The People of the Beautiful River at Jemseg

Volume 2: Archaeological Results

edited by
Susan Blair

New Brunswick Manuscripts in Archaeology 36E

Wolastoqiyik Ajemseg

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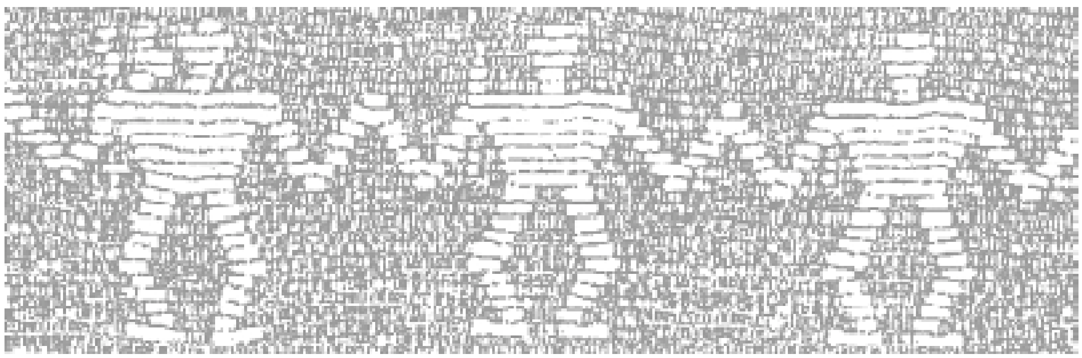

Volume 2
Archaeological Results
Jemseg Crossing Archaeology Project

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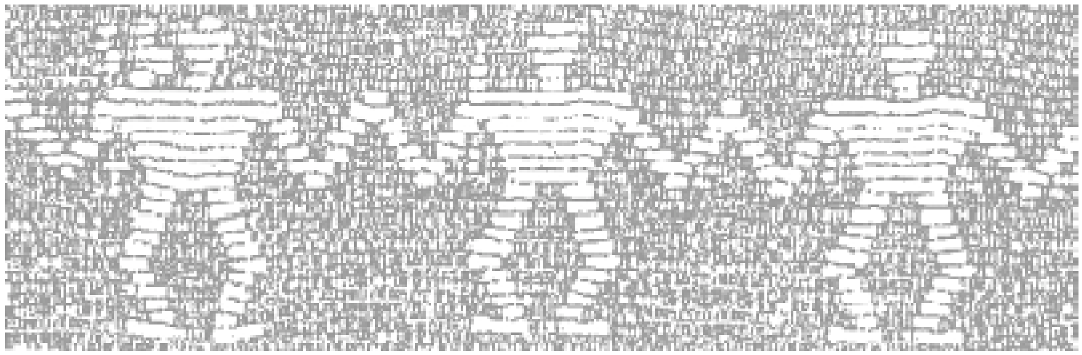

Mawlukhotapun - Working Together
Acknowledgements

The Jemseg Crossing Archaeology Project was only made possible by the philosophy of “working together”. In business settings, this approach is often called the “team” approach. However, the concept of a “team” is a simplification of how it actually worked at Jemseg. “Teams” are usually formal concrete working groups, usually formed to compete against other teams. Our “working together” was less formal. We were united by our desires to salvage an important site as respectfully and carefully as we could. In a basic way, the project only moved forward through the hard work and contributions of hundreds of individuals. We thank you all for your effort, courage, time, patience, and care. These contributions were often multifaceted, and many gave freely of their expertise and hidden talents in ways not initially envisaged when they came to the site. Many project members, such as John Keenan and Bazil Nash, worked tirelessly to provide information about the project to their communities, and yet were also fundamental in the group approach to solving the archaeological field work problem of working through the winter.

The fieldwork was enabled by a core of archaeological supervisors, including Colin Varley, Chris Blair, Katherine Patton, Sam Gallagher, Bazil Nash, Pamela Dickinson, John Keenan, Darcy Dignam, Vincent Bourgeois, Joel Calabrese, Jason Jeandron, Michael Saunders, Shianne MacDonald, Phillip Atwin, Paul McEachan, Mike Nicholas, and field crew, including Viktoria Kramer, Frank Lewey, Jennifer Butler, Barbara Oldford, Clifton Sacobie, Elvis Sacobie, Mike Smith, Nathan Atwin, Donald Paul, Joe Brooks, the late Gerry Pickles, Philippe McKay, Alexandra Francis-Steward, Ian Steward, Wesley Atwin, Terry

Smith, Carol Smith, Fred Masters, Doug Solomon, Ryan Francis, Frank Atwin, Dale Nash. The "Week-enders" filled in for us on Saturdays and Sundays, and included Patricia Looman, Daniel MacKenzie, Larry Orechia, Starr Perley, Chkwabun Nicholas Sappier, Wade Perley, Lisa Maher, David Wilson, Chris Nason, Melanie Doerig, Sonja Harding, Brad Lamey, Cory Lavender, Randy MacBeth, Amanda White, Shelly Perley, Forest Boudreau, Alphonsus Bourgeois, Jeff Dobson, Jeremy Farris, Brent Francis, Ryan Francis, Jamie Gullison, Hazel Haneveld, Mark Hiscock, Wendy Hogan, Ben Hood, Greg Houston, Gary Jonah, Janice Keenan, Sherry Morin, Mona Nicholas, Mike Niski, Brad Paul, Karri-Lynn Paul, Richard Paul, Scott Paul, Leslie Perley, Marie Perley, Robert Perley, Danny Sabattis, Bert Sacobie, Joseph Sacobie, Paul Tomer, Janet Wainwright, and Kathy Weeks.

The conservation, laboratory work and analysis was facilitated by a dedicated crew of analysts, cataloguers, technicians and a conservator. These included Frances Stewart, Alexandra Sumner, Brent Suttie, Valery Monahan, Paula Paul, Ramona Nicholas, Erica Bear, Tanya Bourgeois, Janice Keenan, Bonnie Atwin, Margaret Stennitt, Diane Paul, Wendy Hogan, David Black, and Stephen Monckton.

The methodological problems were overcome by considerable brainstorming by Tim MacAfee, Bazil Nash, Phil Atwin, Frank Atwin, Dale Nash, Chris Blair, Peter Jardine, and Patrick Polchies.

As the educational component of the project grew under the guidance of Karen Perley, project members offered their expertise and interest, so as to bring information about our work and New Brunswick's Wolastoqiyik community to the public and to the large number of young people who came with school or community groups, such as Ramona Nicholas, Valery Monahan, Cynthia Adams, Teana Pickles, Shelly Perley, Tim MacAfee, Pamela Dickenson, Chris Blair, Alice Paul and Erica Bear.

The site was originally found due to the diligence of Colin MacKinnon, who recovered artifacts from the beach in the early 1990s, and reported them to Archaeological Services.

Volunteers came to site and contributed labour, including Stella Nicholas, Rodney Bear, Tasha Moulton, Doreen Francis, Perry Perley Jr., Mike Moulton, Carl Perley Jr., Storm Perley, Baquahason Sappier and Heather Smith.

Site security and transportation was handled by a number of individuals, including Daryl Paul of Oromocto First Nation, Joe Paul, Donna Paul, The Peacekeepers, including Tina Nicholas Bernard, Raymond Nicholas and Tina Nicholas Martin, and the RCMP provided additional support to these efforts. Additional legal advice was provided by Ron Gaffney.

The project was coordinated by a team consisting of Susan Blair, the field director, Karen Perley, the education coordinator, Patrick Polchies the project manager, and Chris Turnbull the director of Archaeology Branch. Together with Patricia Allen of Archaeology Branch, this group 'liaised' between provincial and aboriginal governments. Pat Allen also provided an important support role in the field and in the main offices of the Archaeology

Branch. Further office administration was provided by Amanda Howlett, Crystall Joscak, and Ernest Merasty.

A project of this magnitude benefits from the contribution of many organizations and government offices, and we received a great deal of assistance from the New Brunswick provincial government, especially Louise Gillis, Jennifer Pollock, Marsha Hello, Shirley Phillips, Mike Randall, Sharon Pond, Wayne Burley, Denis Lachappelle, Dan Horseman, Mike Phillips, Brian McEwing, Doug Johnson, Bernard Richard (Minister of Intergovernmental and Aboriginal Affairs, Sheldon Lee (Minister of Transportation), and Ann Breault (Minister Municipalities, Culture and Housing), as well as from the Maritime Road Development Corportation, especially Bob Burdette and Bob Hodgins.

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The first Maliseet advisory committee on the Jemseg Crossing Project involved a great deal of time and support from a number of individuals, including Irvin Polchies, the late Charlie Paul, David Perley, Karen Perley, Ned Bear, Dick Paul, Robert Bernard, Chris Turnbull, David Keenlyside, Brian McEwing, and Mike Phillips.

Many individuals have continued to provide time and support through the second Maliseet Advisory Committee on Archaeology, including Charles (Diamond) Nicholas, Vincent Nicholas, Patty Paul, Mae Perley, Linda Paul, Marjorie Paul, Rocky Paul, Sharon Paul, Tim Nicholas, Phil Atwin, Ned Bear, Robert Bernard, Dianne Pelletier, Barb Nicholas, Amanda Howlett, Karen Perley and Patricia Allen.

Many individuals independently came to the site or provided support, insight and knowledge, including Wayne Nicholas, Marlene Shumate, Shirley Bear, Gwen Bear, Darrel Paul, Alice Paul, the late Christina Nash.

We would like to thank the following Elders who took part in the Spoken History project: Tina Brooks, Pat Laporte, and Josephine Paul (Sitansisk/St. Mary's First Nation), Richard Polchies Junior (Sitansisk/St. Mary's First Nation), the late Theresa Sacobie (Pilick/Kingsclear First Nation), Ronald Paul (Sitansisk/St. Mary's First Nation), Charles Solomon Sr. (Pilick/Kingsclear First Nation), Rose Atwin (Pilick/Kingsclear First Nation), Gina (Jeanna) Polchies (Woodstock First Nation), Bob Nash (Gagetown), Noel Francis Junior with Kathleen Francis (Madawaska Maliseet First Nation), Elizabeth Paul (Welmooktuk/Oromocto First Nation), Charlie Bear (Neqotkuk/ Tobique First Nation), Pat Sacobie (Welmooktuk/Oromocto First Nation), Pious and the late Harriet Perley

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After the project was officially completed, we continued the analysis. Archaeology Branch found research money whenever it could to enable this process, but a considerable amount of free time and labour were provided by Jason Jeandron, Pam Dickinson, Cynthia Adams and Susan Blair, who independently continued this research whenever they could. Jason Jeandron was especially helpful in producing and processing many of the photographs in this volume.

David Black and Chris Blair provided considerable assistance with final copy editing and comments of the final report.

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We would also like to thank the uncounted number of people who chose to come to the site, to talk to us about the work that we were doing,

Finally, this document was assembled with financial support from the Grand Lake Meadows Project Management Committee, and we recieved special assistance from Todd Byers and Kevin Craig, both of the Department of Natural Resources and Energy.

We are grateful to the professional staff of Communications New Brunswick who contributed to the final editing and formatting of this report. We would like to thank the following agencies, communities and individuals for providing the illustrations that accompany this document; The University of New Brunswick Archives, the Provincial Archives of New Brunswick, the New Brunswick Museum, the Canadian Museum of Civilization, the Public Archives of Canada, the University of Pennsylvania, the Houlton Band of Maliseets, Charles Solomon Sr., Kathleen Francis, Shirley Sacobie, Edith Paul, Patricia Allen and Karen Perley.

Contents

Preface to the Second Volume

Susan Blair

Archaeological research is largely motivated by a curiosity about human pasts, and a perception of their importance. However, I have come to realize that the privilege of obtaining knowledge about the past creates obligations and responsibilities. If we are lucky, we learn of these things as I did, as an undergraduate learning from thoughtful and experienced teachers like Peter Ramsden and David Black. However, it is in particular contexts and settings that the two-faced coin of privilege and responsibility gain meaning. I am very fortunate to have been befriended and mentored by people who understand the delicate balance between taking and giving. Karen Perley has tempered my sense of awe and reverence for the things that I have had the honour to find, with an awareness of their setting in an intricate web of past, present and future meaning. She has also taught me that these objects create obligations to living communities, and that I must discharge these over the course of my career. Patrick Polchies has taught me to appreciate the deep and abiding humour that has carried Wolastoqiyik through a modern world of conflict and resistance, and has challenged me to re-examine the seriousness with which we academics sometimes take ourselves and our research. Karen and Patrick, and all of the Wolastoqiyik who helped in the management and implementation of the Jemseg Crossing Archaeology Project, brought information back to their communities and defended their right to explore their own past through archaeology, instructed me and my other archaeological colleagues on the practice of courage.

During the project and its aftermath, I learned many things about archaeology and about the past from Wolastoqiyik elders, colleagues and critics. These include (but are not limited to) several basic principles:

- *Kci t'mitahoswagon*, "respect" ,
- *Mawlukhotepun* "working together" and
- *Weci Apaciyawik*, "so that it will come back".

None of these principles are found in any rulebook or code of conduct. Such a codification might invite circumvention or superficiality. Instead, we archaeologists must grapple with them on our own, and try to find new ways to meet the challenges they present.

To me, *Kci t'mitahoswagon* or "respect" involves openness, both to people and to new ideas. I have found it difficult sometimes to enter into meetings with people who I know have many angry words, but I respect this anger, in the recognition that it is valid and comes from long years of hurt, with little redress. I find it easier to be open to new ideas and perspectives. Although I can easily get caught up in the intricacies of archaeological theorizing, I try always to remember that most of it is just an elaborate set of interlocking arguments that form a particular vision of the past. My stories of the past are told in the voice of an archaeologist. Mine is not, however, the only voice telling the only stories, nor are they necessarily the most correct stories. I have come to profoundly respect the self-knowledge that flows deeply within the Wolastoqiyik. This perspective has allowed me to glimpse parts of the past that would never be accessible to me with my archaeologically informed eyes. In this world, I am and will remain both an outsider and a junior apprentice, who may occasionally be privileged with small insights gleaned from the true experts on the Wolastoqiyik, their own elders.

Mawlukhotepun, or "working together", has been an obligation that I have been pleased to discharge. For me, this involves both formal and informal interaction, through involving Wolastoqiyik in all parts of my work - through the context of field work, laboratory work, and analysis but also including relaxing together outside of work and philosophizing together about the past. While I have found this principle to be very positive to enact, it is one that may cause some archaeologists concern, as it involves the relinquishing of power and control. We have come to realize that "working with" is not the same as "working for", and the involvement and training of Wolastoqiyik must proceed as a process of enfranchisement. It is in this spirit that I am pleased to have been able to participate, even in small ways, with First Nations Chiefs and communities in the development of the Maliseet Advisory Committee on Archaeology, a strong first step in the direction of co-management of the archaeological and heritage resources of the Wolastoq.

The final principle, *Weci Apaciyawik* , or "so that it will come back" is perhaps one of the most important, but also the most difficult. This work is a professional and academic treatise. The archaeological relevance of such research rests on the construction of arguments that are built on decades of archaeological philosophy and theory. Some parts of this work are written for an audience familiar with both this body of literature, and the academic style of communication. In the spirit of openness, all of this is lodged within the Wolastoqiyik community. However, this is not enough. I have tried to bring some of the archaeological perspective back to the community through related projects, such as an agenda paper "Wolastoq and its People", prepared for the Maliseet Advisory Committee on Archaeology, the poster project "Wolastoq Amsqahs Peciyat", and other presentations. I will persist in trying to create accessible documents for school children and communities, and I will join my voice with others who request public spaces for the history and heritage of the Wolastoqiyik. It will take a career of "bringing it back" to repay the Wolastoqiyik for the privilege of working with them in an exploration of their archaeological past.

Forward: The Road to Jemseg

Christopher J. Turnbull

The Jemseg River in central New Brunswick sustains the Wolastoqiyik, and it has served as a transportation route for generations of their ancestors. It is ironic that the current need for a safe and efficient four-lane highway should jeopardize an ancient place along this same river. But New Brunswick's Environmental Impact Assessment process identified the need for remedial action to balance our society's present desire for a modern transportation system with our society's need to be respectful of the Wolastoqiyik legacy. Thus it was that we undertook an archaeological excavation in 1996 and 1997 on the spot where the proposed Fredericton to Moncton Four Lane Highway crossed the Jemseg River.

The Jemseg Crossing Archaeological Project had many different dimensions. It was certainly an archaeological excavation to rescue information about New Brunswick's past before construction of the new highway. Although heritage impact assessments for environmentally regulated projects have a comparatively brief history in New Brunswick, this was the first time that they had led to the mitigation of a major archaeological site. The crossing place of the new highway had been fixed through the previous construction of highway segments in the Jemseg area, so salvage of information from the site offered the only cost effective option to prevent its total destruction.

However, the excavation of Aboriginal archaeological sites impinges upon ongoing discord between Canada (and New Brunswick) and indigenous societies. In the case of the Jemseg Crossing site, the Wolastoqiyik peoples (more commonly known by their Mi'kmaq-derived name of 'Maliseet') are the descendants of concern. While archaeology does not normally play a prominent role in these struggles, the circumstance of the excavation quickly brought the site into this realm.

Contemporary Canadian society is divided by the history of relationships between indigenous and non-indigenous society. These relationships are tainted by prejudice and bigotry. Canada has yet to deal satisfactorily with the results of European immigration. In the Maritime Province, land ownership has not yet been ceded by treaty, and this fundamental of relationship over land affects Aboriginal perspectives of Canada. So when an ancestral Wolastoqiyik site is threatened with disturbance, it becomes a part of this ongoing disagreement.

Those who have practised archaeology are not without blame. We intruded into these struggles with narrowly focused academic eyes. Archaeologist have been reluctant or, at least, slow to recognize the role that the Wolastoqiyik of today must play in any excavation of their history. Several incidents during the previous quarter century brought engaged archaeology in the larger struggle between indigenous societies and Canada, compounding the situation. This recent history came to a head at Jemseg.

All of this led to a series of protests and demonstrations over the course of the fall and winter of 1996 and 1997. Although these were created by history, they were fuelled by the media. However, through negotiations, and with the full support of the Fredericton to Moncton Highway Project, Department of Transportation, an accord was reached with the Chiefs of a majority of Wolastoqiyik communities in New Brunswick. Despite some misdirected attempts at consultation on our part, this agreement supported the continuation of the excavation with the provision that impacts would cease if evidence of burials were found. This support was predicated on the notion that the highway would have to be rerouted around a site containing burials.

The essence of archaeology is discovery of the unknown. The finding of a burial-like feature in the midst of an ancient settlement was enough to halt the excavations and relocate the highway away from the site. It was only at this point that a new relationship between the Wolastoqiyik First Nation and Province of New Brunswick began. It is one thing to make a promise and but it is yet another to honour it with all the consequences. To the Province's everlasting credit, it did so in the Spring of 1997. The slight jog in the four-lane highway bridge at Jemseg River was a turning point in the relationship between the Province and the Wolastoqiyik community– at least with regards to archaeology.

The Jemseg Crossing Archaeological Project has achieved some notable results. The excavation was the largest to date on any Aboriginal site in the Maritimes. The site contained a major ancestral Wolastoqiyik settlement dating to between 2000 and 3000 years ago. There is also evidence on the site stretching back to more than 6000 years ago, and continuing to the twentieth century. As a part of the project, many spoken histories and recent stories were recorded from the Wolastoqiyik Community.

The project has also set the tone for an increasingly constructive relationship between the Province of New Brunswick and the Wolastoqiyik community. To avoid this very situation, both communities have agreed to meet together regularly to cooperate on the management of heritage resources through the Maliseet Advisory Committee on Archaeology. Both communities are dedicated to working together to expand this historic committee beyond a talking place, and to develop a better understanding through cultural development. The committee has produced a major travelling exhibition based on historic Wolastoqiyik photographs, several posters, and caused Gabe Acquin—a nineteenth century leader—to be recognized as Nationally Significant person in Canadian history. The committee is currently working to develop a Wolastoqiyik web site as a place to gather and disseminate information about Wolastoqiyik culture, so save if for future generations, and ensure that it should become a tangible asset to both communities.

These volumes are filled with Wolastoqiyik stories, both recent and archaeological; it is a testament to the power of working together to find better ways of living together respectfully.

Section One

INTRODUCTION

Tan psiw weskuhutahsik

1. Introduction

Susan Blair

The Jemseg Crossing Archaeology Project began in the fall of 1996 and continued through the winter to April 1997. The purpose of the project was to salvage information from a major archaeological site that was in the footprint of a proposed alignment of the new TransCanada highway.

The archaeological aspects of the Jemseg area were confirmed during a heritage assessment, conducted to satisfy regulations for the construction of the TransCanada Highway. The Jemseg Crossing Archaeological Project (JCAP) transpired through a combined effort on the part of Wolastoqiyik (the 'Maliseet' people), the New Brunswick Department of Transportation, Archaeological Services, part of the New Brunswick Department of Municipalities, Culture and Housing (presently situated in the New Brunswick Culture and Sport Secretariat), and the New Brunswick Department of Education. However, it was only able to proceed through the support of Wolastoqiyik (Maliseet) individuals and First Nation communities.

The Jemseg Crossing Project has contributed a great deal to the archaeology of the Maritime Provinces, for the following reasons:

(1) the project was co-managed between Aboriginal and non-Aboriginal peoples, and directly involved Maliseet people in all aspects of its implementation,

(2) a number of new and innovative approaches were developed to cope with the logistics of winter excavation, and

(3) the archaeological information that was recovered during the project sheds light on periods of time that are very poorly understood in this region, especially of periods older than 5000 years ago, and between 3500 and 2500 years ago.

The fieldwork component of this project began on September 3, 1996. At that time, a Jemseg Maliseet Advisory committee was brought together with the purpose of providing input into the project and information to the Maliseet First Nations. In September and early October, the nature and age of the site was explored with the goal of developing an appropriate and expedient methodology for the mitigation or salvage of archaeological materials that might otherwise be destroyed by the bridge construction for the highway. These preliminary explorations revealed that the site was significantly more complex than had originally been thought, with accumulations of cultural material (such as stone tools, pottery, cooking hearths, house floors, and debris from making stone tools and other everyday activities) that spanned 5 or 6 millennia.

The full-scale mitigation of this area was synchronous with both growing concerns within Aboriginal communities about the nature and pace of the archaeological project, and with growing interest of the media. All parties involved in the project took the concerns of the Aboriginal community very seriously, and delayed aspects of the fieldwork so as to ensure discussion with community members.

In conjunction with the fieldwork, the archaeology project developed a public education program. The purpose of this program was to create an appreciation and respect for the rich cultural heritage of Wolastoqiyik, and to ensure a sense of openness in the conduct of the project. During the course of the education program, the project saw visitation from tourists, interested members of the public and local residents, and large groups of school children.

The archaeology project was enhanced by an oral history program which included visits and interviews with Wolastoqiyik elders, and with Jemseg residents. This program provided valuable insight and information, and served to remind all involved of the richness of living Wolastoqiyik history. This history complements and transcends the archaeological interpretations.

The archaeological evidence recovered from the Jemseg Crossing Archaeology Project (JCAP) pertains to both pre-contact and post-contact period activity. The oldest artifacts from the Jemseg site (older than 6000 years old) suggest that the Jemseg area was used as a camp site for many thousands of years, a place where people made stone tools (such as knives, spear points, and heavy woodworking tools), and fished, hunted, and gathering plants for food and medicines. They may have carried out other social and industrial activities, such as making basketry or canoes, or gathering together to strengthen family ties and socialize.

In the period from 3500 to 1500 years ago, there is evidence of larger groups of people who stayed for longer portions of the year at Jemseg, where they constructed houses, made and used stone tools (many from rocks quarried from a chert source in the local area, Washademoak chert), and carried out activities such as gathering plants, hunting, fishing, food preparation and storage, and conducted various cultural and social activities. These people also participated in far-flung interaction and exchange networks, through which both ideas and raw materials (such as tool-stone) flowed. This period of time has been very poorly understood in this region (the "Little Gap" in Maritime archaeology, Turnbull 1990). The information gathered from Jemseg suggests that this gap has been caused by lower archaeological visibility in this period, and a general lack of archaeological excavation and fieldwork. Although Jemseg is large, it may be one of several such sites in the region. Until now, we simply haven't been able to locate and explore one of these sites.

The Jemseg area continued to be an important camp site in the seasonal round of the Wolastoqiyik up to the modern era. However, for much of the period between 1500 and 500 years ago, the main focus of activity in the Jemseg area was closer to the outlet of Grand Lake. The site was once again intensively utilized during the post contact period (after the early 17th century). In this era, it is harder to distinguish between Aboriginal activity, and that of local non-Aboriginal people, who cultivated crops and maintained pasturage in the site area. Nonetheless, as indicated by the spoken histories in Volume 1, Wolastoqiyik continued to camp in the area, leaving behind subtle traces of their lives.

The data collected during the Jemseg site not only allows us to view the past from a new perspective, but will continue to do so, as this new information is processed and through a synergy with Aboriginal history and perspectives, develops into additional, complementary narratives about the ancient people of the *Wolastoq*.

Section Two

BACKGROUND

Nkihtahkomikumon

2: The environmental setting

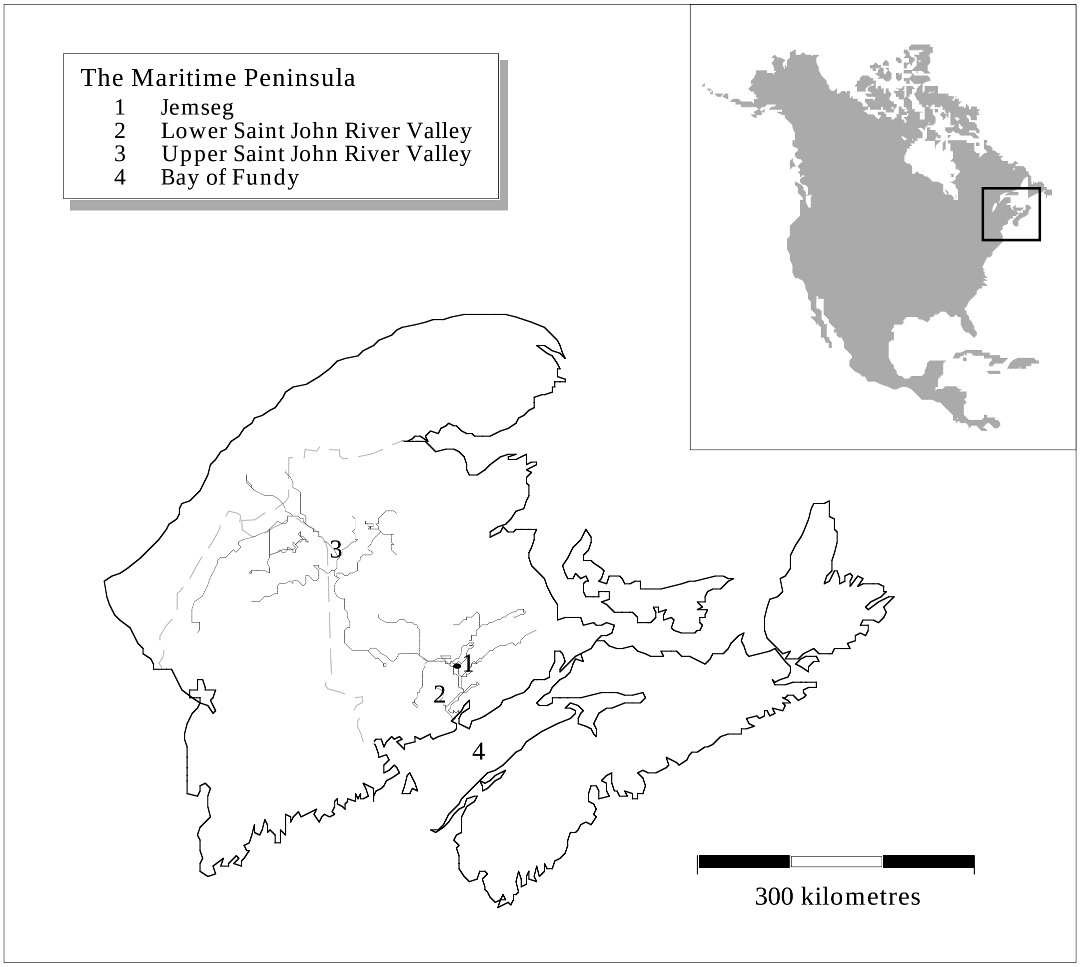
Susan Blair

The Jemseg Crossing site is located in the heart of the lower Saint John River valley (herein referred to as the LSJR), within the New Brunswick portion of the Maritime Peninsula of Northeastern North America. The Maritime Peninsula juts into the Atlantic Ocean along the southern shores of the St. Lawrence estuary, and contains part of the northernmost extent of the Appalachians mountain range (Hoffman 1955, Bourque 1992). The Saint John River is the largest river basin in this Peninsula. Indeed, it is the largest watershed flowing into the Atlantic Ocean between the St. Lawrence and the Susquehanna (Burke 2001 pers. comm.).

