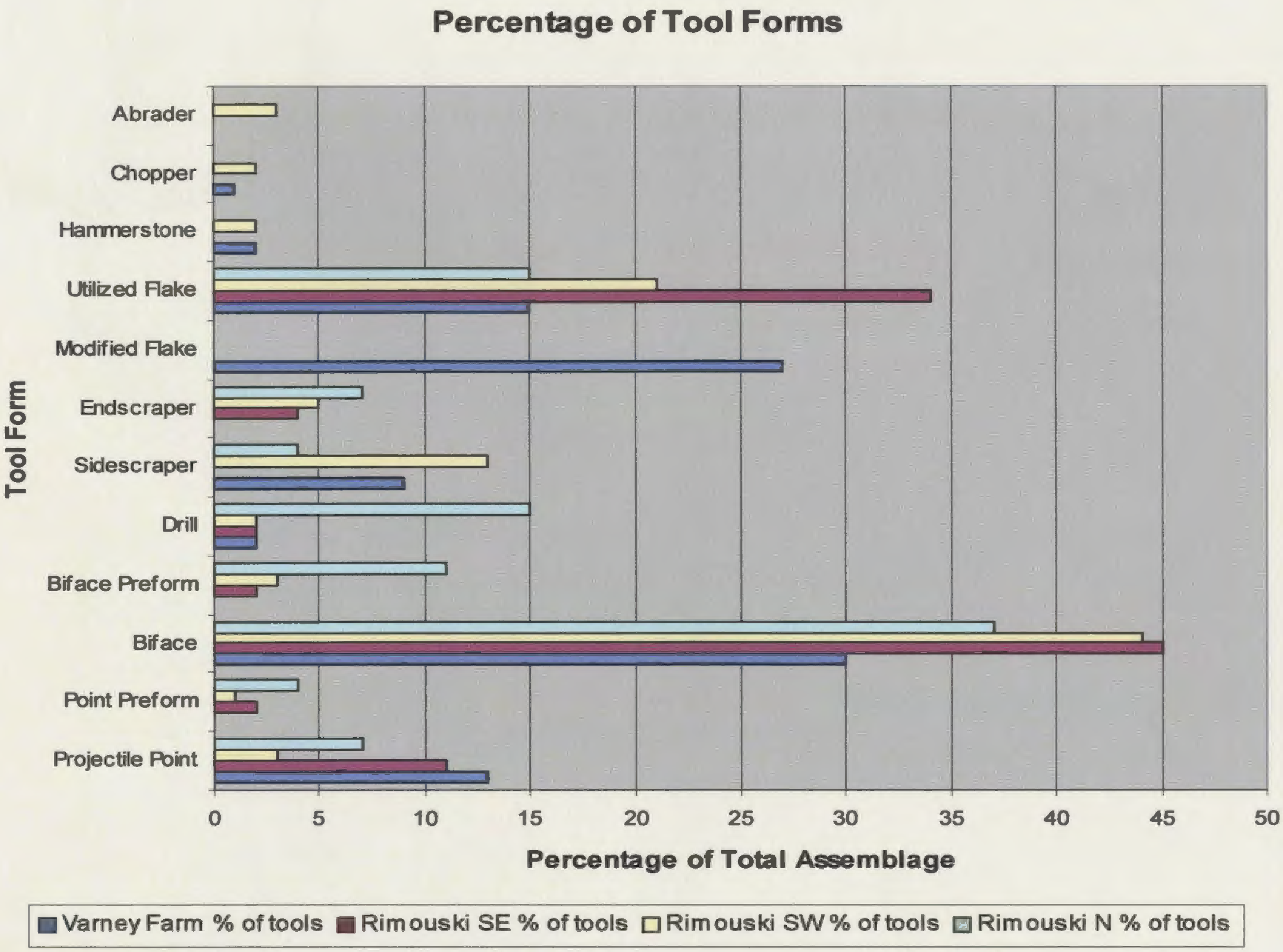



**Figure 6.5: Proportion of tool forms represented at Varney Farm site and at North, Southwest and Southeast loci at Rimouski site.**

### *6.4.3 Case Study III: Trianguloid Point Associated Assemblages*

As has been observed in this thesis, the trianguloid, concave-based point form is found primarily in the furthest northern and eastern reaches of the study area. Unfortunately, documentation for these sites is poor. Metric attributes have been published for a number of the surface collected points from the Gulf Shore of Prince Edward Island, and the author was able to examine and record metric attributes for the Magdalen Island specimens. Although likely considerably later temporally (see section on *Chronology* below), some of the Cowpath site specimens from the Strait of Belle Isle were also examined by the author for the purpose of comparison. However, these are not a complete sample, as many of the Late Paleoindian-like points referred to in such sources as McGhee and Tuck 1975 and Renouf 1977 could not be located.

**Table 6.6: MetricAttributes of Magdalen Island Projectile Points.**

| **MAGDALEN ISLAND PROJECTILE POINTS (ChCl-9, ChCl-5, ChCl-4)** | | | | |
|---|---|---|---|---|
| **Catalogue No.** | **Height** | **Width** | **Thickness** | **Basal Depth** |
| ChCl-9-25 | 52.7 | 27.2 | 9.0 | 4.6 |
| ChCl-9-29 | 47.8 | 31.6 | 8.0 | 9.1 |
| ChCl-5-50 | 41.0 | 23.5 | 4.8 | 3.9 |
| ChCl-5-56 | n/a | 25.2 | 7.1 | n/a |
| ChCl-4-61 | n/a | 31.6 | 10.6 | 2.5 |
| ChCl-4-34 | 60.3 | 27.0 | 7.8 | 6.1 |
| **Range** | 41.0--60.3 | 23.5--31.6 | 4.8--10.6 | 2.5--9.1 |
| **Mean** | 50.5 | 27.7 | 7.9 | 5.2 |
| **Standard Deviation** | 8.1 | 3.3 | 1.9 | 2.5 |