Humans have lived in the Saint John River valley for thousands of years. The original name of Saint John River is the Wolastoq, the "beautiful river". It is the ancestral territory of the Wolastoqiyik, the Aboriginal nation who name themselves "the people of the beautiful river". The Wolastoqiyik are Algonquian language speakers and members of the Wabanaki cultural group, along with the Mi'kmaq, the Passamaquoddy and the Penobscot (Snow 1980: 27). Although the Wolastoqiyik are often called the "Maliseet" (or "Malecite") in the ethnographic literature (Mechling 1913, McFeat 1962, Ray 1983, Smith 1957, Speck 1915, 1917, Speck and Dexter 1952, Speck and Hadlock 1946, Stamp 1915), it is a name given to them by the Mi'kmaq, their neighbours to the east, meaning "broken talker". In their own spoken histories, and in ethnographic and historic accounts, the Wolastoqiyik are the quintessential river dwellers (see Volume 1, Snow 1980, Speck and Hadlock 1946). They perfected the construction of lightweight bark canoes, with which they accessed the myriad of streams, lakes, ponds, and bogs of the Wolastoq drainage (Butler and Hadlock 1957: 22-23, Ganong 1983: 22).

As the home of the Wolastoqiyik, the Wolastoq or Saint John River is a physical, social and ideological universe (see Blair 2001). Their traditional stories tell of the origins of the SJR:

Figure 2.1: The Maritime Peninsula showing the site area and the Saint John River system (Wolastoq)



> Aglebe'm... [a monstrous frog] kept back all the water in the world; so that rivers stopped flowing, and lakes dried up, and the people everywhere began dying of thirst. As a last resort, they sent a messenger to him to ask him to give the people water; but he refused, and gave the messenger only a drink from the water in which he washed. But this was not enough to satisfy even the thirst of one... At last a great man was sent to Aglebe'm to beg him to release the water for the people. Aglebe'm refused, saying that he needed it himself to lie in. Then the messenger felled a tree, so that it fell on top of the monster and killed him. The body of this tree became the main river... and the branches became the tributary branches of the river… while the leaves became the ponds at the heads of these streams... (Tale of the origins of the Saint John River, told by Gabe Paul of Pilick, and recorded by Speck 1917: 480-481).

Their oral histories are replete with stories of the use of traditional hunting grounds, fishing and gathering areas, and landforms to this day bear the marks of their ancestral culture hero, Gluskup (see Volume 1, but also Blair 2001, Ganong 1896, Mechling 1914, Speck 1917, Szabo 1985). Historical toponymy reveals Wolastoq'kew names for streams, brooks, rapids, rocks, campsites, islets, lakes and ponds in every part of the SJR drainage (Blair 2001).

THE PHYSICAL STRUCTURE OF THE SAINT JOHN RIVER

The Saint John River (SJR) is the largest river system in the Maritime Peninsula (Hustins 1974: 1). It rises on the border of the Province of Québec and the State of Maine at an elevation of 480 m above mean sea level (amsl), and flows in a broad arc east, then south, for 675 km to empty into the Bay of Fundy (see Figure 2.1), bisecting the entire Maritime Peninsula. Although this linear size is comparatively large, the SJR's true extent is measured by the area that it drains, approximately 55,000 km^2 (Hustins 1974: 1). This vastness is due to the increase in the SJR by the waters of many tributaries.

The Jemseg Crossing site is located in the lower portion of the SJR. In the final leg of its journey to the Bay of Fundy, the river becomes broad, with gentle river banks and extensive floodplains. The low relief of this area (rarely over 150 m amsl) is derived from the underlying, eroded, calcareous and non-calcareous, sedimentary rocks of Upper Palaeozoic age. These consist of minimally folded and compacted formations of grey lithic and feldspathic sandstones, shales and conglomerates that formed from continental and brackish water sediments (Colpitts *et al.* 1995: 32, IWD 1974: 2, McLeod *et al.* 1994). The climate of this region is the warmest in the SJR (averaging 1700 to 1800 annual growing degree days, Dzikowski *et al.* 1984). The Grand Lake system, containing almost 22,000 hectares of open water, acts as a heat sink, strongly moderating local climatic conditions (DNRE 1998: 12). This warmer climate, combined with the presence of broad, fertile, alluvial floodplains and extensive wetlands, creates an environment for vegetation which is typically found to the south of the Maritime Peninsula, including trees such as ironwood, basswood, butternut, white ash, green ash, and silver maple (DNRE 1998: 13).

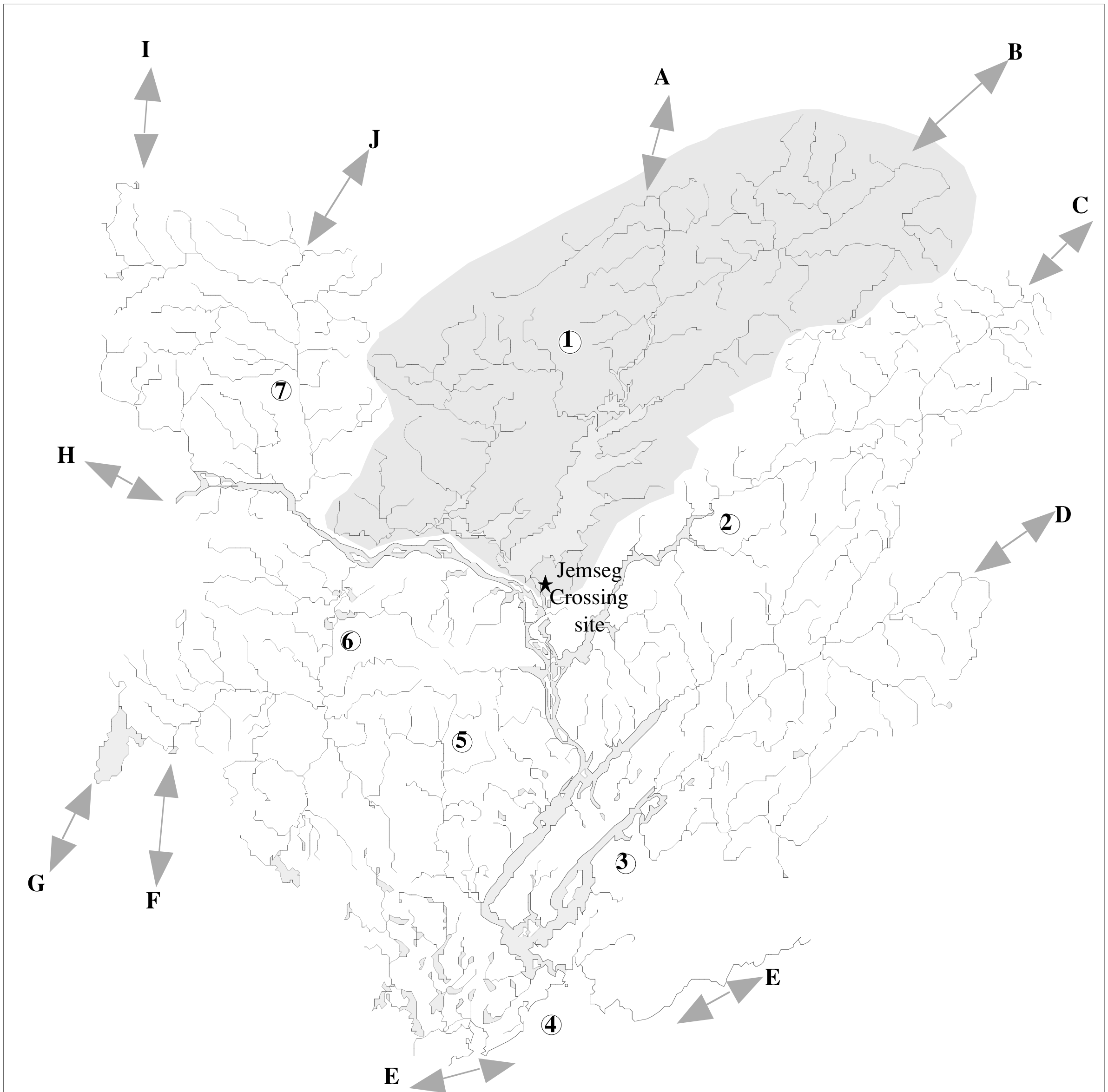
In its final progress to the ocean, the SJR passes through the southern arm of the New Brunswick Highlands, the Caledonia highlands. Like the Miramichi highlands, these geologically complex rocks create a more rugged topography. These include interbedded felsic and mafic volcanic rock, areas of siliclastic sedimentary rocks composed of calcareous red mudstones, red sandstones, and conglomerates, as well as non-calcareous sedimentary rocks (Colpitts *et al.* 1995: 32, McLeod *et al.* 1994). At its mouth, the SJR becomes constricted by the Reversing Falls gorge. This unique physiographic feature has a large impact on the character of the river over its final leg. At one time in the past it was a waterfall. Isostatic rebound from crustal depression of the region due to glacial ice has caused the southern coast to have a rising sea-level during much of the Holocene (Grant 1975).

At some point, likely during the early to mid-Holocene, this waterfall was transgressed by the waters of the Bay of Fundy at high tide. Due mainly to its shape, the tidal amplitudes of the Bay of Fundy are some of the highest in the world. As the outflow of the SJR passes through the gorge at low tide, the ledge at the mouth forms a small drop in elevation resulting in rapids. During high tide the marine waters of the Bay of Fundy rise above this drop and flow back into the river almost as forcefully. In recent years, this phenomenon has become a tourist attraction called the Reversing Falls. Even though tidal amplitudes within the SJR are much lower than in the Bay of Fundy, the influence of the charging of the SJR with marine waters is felt far inland, with diminishing tidal fluctuations experienced as far 140 km upstream. The tidal amplitude was less than 1 m in the Jemseg River in front of the Jemseg Crossing site. The water salinity in the lower leg increases towards the mouth, from almost entirely non-saline above Fredericton (ca. 100 km from the mouth), to layered saline and pure marine waters in Kennebecasis and Grand Bay. The Reversing Falls gorge also limits the amount of discharge to a maximum of 60 cm of outflow per week regardless of tides (SJRBB 1972). As a result, the lower SJR can periodically accumulate and store large volumes of water during times of high river flow. This happens annually after snow melt in the spring, resulting in a flood known locally as “the Freshet”. Since the waters of the Bay of Fundy do not freeze in the winter, the climate in this region is strongly marine-influenced, resulting in cooler summers and milder winters, and often creating dense blankets of coastal fog. This region is on the southeasterly storm-track along the Atlantic coast, and resulting storms locally increase the precipitation levels (DNRE 1998: 10-11). This cooler marine climate encourages a conifer-dominated forest, consisting of discontinuous patches of boreal forest and mixed hardwood forest (DNRE 1998: 11).

The entire SJR was glaciated during the last ice age. Most of the overburden is a thick blanket glacial till, mainly composed of silty, gravely sands with cobbles and boulders, generally reflecting underlying bedrock. Glacial features occur throughout the SJR, including terraces, deltas, glacial outwash plains, eskers, and moraines. Much of the ancient SJR valley has been filled with Pleistocene-derived overburden, and in most places the modern course of the river has only partially incised this overburden. Some parts of the SJR contained glacial lakes that laid down thick layers of glaciolacustral clay (Rampton *et al.* 1984, Jeandron and Dickinson 1999, Kite 1982). Some have speculated that the Grand Lake Meadows, the broad fertile wetlands to the north and west of the Jemseg Crossing site, formed over such a deposit of thick clay (Choate 1973).

The lower portion of the SJR is composed of a number of smaller ecological zones, habitats and landforms (see Figure 2.2). In all, the LSJR contains eight major tributaries, one salt marsh system, eleven large water bodies (mostly lakes), three major freshwater wetland systems, cool,

Figure 2.2: The tributary systems of the lower St. John River. Numbers designate self-contained tributary watersheds, and letters designate known portage routes into adjacent watersheds or regions.



1: Grand Lake/Salmon River system
2: Washdemoak Lake/Caanan River system
3: Kennebecasis system
4: Coastal/Musquash River system
5: Nerepis River system
6: Oromocto River system
7: Nashawaak River system

10 0 10 20 30 kilometres

A: To Cains River & Miramichi estuary
B: To Richibucto River & Northumberland Strait
C: To Bouctouche River & Northumberland Strait
D: To Petitcodiac River & Nova Scotia
E: Along coast to Nova Scotia & Gulf of Maine
F: To Peltoma Lake, Piskahegan River & Bay of Fundy
G: To Cranberry Lake, Lepreau River & Bay of Fundy
H: Upriver to Middle Wolastoq & Tributaries
I: To Napudogan into Miramichi Lake estuary
J: To Taxis River & to Miramichi estuary

N

moist wooded plains, and a fringe of drier wooded uplands. It is significantly different from the upper and middle reaches of the SJR in three key attributes:

(1) the influx of marine waters creates an estuary that deeply penetrates the interior,
(2) the constriction of the river at its mouth creates a broad floodplain, and
(3) the distribution of water resources in the SJR is such that 90% of large water bodies within the entire watershed are found in the LSJR, affecting the climate by trapping and storing summer heat.

All three of these variables enhance the ecological productivity of the LSJR. The combination of various kinds of bottomlands, wetlands, open lakes, free flowing rivers, and marine incursions creates a diverse and highly productive environment for organic resources (foods, materials and medicines). Resource extraction may be focused both on inorganic resources such as tool stone, native metals, and minerals such as ochre, and on organic resources such as plant and animal materials for food, tool elements, housing material, cordage and medicines. We generally categorize resource extraction activities as encompassing gathering, fishing, and hunting.

Gathering

Gathering activities consist of collecting plants for food, medicine, and tool-making (cordage, containers, houses, and canoes). On the basis of both local and macroregional ethnographic accounts (Adney 1944, Chandler *et al.* 1979, Erichson Brown 1979, Mechling 1911, Petersen 1977, Speck 1915, Speck and Dexter 1952, Van Wart 1948), as well as availability within the LSJR (Hinds 1986, 1999), I have accumulated references to more than 165 plants with food potential, 37 plants with known medicinal uses, and 28 plants used for making tools. I have been informed that Wolastoqiyik elders retain and carefully nurture knowledge of many more plants with medicinal properties and other useful attributes. Some of these are discussed in Volume 1 of this report. In this volume, I wish to point out both potential and actual involvement by Wolastoqiyik and their ancestors with a variety of highly productive plant resources. However, I defer to the concerns of those with traditional knowledge of plants that this knowledge be safeguarded against dissemination and exploitation by the non-Aboriginal public. As a result I have elected not to itemize potential medicinal plants, although it must be noted that the Wolastoqiyik have detailed knowledge of the medicinal attributes of a vast array of plants (Mechling n.d., Perley 2000: pers. comm., Speck and Dexter 1952). As a result, the number of plants discussed in this report is an underestimate of the actual potential of the LSJR.

Plants with food potential include nut-bearing trees and shrubs (4 species), seed-bearing annuals (10 species), aquatic plants with starchy tubers, roots, rootstocks, corms, or bulbs (16 species), terrestrial plants with starchy root systems (24 species), trees that produce edible sugary sap (3 species), berry-producing plants (42 species), plants that produce shoots, leaves or stems that can be eaten as greens or vegetables (30 species), mushrooms (at least 4 species), and a range of other plants that have parts that can be used for teas and various emergency foods. However, not all of these species have the potential to have made a significant contribution to the diets of pre-contact gatherers. Plants can be ranked in their productivity (the amount of food a single plant provides), density (how many plants occur in patches or areas), availability (both how common they are within the region and length of time during which they can be harvested) and the ease of collection and processing. With these parameters generally in mind, I generate a list of possible core plant species, Table 2.1.

While "potential" is not equivalent to "use", archaeologists who use optimal foraging theory favour considering resources with significant nutritional potential in models of resource procurement and subsistence (Winterhalder and Smith 1981). Even if we do not adopt the broader implications of optimal foraging theory, we should reconsider dismissing the importance of plant resources to pre-contact diets without a full consideration of the potential of local environments. Furthermore, many of these plants have confirmed uses in both ethnographic and ethnohistoric accounts, and have been recovered from archaeological contexts in the region. The wild plant foods of the Wolastoqiyik living near Woodstock have included fiddlehead, wild onion, wild artichoke (solomon's seal?), bulb of dog-tooth violet, "wild turnip" (groundnut? jack-in-the-pulpit?), red roots of rock brake (a fern), yellow pond lily root, high-bush cranberry, large (low-growing) cranberry, sand plums, wintergreen berries, teaberries, blackberries, strawberries and blueberries, and maple sugar (Smith 1957: 5). Archaeological sites within the Maritime Peninsula have also documented the significance of plants to pre-contact diets. These have included butternut (Monckton 1997), groundnut (Leonard 1996), wild plums (esp. Canada plum, Deal *et al.* 1991, Gorham 1943, Hinds n.d., 1986, Leonard 1996), and various berries and seeds (*Rubus* sp., *Fragaria* sp., *Vaccinium* sp., *Ribes* sp., *Sambucus* sp., *Mitchella repens* (partridgeberry), and *Cornus canadensis* (bunchberry), *Polygonum* sp., Deal 1998: 6).

However, preservation of these materials in archaeological sites is heavily skewed towards plants that get charred (accidentally or through food preparation and discard), and towards plants with tough elements such as seeds and nut shells. Leonard's recovery of a pot containing groundnut fragments was due both to the fortunate conditions of preservation and, to Leonard's ability to recognize the charred tubers in the field (Leonard 1996). It is difficult to imagine how we would have captured evidence of other potentially important plant resources, for example, maple sap production, with our current field techniques. Recent work by Deal and his colleagues on residue

Table 2.1: Plant resources within the LSJR with significant potential for human food (Wolastoq'kew name derived from Hinds 1999).

Type	English Name	Latin Name	S*	Wolastoq'kew name
NUTS	Butternut	*Juglans cinerea*	F	Pokanewimus
	Beaked Hazelnut	*Corylus cornata*	F	Malipokansimus
	Bur Oak	*Quercus macrocarpa*	F	Wahcilomoss
	Red Oak	*Quercus rubra*	F	Asahqahawimus, Olonikp
	Beech	*Fagus grandifolia*	F	Mihihqimus
SEEDS	Hog-Peanut	*Amphicarpa bracteata*	F	
	Northern Wild Rice	*Zizania palustris*	eF	
AQUATIC	Sweetflag	*Acorus calamus*	Sp	Kiwohossuwasq
ROOTS**	Water Shield	*Brassenia schreberi*	F	
	Common cattail	*Typha* spp.	A	segidebigakde'gil
	Fragrant Water-Lily	*Nymphaea odorata*	F	'Samaqani pesqahsuwehsok
	Grass-leaved Arrowhead	*Sagittaria graminea*		
	Broad-leaved Arrowhead	*Sagittaria latifolia*	F	
	Yellow Nut-Grass, Sedge	*Cyperus esculentus*	F	
	Arrowhead or Wapato	*Sagittaria cuneata*	F	
	Bullhead Lily, Beaver-root	*Nuphar luteum variegatum*	F	Pskeht(iyil)
TERR.	Groundnut	*Apios americana*	A	Ktahkitom
ROOTS**	Solomon's Seal	*Polygonatum pubescens*	A	
	Cow Parsnip	*Heracleum maximum*	F	Paqolus
	False Solomon's Seal	*Maianthemum racemosum*	Sp	Amuwiminik(ol)
SAP	Maples	*Acer* spp.	Sp	Sonaw
FRUIT	Canada Plum	*Prunus nigra*	F	Mehqewicik
	Pin-cherry, Bird-cherry	*Prunus pensylvanica*	F	Masqesiminok
	Black cherry, Rum-cherry	*Prunus serotina*	F	Oluwininol
	Common Elderberry	*Sambucus canadensis*	Su	Saskibimos
	Wild Black Currant	*Ribes americanum*	Su	
	Canada Gooseberry	*Ribes hirtellum*	Su	Katesiminaks
	raspberries	*Rubus* spp.	Su	Saqtemin, Minsoss, Sosoqimins(ok)
	Large Cranberry	*Vaccinium macrocarpon*	lF	
	Low Sweet Blueberry	*Vaccinium angustifolium*	F	
	Bog Cranberry	*Vaccinium oxycoccus*	F	Sun-un-ul
	Rock Cranberry	*Vaccinium vitis-idaea*	F	Sihkimin(ol)
	Hobblebush, Mooseberry	*Viburbum lantanoides*	F	Otuhkimus
	Highbush Cranberry	*Viburbum americanum*	F	Ipimin(ol)
	Riverbank or Frost Grape	*Vitis riparia*	F	Al-ag-wi-min-ul
GREENS	Fiddlehead	*Matteuccia struthiopteris*	Sp	Mahsus

*season of use, with Sp = spring, Su = summer, eF = early fall, lF = late fall, and A = all year round

** TERR. = terrestrial; both include tubers, rootstocks, taproots, corms and bulbs analysis may hold the key to an understanding of the relevance of plants in regional economies (Deal 1990, Deal *et al.* 1991, Deal and Silk 1988).

From a seasonal perspective, one or other of the potential food plants are available in the LSJR throughout the year. In the early spring (often in March), maple sap begins to flow from winter storage in the roots to the branches and leaves. Wolastoqiyik collected this sap with wooden spiles and bark containers, and processed it into cakes of sugar (Butler and Hadlock 1957: 18-19). After this, as snows began to melt, shoots, greens (especially the shoots of the ostrich fern, known as "fiddleheads", but also cattail shoots, and others), and rootstocks (sweetflag and false-solomon's seal) were collected. Greens and shoots can continue to be harvested into the summer, and cattail flowerheads, stalks and pollen (Petersen 1977: 158) can be supplemented by summer berries (strawberries, elderberries, currants, gooseberries, and raspberries). Root-bearing terrestrial plants, including solomon's seal and groundnut can be harvested any time of the year, but would have been easiest to collect from moist summer soils. In early fall, grains such as wild rice and hog-peanut ripen, and aquatic roots become full of starches, increasing their food value. These latter foods can be harvested throughout the fall and winter, and into early spring in times of need. Fall berries also begin to ripen, including plums, cherries, blueberries, grapes, and cranberries; many of the cranberries hold their berries into the winter, providing a potential late fall supplement (Petersen 1977: 222). In October and November, nut and seed crops ripen and some can be collected in large numbers.

Gathering activities also encompass the collection of plant materials for manufacturing and construction (Table 2.2). Harper (1956) and Whitehead (1987), have found evidence of pre-contact cordage and fibre industries, using cedar bark, Indian hemp, reeds and rushes, cattail, basswood, and beach grass (Deal 1998, but see also Petersen 1990). Various hardwoods and

Table 2.2: Plant materials for tools (Wolastoq'kew name derived from Hinds 1999).

English Name	Latin Name	Wolastoq'kew name
Eastern White Cedar	*Thuja occidentalis*	Kakskus
Indian Hemp	*Apocynum cannabinum*	
Soft-stem Bulrush	*Schoenoplectus tabernaemontani* *	
Soft Rush	*Juncus effusus*	
Broad-leaved Cattail	*Typha latifolia*	Pkuwahqiyasq
Basswood	*Tilia americana*	Olonikp
Beachgrass	*Ammophila breviligulata*	
White Ash	*Fraxinus americana*	Akomahq
Black Ash	*Fraxinus nigra*	Wikp
Green Ash	*Fraxinus pennsylvanica*	Sonutamkiyey
Canoe or paper birch	*Betula papyrifera*	Masqemus

*formerly *Scirpus lacustrus*

softwoods were used as structural members, for constructing fish traps, canoe slats, snowshoes, tool handles and shafts, and other wooden tools (Speck and Dexter 1952), and ash continues to have a special role in the construction of Wolastoq'kew basketry.

However, the pre-eminent organic tool material may have been the bark of the paper birch. As discussed above, this material formed the basis of a major contact-period technological system oriented towards the construction of houses, canoes, containers, clothing, utensils, and storage facilities, among other uses (Butler and Hadlock 1957, Amin 1979).

Finally, as noted above, the chemical and pharmacological properties of plants were well known to the Wolastoqiyik. Not only were plants used for dying other materials and for tanning hides, they had many applications as medicines (Perley 2001, pers. comm., Chandler and Hooper 1982, Chandler et al. 1979, Mechling 1911, Speck and Dexter 1952, Stewart 1979, Van Wart 1948). These plants would have required specialized gathering strategies. The goal of medicinal plant gathering may be to obtain smaller quantities of specific species of plants that may be distributed over great distance, or in unique locales. Unlike food gathering, more is not better, as the pharmacological attributes of plants may diminish over time — in other words, they do not necessarily store well. Furthermore, precise identification and collecting methods are often required, necessitating a high degree of knowledge and experience. Although collecting medicinal plants may have been embedded in subsistence activities (*sensu* Binford's 1979 view of lithic procurement), it may also have been a private or personal activity, carried out by herbal / medical specialists.

Hunting

Within the LSJR there are a number of animals with potential as prey species. These include large and small terrestrial mammals, aquatic mammals, birds (especially waterfowl), and reptiles (see Table 2.3). Although freshwater invertebrates are available (especially freshwater clams and mussels) they do not appear in faunal inventories from archaeological sites, nor were they considered to be food in ethnographic accounts (Speck and Dexter 1952: 3).

All of the large terrestrial mammals were used by Wolastoqiyik as food, including moose, woodland caribou, black bear, and white-tailed deer. In the past, the first three were likely the most economically important. White-tailed deer populations have increased in recent years in response to modern land clearing practices. These same practices have resulted in the caribou becoming extirpated in all southern and central portions of the Maritime Peninsula. Some ethnographic accounts suggest that in the past the caribou was the most important large mammal to the Wolastoqiyik (Smith 1957: 4). Unlike its northern cousins, woodland caribou gather in smaller herds of between 10 and 50 individuals. Nonetheless, they are more gregarious than moose, as suggested by Snow (1980): "…(w)hile a few hunters might pursue a single moose through deep snow and make a kill when the animal bogged down, caribou could be ambushed in groups on known trails by larger hunting bands" (1980: 46). These animals wintered in old-growth forest, where they subsisted on lichen. In the summers they moved to more open uplands and hilltops (Miller 1992, CWS 2001). While Snow suggests a winter hunting season, this may not have been the case in the LSJR. The annual spring flood or "freshet" frequently drives exhausted moose and deer to any small rise of land in the floodplain. In the modern era this is usually the local highway, but small glacial features such as eskers and moraines are used in the same fashion. These animals may have been more easily hunted during this time of year, especially with the aid of canoes.

Table 2.3: Birds, mammals and reptiles with food potential in the LSJR (Wolastoq'kew names from Chamberlain 1899, Speck and Dexter 1952).

English Name	Latin Name	Wolastoq'kew Name
MAMMALS		
Moose	*Alces alces*	mus
Woodland Caribou	*Rangifer tarandus caribou*	muk-a′-lip
White-tailed Deer	*Odocoileus virginianus*	hĕt′-tok
American Black Bear	*Ursus americanus*	mu′-win, mu′-in
Muskrat	*Ondatra zibrithicus*	kai-u′-hĕs
Beaver	*Castor canadensis.*	kwa-pit′
Porcupine	*Erethizon dorsatum*	ma-tu-wźs′
Snowshoe Hare	*Lepus americanus*	ma-tĕ-kwźs′
River Otter	*Lutra canadensis*	ki-u-nik′
Pine Marten	*Martes americana*	tchi-a-kǑs
Fisher	*Martes pennanti*	pĕk-ĕmk′
Canada Woodchuck	*Marmota monax*	
Raccoon	*Procyon lotor*	źs′-pĕnts
BIRDS		
Ruffed grouse	*Bonasa umbellus*	
Spruce grouse	*Dendragapus canadensis*	
Passenger Pigeon	*Ectopistes migratorius*	
Common Snipe	*Gallinago gallinago*	
American Woodcock	*Scolopax minor*	
Black Duck	*Anas rubripes*	
Wood Duck	*Aix sponsa*	
Goldeneye	*Bucephala clangula*	
Ring-necked Duck	*Aythya collaris*	
Canada Goose	*Branta canadensis*	
REPTILES		
Snapping turtles	*Chelydra serpentina*	

While their value as high protein food was likely a key consideration, animals provided other materials as well. In contexts of good organic preservation (especially in coastal shell middens), bone harpoons and fish hooks, beaver incisor tools hafted in antler handles as crooked knives, and a variety of bone awls and needles have been recovered (Black 1992, Bourque 1995, Sanger 1987). Speck and Dexter illustrate the uses of other animal parts:

> The woodland caribou, moose, and white-tailed deer were the important ungulates that served as food and provided skins for clothing and shelter. Moose hide was used in making canoes and moccasins as well as clothing; the intestines [were also used for] cording snowshoes. The intestines were also cleaned, dried and stored for winter food. Moose hair was used for embroidery on pouches and containers made from animal skins. The hides of all of these large animals were used in making bags and containers. Sometimes the whole skin of one animal was adapted for that purpose. The black bear likewise was utilized for many purposes - flesh for food, hides and fur for clothing and shelter, intestines for bow strings, teeth and claws for beads and decorations, and bones for scrapers (1952: 3).

Of the smaller mammals, including muskrat, beaver, porcupine, snowshoe hare, river otter, marten, fisher, and raccoon, and other smaller rodents, squirrels, and weasels, the muskrat has been the most important to the Wolastoqiyik. Not only does it figure in many of their oral histories, the Wolastoqiyik were called the muskrat eaters by the Abenaki (*Mouskouasoaks*, Speck and Dexter 1952: 3), and the Mi'kmaq (*Kuuswekitchinuuk*, Wallis and Wallis 1955: 47, Burke 2000: 19). Wolastoqiyik also hunted birds, and gathered eggs (Speck and Dexter 1952). They often focused on migratory waterfowl (see below), but also hunted ruffed and spruce grouse (Smith 1957: 4), passenger pigeon (now extinct), snipe, and woodcock (Speck and Dexter 1952: 3). Finally, Speck and Dexter indicate that snapping turtles and their eggs were also gathered for food (1952: 3).

Although some of these animal species are ubiquitous in their distribution and seasonality, many aggregate or are available at particular times of the year. These distributions indicate potential patterns of seasonal exploitation. In the spring, large numbers of waterfowl congregate in the LSJR. Some of these birds use the region as a resting place or stopover during migrations to the north, while others, especially black duck, wood duck, goldeneye, and ring-necked duck, use the extensive wetlands of the central portion of the LSJR as breeding and nesting grounds. Both birds and eggs would have provided food during this time. Migratory birds also accumulate in some areas in the fall. Although large mammals may have been preferentially hunted in the fall when they carry larger amounts of body fat, it is also possible that flood-trapped animals and their young were hunted in the spring. Snow (1980) has suggested that woodland caribou would have been hunted in their wintering grounds, but it seems plausible that they might have been hunted during seasonal movements, along known trails from wintering grounds to summering grounds, and during calving season in the spring. Some ethnographic hunting patterns may have been stimulated by contact- and post-contact-period economic interactions (especially winter hunting for fur-bearing animals). As many small mammals have ubiquitous distributions both spatially and temporally, they could have been opportunistically hunted year-round. Wolastoqiyik traditionally hunt muskrat for food and furs in the spring when they are flooded out of their riverbank holes (K. Perley, pers. comm.).

Fishing

Many ethnographic accounts of Wolastoqiyik food-getting practices start with fish (Speck and Dexter 1952: 3), and it is clear that fish have been a significant part of the diet of people in the LSJR. Smith notes that in the middle leg of the SJR, "...formerly all the local fish were eaten...", including striped bass, sturgeon, salmon, gaspereaux, white fish, eel, smelt, and trout (Smith 1957: 6). Speck and Dexter (1952: 3) add shad and white perch to this list. However, the varied water resources of the LSJR create a habitat for a significant diversity of fish, including anadromous fish (11 species), catadromous fish (1 species), freshwater fish (12 species), and a variety of small minnows, shiners, daces, killifish and sticklebacks that may or may not have been used as either bait or as food fish. In addition, the fish resources of the lower estuary have a marine component because the "... upper two-thirds of the estuary is entirely freshwater, while the lower one-third... is increasingly saline downstream as a direct result of incoming tides. This brackish water forms a surface layer of varying depth (5-20 m) over the more saline deeper waters of both Long Reach and Kennebecasis Bay" (Meth 1971: 2). This allows some marine species to regularly penetrate the lower estuary where they can be caught (9 regular species, plus many more accidental or rare species, see Table 2.4, Meth 1971, Trites 1960). Anadromous fish that have large, seasonally predictable runs (especially striped bass, freshwater eel, Atlantic salmon, sturgeons, gaspereaux, and shad) were historically very important to the people of the LSJR, and have supported commercial fisheries to modern times (Meth 1971, see Table 2.4). Some archaeologists have suggested that salmon did not assume the singular importance as a resource in the Northeast that it did on the western coast of North America due to differences between the biology of Atlantic salmon and west coast species (Carlson 1988). This seems likely, at least in the context of the SJR, since salmon are simply one of a number of predictable and abundant anadromous resources. In the place of a single massive seasonal run of fish, the LSJR experiences multiple runs ranging from small to large in size and duration (see below).

Ethnographers and oral histories have recorded numerous methods of fishing and a diversity of specialized fishing gear. During seasonal runs, Wolastoqiyik were able to trap or spear some species

Table 2.4a: Exploitable fish resources found in the lower St. John River (from Gorham 1970, Meth 1971, Scott 1967, and Scott and Crossman 1973, Chamberlain 1899, Speck and Dexter 1952).

Latin Name	Wolastoq'kew name	English name	typ	val	dis	notes
Petromyzon marinus		sea lamprey	A	na	C	
Acipenser brevirostrum		shortnose sturgeon	A	C	C	spring spawning
Acipenser oxyrhynchus	pa′-si-kĕs	Atlantic sturgeon	A	C	C1	spawns end May to June, h.o.t.**
Alosa aestivalis		blueback herring	A	na	U	spawning run, lt May-June
Alosa pseudoharengus	si-kwĕn-ĕm-ekw′	gaspereau, alewife	A	MC	C	spawning run, lt May-June
Alosa sapidissima	ĕm-sam′	American shad	A	C	C	spawning run, lt May-June
Coregonus clupeaformis		lake whitefish	F	G	C	Oct. run into GL&Wash*
Salmo salar	pĕ-lam′	Atlantic salmon	A	MC	C1	e summer and fall runs
Salvelinus fontinalis	sko′-tĕm	brook trout	AF	G	C1	Oct runs of sea-run trout
Salvelinus namaycush		lake trout	F	G	U	in shallow lakes in winter
Osmerus mordax	sĕ-mel′-sis	rainbow smelt	A	G	C	winter ice-fishing, spring runs
Catostomus catostomus		longnose sucker	F	na	R	only common in upper SJR
Catostomus commersoni	ki-kamkw′	white sucker	F	G	C	throughout, lakes & streams
Couesius plumbeus	pĕ-nČp-skwźs′	lake chub	F	G	C	throughout, lakes & streams
Semotilus corporalis		fallfish	F	na	C	found in GL system
Ictalurus nebulosus	mĕ-te-pes′	brown bullhead	F	G	U	found in GL system
Anguilla rostrata	kat	American eel	C	MC	C	throughout, year-round
Lota lota		burbot	F	G	C	in SJR & GL, ice-fish
Microgadus tomcod		Atlantic tomcod	A	G	C	spawns Dec-Jan at mouth SJR
Morone americanus	po-ka′-kĕn	white perch	A	G	C	sizable permanent pop. in GL
Morone saxatilis	mĕk-ak′	striped bass	A	C	C1	in GL & h.o.t**, spring runs
Lepomis auritus		redbreast sunfish	F	G	U	in Oromocto river
Lepomis gibbosus		pumpkinseed	F	G	C	in SJR and Oromocto river
Perca flavescens	at′-sak-wa′-lus	yellow perch	F	G	C	throughout
Cottus cognatus		slimy sculpin	F	na	C	throughout

typ: A=anadromous, C=catadromous, F=freshwater, M=marine
val: na=unknown / poor value, G=good value, C=(known) historic commercial value, MC=major historic commercial value
dist: C=common, C1=common prior to dam construction, U=uncommon, R=rare
*GL&Wash=Grand Lake system and Washademoak lake
** h.o.t.=head of tide

Table 2.4b: Exploitable fish resources found in the lower St. John River (from Gorham 1970, Meth 1971, Scott 1967, and Scott and Crossman 1973, Chamberlain 1899, Speck and Dexter 1952).

Latin Name	Wolastoq'kew name	English name	typ	val	dis	notes
MARINE VISITORS						
Squalus acanthias	sik-lat'	spiny dogfish	M	na	U	found as far as 25 km in
Raja radiata	hĕp	thorny skate	M	na	U	in Kennebecasis Bay (KB)
Brevoortia tyrannus		Atlantic menhaden	M	na	R	found as far as 25 km in
Clupea harengus	pźl-kwakw'-sit	Atlantic herring	M	na	R	
Gadus morhus	nĕk-mekw'	Atlantic cod	M	na	U	in lwr Kennebecasis River
Urophycis chuss	kul-pa'-pe-ki'-kĕn-ĕs	red hake	M	G	C	in lower SJR in winter
Peprilus triacanthus		butterfish	M	na	U	found as far as 15 km in
Sebastes marinus		ocean perch	M	na	R	in Kennebecasis Bay
Cyclopterus lumpus		lumpfish	M	na	R	in Long Reach and KB

(especially striped bass, gaspereaux and shad, salmon and eels) in large numbers. They fished for salmon with special rock maple spears (*sapti hi' gan*) (Barratt 1951, Speck and Dexter 1952: 3); they employed similar spear-based technology for other aggregating anadromous fish, including harpoons (*si-gawan*) or leisters (*ni'gak*), and other fish spears (*ni- ka'-kwûl*). They also speared eels speared but more commonly took them in eel pots or traps (*kadewi-galhi-gan*) made of splints (Speck and Dexter 1952: 3). The Wolastoqiyik developed specialized methods for catching Atlantic sturgeon. Although these fish do not occur in the abundance of other running fish species, they are very large (up to 4 m long) and a single fish can produce hundreds of pounds of meat. By using a torch (*pu'segwo-n*) in a canoe at night, they lured the sturgeon to the surface, where they could be harpooned and played until tired (Butler and Hadlock 1957: 30-31).

Wolastoqiyik captured freshwater lake and river fish with a variety of other fishing technologies, including dip nets (*azahi'gan*), fish nets (*hap*), hooks (*pki' ekan* or *ûm-ki'-kûn*) and fish-lines (*ûm-ki-kû-nap'*) (Chamberlain 1899, Speck and Dexter 1952). They also used this latter technology for ice-fishing winter spawning tomcod, smelts, and red hake, which aggregate within the lower estuary in winter. Although ethnographers have recorded few examples of larger capture facilities, archaeological investigations in Maine at Sebasticook Lake uncovered extensive weir facilities used and repaired over long periods of time from as early as the Late Archaic (Petersen *et al.*

1994). These kinds of facilities have low archaeological visibility in areas where lakes levels do not fluctuate greatly, and it is possible that pre-contact fishers constructed similar facilities at the mouths of some of the lakes in the LSJR.

From a seasonal perspective, the fish of the LSJR vary in their annual availability. A series of spawning runs begin in early April, with smelt running from the brackish mouth of the estuary (where they congregate in the winter), to small streams (Scott and Crossman 1973). This is followed by very large runs of the freshwater herring species (gaspereaux, blue-back herring and shad) from the ocean into the tributaries of the LSJR. There are also large spring runs of striped bass and sturgeon along the main river to the head of tide. In the early summer Atlantic salmon start large runs. After the major spring runs, the fishery likely shifted in scale and locale to focus on resident lake and stream fish (Burke 2000: 22), including American eel, brook trout, smelts, suckers, lake chub, fallfish, bullhead, white perch, sunfish, pumpkinseed, yellow perch, and sculpins. By October, lake whitefish and sea-run brook trout begin large spawning runs, and there is a second run of Atlantic salmon. As the lake waters cool, lake trout and burbot rise to nearer the surface. Once the lakes freeze, these and other lake-dwelling fish can be caught through the ice. Finally, as the brackish waters near the mouth of the SJR freeze, smelt and spawning tomcod begin to congregate. These can be ice-fished along with the other marine species (especially red hake) that penetrate the lower reaches of the river in December and January.

INORGANIC RESOURCES

I have indicated a number of organic resources that furnished raw materials for tools and facilities. However, some inorganic materials were also technologically important to pre-contact peoples. Pre-contact tool makers used fine-grained rocks with particular fracture characteristics as toolstone for flaked implements. The varied geology of the LSJR creates potential access to rocks exhibiting these characteristics, including various felsic and mafic igneous rocks, mudstones, quartzites, metaquartzites and other metasedimentary rocks, cherts, and minerals such as quartz. Furthermore, they ground a variety of hard, massive rocks, such as siltstones, plutons, volcanic rocks, and slates into tools. They may have quarried some of these rocks from bedrock exposures, but tool-makers likely procured many raw materials from secondary sources, such as beds of river cobbles and glacially-derived cobble features. Although local groups may have “embedded” lithic procurement in the seasonal movements oriented towards food acquisition (Binford 1979), some lithic raw materials were clearly obtained from considerable distances away (Black 1992, Blair 1999, Bourque 1994, Bourque and Cox 1981, Burke 2000). While the complexity of regional bedrock geology, combined with the resculpturing and disordering of the land by glaciers has made comprehensive sourcing of lithic assemblages very difficult, the disentangling of sources of raw materials, and the information they provide about seasonal rounds, regional integration, and interregional interaction will be a major theme in subsequent chapters. The only well-studied source area within the LSJR basin is the Washademoak chert source, which contains brightly coloured, fine-grained, waxy to glassy cherts (Black, this volume, Black and Wilson 1999).

In addition to lithic raw materials, in some periods pre-contact peoples sought native copper and clay to make tools. Naturally occurring native copper is not known to have been available within the SJR, although there are sources in the Bay of Fundy to the south (Blair 1999, Deal 1998, Leonard 1996). On the other hand, the LSJR contains some useable clay beds, especially around Grand Lake, and at the river's mouth (Allain 1984, Deal 1998).

PALAEOENVIRONMENTS

In the discussion above, I have made reference to the possible uses of the environments of the LSJR by pre-contact peoples. In reality, however, the notion of the "pre-contact era" has little utility as a palaeoenvironmental unit. While it may be supposed that the environment of the time immediately before contact (ca. 600 years ago) was considerably like the historic environment of the Maritime Peninsula, it becomes increasingly problematic to push these environmental conditions, and associations of particular flora and fauna, back in time. Those researchers concerned with human adaptation have emphasized this view:

> It cannot be overly stressed that environmental analysis must be approached from the viewpoint of dynamic systems. While this may appear to be trite to some, a systematic, classificatory approach to environment remains in vogue in archaeology, even among those who pay lip service to the "ecological approach". For some archaeologists, a discussion of environmental contexts in terms of a static classification of microenvironmental zones is regarded as sufficient, without consideration of temporal periodicity, long-term change, and the like. We would be well advised to heed the spirit of Tansley's (1935) original definition of the ecosystem as a dynamic interaction sphere (Kirch 1980: 136).

There have been two approaches to paleoenvironmental research in the Maritime Peninsula – the macroenvironmental view and the microenvironmental view. The traditional approach in this region has been the former, consisting of broad temporal and spatial vegetation histories based primarily on pollen analysis, supplemented by investigation of widespread geomorphological trends such as crustal downwarping and isostatic rebound, causing changes in sea-levels (Grant 1975). In the lower SJR, much of this analysis has been based on the work of Mott and his colleagues (1975, Mott *et al*. 1986) on sites near the Fundy coast (Basswood Road Lake, now Splan Pond, and Little Lake, Miller and Cynwar 1991). This research suggests that Holocene environments developed from a tundra-like post-glacial context through a series of northeastward migrations of coastal plain flora and fauna (Clayden 1999: 44). Most of this detailed research has been directed towards exploring late Pleistocene and early Holocene events, such as the formation of glacial features such as delta systems (Pronk and Seaman 2001), and the impact of the Younger Dryas (Levesque *et al*. 1993). As a result, an understanding of mid- to late-Holocene period environments, which are of greatest interest to the present study, tend to be secondary research products. Nonetheless, broad trends can be discerned:

> Vegetation response to the warming climate was rapid after 10,000 years ago. Forests of spruce and fir were succeeded within a few thousand years by mixed stands soon including all of the conifers and most or all of the hardwoods present in today's forests. The relative proportions of these species varied along climatic/topographic gradients and in relation to fire frequencies, competition, soil development, and tree diseases (Mott 1975, Ritchie 1987). The temperatures peaked in the Maritimes between 7,000 and 5,000 years ago at values about 2°C warmer than at present (Pielou 1991, Jetté and Mott 1995), and then began a decline which continues to the present. During the climatic optimum (or "Hypsithermal interval"), white pine, hemlock and oak reached their maximum postglacial abundance in New Brunswick, indicated by a pollen representation locally up to twice that found anywhere in the region at present (Jetté and Mott 1995). Hemlock was subsequently decimated in New Brunswick (Mott 1975, Warner et al. 1991) and throughout eastern North American by unknown factors, possibly including one or more major epidemics of defoliating insects (Bhiry and Fillon 1996). While it recovered, sugar maple, beech and other trees characteristic of the present hardwood forests of the province assumed greater prominence. The pollen record for the past millennium indicates a rise in spruce, and a decline in hemlock and temperate hardwoods, signifying the onset of increasingly cool, moist climatic conditions (Mott 1975) (Clayden 1999: 45).

This summary suggests that modern environments began to form by 5000 years ago. It is clear that (at least in broad terms) the closer the period of research is to the present, the more tightly modern and historic associations reflect previous environments. However, detailed local palaeoenvironmental research directed at the later portions of the Holocene have yet to be conducted, and provisional, large-scale frameworks will have to suffice. Undoubtedly these are problematic or even incorrect at finer temporal and spatial scales, and so these frameworks must only be accepted in terms of the ecological analysis above with considerable reservation.

Microenvironmental analyses contain some potential for resolving environmental patterning at fine-scales. While it is clear that environments are dynamic at large scales, they may also experience periodic (fluctuating) or singular (event-like) changes, that may be severe but of short duration (see Anderson 2001, Fiedel 2001). This research has developed through the application of ice-coring, tree-ring and lake-sediment records to perceive changes on an annual scale. Although some researchers have isolated particular events in these records and have attempted to associate them with particular historic or archaeological situations, such causal linkages remain troublesome, and causality is inferential, at best. At the present time, the local influence of events visible in these records has yet to be determined with other forms of local palaeoenvironmental data. Further resolution in both the archaeological record, and local environmental conditions in the past are necessary before these records can be used to their fullest.

This analysis suggests that the LSJR was unlike other parts of the SJR drainage and other interior parts of the Maritime Peninsula. However, it is also unlike coastal regions. Resources were generally diverse and abundant, and a number of particular resources (especially spring runs of anadromous fish, wintering caribou, migrating waterfowl, and fall nut and grain harvests) exhibit aggregated characteristics, suggesting discrete periods and locations of particular abundance. This rich setting created opportunities for the people of the Jemseg Crossing site. The site was ideally situated to allow the people living there to travel to resource areas, to other neighbouring sites and other seasonal encampments, and to participate in the rich ecological systems of the lower Saint John River.

Elehtasikpon Ktahkomiq

3: The formation of the site area

Susan Blair

Jemseg Crossing archaeological site is located on the southeastern shore of the Jemseg River. The excavation area was defined by the “footprint” of the bridge. Over the course of the project this footprint, or zone of impact was reduced as much as possible through collaboration with New Brunswick Department of Transportation engineers, with the intent of reducing the area of impact on the archaeological materials in the area. Based on an examination of private collections and artifacts that have become exposed on the beach due to erosion, it is clear that the site extends well outside of the area of excavation. The only section of the beach or lands adjacent to the beach with negligible potential for archaeological resources was the area around the marina that was located to the south of the excavation area. This lack of potential is a direct result of the high impact that the construction of the marina had had on the beach front, and significant previous disturbance, including two separate periods of bridge construction and road building, adjacent to the marina (P. Allen 1997: pers. comm.).

The proposed highway footprint transects a number of topographic features, including:

(1) the river bed,
(2) the beach,
(3) a levee,
(4) a slough,
(5) the break in slope, and
(6) an upper terrace.

This topography has created significant variations in the nature of the archaeological deposits and has impacted significantly on general site formation processes. These topographical elements are indicated in plan and profile in Figure 3.1, and will be discussed below.

(1) River bed

The Jemseg River is a long thoroughfare that connects the Grand Lake system with the Saint John River. In the east side of the river (the section in front of the site), the Jemseg is shallow and silty. A channel, which has been dredged to allow barges to ship coal from Minto, passes on the far side of the centre of the river. We recovered lithic artifacts from within the shallows near the bank (P. Polchies 1996: pers. comm.), and there appears to be a fairly steady rate of erosion of the bank into the river. Some of these materials may have been dislodged during the spring break-up of ice on the Grand Lake system, as the section of bank in front of the site appears to have experienced periodic ice scouring (see below).

Initially, we were greatly concerned about the archaeological potential of this portion of the footprint. The presence of fine-grained silts and a wide shallow shelf in front of the site suggested that the sediments in the Jemseg river might be accumulating at front of the site. Water-saturated sites occasionally produce very delicate organic artifacts, such as netting, basketry, fishing lines, or watercraft (canoes) (D. Keenlyside 1996: pers. comm.). These materials are very rarely recovered in the Northeast, and are also very difficult to excavate and properly preserve. To determine whether such deposits might exist, we installed a long sediment-control curtain in front of the site, and began wet screening test samples. This process involved flushing samples through screens with water. These failed to produce any identifiable pre-contact artifacts, but we remained concerned until the analysis of NBDOT boreholes by a geomorphologist (A. Seaman, DNRE). These boreholes indicated that the layer of silt in front of the site consisted of a thin veneer over a thick layer of late Pleistocene glaciolacustrial clay. We were able to infer from the thinness of this silt layer that ice scouring and the removal and replacement of silts by the currents of the river are major destructive forces in the river bed. We concluded that any archaeological materials that might have been deposited in front of the site have been long since destroyed by erosion.

The water level at the front of the site indicated in Figure 3.1 is slightly below the 1 m mark, a reading taken by surveyors on September 5, 1996. Given the tidal nature of the lower Saint John River, the actual water level varies considerably over the course of a day. It also varies over the course of a year, and over the course of many years. The graphs in Figure 3.2 are derived from readings taken over the last 30 years by an Environment Canada station located on the previous Jemseg bridge. Some of these variations are related to the regulation of the river levels and the requirement for power by the Mactaquac dam (B. Nash 1996: pers. comm.), while others are a part of the seasonal fluctuations of the river. These seasonal fluctuations are most severe in the spring, when the annual spring "freshet" or flood, causes the waters of lower Saint John River to rise as high as 6 metres or more. It is this force which has allowed for the build up alluvium over most of the site area, and in particular, over the 150 m zone running parallel to the river.

(2) The Beach

During periods of relatively low water levels, a narrow beach of reddish-brown silt, sand and gravel overlying a light grey

Figure 3.1

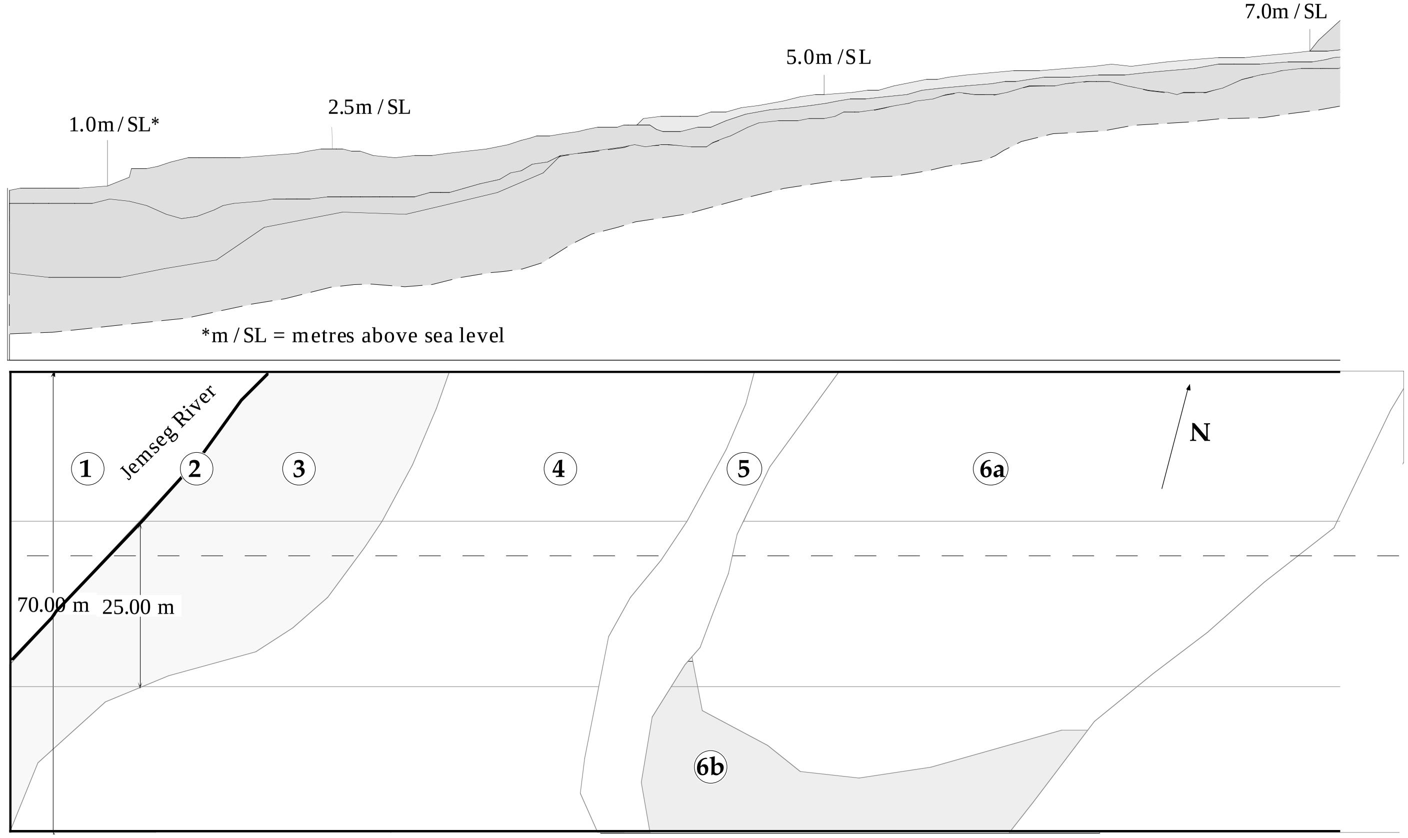


FIGURE: the profile and plan of the proposed highway footprint, showing topographic zones. The upper figure is a profile of the site drawn along the proposed centre-line, represented by the dashed line

1 River bed
2 Beach
3 Levee or lower terrace
4 Low wet area
5 Break-in-slope
6a Upper terrace: ploughed
6b Upper terrace: unploughed
7 1980s Fill

40 metres

clay is exposed in most areas in front of the site. The beach itself may simply be an exposure of the river bed, since the beach and river bed are only differentiated by the presence of water over the latter. The shoreward margin of this beach is defined in most places by a modest topographical rise, which is grown up in alders, grasses, low bushes, and in some places, small trees. In a few places the plants and trees have become drastically undercut by erosion, indicating the degrading nature of the levee and beach area. During the preliminary walk-over of the beach area, and in subsequent surface collection during the JCAP, we recovered abundant lithics, post-contact period ceramics, metal and glass from the beach. These finds appeared to be clustered in a zone adjacent to southern edge of the 70 m footprint (subsequently designated Area D), and in a wide beach segment north of the northern edge of the 70 m footprint (subsequently designated Area F).