**Table 6.7: Metric Attributes of Selected Late Paleoindian Points from Prince Edward Island (after Keenlyside 1991).**

| PRINCE EDWARD ISLAND PROJECTILE POINTS | | | | |
|---|---|---|---|---|
| **Cat. No.** | **Length** | **Width** | **Thickness** | **Basal Depth** |
| CcCq-3:2493 | 86 | 46 | 9.5 | 10 |
| CcCq-3:2475 | 46 | 30 | 7 | 9 |
| CcCq-3:2494 | 49 | 33 | 5.5 | 8 |
| CcCq-3:2503 | 44 | 36.5 | 6 | 3 |
| CcCq-3:2505 | 40 | 24 | 5.5 | |
| CcCq-3:1000 | 64 | 31 | 8 | 4 |
| CcCq-3:2510 | 43 | 28 | 7 | 2 |
| CcCq-3:2502 | | | 7 | |
| CcCq-3:2506 | | | 6 | |
| CcCq-3:2497 | 57 | 33 | 6.5 | |
| CcCq-3:2501 | | | 5 | |
| CcCq-3:2511 | 60 | 45 | 11 | 4 |
| CcCq-3:2508 | 40 | 22 | 5.5 | 4 |
| CcCq-3:2512 | | | | |
| CcCq-3:2500 | | 46 | 11 | 7 |
| CcCq-3:2498 | 46 | 25 | 6.5 | 3 |
| CcCq-3:2105 | | 25 | 7 | |
| CcCp-7:1 | | 37 | 7 | 16 |
| CcCm-18 | | 36 | 5 | 11.5 |
| CcCr-1:49 | 41 | 25 | 7 | 5.5 |
| CcCr-1:50 | 45 | 33 | 8 | |
| VIII-C:179 | 63 | 30 | 9.5 | 8.5 |
| CcCm-6:a | 29 | 19 | 5 | 6 |
| CcCm-6:b | 55 | 33 | 6 | 7 |
| CcCm-6:97 | 52 | 30 | 7 | 5 |
| **Range** | 29--86 | 19--46 | 3--11 | 2--16 |
| **Mean** | 50.6 | 31.8 | 7.0 | 6.7 |
| **Standard Deviation** | 13.0 | 7.5 | 1.7 | 3.6 |

**Table 6.8: Metric Attributes of Cowpath Site Projectile Points.**
**N.B.: basal concavity is not recorded as most points are straight or nearly straight based.**

| COWPATH PROJECTILE POINTS (EjBe) | | | |
|---|---|---|---|
| **Catalogue No.** | **Length** | **Width** | **Thickness** |
| 7--62 | 39.2 | 26.5 | 10.7 |
| 7--268 | 42.5 | | 9.1 |
| 22--30 | 31.8 | 24.4 | 7.1 |
| 22--37 | 28.7 | 23.8 | 6.9 |
| 22--29 | 38.7 | 24.2 | 6.3 |
| **Range** | 31.8-42.5 | 23.8-26.5 | 6.3-10.7 |
| **Mean** | 36.2 | 24.7 | 8.0 |
| **Standard Deviation** | 5.7 | 0.3 | 1.8 |

Measurements from the Magdalen Island specimens are found in Table 6.6. Table 6.7 contains measurements from the Prince Edward Island specimens as recorded by Keenlyside (1985, 1991), and Table 6.8 contains the available measurements for the Cowpath points examined by the author.

The Prince Edward Island sample is considerably larger than the others and, as would be expected, exhibits a wider range of measurements in terms of all four of the attributes recorded (i.e., length, width, thickness and depth of basal concavity). The mean measurements, especially in terms of length, width, and thickness, are strikingly similar for the Prince Edward Island and Magdalen Island specimens. This is not unexpected, as the two areas are very close geographically and, it is suggested, have roughly contemporaneous Late Paleoindian occupations. The Cowpath site points are considerably smaller and have a very small basal concavity to no basal concavity, and are made primarily on quartz and quartzite, while most of the Prince Edward Island and

Magdalen Island points are made on the Ingonish chert/rhyolite. The changes in size and morphology are likely attributable at least in part to temporal differences.

It is also notable that in addition to being much shorter and broader than the elongate, parallel-flaked points found further west in the study area, the trianguloid points are also considerably thicker. The makers of these points must have been less concerned with the aesthetics of their tools, as these points are made much less finely and delicately than the elongate points found in Maine and on the Gaspé Peninsula. Most of the flaked stone tools in the elongate parallel-flaked Late Paleoindian tradition show a definite attention to detail and beauty. This may have had something to do with access to raw materials, insofar as it would have been much more difficult to make fine and delicate tools on the materials available in the eastern Maritime Provinces than on the cherts available in northern Maine and the Gaspé Peninsula. However, this is not likely the sole determining factor, as distance was rarely an issue in terms of Late Paleoindian lithic raw material use. It is not likely attributable to environmental factors, as the habitats of the two areas would not have been strikingly different and most of the same floral and faunal resources were found throughout the area in question, as outlined in Chapter Four. For some unknown reason, the Late Paleoindian inhabitants may have simply placed a greater cultural value on the quality and aesthetic characteristics of their projectile points than did their neighbours to the east.

In the case of the trianguloid Late Paleoindian projectile point tradition, it is not possible to compare overall assemblages as has been done in the previous case studies, as a fully excavated assemblage is not yet available for a site representing this technology.

The points that are available represent a series of isolated finds, and this is not and cannot be directly related to one another in the same way as an assemblage from a single site. It was hoped that fieldwork undertaken by the author in the summer of 2001 (MacCarthy 2002) would remedy this situation, but an *in situ* assemblage of Late Paleoindian affiliation in the eastern Maritimes remains elusive.