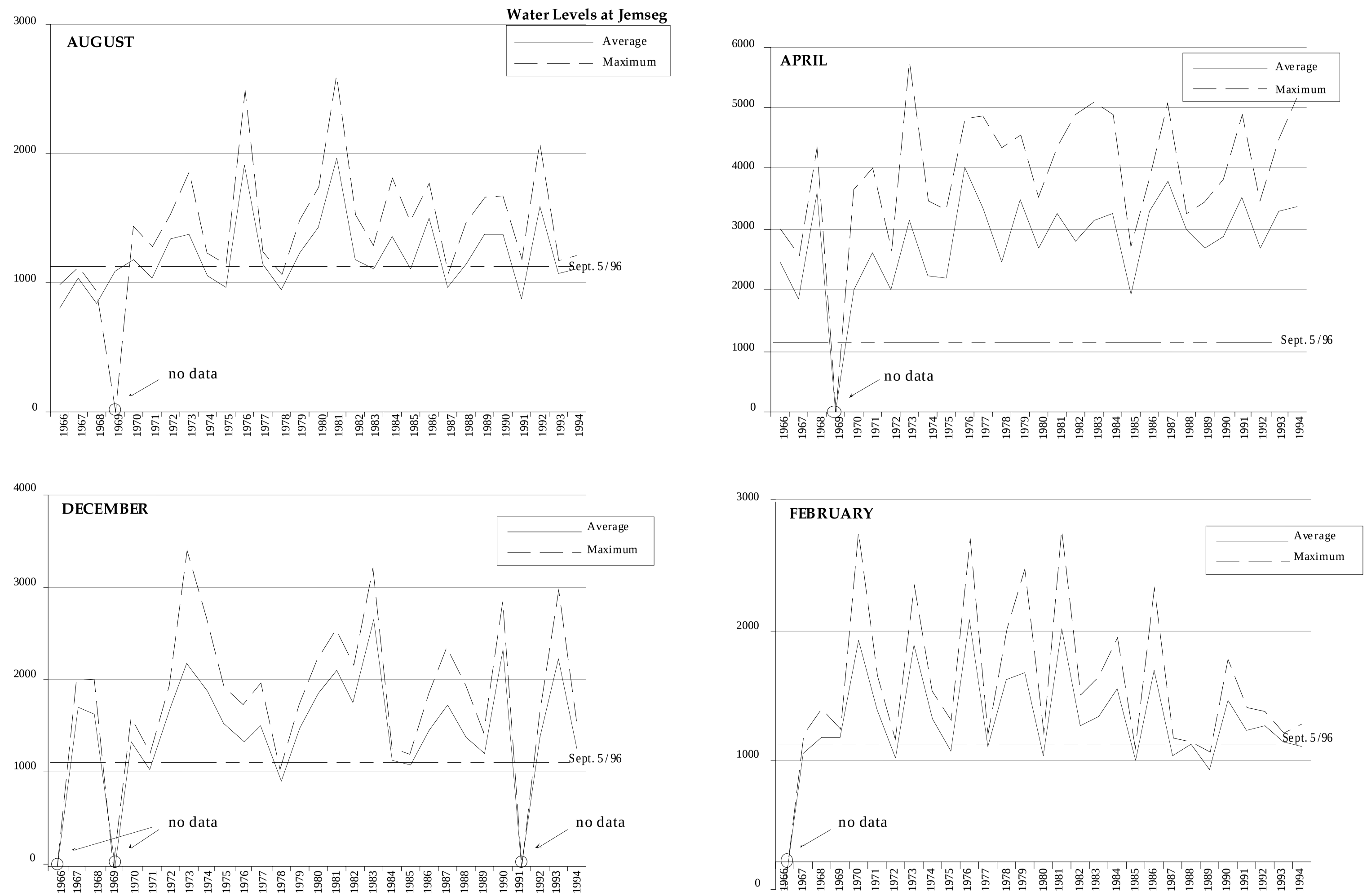
(3) The Levee

The small topographical rise adjacent to the beach is referred to as the levee or the lower terrace. Significant evidence of pre-contact period activity in the levee area was uncovered during the JCAP. In the southern part of the 70 m wide footprint, this levee appeared as a low hump, 10 m to 20 m wide that diminished in height but broadened to the north to 25 m to 30 m wide. Test excavations placed in the southern portion of this rise indicated a considerable buildup of alluvial soils. The excavation of these units was halted when we reached water table at 120 cm, although they were still producing abundant cultural material at that depth. To the north, the deposits appear to be more shallow, as well as more disturbed. A previous landowner recounted to me that he had bulldozed alders off of the northern part of the levee (from about 10 m or 15 m south of the centre-line, northward) to create pasturage for cattle. This disturbance appears to have been localized but severe, and may account the deflection of shrubby vegetation such as alders and brambles in favour of grasses and sedges on the northern half of the levee.

(4) The Slough

The relief behind the levee area evens out again, particularly in the southern half of the 70 m footprint, creating a low wet zone, or slough. The landward limit of this area is between 3 m and 3.5 m above mean sea level. The soils in this area were sandy-clays, rich in partially decayed plant matter. To the north, the soils appeared to be sandier, and more well-drained. This zone is one of open vegetation, with a number of marshy and boggy grasses and plants growing in it. It was very difficult to conduct subsurface testing in the slough due to the quantities of standing water, the dense mass of sodden grasses in the upper layers, and the sticky quality of the clay-rich soils. Nonetheless, a series of test units (TD1, B68, E71, and TH1) were placed across the width of the site in this zone. Most of these units produced only a few flakes. Test Unit TH1, which was at the northern edge of the footprint, produced

Figure 3.2: The monthly water-levels in the Jemseg area taken over 3 decades. Only four months are represented in these graphs, August, December, February and April, since these were the month of greatest concern to the JCAP. Recent levels are effected by the Mactaquac Dam, which came into use in 1971. These graphs are derived from data gathered from an Environment Canada station, and generously provided to the project by P. Hilts of Environment Canada.



slightly larger quantities of materials (10 flakes and 27 pieces of recent post-contact iron debris). This may relate to the sandier nature of the soils, the degree of post-contact disturbance (see above), or both. Generally, however, the slough was a zone of low archaeological productivity.

Discussions with previous landowners have indicated that this lower zone and the levee by the water's edge were used as pasturage in previous years. None of the people in the area that JCAP project members talked to recalled these lower zones being ploughed for agricultural purposes (Dignam 1997), although this is not unexpected given the water-saturated soils of the slough area.

(5) The Break in slope

The break in slope is the area between the low relief wet area, and the upper terrace. It occurs as a shift in elevation from 3.5 m to 4.5 m or 5 m above sea level, over a distance of 15 m to 30 m. Although the rise in land is relatively gradual, it is archaeologically significant, not only because it defines the edge of the ploughed field on the upper terrace, but because it appears to have been a zone of intense post-contact use and disturbance. Indeed the edge of the ploughed field and high density post-contact period material may be related. Some of the possible explanations for this will be explored more fully in subsequent chapters, but the ploughing of the field may have resulted in large refuse objects and rocks being cast to the edge of the field. It is also possible that the ploughed field restricted contemporary site activity (such as actual campsites) to the break in slope. Finally, the field edge and a change in topography may have led to periodic episodes of dumping, or the deposition of fill.

Although the soils in this area contained a component of clay, the drainage was better than the soils in the slough. The accumulation of alluvium in this area was fairly deep, with some excavation units producing materials from a depth of over 125 cm. These units were not completed, due to problems with poor drainage and water accumulation in the lower depths, and because of changes in the location of the highway footprint, which shifted the area of impact to east of the break in slope.

(6) The Upper Terrace

The upper terrace consists of a broad, gently sloping field that rises from the break-in-slope to the modern highway. In recent years, a large quantity of debris and fill (containing large angular slabs of asphalt, boulders, and shattered bedrock) have been deposited on the upper surface of this field to a height of 2 m to 8 m. Prior to 20th century road-building (including recent additions to Highway 2 and the older highway, now called Grand Lake Drive) and farming, this terrace likely rose gradually for at least several hundred metres to a second break in slope. A single test unit (Test Unit TK1) placed in an exposed surface of the field immediately adjacent to the old highway (Grand Lake Drive, over 200 m from the rivers edge) recovered a small selection of post-contact period artifacts but no definite pre-contact artifacts, suggesting that the area of intense pre-contact activity was closer to the Jemseg River (perhaps within 150 m to 175 m of the rivers edge). In the 19th and 20th century, portions of this field were ploughed for agricultural purposes. Based of the inferred distribution of the ploughzone, this terrace is divided for the present discussion into two sections: the ploughed field, and the unploughed field.

(6a) The Ploughed Field

Previous landowners have indicated to us that early 20th century ploughing had been restricted to the northern half of the upper terrace (Roy Dykeman: pers. comm, Dignam 1997). The archaeological evidence, in the form of the distribution of cross-mending artifacts (closely clustered in the unploughed field, and widely distributed in the ploughed field), and an indistinct vertical zoning (darker loamy-sandy soil from the surface to ca. 25 cm depth below surface and slighter reddish-brown loamy-sandy soil with larger clasts below 25 cm) supports this suggestion. It is likely that the distribution of recent ploughing activities may have been related to either drainage and topography, or to more prosaic factors, such as traditional property boundaries.

Although ploughing seems to have had the effect of levelling the surface of the upper terrace, there was a great deal of subsurface variation in the depth of alluvium and the paleotopography of the basal till underneath it (see below). Although the basal till appeared between 30 cm and 50 cm below the surface in most units, in some units there was more than one metre of accumulated alluvium. In some cases (such as in the northeast corner of Area A), this shift in relative depths of alluvium was fairly localized.

The upper terrace produced most of the identified pre-contact period features and the majority of the recovered artifacts. The ploughing of the field has had various effects on archaeological materials. All of the features recorded during the project were encountered below the ploughzone. In some cases, features were apparently truncated by ploughing, as indicated by the dispersal of fire-cracked cobbles, hearth stones and charcoal immediately above intact features. It seems likely that ploughing has also damaged or destroyed artifacts. For example, almost all of the pre-contact pottery recovered from the site came from below the ploughzone. However, ploughing activities also assisted in the identification and initial assessment of the site. The concentration of artifacts in the ploughzone led some of the local people in the area to collect the artifacts exposed by the action of the plough. As a part of the process of collecting information about the site area, we documented as many of these private collections as possible. One of these (the Dykeman collection) was made by two brothers who apparently would visit the fields of the Jemseg site after the semiannual ploughing, specifically to collect newly upturned artifacts (see below).

(6b) The Unploughed Field

During the initial phase of testing the site in September and October, we placed several units at the southeastern edge of the 70 m footprint. Vertical distributions of artifacts (such as localized and comparatively dense concentrations of 19th century ceramic at 5 cm below surface) suggest that this portion of the field had not been as heavily ploughed as the area to the north, an inference which was supported by information given by previous landowners (R. Dykeman pers. comm., Dignam 1997). However, only a few units were placed in this portion of the field before the highway footprint was narrowed to 25 m in an area to the north. The findings in these units suggest that this section was used by some of the earliest groups at the site (see Chapter 16). The alluvium in these areas is comparatively thin, with the basal till appearing at approximately 35 cm below surface.

(7) The Fill

As discussed above, the landward portion of the upper terrace is covered by a significant quantity of fill. The fill originates from two episodes of deposition. Most of it comes from local highway construction in the early 1980s, and contains highway-related debris such as asphalt slabs and unconsolidated bedrock. As this fill originated off-site, it has had minimal impact on subsurface archaeological materials, covering (and hence protecting) archaeological materials. We verified this by scraping off a small area of this fill (in Area D), exposing the original field surface, and excavating it. This test excavation revealed that the areas of the field under the fill contain a density of artifacts (and likely features) as great or greater than that of the exposed portions of the ploughed field.

However, prior to the deposition of highway fill, the back portion of the field had been impacted by a series of other activities, including the construction of a road (the old highway, now Grand Lake Drive), and the construction of a small gas station and restaurant adjacent to the old highway. As a part of this development, a portion of the field (ca. 60 m northeast of Area A) was removed with a bulldozer and piled to the northeast as a base for the construction of the gas station. This operation created the large knoll (ca. 8 m above the surface of the field) next to the old highway. The gas station and restaurant have subsequently been demolished, and it was upon this knoll that the interpretative centre was located during the JCAP. A flake recovered from the modern surface of this knoll attests to the fact that it was created using parts of the field which had contained archaeological materials. To determine the extent of destruction caused by these activities, we identified the area where the field had been excavated. This area had been subsequently filled in with 1980s highway debris. By carefully removing the recent fill, we discovered that soil layers under the fill had been obliterated by the construction of the gas station knoll to depths of over 165 cm, after which groundwater impeded further examination of subsurface characteristics. This suggests that a portion the back surface of the upper terrace of undetermined dimensions has been completely destroyed. Although some of the artifacts may still exist within the knoll adjacent to the road, all of the relationships between these artifacts, as well as features such as hearths, house floors, and pits have been obliterated.

SOIL STRATIGRAPHY

In this section, I will discuss the natural soil layers that were encountered over broad areas of the Jemseg site, and suggest some of the geomorphological processes which may have generated them[1].

In general terms, the site area contains five soil layers: (1) fill, (2) alluvium, (3) glaciolacustrial clay, (4) basal till, and (5) bedrock (see Figure 3.3). Although the fill is not technically a soil in the traditional sense, we could consider the 1980s highway fill to be a recent archaeological soil layer. Generally, its wide distribution and the impact that it has on site profiles is significant enough to warrant its inclusion here. This "layer" has been discussed above.

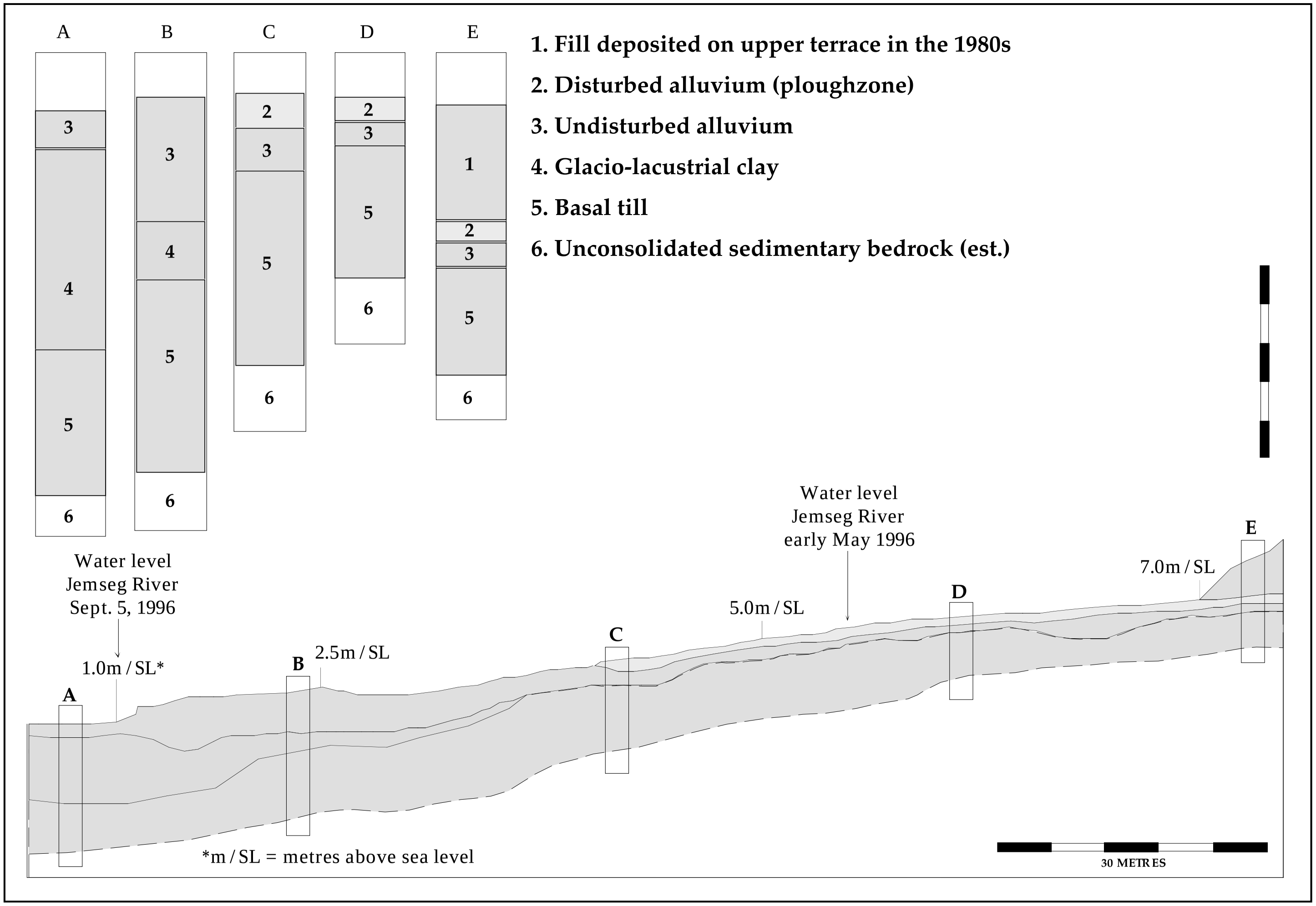
The next layer consists of a blanket of alluvium that has accumulated during the Holocene (after ca. 10,000 years ago). This alluvium was described as a reddish-brown sandy silt, with zones or areas of brown or grey sandy clay. For the purposes of archaeological analysis, the disturbed alluvium (the ploughzone of the upper terrace) has been distinguished from the more widespread undisturbed alluvium, although in geomorphological terms they are essentially the same thing. In a general way, the alluvium is roughly wedge-shaped with thicker deposits forming close to the waters edge (estimated as 1.5 to 2 m thick), and thinning out with rising elevations to the upper terrace (where they were usually 30 to 50 cm thick). As lower areas have experienced a greater degree of flooding, they have experience greater deposition of silt and sand. The onset of these processes is poorly understood regionally, as we have yet to fully explore the complex relationships between coastal subsidence, the formation of the Saint John estuary, and the onset of annual flood regimes (P. Dickinson pers. comm.).

The alluvium developed over a glaciolacustrial clay in the lower site areas (the levee and the wet zone). This pale grey to white dense clay may have been deposited when a large glacial lake formed over location of the modern the Grand Lake system, after the melting of the glaciers (some time after 12,700 years ago). This glacial clay is widely distributed in the area to the south and west of Grand Lake, and is the same material that forms the hydrographic barrier that creates the broad areas of wetland known as the Jemseg Flats and the Grand Lake Meadows (Choate 1973).

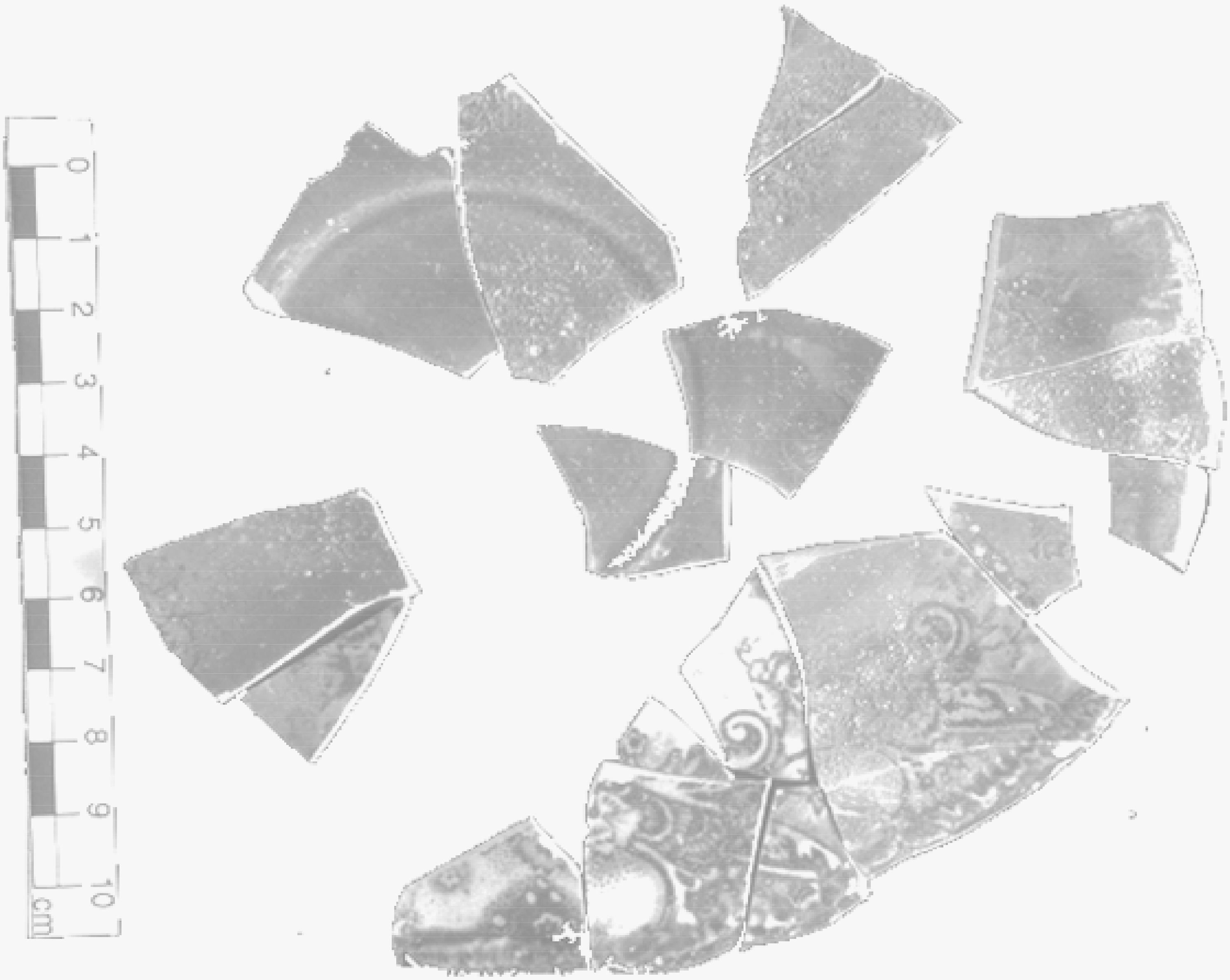
Stratigraphically beneath the clay is a thick layer of basal till, a glacially derived deposit over 13,000 years old (A. Seaman pers. comm.). This glacial clay was not encountered on the upper terrace, and in this part of the site the alluvium rested

1 These inferences are gleaned directly from my discussion of this subject with Alan Seaman (NB Department of Natural Resources and Energy). Any errors in this presentation are the result of my own imperfect understanding.

Figure 3.3: A stratigraphic cross-section of the site, drawn along the centre-line of the proposed TransCanada Highway (running roughly east-west), with geomorphology and lithostratigraphy developed through discussion with A. Seaman (DNRE, Minerals Branch). The vertical dimensions and horizontal distribution of layer 4, 5, and 6 are estimates, based on deep-trenching and boreholes. Note that the vertical scale is not the same as the horizontal scale.



directly on top of the basal till. This till is a gravelly sand, with some (ca. 20%) clay. Based on NBDOT borehole samples, the till is estimated to be 2 m to 3 m thick. Beneath the glacial till is a silty deformation till, and unconsolidated bedrock. The bedrock underneath the site is composed of flat-bedded coarse grained terrestrial sediments, such as conglomerates, sandstones, siltstones and shales (Black, this volume, from McLeod, Johnson and Ruitenberg 1994; Potter, Hamilton and Davies 1979).



Section Four

ANALYSIS

Elluhkatomek

4: Methodology, Part I

text by Susan Blair

photographs by Viktoria Kramer

"We're gonna need a bigger boat" (Patrick Polchies, quoting Roy Scheider, from *Jaws*)

The initial visit to the site by members of the archaeological team and the Jemseg Maliseet Advisory Committee was August 26, 1996. At that time, the standard estimates of a highway footprint of 120 m wide was rejected by the DOT as too unwieldy[1] . To protect the parts of the site that were not within the immediate zone of destruction of the proposed highway, and to control the size of the excavation that would be required, and it was determined that in this case, the "footprint" (or area of impact) would be limited as much as possible, with the result that a modified

[1] Given that local informant had suggested that artifacts had been found as far as 200m back from the waters edge, this footprint allowed for an area to be mitigated of 24000 square metres.

footprint of 70 m wide was proposed[2].

The field project began of September 3, 1996, with a formal deadline of the end of May, 1997. At this time we were uncertain about the nature of the site. Topographically, the site area consisted of six zones, all of which would be crosscut by the proposed highway (see Chapter 3, Figure 3.3):

a) underwater zone
b) the levee (the lower terrace)
c) the slough
d) the break in slope
e) the upper terrace
f) the 1980s highway fill

The initial Environmental Impact Assessment survey had suggested that the site was likely shallow and disturbed[3]. It has also been the experience of archaeologists working in the Maritimes that sites of this structure tend to be relatively recent (i.e.: dating from the last 2000 years), and localized in terms of the actual distribution of artifacts. These perceptions were fundamental to our ideas about the feasibility of large-scale mitigation of the site, and the initial proposal of methodologies for the mitigation of the site. However, given the nature of such probabilistic statements, and the significance of the problems that would inevitably arise if these assessments were incorrect, we felt that we should err on the side of caution. Our concerns at the preliminary stages of the project were focussed on three basic questions:

1) What was the maximum depth of archaeological material and the relative level of disturbance?
2) What was the distribution and age of materials? Were they localized, relatively recent flake scatters?
3) What was the potential for a wet site off the front of the site?

Based on these concerns it was decided that the first aim of the archaeological project would be to establish the nature and integrity of the site, and to develop a set of data that would facilitate further planning for the overall mitigation.

EXPLORATORY TESTING

Once the 120 m footprint had been reduced to a 70 m footprint , we began to explore these three issues. As DOT surveyors were establishing our footprint on the ground, and mapping in the site area, we started to lay in 1 m by 1 m test

[2] This reduced the area of impact to 14000 square metres (3500 - 2 m by 2 m soil blocks). In retrospect, and given the goal of 100% mitigation set out by licensing agency, Archaeological Services, even this footprint was vast. It was hoped, however, that this area might be reduced by focusing on areas with high artifact densities, while clearing some parts of the footprint for mitigation by virtue of not finding any materials.

[3] The primary purpose of the archaeological testing conducted during the Environmental Impact Assessment had been to indicate the absence or presence of archaeological material. The Environmental Impact Assessment survey was sufficient to meet this goal, however, there remained an unclear picture of the nature and parameters of the site. However, based on the results of the Environmental Impact Assessment, the initial perception of the site was that it was restricted to the ploughzone, and therefore shallow and disturbed. Because it was assumed that most of the archaeological evidence at Jemseg was disturbed, there was an expectation that features (non-movable archaeological evidence such as cooking hearths and living floors) would *not* be discovered.

units using standard (manual) archaeological procedures around the perimeter of the 70 m footprint. These units all produced archaeological materials, but in a pattern that was completely contrary to what we had expected. The first unit (Test Unit TB1) produced a ground stone rod fragment dating to between 6000 and 8000 years old, far older than we had expected. The second unit (TF1) appeared to be culturally sterile in the upper layers, however, at 70 cm below surface it began to produce the first of a series of lenses and layers of pre-contact artifacts including stone tools, hearths and flakes from stone tool production. This was far deeper and much less disturbed than expected. The preliminary testing and discussions with local people and previous landowners also indicated that archaeological materials continued in relatively high densities over most of the upper terrace, suggesting that while the north-south dimension of the area to be mitigated could be limited by reducing the footprint, the east-west dimension was at least 200 m long. Within a short period of time, we had shattered most of our early expectations about the nature of the site. Although this had serious implications for the mitigative aspects of the project, it was archaeologically exhilarating, since the kind and quality of information that could be expected to be recovered from such deposits is much greater than could be recovered from ploughzone.

Shortly thereafter, we brought in a long-arm excavator with an operator who excavated a series of 1 m by 4 m units at 20 m intervals down the centre-line (what was to become the "E" line) of the site. Unlike the perimeter test units, which were intended to determine the horizontal extent of the site, the purpose for using an excavator was to assess the depth of archaeological deposits. The excavator removed the soil from these units to the level of unconsolidated bedrock (between 2.8 and 3.5 m below surface), and placed it in roughly stratigraphic order on tarps. From these tarps this soil was screened through 1/4" mesh. These tests revealed that the dark brown gravelly soils contained a high proportion of clay, slowing our attempts to screen it and complicating the identification of artifacts and features.

Plate 4.2: The long-arm excavator, deep-trenching the centre-line

However, on the upper terrace and break in slope, the deep testing failed to recovered any materials from below the top 40 or 50 cm. We subsequently learned that this depth corresponded to the top of the basal till (see Chapter 3, A. Seaman 1997 pers. comm.). With this data we were able to confirm that the upper field did not contain deeply stratified and ancient cultural layers.

Deep testing of the lower area was far more problematical. Due to the level of the water table, water filled these units faster than they could be excavated. Nonetheless, the preliminary analysis of the test-units from this area revealed lower artifact densities than on the upper terrace. Furthermore, a thick layer of whitish grey clay was encountered at ca. 1.5 m, corresponding to the bottom limit for the alluvium (and the potential maximum depth of cultural layers) and the beginning of glaciolacustrial clay in this zone (see Chapter 3).

The bed of the Jemseg River is shallow and silty in front of the site, and one of the first issues raised by a senior project advisor (D. Keenlyside of the Canadian Museum of Civilization) was that there might possibly be a "wet" or waterlogged component to the site. If this were the case, we would have to develop a specialized methodology and set of expertise. Due to the particularities of wet deposits, such components can contain a whole range of extremely fragile organic artifacts, such as

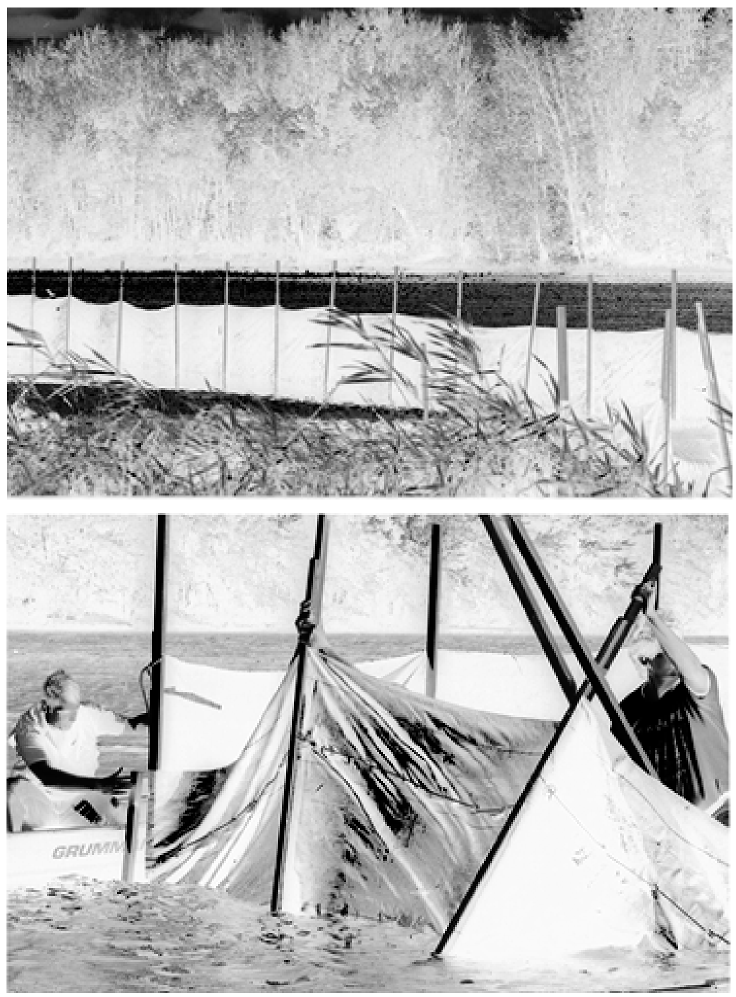
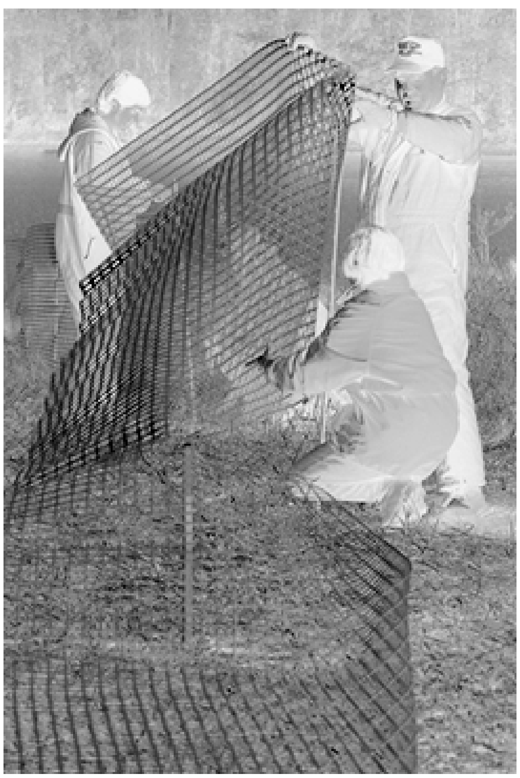


Plate 4.2 and 4.3: Installing the silt curtain in front of the site.

Plate 4.5: Wet screening the front of the site.

nets, fishing lines, baskets, canoes, and paddles. These would have tremendous interpretive and cultural significance[4] , and would require experienced conservation personnel. To determine if such a component existed, we erected a long silt curtain in front of the site area, and embarked on a period of water screening of river bed samples. This continued during first six weeks of the project (September 2 to October 12). Although many suggestive fragments of organic material (primarily wood and bark) were recovered, none were identified as artifacts. This sampling was abandoned just prior to the mid-October work stoppage, due to low returns and increasingly inclement weather. However, the wet-screen provided data on geomorphology. After seeking corroborative data from bore hole samples recovered by DOT during preliminary area assessments, and through discussion with provincial geomorphologists (A. Seaman, Minerals Branch, DNRE), it was determined that the area in front of the site was annually scoured by the ice break-up, and that alluvial soils (those likely to bury and protect archaeological materials) did not accumulate in front the site. Based on this information, the area in front of the site was determined to have negligible archaeological potential, and was not sampled further.

Plate 4.6: Delimiting the 25 m footprint.



[4] Although such sites have been excavated on the West coast of North America and elsewhere, they have rarely been recorded in the Northeast.

The final area of the site sampled during the preliminary testing phase was the portion of the site under the fill (see Chapter 3). This area was sampled using a long-arm excavator to remove a portion of the fill, clearing it down to the original surface. This surface was tested, and revealed high densities of lithic materials, confirming that archaeological materials did occur under the fill. These high densities seem to suggest that the fill may even have protected the archaeological materials to a certain extent. However, we decided to leave the mitigation of materials under the fill until the spring, to facilitate the salvaging of lower portions of the site before the onset of freezing weather and the spring freshet. As the section of the site that is under the fill is largely above the flood line, it was felt that it would be prudent to work on areas that might be flooded first.

Based on the results of the preliminary tests and the increasing evidence that the site was larger, more significant and less disturbed than expected, and also, deriving from the notion that a thick cap of material, such as was encountered in Test Unit TF1 and in the fill area, might actually protect archaeological materials, we began to collaborate with DOT engineers to seek ways reducing the salvage area. Since the whole purpose of the project was to avoid the loss of materials to site destruction, some form of site protection was needed. It was proposed was that the sections of the site outside of the immediate area of destruction (e.g., those not under the direct placement of piers) could be protected from the damaging effects of heavy machinery and localized activity by covering them with geotechnical fabric and thick layers of sand and gravel. These would form a temporary cap which could be removed after completion of the bridge. Given the growing impossibility of mitigating the entire 70 m by 200 m area of the site that was within footprint in the time available (or likely even a much greater length of time), this proposal met with our approval. With this plan, DOT was able to effectively shrink the footprint from 70 m to 25 m. At that time, the actual design of the bridge and its pier placements were not finalized. Thus the 25 m footprint remained a long corridor representing all possible pier placement options within the proposed alignment.

The preliminary testing had also revealed that the separate topographic zones (and in particular, the levee, the slough and the upper terrace) would each require specialized strategies for mitigation. The levee area, with its deeply stratified deposits would have to be excavated carefully by hand. A greater deal of brainstorming was required for the slough, which had apparently low archaeological productivity and highly problematic waterlogged and clay-rich soils. As winter began to set in and the slough turned into an enormous ice block, we decided to delay dealing with its mitigation until the spring when we could determine more fully the degree of archaeological productivity, and when the soils might be more tractable to removal.

The upper terrace initially appeared to be somewhat more straightforward. The

Plate 4.7 and 4.8: Power screens; (top) version 1, a modified industrial aggregate screen; (bottom) version 2, designed and built by T. MacAfee, with B. Nash and J. Keenan

developed through consultation with advisors and the provincial archaeologist was to grid the site in a 2 m grid, and remove these 2 m by 2 m "soil blocks" of ploughzone (the top 25 cm) with heavy machinery, followed by teams who would screen the soil and collect and record any artifacts. We dubbed this the "mechanized" approach. Although this kind of excavation has never been conducted in New Brunswick, there are precedents in other jurisdictions (notably in Ontario, where recovery of materials from shallow, disturbed sites is relatively commonplace).

Initially, we decided to attempt a mechanized approach, which incorporated a backhoe to remove the top layers, a power screen with a 1/4" mesh to remove the artifacts from the soil, a crew to maintain the equipment, to move accumulating back dirt, and to sort the resulting large fraction, and a field archaeologist to take notes. Despite this theoretically efficient system, we found it plagued with problems. The power screen was hard to control and had the potential to damage the artifacts. The backhoe, however expertly operated, was imprecise compared to usual archaeological standards,

preliminary testing had suggested that the materials within this portion of the site would be within the top 20 to 30 cm of soil. We concluded that the early 20th century ploughing of the site would have mixed any archaeological materials. This type and degree of disturbance usually precludes the presence of features within that layer, and causes artifact patterning to be on an inflated scale (due to the horizontal movement of materials). Given these variables, the initial methodology

particularly in terms of feature excavation[5]. The system generally was noisy and, given the involvement of large equipment, dangerous. The machinery outstripped the sorting process considerably, so that frequently the excavator and the screener were idling while the archaeological crew scrambled to sort, record and shift back-dirt. Given the expense of this machinery it was frustrating. Furthermore, as the fall wore on and frost began to set into the ground, it became apparent that this system would only work well on thawed ground. Finally, after having tried several refinements, the crew found a large oval patch of slightly darker soil at the base of the ploughzone, which was highly suggestive of a habitation-site feature[6].

The possibility of sub-ploughzone features resulted in a rethinking of the mechanized approach. However, before we could grapple with the issue more fully, the concerns that some Aboriginal people were voicing about the process behind the project, and the degree to which the Aboriginal community had been informed came to a head. Given the concerns and apprehension[7] expressed by Aboriginal

Plate 4.9: Shovel-shining

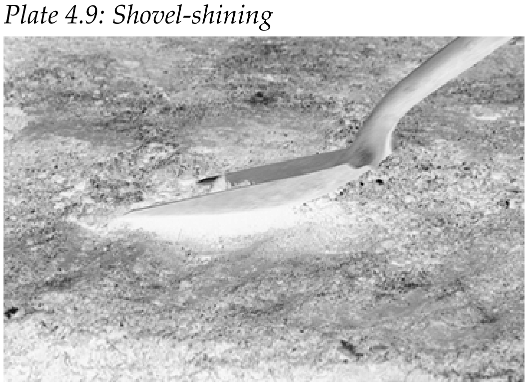


Plate 4.10: Block-lifted pre-contact ceramic sherds

[5] With these methods, features could only be identified *after* they had been removed (i.e. as a stain in the subsoil). This impedes feature analysis, negating the positive aspects of identifying them.
[6] Due to the excavation technique, the precise nature of this feature is difficult to determine, but it may be a pre-contact housefloor (Chapter 14), or a some kind of post-contact activity area (Varley and Howlett 1997).
[7] Some of concern was generated by people having being told we were excavating burials, but is also based on previous experiences with non-Aboriginal governments and archaeologists.

chiefs and leaders in an Aboriginal Peoples Congress (APC) resolution, we issued a voluntary work stoppage on October 10th. There ensued an intensive round of discussions with Aboriginal leaders and political organizations. As a result of these discussions, we were asked to resolve the issue with the Maliseet chiefs, which we attempted to do.

During the period of work-stoppage, the field crew prepared for the full-scale excavation of the site. With the new 25 m footprint, we were able to establish a 2 m alphanumeric grid, and organize ourselves into work groups. We also devoted time to preparatory work and background research, such as attempting to refine mechanized vs. hand-excavation procedures, developing an interpretive centre and examining local private collections and local geological resources (see Jeandron 1997, Perley, this volume).

When we returned to the field five weeks later, we had abandoned the mechanized system in favour of the more traditional archaeological practice of manual excavation, which involved a greatly expanded crew. As we continued to be concerned about the potential for very subtle sub-ploughzone features, as had been suggested by the last unit excavated before the work stoppage, we developed a system which retained the 2 m grid, and involved "shovel-shining" the ploughzone (the top 25 to 30 cm of soil), screening it through 1/4" mesh, and identifying sub-ploughzone features and removing them with trowels, bulk samples, and block-lifts. When cultural features were encountered, they were bulk sampled for later flotation and fractionation (see below). Although this technique was more labour intensive, the expense of an excavator and operator was eliminated, and productivity was as good or better. Furthermore, this system allowed for a greater involvement of First Nations communities and Aboriginal peoples as project personnel and staff.

However, as the end of November neared, a whole host of new problems were becoming apparent. The greatest of these was the onset of winter. Furthermore, when field work had begun in September, the water levels were relatively low and the site dry. However, as the fall progressed, water levels began to rise and the soil became laden with moisture. Frequently the team would encounter water coming into open excavation units through the side walls, suggesting that subsurface running water (likely from both springs and rainwater

Plate 4.11: Flooding and ice on the levee, December.

runoff - A. Seaman 1997: pers. comm.) was travelling over the surfaces of more clay-rich layers.

To offset some of the impact of deteriorating weather conditions, the following measures were taken:

- the 25 m footprint was covered in straw (12.5 metric tonnes to a depth of 45 cm),
- portable garages (modified with vapour barriers) were set up over work areas,
- modular portable frames, or "corrals" (designed by B. Nash and P. Dickinson, in conjunction with T. MacAfee), lined with polyethylene sheeting or reflective insulation, containing rows of heat lamps were constructed to fit over the 2 m2 excavation units,
- the site was wired with heavy cable to provide electricity for heat lamps, light bulbs, and electrical heating units,
- sump pumps were place in the lowest units in the levee area, to facilitate drainage of the levee and the wet zone before deep freezing set in, and
- traffic patterns over the site were altered to avoid driving frost into the ground.

The system that evolved to mitigate materials on the upper terrace involved separating the crew into 10 teams, consisting of one archaeological supervisor, with four crew members each. These teams worked in tandem within five “tent-systems”. A “tent-system” consisted of three portable garages, each containing

Plate 4.12: Units on the break-in-slope, flooded and frozen

Plate 4.13: Attempting to use a sump pump to drain E61

Plate 4.14: The electrical subsystem.

Plate 4.15: Erecting a portable garages as a part of the "three tent system"

Plate 4.16: A corral in use, thawing an excavation unit.

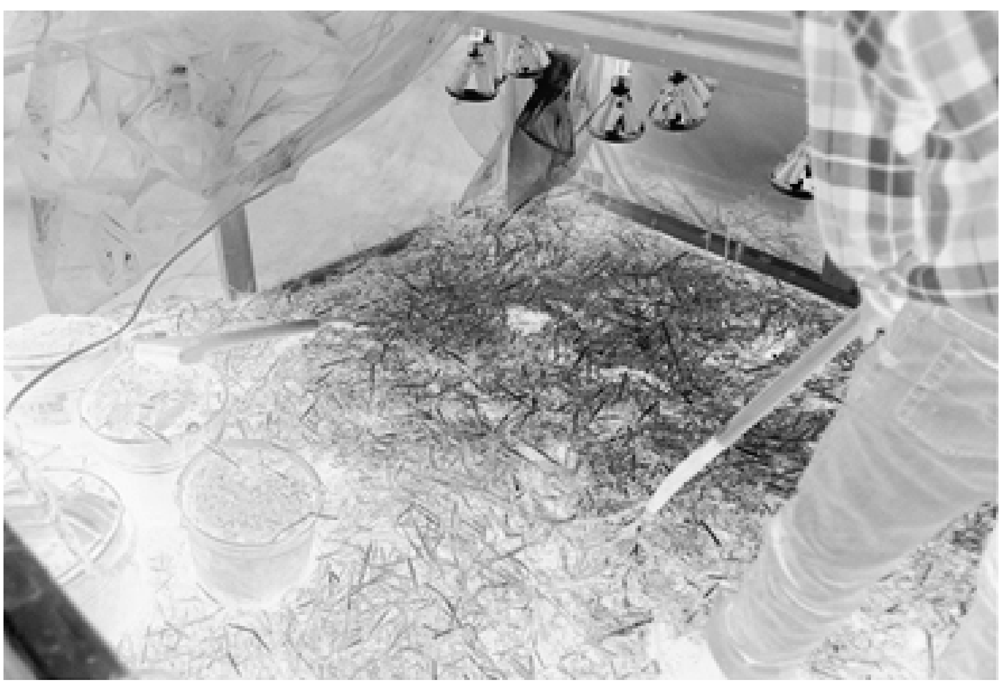


Plate 4.17: The three-tent system in action, as viewed from the top of the fill, in February.

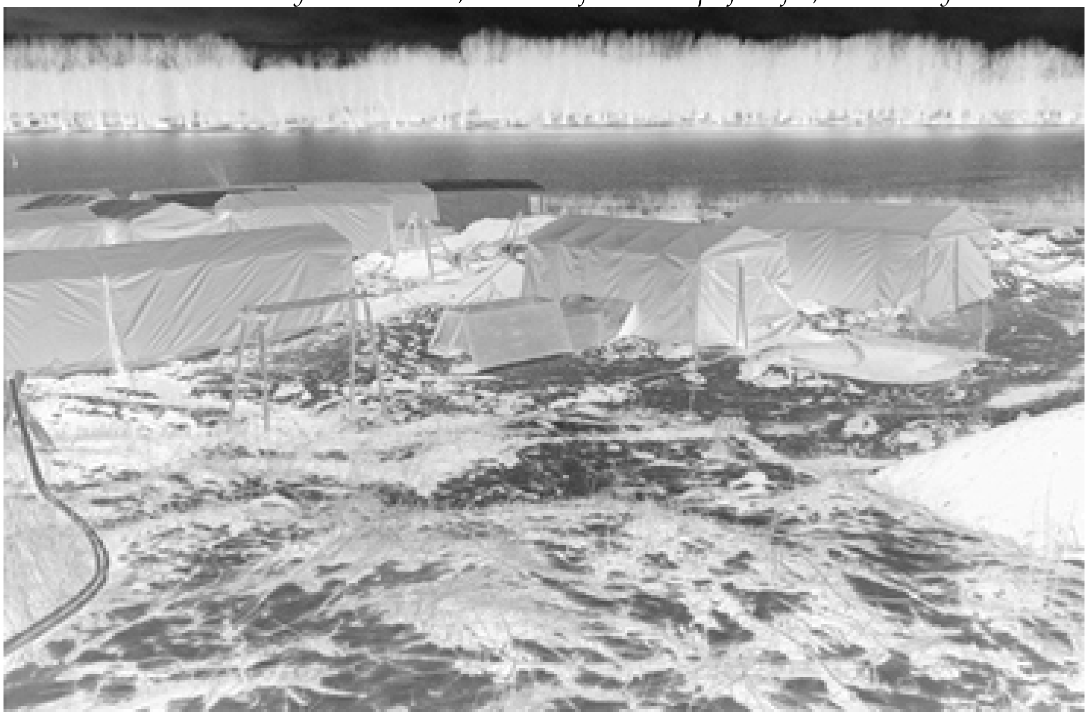


Plate 4.18: Inside the three-tent system.

several insulated and heated modular frames, and a set of wiring. The garages were set up end to end along a gridded line, in effect creating a long tunnel. Ideally, the excavation process worked as follows: two modular frames would be set in the first tent, so as to thaw the ground over the units to be excavated. Adjacent to them, in the second tent, there would be two open units, in which the two teams worked (one crew member excavating, one crew member carrying buckets) The third tent would cover units that had already been excavated, into which the remaining two crew members screened the soil.

Once the system reached a degree of refinement it worked quite well. However, it was prone to some problems, which became manifestly clear between Christmas and the New Year, when a sudden

Plate 4.19 and 4.20: The effect of the windstorm on the tents.

abnormally severe wind storm[8] blew some of the tents down. Although most of the tents could be salvaged, some were completely mangled, and were blown as far as 200 m to the north. Given that these tents had been anchored with steel pegs and 75 cm lengths of rebar, this result must be considered in the context of this exceptionally strong storm.

This system worked very well in the ploughed field portion of the site. As the excavation of this area progressed, it became apparent that a large number of pre-contact cultural features had survived the ploughing of the field, due to the fact that the depth of the alluvium was irregular over the upper terrace, creating pockets of deep soil. Some features were contained within these deeper zones, and were thus below the base of the ploughzone. However, in the lower area (the levee and the slough and the break in slope) the work was far more problematic. In December the inevitable began to happen. A wet summer and fall resulted in high winter water levels, and the stratified areas at the water's edge flooded. Even further up in the footprint, clay-rich waterlogged substrates and freezing temperatures affected the mitigation process. From the beginning, the high clay and water content had impeded excavation and screening in this area.

[8] This same wind storm resulted in province-wide damage to roofs and trees, as well as caused the Prince Edward Island ferry to run aground.

Conversely, the lack of disturbance and the presence of intact features required the application of the most meticulous techniques. When the waters began to rise and then to freeze, the situation became impossible. By mid-December, the units closest to the water's edge (Units A83 to 88 and B83 to 88) were completely flooded.

The situation was not much better closer to the break-in-slope (Units A59 and 60, B59 and 60, and C59 and 60). The use of sump pumps seemed to reduce the standing water in these units, but did little to stem the influx of water from the water table and the surrounding ground. When temperatures dropped at the end of December, this water began to freeze, disabling the sump pumps. Given these problems, we pulled the tents from these areas to the upper terrace where work was able to progress.

The operation in this zone reached peak size and efficiency in February 1997. To further enable the excavation, DOT engineers began to examine the ways of defining the footprint (and restricting the impact of highway construction) further. In early March, through intensive efforts in the Design and Planning branches, parameters for the bridge design were established, and pier locations for the proposed bridge were located at the crossing. The pier placements were designed to accommodate both reasonable bridge costs, and to avoid the parts of the site that would be too expensive and difficult to salvage effectively (such as the levee and the slough). The pier impact areas were 25 m by 25 m, with the intention that areas outside these piers would be covered and protected with geotechnical

Plate 4.21: Winter.

Plate 4.22: The Ajemseg Interpretive centre.

Plate 4.23: A group of school children participate in a laboratory visit.

fabrics and fill. Finally, with three months to the deadline, the team had a "do-able" archaeological problem, which we tackled with fervour.

In conjunction with this phase of the project, a public/education program was developed under the guidance of Karen Perley. The focus of this aspect of the project was to encourage people to visit the site (so as to ensure openness and confidence in the proceedings), and to use the information gathered during the project to foster an appreciation for Maliseet culture and history in the wider public. The cornerstone of this project was the Ajemseg Interpretive Center (see Perley, this volume), through which site tours, traditional storytelling, basket and stone-tool making demonstrations and laboratory visits were hosted. Invitations were extended to provincial schools, which were taken up by many schools, both near and far.

THE END OF THE EXCAVATION PHASE

In the westernmost pier location established by DOT (later designated Area A) the team uncovered evidence of an Early Maritime Woodland community (ca. 2000 to 3000 years ago), including pieces of pottery, stone chips produced as a result of making stone tools, broken and reused tools, hearths, and house floors. Until April 12, 1997, all of the evidence recovered during the excavation indicated the living areas of pre-contact peoples.

On April 12, with only 15% of the pier area left to be excavated, the archaeological team uncovered a basin-shaped red ochre-lined pit feature on the western edge of the Area A. The archaeological excavation was halted, and chiefs, elders, politicians and DOT officials were notified. April 12 was to be the last day in the field at Jemseg.

In the northeast, red ochre is associated with ceremonial features, and frequently, burials. The pit was small, being 30 cm by 70 cm by 25 cm deep, with the red ochre coating the bottom of the pit. No artifacts or bones were recovered. The high levels of acidity of the soil would naturally destroy all bone over time, so the lack of bone was not unusual. Furthermore, burials from Late Archaic period have been encountered that conform to the structure and contents of this feature (see discussion below).

Given these considerations, the archaeological team made the recommendation to DOT that whether or not it could proven that this feature was a burial, it must be treated as such. The Ministers of Transportation, Intergovernmental Affairs, and Environment met with the Maliseet chiefs, examined alternative routes, and accordingly, on April 24, 1997, announced a shift of the approach of the highway to the Jemseg river, which would allow the highway to bypass the site completely.

By the end of the field component of the project, the archaeological team had excavated an area of 746 square metres. The excavations produced over 40,000 artifacts, and significant evidence (in the form of floral and faunal materials, debitage, and features) of long-term human activity in the Jemseg area. This evidence forms the foundation for an understanding of the ancient past of the Province of New Brunswick, and an exploration the people of Jemseg.

AFTER THE EXCAVATION

In the three weeks following the termination of the field project, the crew completed the following tasks, oriented towards closing the work site:

- field equipment, such as tents, wiring, and excavation tools were removed from the site, cleaned, inventoried and stored,
- all open excavation units were refilled,
- exposed surfaces of the site were reseeded with grass seed and traditional Maliseet medicinal plants, such as sweetgrass, angelica, and sweetflag, in the hopes of continuing the traditional uses of the site area, and

- spare crew trailers, excess wiring and electric entrances were removed from the site area (as they became underutilized).

The field laboratory, artifact storage, and a small interpretive centre were maintained at the site during the summer months. In the months of May and June, the project received heavy visitation from school groups, who were given tours of the lab and the interpretive centre, and demonstrations of flint-knapping (making stone tools) and traditional Maliseet basket-making. These tours decreased with the end of the school year, but the project continued to welcome regular drop-in visitation by tourists and interested local people.

The analyses of the Jemseg Crossing material focused on the following tasks:

- the development of an archive of collected material, including a catalogue of artifacts, a catalogue of photographs, field notes, and maps of the site, excavation units, and features,
- cleaning and conserving some of the artifact classes which exhibited destabilization (such as glass beads),
- more closely identifying classes of materials using close scrutiny or special techniques (such as petrographic types, and the identification of animal bones or seeds),
- categorizing and classifying archaeological materials according to material type, and functional, chronological, and/or manufacturing categories,
- recovering further information from samples and artifacts (such as through flotation (see Barefoot, this volume) of feature samples, processing of radiocarbon samples, and collection of residues from artifacts), and
- integrating all of the various forms of information into interpretations and inferences about the past.