### *6.5 Chronology*

Although Petersen (Petersen and Cox 1998; Petersen 2000; pers. comm. 2001) favours the earliest radiocarbon date of 9,410 ± 190 (uncalibrated conventional C14 date) for the Varney Farm site, it is felt by this researcher that the cluster of five AMS radiocarbon dates between 8,700 ± 60 B.P. and 8,380 ± 100 B.P. may be the more representative of the actual age of occupation at the site. The Rimouski site date of 8,150 ± 130 B.P., considered by Petersen (2000: 118) to be too recent, may fit the regional chronology within the acceptable range of standard deviations. The 5,960 ± 100 B.P. date obtained from Ste.-Anne-des-Monts, a Plano-like site very similar to Rimouski, considered by most researchers to be too recent (e.g., Wright 1982; Dumais et Rousseau 1985), although the original researcher at the site does not discount it (Benmouyal 1987). Although it is possible that the Plano-like, parallel-flaked point tradition persisted longer in the Gaspé region of Québec than in other regions of the northeast, this date seems unduly recent. Most dates obtained from Late Paleoindian sites within the Gaspé region suggest occupation beginning perhaps slightly before 8,000 B.P. Recent dates obtained for the Squatec site (ClEe-9) (Dumais 1993, 2002, pers. comm.), a Late Paleoindian site of the Plano-like tradition in Témiscouta, Québec, are clustered between about 8,400 and 7,800 B.P., thus supporting the Rimouski dates. A further radiocarbon date for the Plano-like Late Paleoindian Plano-like manifestation in the Gaspé Peninsula comes from the Saint-Romuald site. This date of 7,990 ± 80 BP is associated with a quartz industry, but the tools are morphologically similar to those of other Plano-like Gaspé Peninsula sites (Laliberté 1992; Chapdelaine 1996). This site may represent a later manifestation of the Plano-like technology than the other identified sites in the region, demonstrating the shift towards the incorporation of poorer quality local lithic sources into the toolkit, a hypothesis tentatively supported by the available radiocarbon dates (a list all relevant radiocarbon dates and their lab reference numbers can be found in Appendix A).

If the fluted point sites of Bull Brook, Debert and Vail are dated to approximately 10,700 to 10,500 (MacDonald 1968; Gramly 1982; Grimes et al. 1984; Levine 1990; Curran 1999), with a slightly later cluster including Michaud, Templeton, and Neponset sites at about 10,200 B.P. which show closer affinities with the Great Lakes region Barnes points of the Parkhill phase (Curran 1999: 7), we might expect a date for Reagan of perhaps several hundred years later than Michaud and its contemporaries. The Barnes points from the Great Lakes are dated to ca. 10,700 B.P. (Ellis and Deller 1990: 40), and the 10,200 B.P. date proposed above for the Michaud group of later Early Paleoindian sites may be a bit too recent; 10,400 B.P. might be a better estimation.

Unfortunately, as has been mentioned, there are no radiocarbon dates available for Reagan site, which has yielded Crowfield and Holcombe-like projectile points (Spiess et al. 1998: 213). The one radiocarbon date for the technologically similar Nicholas site (approximately 6,600 B.P.) is considered too recent based on the tool morphology at the site (Wilson et al. 1995: 164). However, at the little reported Esker site in Maine, which yielded "Holcombe-like points identical to those from the Nicholas site," a radiocarbon date from spruce charcoal was obtained, providing an uncorrected date of 10,090 ± 70 B.P. (Spiess et al. 1998: 218). In the Great Lakes, Crowfield points have been roughly dated to 10,500 B.P., and Holcombe points to ca. 10,300 B.P., although these dates are based on guesswork and assumptions of cultural evolution in projectile points, not on radiocarbon or other absolute dates (Ellis and Deller 1990: 40). It should be expected that, given a general west-to-east movement of people and their associated technology, the Great Lakes point should be slightly older than their northeastern New England counterparts. The full development of the elongate parallel-flaked point tradition in the Northeast could easily have taken another millennium. The same may be true for the concave based to straight based trianguloid point tradition.

The current radiocarbon record indicates some temporal and geographical overlap between the technologies considered Late Paleoindian and Early Archaic. Several well-stratified sites, particularly in northern Maine, have yielded diagnostic Archaic artifacts such as ground stone tools likely dating to over 9,000 B.P. at the Sharrow site (Petersen et al. 1986; Petersen and Putnam 1992). There is also some evidence to suggest the presence of Archaic ground stone gouges and adzes at the Blackman Stream site dated to as early as 8,360 ± 150 B.P., although several later dates were also associated with this deposit (Sanger et al. 1992). There is no reason to doubt that these two groups may have co-existed for some time, with some groups holding on to an older technology longer than others. However, most of the dates on Archaic materials from the far Northeast post-date 8,000 B.P. Based on the many similarities in site location preference, trends in raw materials (in which more and more local materials became used in the Late Paleoindian period), and tool morphology, continuity seems more likely than population replacement to explain the introduction of the ground stone technology known as Archaic in the far Northeast.

There are still some obvious holes in the archaeological record for much of this time, a so-called "cultural gap" (LaSalle and Chapdelaine 1990: 15). Data and sites are few and far between for the period preceding about 6,000 B.P. in the Northeast, and the lack of organic preservation in the region compounds the problem, making radiocarbon dating impossible in many cases. It is, in large part, this lack of refinement in the radiocarbon record that may make this gap seem more significant than it truly is, and if the rate of increase of archaeological data over the past twenty years is replicated in the next twenty years, it is likely that much of this "gap" will soon be filled.