Elluhkatomek
5: Methodology, Part II

SPRAY BOTTLES AND TUPPERWARE: THE FIELD LABORATORY

Valery Monahan

Excavation may well be thought of as a controlled disaster (Logan 1988:8)

The following is a brief overview of the activities carried out at the Jemseg field laboratory. It will describe the system which allowed a small crew (between three and ten individuals) to process the output of a large excavation. The field laboratory supervisor was also project conservator. A brief description of the treatments and treatment-related activities is given, along with some discussion of the contributions that an archaeological conservator and a good laboratory staff can make to an ongoing excavation.

The Field Laboratory

In an archaeological excavation, the field laboratory is the bridge between the raw data from the site and its interpretation. Field laboratory processing combines aspects of artifact conservation, registration and collections management. The work of the laboratory crew is repetitive and time-consuming, yet it is critical to the archaeological process.

In the laboratory, artifacts are identified, cleaned, labelled, catalogued, grouped and housed. Notes and maps are arranged, provenance clarified and recorded. Fragile artifacts are assessed and given special attention. The laboratory crew are the first to see the artifacts cleaned and arranged. They are often the first to identify important finds and to spot any patterns reflected by the artifacts. The observations of the field laboratory crew can help fine-tune excavation methods and suggest avenues of analysis.

The unusual nature of the JCAP made the presence of an on-site field laboratory particularly important. It allowed the archaeologists continuing access to the growing artifact collection from the site. Field crews were encouraged to visit the laboratory regularly to follow up on artifacts and help obtain a broader understanding of the work they were doing, many of them for the first time. In the same way, the laboratory crew could take the time to observe excavation, learning what was important to the archaeologists and ensuring that the information they needed was being recorded. Visitors to the site were able to see how artifacts and information from an excavation are processed. This presented them with all the aspects of archaeology: excavation, collections management, analysis, and interpretation.

Artifact Processing

The Jemseg artifacts were divided into three categories for processing: wet, dry and damp. Archaeological artifacts have been altered by contact with soil and water and have reached a state of equilibrium with the underground environment. Excavation breaks this equilibrium and unstable artifacts may change rapidly, losing important cultural attributes and even disintegrating altogether (Cronyn 1990: 5). If artifacts remain at a moisture level similar to that of the archaeological context, deterioration can be kept to a minimum until full recording and/or stabilizing treatment can be carried out (Mathias and Foulkes 1996:102). At Jemseg, the field crew were instructed to keep the various types of artifacts separate and laboratory staff worked to keep them supplied with materials for this purpose. At the end of each day, the laboratory supervisor went through all the finds to ensure that artifacts were properly separated.

Dry Artifacts

Artifacts which were unlikely to deteriorate after excavation were bagged "as is" in resealable polyethylene Zip-loc® bags. Waterproof markers were used to record excavation provenances directly onto the bags. Dry material included lithics (the largest artifact category), historic ceramics, and some bone and shell. In the field laboratory, shell and bone were brushed with natural fibre brushes, while lithics and ceramics were washed in tap water and air-dried .

Discussions between the Project Archaeologist (S. Blair), the Education Officer (K. Perley) and Maliseet Elders had indicated that some members of the Maliseet community found the application of permanent numbers to Native artifacts offensive. An alternative system for cataloguing was designed, using resealable polyethylene bags and acid-free paper labels. After processing and cataloguing, all dry artifacts were placed in a bag with a label indicating catalogue number and other provenance information. Some artifacts, such as chipped stone tools, had basic artifact drawings on the reverse of their labels to help track them. Very fragile objects were placed in small acrylic boxes with their labels.

Wet Artifacts

Metal artifacts and a few artifacts of textile and leather were kept immersed in tap water from the time of excavation through processing. Polyethylene bags, Tupperware® containers, and metal buckets were used to move wet artifacts from the field to the laboratory. Waterproof markers were used to record field information on bags and plastic "Dymo®" labels with catalogue numbers on them were placed with artifacts through the processing system. Laboratory crew used white cotton towelling, polyethylene sheeting and spray bottles of tap water to keep artifacts wet during cataloguing.

The majority of wet artifacts were identified as having come from a disturbed, upper layer of the site. Since they were recent and, in most cases, without context, no stabilizing treatments were carried out on them. After preliminary analysis, the decision was made to air-dry these artifacts.

Damp Artifacts

Artifacts that were likely to change if allowed to dry out, but whose porous nature or general fragility made immersion on site risky, were kept damp after excavation. This category included pre-contact era Aboriginal ceramic, deteriorated bone and glass beads. These artifacts were kept damp with spray bottles of tap water, cotton gauze, Tupperware® containers and resealable polyethylene bags. In some cases, artifacts were packed with associated soil or lifted as a block for laboratory excavation. In the laboratory, damp artifacts were sprayed with approximately 40% vol/vol isopropanol/water solution, to prevent mould growth (Grant 1993: 6). In general,

Plate 5.1: Pre-contact ceramic sherds block-lifted for recovery in the laboratory.

these artifacts required treatment for identification and storage, so their processing was completed by the project conservator. After treatment, they were recorded following the same procedure as described above for "dry" artifacts.

Conservation

Conservators can play a number of roles in the context of an archaeological excavation. They are trained in material science, allowing them to contribute to accurate artifact identification and interpretation (Logan 1988: 8). Their manual skills and experience with fragile objects makes them useful when specialized excavation techniques are required or unstable artifacts are uncovered. Conservators' familiarity with collections management and display techniques makes them a useful resource to the archaeologist. They can help the archaeologist solve some of the problems surrounding the long-term storage of archaeological collections and their interpretation for research and education.

A conservator's expertise is only useful to the archaeologist through collaboration (Logan 1988: 9). By working together, the conservator and archaeologist can pool their expertise to reveal and record information and to protect archaeological resources so that they can be used in the future.

The JCAP provides many examples of how conservation and archaeology work well together. The conservator, archaeologists and other project staff consulted regularly and a variety of problems were solved. Examples include the Jemseg numbering system and the use of wet storage for finds. Neither of these methods have been used in New Brunswick archaeological projects before and they worked well at Jemseg. The presence of a conservator on site meant that fragile objects could be block-lifted and the archaeologists had someone immediately available to deal with materials they felt needed immediate attention. Treatments were done on a number of artifacts while excavation was ongoing allowing for rapid analysis of artifacts.

The JCAP also provided an example of the necessity of long-term goals if conservation is to help in solving problems of archaeological storage and interpretation. The mandate of the project was to save archaeological resources from development. By the end of the project, a large collection of artifacts had been amassed. Since the project did not initially include very specific research targets, this made it difficult for the archaeologists and the conservator to select what level of care to give individual artifacts. In some cases, decisions made early on about the level of treatment and recording had to be examined again at the end of the field season as the sheer volume of the material and fiscal constraints made further intervention impossible. Efforts aimed at recovering analytical samples, stabilizing individual artifacts and preserving particular aspects of the collection were carried out, but without continuity in research design, these efforts may not result in information being recovered. This problem was complicated by ambiguity about the final destination of the Jemseg Collections. The recommendations of a conservator about treatment, level of recording and long-term storage strategies can only be made through understanding the way in which artifacts will be used (Logan 1988: 9).

Treatment

In a broad sense, many activities carried out on excavated artifacts, even bulk washing of lithics, can be considered treatments. In practice, treatment usually refers to specialized methods of cleaning and stabilization. Conservators are required by their code of ethics to record any and all work done to artifacts in their care, and thus any formal conservation treatment includes detailed records (IIC-CG and the Canadian Association of Professional Conservators 1986). Any Jemseg artifact which required the application of such techniques before it could be processed or analysed, was treated individually by the project conservator. The following are general descriptions of the conservation treatments, anyone interested in more specific information should consult the Jemseg Project Conservation Records housed at Archaeological Services in Fredericton, New Brunswick.

Bone and Shell

Badly degraded animal bones were encountered in various excavation units. These were kept stable by storing them in damp conditions after their excavation, until they could be consolidated by immersion in a solution of tap water and an acrylic emulsion (Rhoplex Ac-33), slowly air dried and bagged with an acid-free label. Small bone artifacts, such as buttons from a recent post-contact feature, were stable, but fragile, and dirty. They were brushed and dry-swabbed under magnification, before recording and bagging.

One large shell artifact was carefully cleaned with natural bristle brushes and sharpened wooden sticks. This cleaning enabled the archaeologists to confirm its identification, and will enable future analysis.

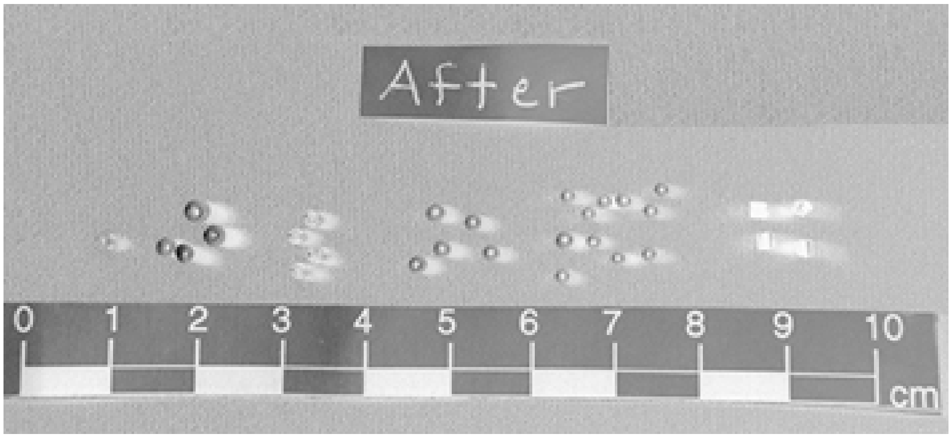
Glass beads

Several hundred glass beads and bead fragments were recovered from the Jemseg Site. These tiny artifacts were cleaned under magnification with solvents, fine syringes needles and cotton lint. The smallest beads could not be manipulated with any of the tools in the laboratory. Tiny loops of the conservator's hair were used to gently draw dampened cotton lint fragments through these beads, cleaning them. Any beads showing cracks, discolouration or other signs of deterioration (Cronyn 1990:130-135) were coated with Acryloid B-72.

Native Ceramic

Approximately 250 pre-contact ceramic sherds were found during the field season. The first sherds found were allowed to dry out immediately after excavation. The clay-rich soil surrounding them promptly bonded to their surfaces, hampering examination and identification. Subsequently, excavated sherds were placed in acrylic boxes on site, with dampened

Plate 5.2: Glass beads recovered from the Jemseg Site, after treatment.



white cotton towelling inside, to prevent drying.

Native ceramic is often soft and crumbly upon excavation. This condition is typical of under-fired, coarse earthenware which have been in continual contact with soil and water. Sherds of this type can be expected to harden somewhat after drying (Cronyn 1990: 150). However, due to the high proportion of clay in the soils of the Jemseg Crossing site, the pre-contact ceramic sherds could not be allowed to dry out until after cleaning.

Sherds were immersed in tap water and small swabs were used to gently detach the wet dirt from the ceramic. The cleaning was carried out under magnification to allow for observation of the ceramic surface. It was not possible to safely remove all the adhered dirt from the sherd edges, from surface losses or from recesses created by decoration or surface treatment.

Damp sherds were cleaned under magnification by placing small droplets of tap water onto their surfaces; any dirt that detached into the water was gently removed with dry swabs. Considerable care was used to prevent disturbance of any charred residues attached to the ceramic. If heavy residues were present, samples were taken. After recording, a new, clean scalpel blade was used to gently scrape away the residues from the ceramic surface. Residues were placed in aluminium foil packets, inside labelled specimen vials, for future analysis. After treatment, sherds were allowed to slowly air-dry in bubble-pak padded acrylic boxes.

Some sherds from the gravel-rich matrix were very friable and initial attempts indicated that their surfaces would not withstand even gentle cleaning methods. No further attempts were made and all sherds from this area were allowed to air dry undisturbed.

Conclusion

The JCAP created challenges for the archaeologists, excavation teams and field laboratory staff. With considerable ingenuity, bad weather, construction deadlines, and the sheer chaos of a large, productive site were transformed into a unique educational opportunity, a permanent record of a fascinating archaeological site and a carefully recorded collection of artifacts and specimens for future research.

The field laboratory was integral to the JCAP, providing continual organization of the artifacts as well as information about the artifacts and the site for the archaeologists, the field crew and the public.

The presence of a conservator on site allowed for the creation of a system of artifact retrieval which minimized deterioration from the ground to final storage. By working with the project archaeologists, the conservator was able to successfully treat a variety of objects which will enable future research and provide useful contributions to our further understanding of the Jemseg Crossing archaeological site.

Elluhkatomek
6: Methodology, Part III

FLOTATION: PURPOSE, PROCEDURE AND APPARATUS

Patricia Barefoot

Flotation is a method of processing soil samples by immersing them in water to separate the heavy and light fragments for the purpose of recovering plant materials, charred or other organic materials, and small artifacts. This technique is necessary for expedient sorting as it eliminates small soil particles and leaves the lab personnel with a manageable amount material to process. It also isolates materials that are of interest to the archaeologist, such as seeds and charcoal, by floating them to the surface for easy retrieval.

Paleoethnobotany is the study of botanical material from archaeological sites for the purpose of determining human-plant relationships (Pearsall 1989). The recovery and analysis of this material may provide clues to such mysteries as ancient diet and medicines. It can help determine cultural practices such as cultivation of crops and the seasonality of settlement due to plant availability. Charcoal recovered with the botanical materials is used to date sites and can also provide information on the types of forest vegetation present at that time as well as the type of fuel used by the inhabitants.

Bioarchaeological specimens like seeds and wood charcoal can be readily found in features such as cooking hearths. These features often provide us with other informative material such as burnt animal bones. The identification of these bones may help piece together information on the species of animals being consumed and the seasonality of occupation of the site. Food preparation methods may also be determined by noting cut marks or crushing of bone.

Along with paleoethnobotanical remains small artifacts are often recovered in the flotation process. Artifacts, such as beads and microflakes, may be difficult to

Editor's note: The Jemseg Flotation Device was designed by Phillip Atwin, Patty Barefoot, Christopher Blair, and John Keenan, and was operated by John Keenan and Patty Barefoot.

see in the soil and can be missed during excavation.

Flotation can be an important aspect of an archaeological project as it can allows the archaeologist to recover a wider variety of information about the people who once occupied the site. Without this evidence a vast amount of information dealing with diet, health, and the nature of the natural surroundings may be lost.

Apparatus

The flotation device used during the JCAP was constructed of four stacked geological screens of descending sizes (6.3 mm, 3.35 mm, 1.70 mm, and 0.425 mm). These screens were secured by a brace constructed of two wooden rings (44 cm outside diameter) clamped together with threaded rods and wing nuts. The top ring had two sets of handles, a flat nylon fabric strap used to rotate the apparatus and two nylon rope handles used to install and remove the device from the tank (see Plate 6.1 and 6.2).

The tank used in the procedure was a cylindrical tank constructed of high-density polyethylene (HDPE). It had a 30 gallon capacity and a spigot at the bottom for draining.

Procedure

The tank was filled with approximately 100 litres of water that had been pumped from the river. A sample of soil, usually about 2.5 litres in volume, was poured into the top screen of the flotation device. It was then lowered into the tank until the water reached the middle of the top screen. The device was agitated to release seeds and other buoyant artifacts.

These "floats" were scooped off the surface of the water using a tea strainer with a mesh size of approximately 0.5 mm and were deposited in a plastic container. The sample was agitated several times until

Plate 6.1: The sieve assembly and the tank, ready for floating.

Plate 6.2: Loading the sieve assembly into the tank.

there were no longer particles floating to the top.

The device was then removed from the tank and dismantled. The non-buoyant components of the sample had passed through the stack of geological screens, creating a series of heavy sample "fractions". These soil “fractions” were transferred to metal trays. Material lodged in the screen was dislodged with by tapping the screen, or with a toothbrush. The trays were brought to the lab and stored on bun racks to dry. No paper

Plate 6.3: Processing the heavy fraction.

products were used in the drying process to avoid contamination of possible radiocarbon samples. The water in the tank was drained and refilled each time a sample with a different provenance was processed to prevent cross-contamination of samples. When the sample fractions had dried they were bagged and stored on bun racks until they could be sorted.

The sorting process consisted of pouring a small amount of dried fraction onto a plastic tray and manually separating the material into various categories. Fine particle fractions were sorted with the aid of magnification. Seeds were transferred to vials using a small dry paintbrush, aided by static electricity. Tweezers were occasionally also used, but only when they would not damage fragile specimens. Nut shell fragments, microflakes or other small artifact were often sturdy enough to be transferred to separate vials using tweezers. All vials were labelled clearly or stored in a labelled bag. Residual soil, small stones, gravel, and modern root fragments were discarded. Botanical materials were then forwarded to a paleoethnobotanist for identification (see Monckton, this volume). All other artifacts were catalogued and stored.

Nutokehihikemikwum

7: "Teaching House": The Ajemseg Interpretive Centre

Karen Perley

Because teachings of our ancestors have not reached all First Nations and non-Aboriginal people, it is the responsibility of those who have begun the process of learning to share what has been learned. For knowledge dies if not shared. -Shirley Bear, traditional Elder, Neqotkuk/Tobique

The Maliseet name for Jemseg is *Acimsek*.

Many Elders have shared their stories of Jemseg and its place in the cultural landscape of Wolastoqiyik, the people of the beautiful river. The late Charles Paul from Neqotkuk/ Tobique said that Jemseg was a place where people went to gather driftwood (pers comm. 1997). It was also known as a place where people gathered. The late Ruth Saulis, originally from Welmooltuk/Oromocto (later of Neqotkuk/ Tobique) remembered visiting the site when she was a little girl. She called the place a "stop over place", where people travelling on the river to Saint John would camp for a day or two, sometimes longer. Here they made baskets, fished, hunted ducks, gathered cranberries, traded and socialized. She recalled a steady stream of people arriving and leaving at different times (pers. comm. 1997).

The late Christina Nash from Welmooktuk/Oromocto remembered visits when people were "fiddleheading" and trapping muskrats. During this time, there were two births that took place at Jemseg, her sister's son, and that of John Atwin (pers. comm. 1996).

Some of these traditional patterns have continued to the present. The late Charles Paul from Welmooktuk/Oromocto told us that John Sacobie (Welmooktuk/Oromocto) continued to visit Jemseg until recently to collect medicinal plants, groundnuts (*Apios americana*) and trap muskrats. Only his health has prevented him from continuing this tradition (pers comm. 1997).

Although Jemseg has an established place in the cultural landscape of the Saint John River, the archaeological aspect of the site has only recently been understood. The Jemseg Crossing Archaeological site was discovered during the testing process that was conducted to satisfy the compulsory environmental requirements set for the construction of the TransCanada Highway. The Jemseg Crossing Archaeological Project (JCAP) developed through a combined undertaking on the part of Wolastoqiyik (the 'Maliseet' people), the Department of Transportation, Archaeological Services of the Department of Municipalities, Culture and Housing (presently housed within the Culture and Sport Secretariat), and the Department of Education.

The intent of the project was to operate in total co-management with Wolastoqiyik, integrating a First Nation's view of their connection to the site with archaeological information. The Ajemseg Interpretative Centre was developed to help fulfil this mandate. In this centre we blended Wolastoqiyik cultural interpretation and archaeological perspectives on the far past, recent past and the present existence of the Wolastoqiyik. With this approach we emphasized the thousands of years of connection between Wolastoqiyik and the site.

Information about the Centre was circulated to the public school system by means of letters, pamphlets, phone calls, and notices. Heightened media coverage of the project generated additional public interest in the site, and resulted in numerous visits from members of First Nations communities, schools and the general public. We also passed information about the Centre through The Maliseet Advisory Committee and Wolastoqiyik employed by the project, and these passed invitations by "word of mouth" ensuring that the flow of information about the Centre and the project reached First Nation Communities.

AJEMSEG INTERPRETATIVE CENTRE

Despite being housed in a small construction trailer, we were able to offer a variety of experiences to visitors through the Centre. To maximize our impact, photographs and images filled the Centre. Visitors were greeted by images of Wolastoqiyik. These were presented through a series of black and white archival photographs taken around the turn of the 19th century representing portraits, summer settlements, mode of transportation and technologies. The photographs were pasted on foam core and displayed on panels. Not surprisingly, it was in this section that Native visitors expressed to staff their personal memories and experiences associated with the theme depicted in the photographs. In addition, many of these visitor offered access to copies of their own photographs accumulated in family photo albums. Through this generosity, we were able to build an informal directory of potential sources for significant photographs.

Upon entering the trailer, visitors were presented with traditional plants and roots found at the site, both in images and actual

Figure 7.1: The Ajemseg Interpretive Centre, showing basket making tools provided by Victor Bear, and baskets made by Traditional Maliseet Basket Limited.

form. This section gave visitors an opportunity for 'hands-on' experience. Medicinal plants such as *Kiwhosuwasq*, *Pagolus* and wild potatoes were displayed in their natural form, encouraging visitors to utilize all their senses to explore traditional medicines. We presented information such as the biology of the plants, including their habitat and habits of growth, emphasizing the history of use and the 'passing down' of knowledge from Wolastoqiyik Ancestors to healers today. We integrated the medicinal plants into broader themes of ceremony, spirituality and healing by presenting an image of a sacred lodge. These messages were enhanced by the sacred tradition of burning sage and sweet grass.

The Centre employed traditional teaching tools as well. We narrated origin stories in both languages. These hold the beginnings, teachings, views and values of the people, and illustrate traditional approaches to education. Bundles of cedar and sweetgrass ('happy little spirits') were presented to all visitors to the Centre, for the purpose of emphasizing positive energy flowing to and from the site. We passed 'teachings' along with these bundles, emphasizing the traditional Wolastoqiyik views that spirits are our grandmothers and grandfathers, and that we must appreciate the food, shelter, water, animals, medicines that the Earth provides for our survival. Visitors were encouraged to pass along this teaching, as a way of giving visitors an

Figure 7.2: Ramona Nicholas demonstrates traditional basket making for a group of students.

opportunity to practice the technique of passing on knowledge through spoken language.

We placed a sample of artifacts in glass display cases. These consisted of pre-contact stone tools and post-contact trade items, representing two distinct periods of activity at the Jemseg site. These stone implements served not only as constant reminders of the complexity, skill, physical strength and precision required to manufacture stone tools, but also served to physically anchor the existence of people in the past. We encouraged a view that integrated the tools and science of archaeology, while focusing primarily on the people, Wolastoqiyik. Through this approach we portrayed the thousands of years of connection Wolastoqiyik have to the Ancestors that travelled through the valley of the Wolastoq.

PUBLIC EDUCATION AND TOURS

The Ajemseg Interpretative Centre, when on site, was housed in a 12' x 20' construction trailer. The limited amount of space, seasonal obstacles during the winter months, and the distance from Fredericton, did not discourage approximately eleven hundred visitors to the site over a period of one year. These visitors came from both within and from outside of the province, and included First Nations people, university students, elementary and high school children, cultural interest groups and the general public.

During the busiest time, the Centre had to accommodate up to eighty school

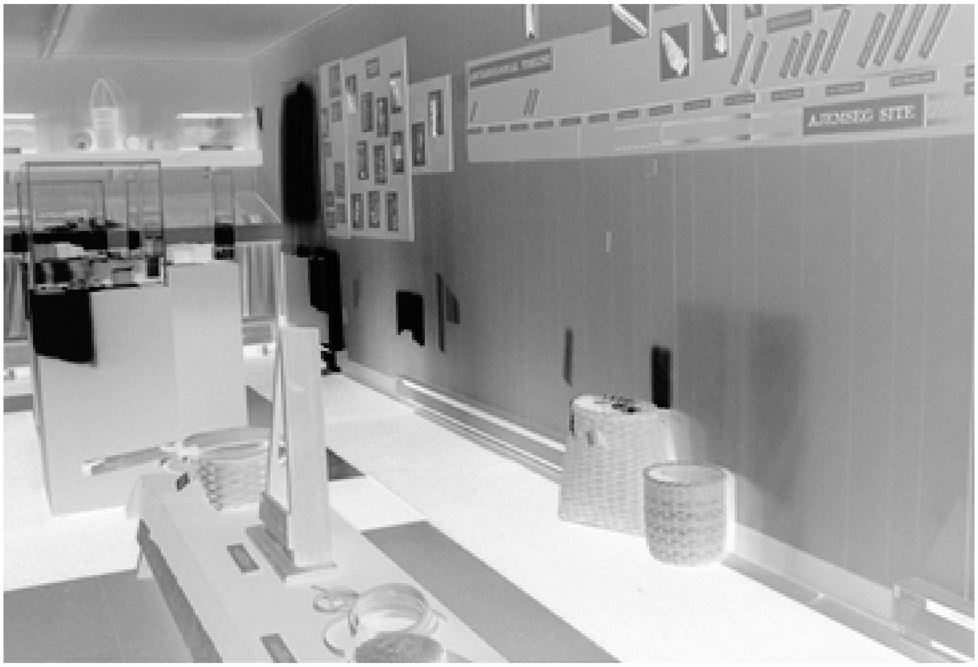
Figure 7.3: Chris Blair explains archaeological methodology to a group of students.

children at a time. To accommodate these numbers, the staff had to set up five temporary venues, or visitor stations. At these stations, experienced staff members demonstrated basket weaving, flint knapping, story telling, spiritual ceremonies and archaeological methodology. Groups of up to sixteen children would proceed through each venue where they could experience different presentations and activities. We also made in-school slide presentations available for those who could not make the trip to the site. However, we generally encouraged on-site tours so students could experience the positive energy illuminating from the living site.

With the end of the excavation, the content of the Centre was moved to Archaeological Services Branch in one of the offices in the upper part of the building. We continued to invite tours in this facility for another year, even though this reduced venue could only accommodated fifteen people at a time.

The public interest generated in Wolastoqiyik culture through the Interpretative Centre, both on-site and later at Archaeological Services, has emphasized the need for and interest in a continuation of Wolastoqiyik cultural interpretation. There is an urgency to act quickly to preserve and store Wolastoqiyik knowledge because the pool of traditional culture is made of Wolastoqiyik language speakers. This language is threatened, and the number of language speakers in the communities continues to decline.

Figure 7.4: Another view of the Ajemseg Interpretive Centre, showing basket making tools provided by Victor Bear, and baskets made by Traditional Maliseet Basket Limited, and artifact display cases.



WOLASTOQIYIK STATISTICS

Wolastoqiyik statistical information presents a frightening picture on the declining number of language speakers and knowledge keepers within and outside of Wolastoqiyik communities. The total population of Wolastoqiyik from six communities (both “on reserve” and “off reserve’) was four thousand, seven hundred fifty-eight as of December 1997.[1] Out of that total only two thousand nine hundred live “on reserve”. Elders aged fifty-five and over total approximately three hundred[2] .

Between 1997 and September 2002 34 elders passed away in Tobique alone. The loss of each Elder lessens the number of Maliseet language speakers and adds to the decline of the culture.

CONCLUSION

The management team of the Jemseg Crossing Archaeology Project, Wolastoqiyik individuals and First Nations, and supporting agencies and departments, willingly enacted policies to incorporate archaeology into Wolastoqiyik perceptions and interpretations of the site. The Ajemseg Interpretative Centre was only an expression of this willingness. The Centre succeeded in opening one page of Maliseet history, but there are more pages that remain to be turned. It was in the Centre,

1 Department of Indian Affairs, prepared by: B. A. Cleveland, Data & Systems Analyst
2 Data collected from the six communities.

through conversation with Wolastoqiyik visitors, that the staff learned of the huge amount of significant data and knowledge housed in Maliseet communities and outside institutions. Whether these exist as photographs, spoken histories, artifacts, or documents, these need to be gathered and preserved. The need is urgent when one considers the ongoing loss of traditional knowledge and language. Furthermore, our experience with the Centre demonstrates an overwhelming interest and positive response to Wolastoqiyik culture by the general public. All of these factors reinforce the idea we need a depository where Wolastoqiyik information can be gathered and stored. It is crucial that there is a combined effort between the New Brunswick and Maliseet Governments to expand their efforts to create a permanent place for Wolastoqiyik cultural heritage where it will be preserved for future generations.

Kansuhsuweyal Elipskasikil

8: The Artifacts Recovered

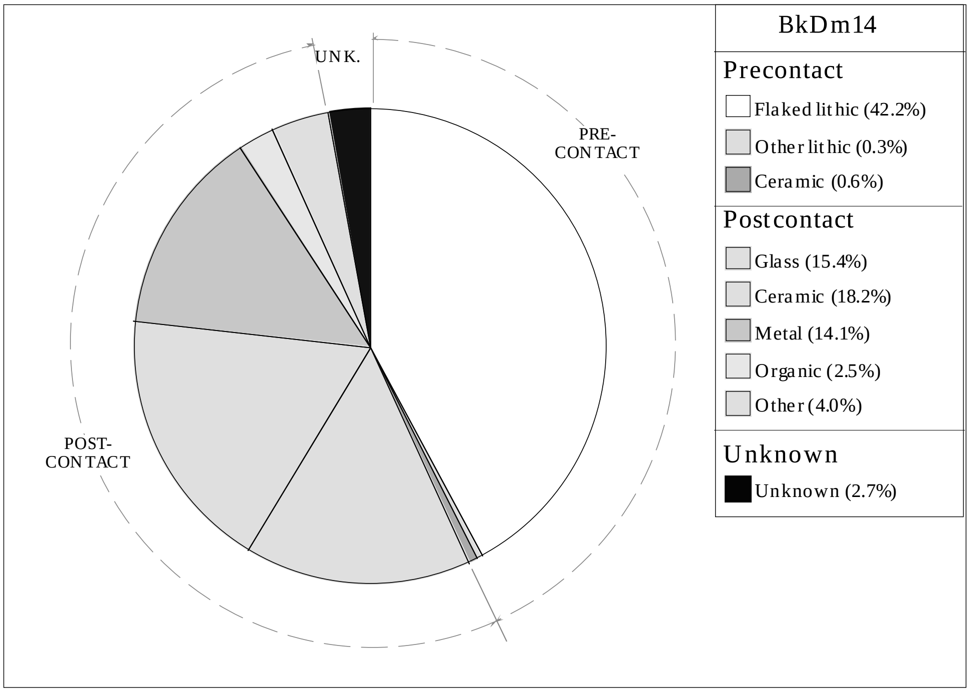
Susan Blair

Archaeological objects, or things that can be removed from archaeological deposits[1] can be of three different kinds: *artifacts* (or objects that are the result of purposeful human action), *bioarchaeological specimens* (non-artifactual organic objects that are the by-product of human activity, e.g., butchered animal bones, charred nut shells, or clam shells), and *ecofacts* (materials which make their way into the archaeological record accidentally and independent of any human action, e.g., pollen, insect and small rodent remains, or land snails) (Black 1992). Artifacts can be the products of a process, (e.g., stone tools), or the by-products of that same process (e.g., the small, sharp bits of rock that were produced during the making of that stone tool, referred to in this report as flakes or "lithic debitage"). As aspects of purposeful human material culture, artifacts are the most common focus of archaeological research, but in recent years, other categories of archaeological material have also yielded vast quantities of information about past human activities. This information can give us insight into patterns of subsistence (the means people use to sustain themselves), settlement (how they arranged themselves and their activities physically over the landscape), and seasonality (their patterns of seasonal resource use and mobility), as well as facilitating the reconstruction of past environments and site formation processes.

During the course of the Jemseg Crossing Archaeology Project, a variety of artifacts, bioarchaeological specimens and ecofacts were recovered. Together these archaeological objects form the *Jemseg assemblage*. This assemblage may be characterized and described in many different ways. Since the objects within it are made of a great variety of materials, and

[1] In contrast to archaeological features, which by definition cannot be removed from the ground intact (see Chapter 14).

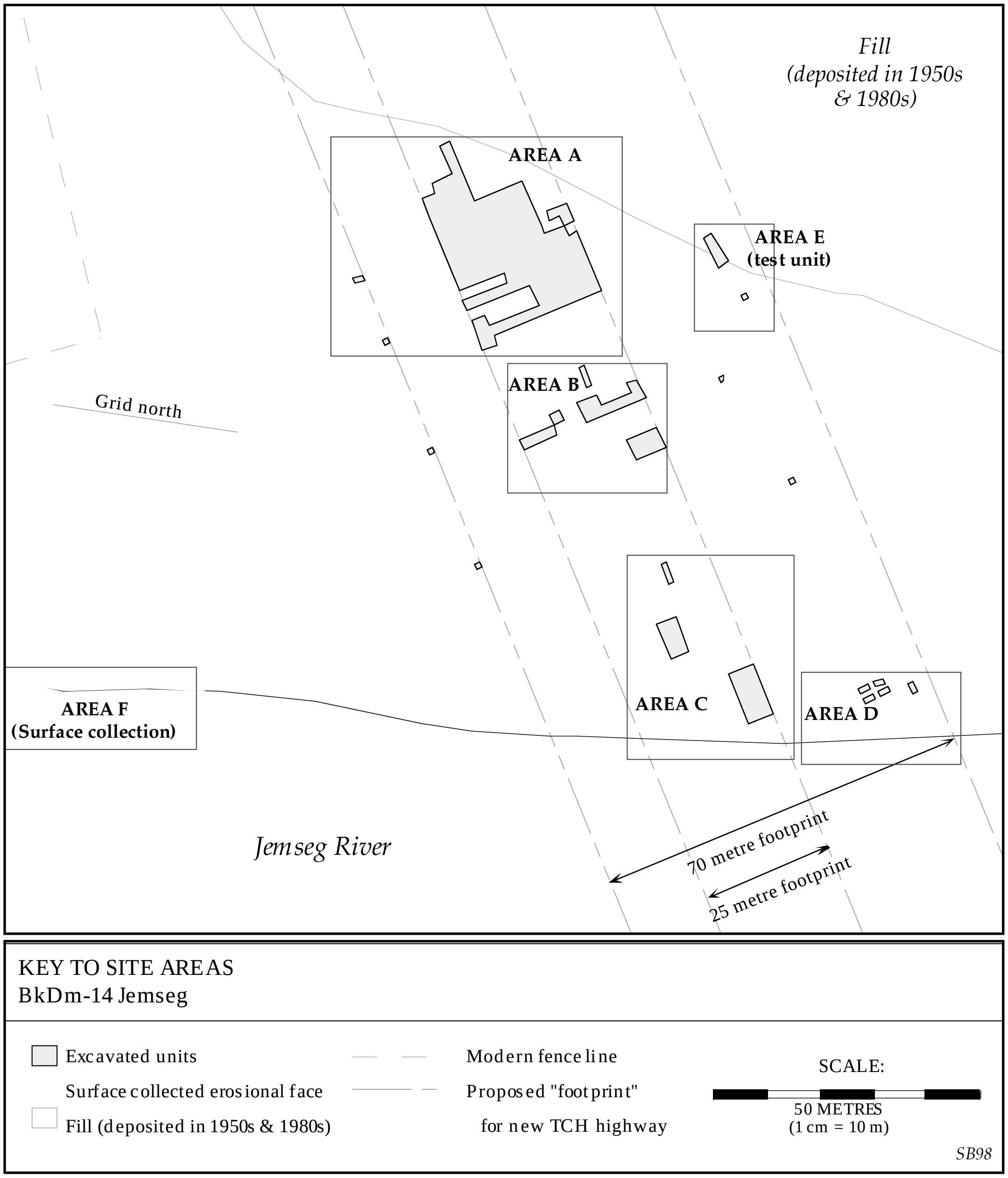
Figure 8.1: The proportion of material and chronological classes for the Jemseg assemblage.



result from activities carried out over a long period of time, these two variables, "materials" and "age" will provide the basis for a broad set of definitions and discussion. Artifacts from the pre-contact and post-contact eras differ in ways that crosscut both of these variables. Artifacts recovered from the pre-contact era are made of primarily of stone and pottery[2], while post-contact artifacts include metals, glass, plastics, and clay pipes and other ceramic objects. The Jemseg assemblage produced well over 40,000 archaeological objects, of which 38,003 were assigned catalogue entries[3]. Of these, 16,375 can be attributed to the pre-contact period[4], while 19,626 can be attributed to the post-contact period (see discussion below). An additional 1042 archaeological objects were classed as "unknown"; these were materials or samples which could be derived from either the pre- or post-contact period (e.g., undated charcoal, soil samples, mussel shell fragments). These pre- and post-contact material represent a variety of material classes, which are tabulated in Table 8.1,

[2] Note that this refers only to materials that were *recovered archaeologically*. A much larger suite of tools and materials would have been used by pre-contact peoples, including organic materials, such as wood, grasses, roots, birchbark, animal bones, teeth, hides, pelts, and antler. These were fashioned into a large array of tools, as well as decorative and ceremonial objects, including baskets, textiles, clothing, mats, fishnets, houses, canoes, harpoons, musical instruments, and personal adornment. These materials are much more fragile than stone and pottery, and are usually destroyed by natural forces (such as soil acids) and the passage of time.

Figure 8.2: Excavation and survey areas recorded during the Jemseg Crossing Archaeology Project.



[3] The objects that did not receive catalogue numbers were very small objects that were recovered from the flotation samples. These materials were grouped by fraction and sample, so that all of the materials recovered from the coarse heavy fraction were given a single number (see Chapter 6).

[4] The assignations were based on inherent attributes such as material, form or known source - e.g.: cow bones with saw marks are post-contact based on the fact that neither saws or cows were present in pre-contact times

Table 8.1: The distribution of material and chronological classes for the site.

	Area A	Area B	Area C	Area D	Area E	Area F	Other	Total
Pre-contact								
Flaked lithic	12068	1443	175	758	121	231	1227	**16023**
Other lithic*	77	12	1	10	3	6	21	**130**
Ceramic	151	5	6	59	0	0	1	**222**
SUBTOTAL	*12296*	*1460*	*182*	*827*	*124*	*237*	*1249*	***16375***
Post-contact								
Glass	3613	1993	133	6	5	1	101	**5852**
Ceramic	5737	929	28	17	30	28	154	**6923**
Metal	1642	3399	175	8	0	13	111	**5348**
Organic	105	819	7	0	0	0	6	**937**
Other**	1232	243	16	1	0	0	36	**1528**
SUBTOTAL	*12329*	*7383*	*359*	*32*	*35*	*42*	*408*	***20588***
Unknown***	503	476	3	45	0	0	13	**1040**
TOTAL	**25128**	**9319**	**544**	**904**	**159**	**279**	**1670**	38003

* “Pre-contact: Other Lithic” consists of ground stone, abrading stones and hammerstones
** “Post-contact: Other” consists of a variety of materials, primarily plastics, rubber, and coal
***The “Unknown:” category consists of flotation samples, shell fragments, seed and other plant remnants, and animal bones and bone fragments

below, and presented in a pie in Figure 8.1.

Over the course of the Jemseg Crossing Archaeology Project, a total area of 735 m^2 was excavated. As discussed in the section on “Methodology”, only portions of the site that were to be directly impacted by the proposed construction area for the highway were excavated. Nonetheless, due to the large site area included within preliminary estimates of the proposed highway footprint (or area of impact) and the variability of deposits and archaeological materials within this footprint, it is useful to distinguish between six site “areas”. These areas, which will be designated in this report as Areas A to F, are shown in Figure 8.2. A comparison of even the most basic material classes from each area reveals a great deal of site variability. This variability may be derived from site formation processes and topography (see Chapter 3), but may also indicate different patterns of site usage (see Table 8.1). This site variability and some of the inferences that can be drawn from it will be discussed in Chapters 15 and 16. This current section will focus on the spatial distribution over the site of archaeological materials.

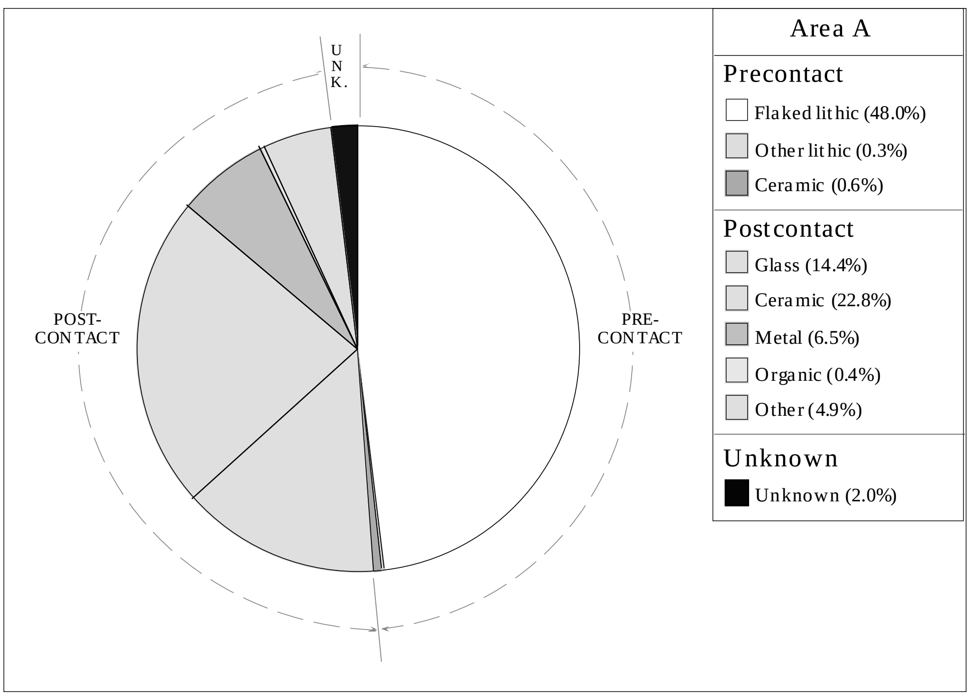
Area A

Area A, located on the upper terrace, was within the ploughed field, at least 70 m from the shoreline[5]. It was the largest of the excavation areas, with a total of 576 m^2 (78% of the total area excavated). Despite the extensive ploughing of this area in recent times, it produced most of the identifiable features (60 features, or 75% of the total number of features) from the site. It also produced the majority of the artifacts (66%) recovered from the entire site area (75% of all pre-contact artifacts and 60% of all post-contact artifacts).

However, within Area A, the proportion of pre-contact to post-contact artifacts is almost 50%-50%, as demonstrated by Figure 8.3. This suggests that while there are intact features beneath the ploughzone, there is still a significant degree of post-contact activity and / or disturbance in this area.

Interestingly, despite the distance to the shore, Area A appears to have been the locus of activity in almost all time periods. This is probably due to the presence of a natural, broad, comparatively well-drained terrace, but is contrary to our expectation of

Figure 8.3: The proportion of material and chronological classes for Area A.



[5] This estimate and others of the relative position of the shoreline is based on water levels measured on September 5, 1996, and the association of this water level with a narrow beach and bank. These two land features suggest that this water level a regular or common one, even though there are periods when the water level is considerably higher (see above).

the pre-contact period. Archaeologists have tended to assume that pre-contact houses and communities would be located close to the waters edge. This perception of site location has had a significant impact on the way archaeologists structure prospection and survey for archaeological materials (Black and Blair 1993).

Cultural components of different ages (consisting of different periods of site activity) are distinctively distributed within Area A. Older materials (from the Archaic period, ca. 6000 to 2700 years ago) are clustered in the eastern half of Area A, while evidence of more recent activity (during the Maritime Woodland period, ca. 2700 to 1500 years ago) is clustered in the western half. This pattern is less clear for later post-contact period materials (see discussion in the next section). A general dividing line between the Archaic and Woodland appears to be roughly the 6 m topographic line with the earlier groups living slightly further back on the upper terrace than subsequent groups. This pattern is somewhat perplexing given that the water level would have been lower in earlier times (see above, Seaman 1997: pers. comm.). It may be that paleoenvironmental variables, cultural preferences, or particular site activities may have patterned this material in a way that is not readily apparent. These issues will be discussed more fully below.

Area B

Area B consisted of a group of non-contiguous excavation blocks that were

Figure 8.4: The proportion of material and chronological classes for Area B.

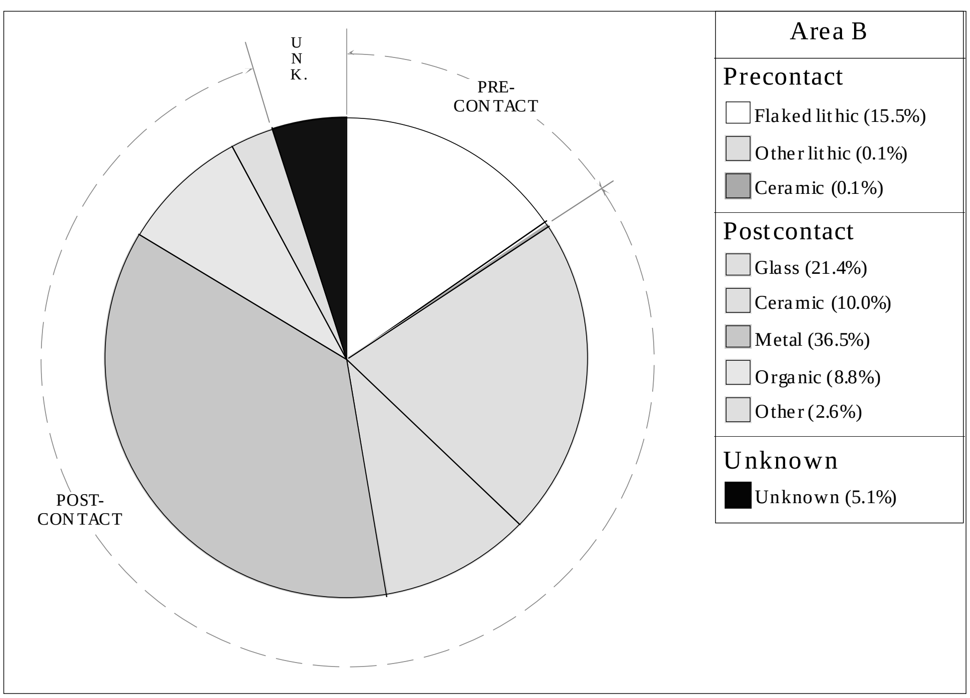
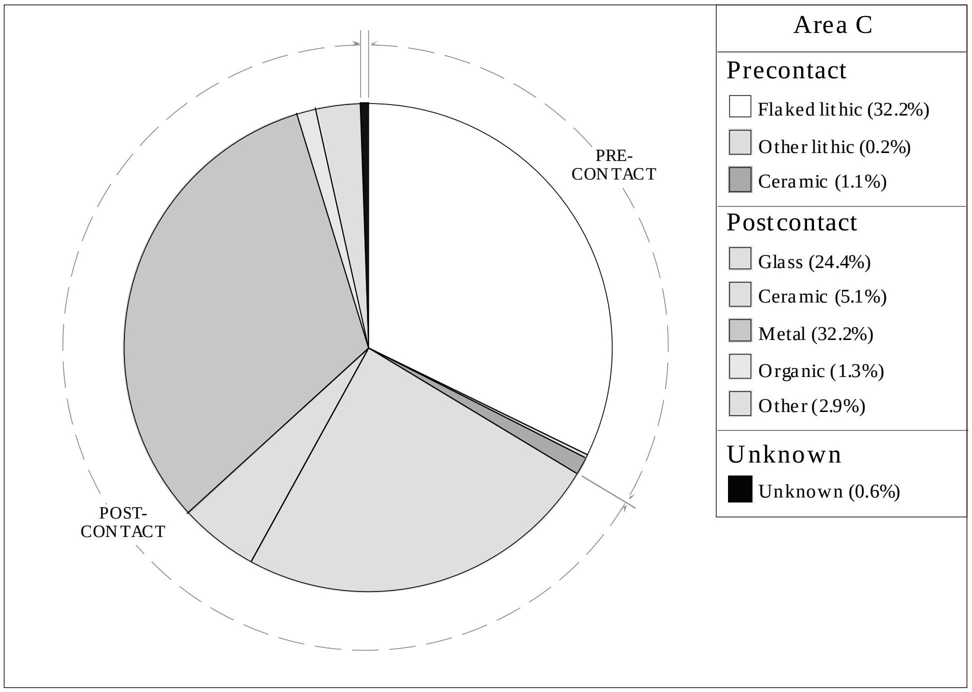


Figure 8.5: The proportion of material and chronological classes for Area C.

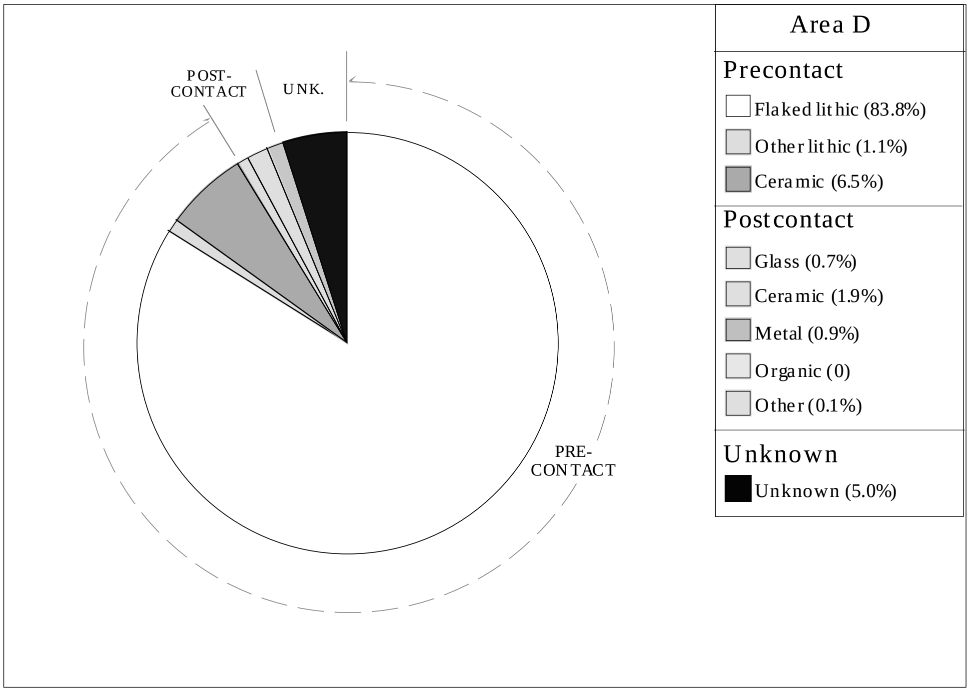


located on the break-in-slope between the low wet area and the upper terrace. The total area of excavation of these units is 86 m² (12% of the total site area). Area B was a locus of intense historic period activity. Despite its relatively small area it produced almost 36% of all of the historic period artifacts recovered from the site. It also produced smaller quantities of pre-contact period material (see Figure 8.4). The frequency of recent historic artifacts suggests that some of these artifact concentrations may be the result of the ploughing of the field (with artifacts and other materials encountered during ploughing being tossed to the edge of the field), or it may be the result of periodic dumping of post-contact period debris. However, it is also possible that some of these artifacts may derive from longer periods of primary post-contact activities, such as the small encampments that elders talked about in spoken histories. Unfortunately, archaeological interpretations about Area B are impeded by the fact that it is one of the more disturbed parts of the site.

Area C

Area C is a broad area on the levee adjacent to the river. We excavated an area of 43 m² in Area C (6% of the total site area). This area produced relatively few artifacts (a little over 1% of all artifacts were recovered from this area). After discussions

Figure 8.6: The proportion of material and chronological classes for Area D.



with landowners, it appears that the northern half of this area was heavily disturbed when the vegetation was cleared for pasturage in the 1950s. The excavations in this area were abandoned before they could progress very far, due to rising water levels in December, which may also account for the relatively low densities of artifacts recovered.

Area D

Area D consisted of a small block of non-contiguous excavation units with a total area of excavation of 10 m^2 (1% of the total site area). This area is at the southern end of the levee, where the alluvium forms thick layers of silt. This area produced abundant pre-contact features and relatively high densities of artifacts (over 3% of all artifacts and 5% of all pre-contact artifacts). Most of these artifacts derive from the pre-contact era (see Figure 8.6). These excavation units were expansions of one of the initial test units (TF2). We stopped excavations in Area D relatively early in the project, due to the fact that we had encountered the water table. Subsequently, there was a change in the proposed footprint, which resulted in these units being placed outside of the area to be mitigated.

Area E

With an excavation area of 5 m^2, Area E was the smallest excavation area at the Jemseg site. It consisted of one of the early test units (TB1), and a narrow trench placed under the edge of the fill. This area was differentiated from Area A to the north on the basis that it appeared have had to relatively little recent subsurface disturbance. Based on stratigraphy and low artifact dispersal rates, we concluded that Area E was beyond the southern edge of the ploughed field. Due to its small size, this area produced only a small proportion of the overall assemblage (see Table 8.1, above), most of which were derived from the pre-contact era (see Figure 8.7).

Area F

Area F is the only one of these areas which is not an excavation area, but rather represents a zone of beach finds to the north of the footprint. Crew and site visitors occasionally collected archaeological materials from Area F that were in the process of being destroyed by erosion. Although there were several concentrations of eroding artifacts along the beach (one in front of Area C and one in front of Area D), Area F designates an exposure near a low marshy area north of the footprint. Generally Area F appears to be a linear exposure of tools, flakes and fire-cracked rock of about 40 m long. Despite the fact that surface collection in this area may have been more selective than the collection methods used in the formal excavation areas (with people more likely to collect recognizable tools and pre-contact artifacts, and possibly miss related bioarchaeological

Figure 8.7: The proportion of material and chronological classes for Area E.

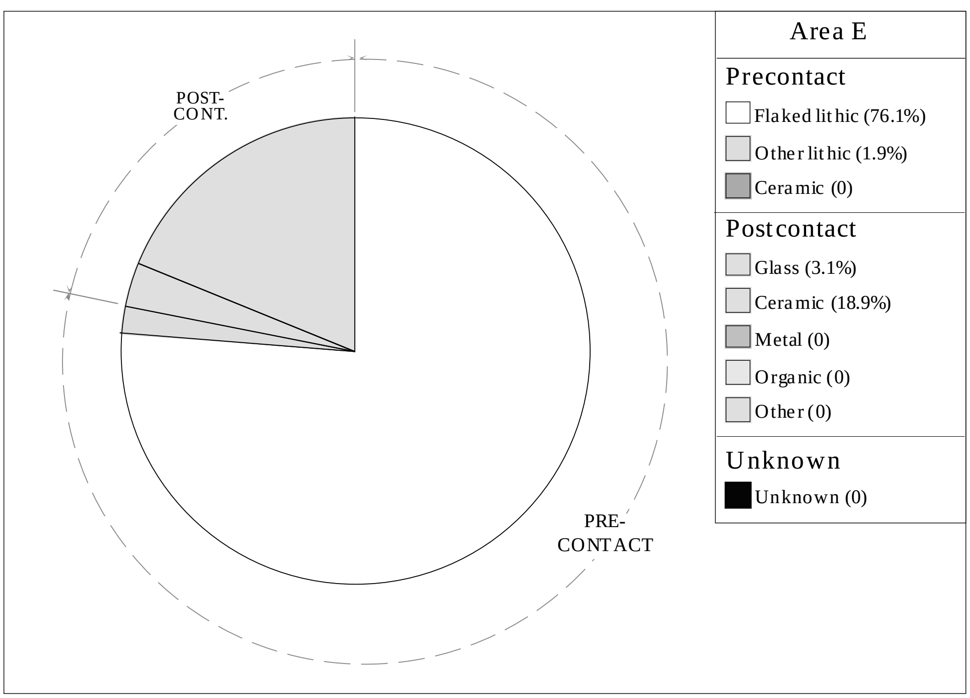
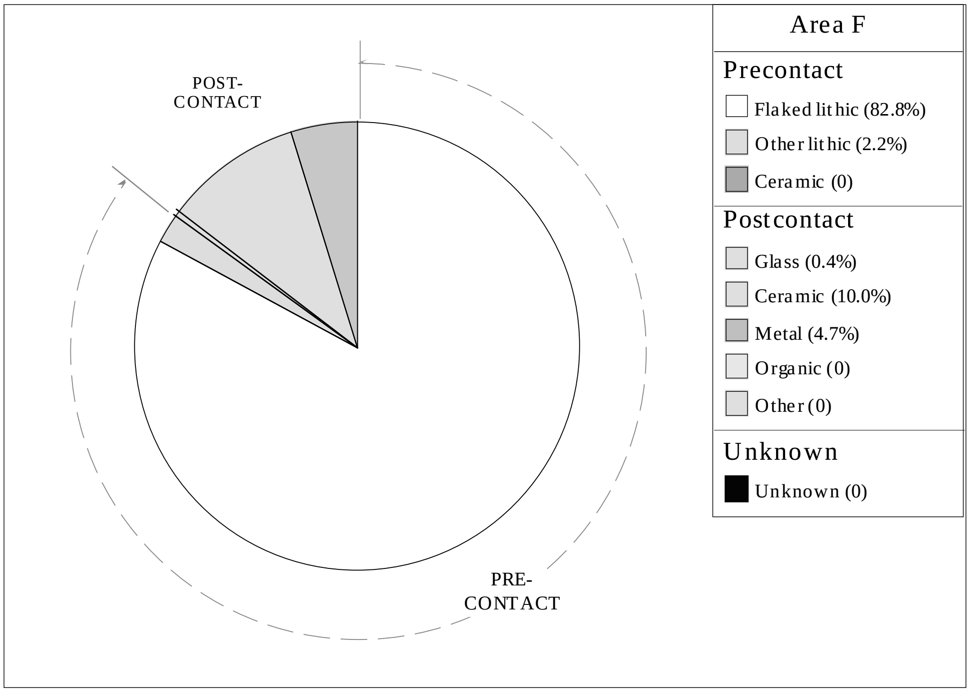


Figure 8.8: The proportion of material and chronological classes for Area F.



specimens and ecofacts), this area produced a significant quantity of pre- and post-contact materials (see Figure 8.8, and Table 8.1)

Other parts of the site

A number of test units that were placed around the perimeter of the 70 m footprint were not included in these excavation units, due to the fact that they were isolated, and produced relatively little material. These areas include the sampling of the alluvium from within the Jemseg River in the front of the site, and encompass an estimated area of 15 m^2.