# CHAPTER SEVEN

## Summary and Conclusions

The preceding chapters have examined much of the available data for the Late Paleoindian period in the far Northeast from a number of perspectives. These have included the paleoenvironment; lithic raw material distribution in terms of source area and transport of raw materials over space and the implications of such movement of materials on mobility; and variation within and between assemblages in the region and their apparent similarities with sites outside the region, and the implications of such patterns on migration, culture, and communication with the place of origin. A number of suggestions have been put forth, and these will here be summarized and expanded upon to make some informed conclusions about the poorly understood Late Paleoindian period in the far Northeast. It is not assumed that all of these assertions are correct, and it is certain that new data will soon disprove many of the suggestions made herein. It is hoped, however, that work such as this thesis will generate continued interest in, and discussion concerning, this difficult stage in prehistory.

The most common reason cited when the increased diversity of projectile point forms is discussed in the literature is increased regionalization, generally assuming both decreased communication and contact with groups in other areas and an increasing adaptation to the local environment (e.g., Wilson et al. 1995). This explanation is entirely too simplistic to satisfactorily answer the myriad questions raised by the available Late Paleoindian archaeological record. This thesis has set forth a number of hypotheses that may contribute to an understanding of the period between 10,000 and 8,000 B.P. in the far Northeast. These will now be reviewed in light of the evidence as outlined in the preceding chapters.

### *7.1 Summing Up: What is Known About the Late Paleoindian Period*

In the period between 10,000 and 8,000 B.P., the environment was in a state of flux. This period marks the beginning of the Holocene epoch, and was characterized by a general warming trend and a concomitant vegetational change (tundra to woodland), although at least one significant climatic reversal, corresponding roughly with Europe's Younger Dryas, has been documented. By this time, possibly around 10,800 B.P., megafaunal species such as mammoth and mastadon were already extinct (Mead and Meltzer 1984). Other resident faunal species of the far Northeast surely responded to the climatic changes of the early Holocene, either by adapting, moving, or becoming extinct. Chapter Four summarized all the known data relating to both the terrestrial and marine species evidenced in the early Holocene record. This includes a wide variety of cervids and other mammals, rodents, birds, fish, and marine mammals. Also available were plant foods such as berries, grapes, and nuts. Unfortunately, very few Late Paleoindian sites have yielded either floral or faunal remains which would link these populations to the exploitation of any of the species available on the local landscape. Further, we are likely seeing a very skewed picture of the total tool assemblage used by Late Paleoindian peoples, who surely made many of their tools from wood, bone and antler, none of which is generally preserved in the acidic soils of the region. Most of our information on Late

Paleoindian subsistence, then, relies on inference and modelling based on indirect and incomplete evidence.

It is possible to say a few things about Late Paleoindian settlement and subsistence with relative certainty. The first is that they were surely a highly mobile population, as evidenced by their raw material use patterns. In some cases, the dominant raw material at a site came from several hundred kilometres away, a situation unlikely to have occurred by means other than direct procurement. This mobility may have gradually decreased throughout the Late Paleoindian period, as more local stone began to be utilized and following large game herds became less and less a focus of subsistence activity, as may have been the case in the Early Paleoindian period (e.g., Gramly 1982; MacDonald 1968) The second is that they must have had far-reaching contacts and communication, also evidenced by raw material patterns suggestive of forward and reverse migration, as well as by the broad regions over which technology travelled. It is also likely that group interactions were necessary for social reasons, such as the exchange of marriage partners, necessary in very low population density situations (Anderson 1996: 44). Finally, I think it is safe to suggest that Late Paleoindians represented a shift towards increased generalization in subsistence, as flexibility would have been a key adaptive characteristic in a fluctuating and unpredictable environment. This generalization apparently persisted into the Archaic period, by which time generalization in subsistence, generally within a much smaller "territory," may have become as culturally entrenched as once was the constant migration and mobility characterizing the Paleoindian period.

### *7.2 The Early to Late Paleoindian Transition*

In the unfluted lanceolate, Holcombe-like assemblages of New England (Reagan, Nicholas, Esker, and Hidden Creek sites, to name a few), the assemblages seem in many ways to parallel Early Paleoindian toolkits. Raw materials tend to be good quality, and in many cases the assemblages are dominated by a single cryptocrystalline lithic source, such as is the case at Hidden Creek site, which is dominated (about 68% of the Late Paleoindian assemblage) by a Normanskill-like chert (Jones 1997; Spiess et al. 1998). The Nicholas site assemblage, as has been mentioned, is almost entirely fashioned on Mt. Jasper rhyolite. This selectivity is highly characteristic of the Early Paleoindian period, as is seen at sites such as Vail, Debert and Bull Brook.

The Reagan site is likely one of the earliest of the Late Paleoindian sites, or perhaps can be seen as transitional between the Early and Late Paleoindian periods as it contains both fluted, Crowfield-like points and unfluted lanceolate, Holcombe-like points. It also contains smaller, triangular points that may be precursors to those found in surface collections from the Maritime Provinces. Based on typological comparisons, the Reagan site probably dates to about 10,200 to 10,000 B.P. It is likely slightly later temporally than the Michaud site in Maine and the Neponset site in Massachusetts, whose points are more akin to Barnes points of the Parkhill Phase in the Great Lakes sequence. We may consider the Reagan site as transitional between what is known as the Early Paleoindian and Late Paleoindian periods. The same designation may apply to the Plenge site in northern New Jersey, which has an assemblage very similar overall to that recovered from the Reagan site. It is also tentatively postulated that such sites may represent meeting areas for a number of groups, possibly as a means of strengthening and maintaining social ties, exchanging information on resources, or exchange of group members as marriage partners. This interpretation would account for the much wider than normal variety of raw materials present in the assemblage, as well as the greater variety in tool forms, which may be representative of the different groups present.

The Nicholas, Esker, and Hidden Creek sites may be considered more fully Late Paleoindian in association; the latter site is located outside the study area, but based on typological similarities and the paucity of sites within the study region, it is also considered here. The biggest and most diagnostic assemblage comes from the Nicholas site, but no convincing radiocarbon dates are available. However, as mentioned, the Esker site, which yielded very similar Holcombe-like projectile points, provided a radiocarbon date of approximately 10,000 B.P. It is here considered that this date likely represents the earliest possible date for this type of assemblage. This technology probably developed *in situ*, but may have been prompted by new arrivals later joining the "pioneering" populations representing the Early Paleoindian period in the Northeast (Dincauze 1996). This would suggest that the unfluted lanceolate point type originally developed in the Great Lakes area, where it is found in much higher numbers than in the Northeast. The identification of a Holcombe-like projectile point from the Melanson site on the Gaspereau River, Nova Scotia (Erskine 1998) is indeed a rare find as this point type has nowhere else been identified in the Maritime Provinces. This form may have been used only briefly in the Northeast before developing into the two other diagnostic forms of the Late Paleoindian period, namely, the concave-based triangular point, which seems to have radiated eastward, and the elongate, parallel-flaked, often lanceolate form, which apparently radiated northward.

It is here suggested that these sites may represent an adaptation to the increasingly forested environments of the early Holocene, in which large mammals were less available, but plant and fish and other diverse resources were more available than in the late glacial environments of the Early Paleoindian precursors in the same region. It is estimated that these sites likely fall within the 10,000 to 9,000 B.P. range, and that this Great Lakes inspired technology was restricted to New England, and did not, in this form, reach the northeasternmost portions of the study region.

### *7.3 Increased Diversity in the Early Holocene*

At perhaps around 9,000 B.P., the users of the Holcombe-like technology may have begun to make increased use of marine resources as they pushed further north and east. This may have been one of the driving forces behind a shift in projectile point technology towards the trianguloid projectile points known from the Maritime Provinces and the Magdalen Islands; conversely, it may be indicative of contacts or migration to the south and west (i.e., the mid-Atlantic region). The Turkey Swamp site in New Jersey, for example, has yielded morphologically similar tools, and many of the Dalton points from deep within the southeast are also strikingly similar. Their overall shape and the depth of the basal concavity favour the explanation of an *in situ* development of this technology out of the Early Paleoindian manifestation in the region, namely, the Vail/Debert fluted point form. The Bull Brook fluted point form is only marginally different, and such points in southern Massachusetts and Pennsylvania may be the precursors to the points identified at Turkey Swamp, an analogous development to that described in the Maritime Provinces. The flatter based triangular points of the Strait of Belle Isle, southern Labrador, and Blanc Sablon on Québec's Lower North Shore, may be later manifestations of this tradition, perhaps dating to some time in the ninth millennium B.P.

The triangular points of the Late Paleoindian period in the Maritimes are share some similarities in overall morphology to endblades used by the marine mammal hunting Dorset peoples of later centuries, and the concave based point users of the Maritime Provinces may have adapted their own technology in a similar fashion. Conversely, bone, ivory and/or antler tools may have been utilized in marine mammal exploitation, or these species may have been used only on an opportunistic basis. In any case, it is here hypothesized that by about 9,000 to 8,000 B.P., the Late Paleoindians of the far Northeast were making use of marine resources in addition to terrestrial, riverine and lacustrine resources. Unfortunately, no faunal preservation is available to confirm this hypothesis, but site locations both for this point-using group (along the northern shore of Prince Edward Island, and the Magdalen Islands localities) and for the parallel-flaked group (along the Gaspé Peninsula) favour this hypothesis.

The elongate, parallel-flaked Plano-like point using groups may represent a parallel development in the region, in this case restricted to the central and northern areas of the study region. In a development analogous to that seen on the Great Plains in Cody Complex points, this tradition of projectile point technology may have prompted or influenced by contacts or migration from further west, likely along the corridor of the St. Lawrence River Valley. This is indicated by the presence of projectile points at Thompson's Island that exhibit very similar characteristics to those further north and east. These points have rarely been identified north or east of the Gaspé Peninsula of Québec, where they are well documented.

There are two areas that presently emerge as centres of activity for the parallel-flaked point using groups: the Gaspé Peninsula and central to southern Maine. Although this may be a bias based on sampling rather than a true distribution, the current data suggest that either a) these two areas represent the general "territory" exploited by the users of the point tradition, including both coastal and interior locations in which similar technology was utilized; or b) it represents two or more "bands" or groups of the same technological tradition, who likely maintained kin ties and perhaps met on a regular basis at times of resource abundance to exchange information and, perhaps, lithic raw materials.

I favour the former suggestion, which suggests a group living part of the year on the coast, and part of the year in the interior. In this pattern, which implies extremely high mobility, it would be less necessary to transport great amounts of lithic materials when travelling north, as the outcrops of the Des Landes formation and other cherts available in the Gaspé would make this unnecessary. When travelling back south however, the lower availability of high quality cherts in central and southern Maine may have encouraged these groups to visit the lithic quarries at Munsungun Lake in northern Maine as they passed through, obtaining sufficient stores of chert to last until their next movement northwards. Conversely, if two groups are represented, we may see in the archaeological record the interior location of the southern (Varney Farm) group, whose coastal locations may now be submerged, and the coastal location of the northern group (Gaspé Peninsula sites such as Rimouski, Ste-Anne-des-Monts and La Martre), whose interior sites have yet to be identified. These could, however, be related to surface finds from find spots such as French Lake, central New Brunswick, or even the Gaspereau Lake and Little Narrows finds on the Nova Scotia mainland and Cape Breton Island, respectively (Keenlyside 1984).

### *7.4 Mobility and Group Interactions*

If there were in fact several different bands or groups represented within the Late Paleoindian period in the Northeast, it is nearly certain that they were regularly in close contact based on the uniformity and consistency of tool morphology throughout the region. It may be possible to suggest that we can identify "bands" based on raw material preference, which may have held symbolic meaning as an indicator of band affiliation. Such a suggestion has been made for New York State and Pennsylvania, where Gramly (1986) suggests three Paleoindian 'areas' based on lithic assemblages dominated by (from east to west) Normanskill chert, Onondaga chert, and Ohio cherts. These areas have been termed "lithic supply zones" (Seeman 1994: 276). Similar suggestions have been made for Ontario (Deller 1989; Deller and Ellis 1986) and the Lower Great Lakes region (Stothers 1996), although Deller (1989) warns against treating all the assemblages in the Paleoindian period as a "homogenous mass," favouring instead analysis based on individual site assemblages, as has largely been done here. In the case of the far northeast, we see Late Paleoindian assemblages dominated by Munsungun chert (Varney Farm), Des Landes Formation cherts (Gaspé sites), Mt. Jasper rhyolite (Nicholas site), and Ingonish chert/rhyolite (Northern shore of Prince Edward Island), to name a few examples. Although it is unlikely that all of these sites are contemporaneous, some indication of group identity may in fact be bound up in these distributions.

The distribution patterns of lithic raw material use is perhaps one of the best lines of evidence available to the researcher interested in Late Paleoindian migration and mobility. Although it is sometimes difficult to identify the mechanisms by which such materials travelled, it is unlikely that enough material to create an entire site's assemblage could be obtained by indirect means, such as trade or exchange, although these mechanisms may account for the very small amounts of exotic materials in some sites. It is also possible that Late Paleoindian groups may have scavenged abandoned sites for materials. For example, it is possible that the Nicolas site inhabitants may have obtained the minute quantities of Munsungun chert present in the assemblage by either:

a) having a small amount of left-over material from a former trip to the source, either by a task group or the entire band;

b) exchanging a resource available in their site vicinity (not necessarily lithic) for Munsungun chert from a group further to the North, even the Varney Farm residents, if these sites were occupied contemporaneously;

c) the exchange of one or more individuals, e.g., marriage partners, who brought with them to the new group a token amount of the lithic material predominantly used by their own group;

d) rather than travelling all the way to the source, nearly 280 km away, the Nicholas site inhabitants may have encountered an abandoned site (Varney

> Farm?) which had usable cores of Munsungun chert, which they then transported back to the site.

Although these proposed possibilities for the movement of lithics are all speculative, especially any suggestion of contact or linkage between the Nicholas site and Varney Farm, it does present an interesting possibility. For example, the Nicholas site assemblage is highly dominated by rhyolite, identified as originating from the Mt. Jasper source in New Hampshire. Munsungun chert is a minority material, making up less than one percent of the assemblage. At Varney Farm, on the other hand, the assemblage is dominated by Munsungun chert, with rhyolite comprising less than one percent of the total assemblage. It is tempting to speculate on some connection between the inhabitants of these sites, whose technologies are very different. It is an unfortunate truth about radiocarbon dating, however, that even if such dates were available for the Nicholas site, they are not refined enough to support or refute such a possibility.

### *7.5 Testing the Hypotheses*

#### *7.5.1 Chronology*

The first of the three hypotheses proposed in Chapter One to explain the diversity in point forms in the Late Paleoindian period is that the three points represent a chronological development. This explanation has in fact been put forth by some researchers; it has been hypothesized that the unfluted lanceolate form from sites like Reagan and Nicholas is the earliest, followed by the parallel-flaked points of the Gaspé Peninsula and northern Maine, and finally the concave base trianguloid points of the

Maritimes (Jones 1997). Although the radiocarbon record can neither confirm nor refute this hypothesis, I do not think this is the best explanation for the diversification seen in the Late Paleoindian period. Although indeed, the unfluted lanceolate form analogous to the Holcombe point form in the Great Lakes may be earlier and thus a precursor to the two other forms identified at Late Paleoindian in the study region, it seems more likely that the elongate, parallel-flaked form and the trianguloid, basally thinned form are roughly contemporaneous. The triangular, concave based points from the Maritime Provinces suggest a direct development out of the Vail/Debert form, the latter of which is fairly confidently dated to about 10,600 B.P. (MacDonald 1968; Levine 1990). Even if it took a full millennium for these minor developments to take place, there is no support for a hypothesis that puts these points chronologically later than the Plano-like forms further west, which have been roughly dated to between 9,400 B.P. and 8,000 B.P. based on dates from the Varney Farm and Rimouski sites. It is here asserted that although there are surely some changes over time, a simple cultural evolutionary model is not sufficient to explain the diversity in the Late Paleoindian toolkits of the Northeast.

### *7.5.2 Raw Material Selectivity/ Projectile Point Diversity and Cultural Identity*

One of the possible explanations for the diversity of projectile points in the Late Paleoindian, and/or selectivity in lithic raw materials, is related to the possible symbolic cultural meanings embedded in the use of a particular point form or material by a particular group. In the hypotheses presented at the outset of this thesis, this explanation was termed the cultural variability hypothesis. The use of a given raw material may have had implications far beyond the pragmatic, technological reasons as suggested by Goodyear (1979, 1989). It seems very possible that the raw materials used may have held symbolic meanings for their users, possibly affirming cultural identity.

The same argument can be made for the projectile point forms that became increasingly divergent in the Late Paleoindian period as compared to the Early Paleoindian period. However, I strongly disagree with the suggestion made by Dumais (2000: 100) that

> We might then consider the multiplication of projectile points [in the Late Paleoindian period] as a sign of cultural diversification, maybe in the context of stressful relations within a geographical space occupied by an ever increasing population.

Although the early Holocene may have been the staging ground for increasing cultural diversification, the paucity of archaeological data, even greater in the Late Paleoindian period than in the Early Paleoindian period, does not support the idea of a greatly increased population density in the early Holocene in any part of North America. Even as more Late Paleoindian archaeological sites are likely to be identified, it is improbable, especially in the Northeast, that the evidence will suggest much larger occupation areas than those identified at Early Paleoindian sites such as Bull Brook, Vail and Debert. However, despite the probable small group sizes in the region in the early Holocene, it is not at all unlikely that regional point "traditions" flourished, and that these may have indeed included a symbolic significance related to group identity. Although mobility may have become slightly reduced in the Late Paleoindian period from the preceding period, it likely still remained high (as was discussed in Chapter Five) and even with only a few (three?) distinct groups in the region, there may have been some overlap of territories, particularly at the margins. The use of one point form over another may have indeed served to reinforce group affiliation and cultural identity.

### *7.5.3 Functional/Subsistence Related Explanations of Point Diversity*

The final hypothesis presented as a possible explanation for increased diversity in the Late Paleoindian period is one that argues for a divergence in terms of the functional use of the tools represented, wherein the differing technologies seen in the archaeological record represent differing subsistence foci. Unfortunately, because of the paucity of faunal and floral remains preserved in the Late Paleoindian sites in the region, this hypothesis is essentially untestable. Until some sites are identified in the region that have superior preservation to those already excavated, in remains unknowable whether or not significant differences existed in the subsistence strategies of the various projectile point using groups. All that can be said is that by the Late Paleoindian period, and especially the latter part of the period, the environments across the region were roughly similar; they shared roughly the same resident vegetational cover and the same terrestrial, marine and lacustrine species available for exploitation, although the availability of any given species may have fluctuated over time in such an unstable environment. It is likely that some differences may have existed in their subsistence patterns, but it is impossible to even speculate on how they may have differed. Both the parallel-flaked and triangular point groups chose at least some of their locations on or near the coast, suggesting that marine species did play a role in their diets. They both likely practiced a generalized subsistence strategy but we will have to await new finds to say more about Late Paleoindian subsistence with any certainty.

### *7.6 Migration Routes*

Some discussion has been included in this thesis regarding external relationships to the far Northeast Late Paleoindian record. Clearly, influences and similarities can be noted from assemblages in the Great Lakes region, the Southeast United States, and even the Great Plains of the western United States. Based on point distributions, it seems probable that both of the Great Lakes and the Southeast Paleoindians may have influenced the transitional assemblages in New England, such as the Reagan site. This site and similar assemblages such as Plenge are postulated to be the earliest in the Late Paleoindian sequence in the far Northeast due to the presence of fluted points. From here, an elongate, parallel-flaked and often lanceolate form may have developed on a northward moving migration route, which could have followed the Androscoggin, Kennebec and/or Penobscot River Valleys. Sites and isolated finds in southern and central Maine support such a suggestion. Finds from the Maritime Provinces, i.e. at French Lake, New Brunswick, and Gaspereau Lake, Nova Scotia, represent rare and perhaps sporadic contact or movement of parallel-flaked projectile point-using groups or individuals into a region dominated by trianguloid points in the Late Paleoindian period.

The concave-based trianguloid points of New England (i.e., those at the Reagan and Nicholas sites) may have developed out of the same source. It seems most likely that the deeply concave based points of Prince Edward Island and the Magdalen Islands developed out of the Debert/Vail point form, and their makers very likely followed a coastal route along the Gulf of Maine and Bay of Fundy, along which they may have begun to develop a means of exploiting marine resources. The fact that no sites have been found along these coasts that support this theory can be attributed to the changing sea levels as outlined in Chapter Four. A few rare occurrences of Holcombe-like projectile points in the Maritimes, namely the Melanson point from the Gaspereau Lakes area and the Geganisg Late Paleoindian point from Ingonish Island, both in Nova Scotia, suggests that this form may fall chronologically in between the Vail/Debert form and the Jones site form, and, as in other parts of the far Northeast, may have been a short-lived transitional technology. Unfortunately, as these points were surface collected and excavated from uncertain stratigraphic contexts respectively, no radiocarbon dates are available to support or refute this suggestion.

### *7.7 **The End of an Era: The Late Paleoindian to Early Archaic Transition***

As has been stressed in this thesis, the broad areas over which lithic resources were transported and used suggest both mobility and communication. If scouting parties first explored the previously unoccupied wilderness of the far Northeast in the late glacial Early Paleoindian period, the information they obtained, and that obtained by the early pioneering populations in the region, was evidently communicated over a broad area and through many generations. The increasing use of local materials towards the end of the Late Paleoindian period and in the Early Archaic period certainly does not indicate a loss of knowledge, but rather a reduced need for mobility in a more productive environment in which the costs of obtaining high quality lithics from distant sources were no longer worth the energy expenditure required. Although this may have been affected by changing cultural attitudes in which tool aesthetics were no longer valued as highly as in the past, and perhaps the cultural value or importance of mobility as an integral part of the hunter-gatherer lifeway decreased, I believe that more pragmatic reasons for the change played the major role and initiated the move to a new technology based on ground stone tools and, in some areas, notched points, and the associated shift in cultural norms. It seems very unlikely that population pressure was the cause, as the Early Archaic period is nearly as poorly represented in the archaeological record as the Late Paleoindian period. It is not until the Late Archaic period, beginning about 5,000 B.P. (although varying somewhat within the region), that we begin to see a greater proliferation of archaeological data that could be interpreted as indicative of increased populations.

Haviland and Power (1994: 38) note that in the period between deglaciation and about 9,000 B.P., over one hundred species of large mammals, including mammoth, mastodon, and moose-elk, became extinct while others such as caribou and musk ox moved further north into tundra environments. No longer were large game hunting adaptations appropriate to the region, certainly not as a subsistence focus. However, both plant foods and marine, lacustrine and riverine resources increased in abundance, making it not only unnecessary but also unproductive to continue the highly mobile pattern of following large game herds throughout the region, procuring high quality lithics at the source along the way. The move to Archaic technology was not a dramatic and abrupt shift from one lifeway to another, but rather a process undertaken over time. The late

Paleoindian period can be seen as a part of this process, a representative of a part of the continuum between the Early Paleoindian adaptation to tundra-like conditions in the recently deglaciated Northeast, and the generalized Archaic adaptation to woodlands with fewer large terrestrial species, but more plant foods, fish, and marine resources.

Although the human element should not be overlooked – someone had to innovate the first notched point, the first ground stone adze, and to figure out how local materials could be used to make effective tools traditionally made on higher quality materials – the transition from Late Paleoindian to Archaic must surely have occurred as an adaptation over time to changes in resource availability and, concomitantly, changing cultural norms and attitudes, that can unfortunately only be seen on a very roughly grained scale in the current archaeological record. I do not see this as a strictly "evolutionary" change that occurred at the same time and in the same way across the region, but as a natural process of change and adaptation to regional, sub-regional, and local change in a fluctuating environment in populations that had to be, by definition, highly adaptive. This interpretation should not be seen as a purely functional/cultural ecological approach, as it is recognized that the environment is not the only variable to influence human decisions. This thesis has included an extensive discussion of raw material preference and use, which may have symbolic meaning as much as functional purpose, style, chronology, and settlement patterning. All of these factors must be considered in order to make some meaningful interpretations about the very incomplete Late Paleoindian archaeological record in the Northeast.

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## Appendix A: Radiocarbon Dates and Lab Reference Numbers

***Weirs Beach, New Hampshire (NH 26-32)***

| **Lab Reference #** | **Uncalibrated $C_{14}$ Date** | **Context** |
|---|---|---|
| GX-5443 | 8,270 ± 210 B.P. | Pit feature bearing point tip |
| GX-4570 | 6,595 ± 195 B.P. | 2nd pit feature bearing point tip |
| GX-4569 | 9,615 ± 225 B.P. | Pit containing argillite flakes |

***Varney Farm, Maine (ME 36-57)***

| **Lab Reference #** | **Uncalibrated $C_{14}$ Date** | **AMS or Conventional** |
|---|---|---|
| Beta-73976 | 2280 ± 60 B.P. | Conventional |
| Beta-112491 | 4080 ± 50 B.P. | AMS |
| Beta-112492 | 110 ± 50 B.P. | AMS |
| Beta-79658 | 9410 ± 190 B.P. | Conventional |
| Beta-88673 | 8700 ± 60 B.P. | AMS |
| Beta-93001 | 8620 ± 60 B.P. | AMS |
| Beta-81250 | 8430 ± 100 B.P. | AMS |
| Beta-88674 | 8420 ± 60 B.P. | AMS |
| Beta-81251 | 8380 ± 100 B.P. | AMS |

***Blackman Stream, Maine (ME 74-19)***

| **Lab Reference #** | **Uncalibrated $C_{14}$ Date** |
|---|---|
| Beta-21681 | 8360 ± 150 B.P. |
| Beta-22125 | 7760 ± 130 B.P. |
| Beta-21682 | 7400 ± 140 B.P. |

***Squatec (ClEe-9)***

| **Lab Reference #** | **Uncalibrated $C_{14}$ Date** | **AMS or Conventional** |
|---|---|---|
| Beta-98696 | 8230 ± 50 B.P. | AMS |
| Beta-147340 | 7950 ± 40 B.P. | AMS |
| Beta-147341 | 8080 ± 40 B.P. | AMS |
| Beta-147342 | 8440 ± 160 B.P. | Conventional |
| Beta-161571 | 7820 ± 190 B.P. | Conventional |
| Beta-161572 | 8340 ± 200 B.P. | Conventional |

*Rimouski (DcEd-1)*

| Lab Reference # | Uncalibrated $C_{14}$ Date |
|---|---|
| Beta-51896 | 1240 ± 80 B.P. |
| Beta-42676 | 1630 ± 90 B.P. |
| Beta-47979 | 7500 ± 150 B.P. |
| Beta-51895 | 7840 ± 100 B.P. |
| Beta-47978 | 8150 ± 130 B.P. |

*Sainte-Anne-des-Monts (DgDo-4)*

| Lab Reference # | Uncalibrated $C_{14}$ Date |
|---|---|
| QU-347 | 5,960 ± 100 B.P. |

*Jones Site (CcCq-3)*

| Lab Reference # | Uncalibrated $C_{14}$ Date |
|---|---|
| S-2844 | 1255 ± 280 B.P. |
| Beta-142841 | 720 ± 40 B.P. |
| TO-9871 | 1840 ± 90 B.P. |
| TO-9870 | 700 ± 50 B.P. |
| TO-9869 | 330 ± 50 B.P. |

*Cowpath (EjBe-7)*

| Lab Reference # | Uncalibrated $C_{14}$ Date |
|---|---|
| I-8101 | 6580 ± 130 B.P. |
| SI-2604 | 6810 ± 95 B.P. |
| SI-2605 | 7210 ± 80 B.P. |
| SI-2606 | 8600 ± 325 B.P. |

*Pinware Hill (EjBe-10)*

| Lab Reference # | Uncalibrated $C_{14}$ Date |
|---|---|
| SI-1801A | 6880 ± 120 B.P. |
| SI-1801B | 6985 ± 60 B.P. |
| SI-2309 | 8850 ± 100 B.P. |
| I-7606 | 6185 ± 125 B.P. |