The Analysis of Material Classes

The above discussion summarizes the basic material classes encountered during the JCAP. However, some of these materials were analysed to a much greater degree, including the lithic materials (stone tools and debitage), the pre-contact pottery, the plant materials and animal bones. These analyses were performed by individuals with relevant expertise, and their reports to the JCAP have been included below.

Ponapsqey

9: Stone Raw Materials

JEMSEG CROSSING PETROGRAPHIC SERIES AND
PRELIMINARY EVALUATIONS OF FLAKED LITHIC MATERIALS

David W. Black

A sample of 2499 pieces of flaked lithic artifacts and debitage from the Jemseg site (BkDm14) was examined to determine the different kinds of toolstones used by Native people who occupied the site. A petrographic series of 55 lithic types was developed by examining the pieces in hand specimen and using a low-powered stereo-microscope. For analytical purposes, the 55 types were compressed into 20 lithic classes.

The major classification problem encountered was distinguishing multicoloured cherts from local and distant sources. Criteria for distinguishing Washademoak (local) chert from Minas Basin (exotic) chert were developed.

Lithic types are complexly distributed across the Jemseg site. The predominant toolstones are high-quality, multicoloured chert (agate, jasper, chalcedony, etc.) and a wide variety of fine-grained, rhyolitic volcanics. Most of these toolstones probably could have been obtained within one day's travel from the Jemseg site. However, small amounts of toolstones from sources in Maine, Nova Scotia and Labrador show that Native people at Jemseg had access to exotic lithic materials from as far as 1500 km distant. They obtained these materials through long distance travel, exchange systems, or other forms of social interaction.

ACKNOWLEDGEMENTS
I thank Susan Blair for this opportunity to examine part of the Jemseg assemblage. I thank everyone connected with the Jemseg Crossing Archaeological Project for their help and co-operation while I conducted the work. In particular, I want to thank Ramona Nicholas, Pam Dickinson and Jason Jeandron for their help with organizing and conducting the research. I also thank Archaeological Services of New Brunswick for allowing me to use quarry specimens from their collection. Some quarry specimens were thin-sectioned as part of the Ecology and History in the Insular Quoddy Region Project, funded by the Social Sciences and Humanities Research Council of Canada. I thank Lucy Wilson (UNBSJ-Physical Sciences) for her descriptions and analyses of the thin-sections. I thank David Pirie (UNB-Geology) for making the thin-sections, and Douglas Hall (UNB-Electron Microscopy) for conducting X-ray spectrometry of some quarry specimens.

INTRODUCTION

This chapter reports the results of the Jemseg Crossing Petrographic Series (JCPS) project, conducted on contract as part of the Jemseg Crossing Archaeology Project (JCAP). Flaked stone tools, and the debitage resulting from their manufacture, are a major source of information about Native occupations at Jemseg.

The JCPS project focused on identifying the toolstones from which flaked stone tools were made, and on defining potential and probable sources for these toolstones. The work reported here was conducted between June 16, 1997, and July 18, 1997, at the Anthropology Lab, Department of Anthropology, University of New Brunswick. The JCPS project was conducted by the author and three employees of JCAP: Ramona Nicholas, Pam Dickinson and Jason Jeandron. Because other analyses of the Jemseg site are ongoing, little attempt is made here to integrate the results of the JCPS project into the larger context of JCAP.

Geology and rock identification are technical subjects for which complex sets of terminology have been developed. Readers are referred to Chesterman (1995) and Hamilton, Woolley and Bishop (1974) for definitions of unfamiliar geological terms.

ORGANIZATION OF INFORMATION

This report is composed of a text section, laid out in standard report format. The initial report, on file with Archaeological Services Unit, also included a series of four appendices. In the text section, the purposes of, and constraints on the JCPS project are outlined, the sample analysed is described, and the methods employed are presented. As background, a brief description of the geological context of the Jemseg site is included.

The substantive results of the project are summarized in text, tables and graphs. Detailed descriptions of lithic materials, keys to acronyms and abbreviations used, and descriptions of computer files created as part of the project, are relegated to the appendices. Presentation of information has been patterned as much as possible after reports on other New Brunswick (N.B.) archaeological lithic assemblages (see, for example, Black 1992, 1996; Blair 1997; MacDonald 1994).

Following the substantive results are two brief interpretive sections. These are necessarily exploratory rather than definitive. Main conclusions are summarized at the end of the text section.

PURPOSES AND PARAMETERS

The purposes of the JCPS project were as follows:

1) development of a petrographic series of lithic material types represented in the Jemseg assemblage;
2) assignment of pieces from a sample of archaeological lithics to the types defined;
3) selection of type specimens for illustrating the types defined;
4) basic quantification of the lithic types represented in the Jemseg assemblage; and
5) provision of information about potential and probable sources of the lithic types represented.

The work was conducted within the following constraints and parameters:

1) JCAP selected the sample of lithics to be analysed;
2) JCAP provided provenance information for the sampled pieces;
3) analysis was restricted to flaked stone materials;
4) no destructive methods were used to examine archaeological specimens from the Jemseg site; and
5) quantification was in terms of piece counts.

GEOLOGICAL CONTEXT

The Jemseg site is located over bedrocks of the upper part of the Pennsylvanian-aged Cumberland Group formations. Unfortunately, in the vicinity of Jemseg, the Cumberland Group has not been divided into specific formations. However, it is known to be composed of terrestrial sediments, red and grey conglomerates, sandstones, siltstones and shales (McLeod, Johnson and Ruitenberg 1994; Potter, Hamilton and Davies 1979).

Down the Saint John River from Jemseg, between Washademoak Lake and the Bay of Fundy, a complex array of older bedrock outcrops. These rocks span the geological ages from the Pre-Cambrian to the Mississippian. They include volcanics, sediments and metamorphics. Of particular note, in terms of potential flaked toolstones that might have been used by Native people, are:

1) the Washademoak Lake chert source, associated with Pennsylvanian-aged sediments (15 km distant); this source has been documented archaeologically since late last century (Matthew 1900);
2) the Queenston Flows, a series of Pennsylvanian-aged mafic volcanic flows and associated sedimentary rocks that may be closely associated with Washademoak chert (15-20 km distant);
3) a series of Devonian-aged rhyolite, andesite and basalt flows located across the Saint John River and south of Washademoak Lake (25 km distant); and
4) a series of Ordovician- and Silurian-aged felsic volcanics (the Long Reach, Queen Brook and Williams Lake formations) exposed on the east side of the Saint John River (30-50 km distant).

To the south and west of Jemseg, about 25 km distant and onward to the Quoddy region, are volcanics, sediments and metamorphics of Silurian, Devonian and Mississippian ages. Of particular note are fine-grained volcanic extrusives, Devonian granitic plutons which are associated with contact metamorphics such as hornfels, and Devonian-aged conglomerates known to contain toolstone-grade clasts of quartzite.

Up the Saint John River from Jemseg, Pennsylvanian-aged sediments persist for 50 km or more. However, north and west of Fredericton, Silurian, Devonian and Mississippian volcanics and sediments are again exposed. At a distance of 120 km up river and beyond, there are extensive exposures of Ordovician-aged calcareous and argillaceous sedimentary rocks, interbedded with some associated volcanics

(McLeod, Johnson and Ruitenberg 1994).

In terms of surficial geology (Rampton, Gautier, Thibault and Seaman 1984), the Jemseg site is located in the Grand Lake basin of the New Brunswick Lowlands. Water movement directions in the vicinity are NW-SE down the Saint John River, and NE-SW down the Grand Lake system. Ice movement directions during the Late Wisconsinan were mainly N-S and NW-SE. The Gagetown moraine is located just south of the Jemseg River on the Saint John River. Glacially deposited materials would have been derived from outcrops to the north and northwest.

The Grand Lake basin was deglaciated before 12,700 BP, and was subsequently drowned by the DeGeer Sea and Inland Sea Acadia. Thus, the Jemseg site is located at the interfaces among 3 sets of surficial sediments:

1) veneers of Wisconsinan-aged loamy lodgement and ablation tills (0.5-3.0 m in depth) composed of silt, sand, gravel and rubble that cover the bedrocks on the Grand Lake side of the site;
2) deep, Holocene-aged, fine alluvial sediments of the Saint John and Grand Lake systems accumulating on the Saint John River side of the site; and
3) earlier Holocene-aged, undifferentiated lacustrine and marine deposits (1-10 m in depth) consisting of sand, silt, minor clay, and gravel that underlie parts of the Jemseg site and the nearby banks of the Jemseg River.

The bedrock in the immediate vicinity of the Jemseg site is too deeply buried to be a direct source of toolstones. Recent alluvial sediments are too fine to contain useful toolstones. Nearby glacial deposits may contain useable clasts of toolstone-grade materials from outcrops to the north and northwest. However, for Native people the most likely close sources of toolstones are the volcanic and sedimentary bedrock outcrops in the Saint John River basin south of the site. Many of these are located within an easy one day journey by canoe.

SAMPLE

The sample consists of 2499 pieces of analyzable lithic material. Approximately 2700 pieces of material were actually examined during the project; the balance of the pieces were rejected from the analysis because they represented pieces of ground stone tools, fire-cracked rock or natural stones mistaken for lithic debitage during the excavation. The sample was judgmentally selected from the Jemseg site lithic assemblage, which consists of more than 15,000 pieces. The sample represents about 15% of the assemblage.

Pieces in the sample ranged from very large (up to 1 kg) core tools and cores to very small (0.10 g) pieces of lithic debitage. The bulk of the pieces were relatively small, in the 0.5-2.0 g range. Artifacts included projectile points, bifaces, scrapers, spokeshaves, utilized flakes, etc. Debitage included cores, core fragments, blocks, shatter, and flakes. Evidence of both bifacial and bipolar reduction were present.

Microdebitage also has been recovered through flotation of sediments from the Jemseg site. These very small pieces were not analysed because neither JCAP nor UNB-Anthropology possesses adequate microscopic equipment.

METHODS

The sample pieces were examined sequentially by groups as they were received by the lab. Initially groups of lithics were sorted by hand specimen into 8 broad 'bucket' categories. Then each 'bucket' was sorted using 2X, 10X and 20X magnification. Lithic types were defined as encountered. Lithic type sheets were completed and type specimens attached to them. Additional information and type specimens were added as the analysis progressed. Each type was assigned a sequential number, a type name, and a four-letter acronym.

By the end of the project, 55 lithic types had been defined. The type sheets are included in the preliminary technical report (type sheets with type specimens attached have been returned to JCAP).

Each type sheet shows the type number, type name, acronym, the 'bucket' the material was originally sorted into, and the type of rock the specimens are composed of. Following this is a brief description of the lithic type including texture, colour, colour patterning, lustre, fracture, light transmission characteristics, visible crystals, inclusions, flaws, cortex, weathering, and so on. Similarities to types defined for other archaeological petrographic series in N.B. are noted where applicable.

A list of type specimens intended to capture the salient characteristics and the variability of the material is included. This analysis did not include photographing of type specimens.

At the bottom of each type sheet an assessment of the source of the material is made. Notes on the reasoning behind these assessments are included.

Each specimen, its provenance information and the lithic type to which it was assigned, was entered into a computer database. A printout of the entire database for the 2499 specimens, organized by specimen number, is included in the preliminary technical report.

For illustrative and analytical purposes, the 55 lithic types were compressed into 20 lithic classes. This compression was accomplished by including very similar lithic types in a single lithic class. Salient lithic types, for example, highly distinctive types and those known or suspected to be exotic, were assigned to individual lithic classes. Names and acronyms were assigned to the lithic classes. The lists below clarify the relationships among 'buckets', lithic types and lithic classes, and show the acronyms and sequential numbers assigned to each.

DESCRIPTIONS OF LITHIC MATERIAL CLASSES

In this section the flaked lithic toolstones used at Jemseg are described by lithic classes. The lithic classes are grouped step-wise according to the likelihood they represent exotic materials. The classes and groupings reflect the layouts of the graphs presented later in this report.

In this report, the term 'exotic' is used in a cultural sense: that is, exotic lithics are those known to have been brought to the site from a distance by human activity. For this study, lithic materials known or thought to have been brought from sources more than ca. 50 km from Jemseg are considered exotic. Such interpretations are always based on current geological information, are somewhat subjective, and are necessarily probabilistic. The uncertainties are expressed in the classification scheme presented below.

Local

These classes include materials known to occur within an easy one day journey from Jemseg.

1) Bleached Volcanics and Cherts (BL VOL/ CHT):

This lithic class includes 687 pieces in five lithic types, and accounts for 27.5% of the sample. It includes all materials too bleached to be assigned with certainty to other lithic types defined. Most of the material is probably bleached rhyolitic volcanics, although some bleached cherts and bleached hornfels may be included. These materials were probably obtained from surficial deposits and outcrops near the Jemseg site.

Bleached lithics are common in archaeological sites in southern N.B. Bleaching is caused by exposure to acidic soils and groundwater, and possibly by exposure to sunlight.

2) Quartz (QTZ):

This lithic class includes 156 pieces in two lithic types, and accounts for 6.2% of the sample. It includes translucent and opaque bull quartz. These materials were probably obtained from surficial deposits and outcrops near the Jemseg site. Quartz is much less common at Jemseg than it is at many other Native archaeological sites in N.B.

3) Washademoak Multicoloured Chert (WMCC):

This lithic class includes 718 pieces in a single lithic type, and accounts for 28.7% of the sample. This is the most common lithic material used at the Jemseg site, probably because of its proximity to the source at Washademoak Lake. It is unusual for sites in N.B. to contain such high proportions of high quality silicate toolstones. Since Washademoak is down river from Jemseg, this material must have been brought to the site by Native people.

Distinguishing between local Washademoak chert and multicoloured cherts from other, more distant sources (such as the Minas Basin area of N.S.) was the main analytical difficulty confronted by the JCPS project. Criteria developed for distinguishing Washademoak Multicoloured Chert from other cherts are presented below.

Probably Local

These classes include materials that can reasonably be inferred to occur within an easy one day journey from Jemseg.

4) Quartzite (QZITE):

This lithic class includes 10 pieces in two lithic types, and accounts for 0.4% of the sample. It includes purple-brown quartzites similar to those found on Grand Manan sites, and grey quartzites similar to those found on Quoddy region sites. These materials probably come from clasts weathered out of conglomerates. They may be exotic to Jemseg, but it is more likely that they were obtained from local surficial deposits or conglomerate outcrops.

5) Porphyritic Volcanics (PVOL):

This lithic class includes 42 pieces in three lithic types, and accounts for 1.7% of the sample. It includes porphyritic rhyolites and/or andesites with green, red and purple-brown groundmasses, and phenocrysts visible in hand specimen. These materials were probably obtained from local surficial deposits or from outcrops in the coastal volcanic belt.

6) Light Coloured Fine-grained Volcanics (LVOL):

This lithic class includes 406 pieces in 13 lithic types, and accounts for 16.2% of the sample. It includes a wide range of fine-grained rhyolites with light-coloured pink, red, green and grey groundmasses, ranging from glassy to stony in texture, having frequent spotting, mottling and flow-banding, but no visible phenocrysts. Toolstones similar to several of these types have been found at sites in the Quoddy region; many are similar to the materials that Doyle (1995:305) refers to as Washington County Volcanics.

Probably most of these materials were obtained from local surficial deposits or outcrops in the coastal volcanic belt. One material, Grey Flow-banded Rhyolite, is worthy of special note: it is identical to material identified in the Northeast Point (BgDq7) assemblage on the Bliss Islands (Black 1996).

7) Dark Coloured Fine-grained Volcanics (DVOL):

This lithic class includes 70 pieces in nine lithic types, and accounts for 2.8% of the sample. It includes a wide range of fine-grained rhyolites, andesites and basalts with dark-coloured red, purple, brown and black groundmasses, ranging from glassy to stony in texture, having frequent spotting, mottling and flow-banding, but no visible phenocrysts. Probably most of these materials were obtained from local surficial deposits or outcrops in the coastal volcanic belt.

8) Siltstones and Mudstones (SILT/MUD):

This lithic class includes four pieces in two lithic types, and accounts for 0.2% of the sample. It includes two types of green silicified mudstones that do not fit into other opaque chert/mudstone types. Probably these materials are Ordovician-aged silicified mudstones. They probably were obtained from surficial deposits near Jemseg or from mudstone outcrops in the coastal volcanic belt. However, they could have been brought to Jemseg from more distant sources by Native people.

9) Questionable Chert (QCHT):

This lithic class includes 41 pieces in a single lithic type, and accounts for 1.6% of the sample. It includes all pieces that could be identified as chert, but could not be assigned with confidence to another chert type. Most of the pieces are relatively small fragments of translucent chert; some are slightly bleached. Most of the pieces are probably Washademoak chert specimens lacking distinctive characteristics of that material. Thus, most of this class is probably local in origin.

Criteria used to distinguish cherts are presented below. These distinctions are necessarily qualitative and probabilistic. Any sizeable archaeological assemblage can be expected to contain chert that cannot be assigned with confidence to familiar types or sources.

Possibly Exotic

These classes include materials known or suspected to come from distant sources but which may be transported into surficial deposits near Jemseg by geological processes.

10) Translucent Quartzite (TQZT):

This lithic class includes seven pieces in a single lithic type, and accounts for 0.3% of the sample. It includes pieces of translucent, clear to white fine-grained quartzite. This quartzite probably has a Canadian Shield origin. The material resembles Mistassini quartzite from Quebec, and may be an exotic from that area. On the other hand, quartzites of this quality, and from Shield sources, may be present as clasts in N.B. conglomerates. A third possibility is that this type represents exceptionally clear pieces of Ramah quartzite from Labrador.

11) Light Coloured Fine-Grained Volcanics (LVOL):

This lithic class includes 120 pieces in two lithic types, and accounts for 4.8% of the sample. It includes two types of rhyolitic volcanics that are distinctive, but unfamiliar, and may have been brought to Jemseg from distant sources. The first is a glassy grey-green rhyolite peppered with white spots that was used with some frequency at Jemseg. The second consists of glassy, bright red rhyolite. One piece of the latter type is peppered with angular fragments of clear glass; this material resembles Kineo-Traveller Mountain Porphyry, except for the red colour of the groundmass.

12) Tobique Rhyolite (TOBR):

This lithic class includes three pieces in a single lithic type, and accounts for 0.1% of the sample. Tobique rhyolite is a distinctive, mottled red and black, weathered rhyolite that outcrops near the confluence of the Tobique and Saint John rivers. It may have been transported into surficial deposits near Jemseg through riverine or glacial processes. More probably, however, it was brought down river to Jemseg by Native people. It has been identified as an exotic in the Quoddy region (MacDonald 1994).

13) Opaque Cherts (OPQ CHT):

This lithic class includes 62 pieces in four lithic types, and accounts for 2.5% of the sample. Mono-coloured red, green and grey, and mottled grey and black materials that resemble Ordovician-aged chert/ mudstones outcropping in the Munsungun Lake and Stone Mountain areas of northern Maine, and the Lake Temiscouata and Gaspé areas of Quebec, are represented. Similar materials may be present in Ordovician outcrops in northern N.B., and similar materials have been reported from the coastal volcanic belt of northern Maine and southern N.B. (Doyle 1995:305). These materials may be present in surficial deposits near Jemseg as a result of glacial or riverine transport from the north. On the other hand, they may be exotics associated with Munsungun Red and Green Chert, or have been brought to Jemseg from other distant sources by Native people.

14) Translucent Cherts (TRNS CHT):

This lithic class includes two pieces in two lithic types, and accounts for 0.1% of the sample. It includes two distinctive types of translucent chert that may be associated with exotics from known sources. One is a piece of green-grey chalcedony or agate mottled with dark opaque areas. This material may be associated with Munsungun Red and Green Chert, or with Minas Basin Multicoloured Chert. The other is a piece of purple-brown agate or jasper speckled with opaque blue-grey patches. It may be an exotic associated with Minas Basin Multicoloured Chert.

Probably Exotic

These classes include materials whose origin is unknown, but which are suspected of being associated with known exotic materials from distant sources, and that are unlikely to have been transported into surficial deposits near Jemseg by geological processes.

15) Green Porphyritic Rhyolite Tuff (GPRT):

This lithic class includes two pieces in a single lithic type, and accounts for 0.1% of the sample. The green rhyolite tuff has some characteristics in common with Kineo-Traveller Mountain Porphyry (Doyle 1995:304) and may have been brought to Jemseg from the same source area in northern Maine.

16) Translucent Cherts (TRNS CHT):

This lithic class includes 46 pieces in two lithic types, and accounts for 1.8% of the sample. It includes two types of distinctive translucent cherts that may be exotics associated with Minas Basin Multicoloured Chert. One is a patchy blue and brown mottled agate. The other is a homogenous red-brown chert. The latter exhibits pebble cortex, and so may have been obtained from a surficial deposit near Jemseg.

Exotic

These classes include materials known to have been brought to Jemseg from distant sources.

17) Ramah Quartzite (RQZT):

This lithic class includes 14 pieces in a single lithic type, and accounts for 0.6% of the sample. It includes pieces of a distinctive quartzite (known as Ramah chert or Ramah quartzite) from the Ramah Bay area of northern Labrador. The material is a fine-grained, semi-translucent quartzite swirled with blue-grey opaque minerals. It is well known from archaeological assemblages in the Northeast, and appears in coastal and near-coastal assemblages from Labrador to Maine in the Late Archaic and Late Woodland periods. It must have been brought to Jemseg by Native people. (It should be noted that a similar type of quartzite is found in the Mistassini area of Quebec. Mistassini quartzite is usually whiter and less opaque than Ramah quartzite, but it is not clear that the two types can always be distinguished from one another. The possibility that some of this material may have come from Quebec should be considered. This does not change the interpretation that at Jemseg this lithic type represents an exotic material brought by Native people from a distant source.)

18) Kineo-Traveller Mountain Porphyry (KTMP):

This lithic class includes 19 pieces in a single lithic type, and accounts for 0.5% of the sample. It includes pieces of a distinctive fine-grained, green porphyritic rhyolite known as Kineo felsite or Kineo-Traveller Mountain Porphyry (Doyle 1995:304). The material contains distinctive beads of clear quartz that reflect the colour of the groundmass. Weathered feldspar phenocrysts also are often present. Most of the pieces in the Jemseg sample are extensively bleached, and were identified from the quartz beads, which do not bleach. However, one small flake retains the typical blue-green groundmass colour. This material is well known from archaeological assemblages in Maine (Doyle 1995), and has been identified as an exotic in N.B. (MacDonald 1994; Black 1997). This material must have been brought to Jemseg by Native people.

19) Munsungun Red and Green Chert (MRGC):

This lithic class includes 13 pieces in a single lithic type, and accounts for 0.5% of the sample. It includes pieces of a distinctive opaque red and green banded chert (or silicified mudstone) known to outcrop in the Munsungun Lake area of northern Maine (Doyle 1995:306; Pollock 1987). Pieces are mainly wine-red opaque chert crossed by relatively wide bands of green (or grey) more translucent chert. This material is well known from archaeological assemblages in Maine. Similar materials may outcrop in northern N.B. These pieces were almost certainly brought to Jemseg from distant sources by Native people.

20) Minas Basin Multicoloured Chert (MBMC):

This lithic class includes 77 pieces in a single lithic type, and accounts for 3.1% of the sample. It includes a range of multicoloured agates, jaspers and chalcedonies known to, or believed to come from sources in the Minas Basin area of N.S. Most of the pieces in the Jemseg sample are of an opaque porcelainite-like jasper known to occur at Blomidon Point and Moose Island (Doyle 1995:306-307). Minas Basin Multicoloured Chert is well known from archaeological assemblages in the Maritimes and Maine, and has been identified as an exotic material in Quoddy region sites (MacDonald 1994). These materials must have been brought to Jemseg by Native people.

Distinguishing between Washademoak Multicoloured Chert and Minas Basin Multicoloured Chert was the main analytical difficulty confronted by the JCPS project. Criteria developed for distinguishing Washademoak from Minas Basin cherts are presented below.

QUANTITATIVE CHARACTERIZATION OF THE SAMPLE

Table 9.1 shows the number of pieces in each of the 55 lithic types defined, and the proportion of the sample assemblage that each of the types represents. Figure 9.1 shows the distribution of the 55 types by number of pieces. Materials represented by more than 100 pieces, and exotic toolstones, are annotated to clarify the distribution. Washademoak Multicoloured Chert is the most common toolstone in the assemblage; it is more than twice as common as any other type. With the exception of bleached rhyolitic volcanics that cannot be further identified, the next most common material is Grey Flow-banded Rhyolite, itself a bleached volcanic. Two other types of rhyolite are represented by more than 100 pieces.

Of the exotic toolstones, only Minas Basin Multicoloured Chert is represented by a substantial number of pieces. The other exotics are represented by very small amounts of material.

Numbers of pieces and proportions for the 20 lithic classes were summarized in the previous sections. These data are shown graphically in Figure 9.2 (number of pieces) and Figure 9.3 (proportions). Local and presumed local materials dominate the sample assemblage. All of the bleached materials together represent a smaller proportion of the assemblage than Washademoak Multicoloured Chert. Quartz and quartzite are relatively uncommon, at least in comparison to many coastal assemblages in N.B. Volcanics are more common than cherts. Exotics and suspected exotics represent a small proportion of the assemblage, individually, and as a group.

Table 9.1: Numbers of Pieces and proportions of assemblage for JCPS lithic types.

TYPES:	NUMBER of PIECES:	PROPORTION (%)	TYPES:	NUMBER of PIECES:	PROPORTION (%)
JC1	8	0.30	**JC29**	19	0.80
JC2	36	1.40	**JC30**	77	3.10
JC3	2	0.10	**JC31**	3	0.10
JC4	5	0.20	**JC32**	45	1.80
JC5	8	0.30	**JC33**	2	0.10
JC6	5	0.20	**JC34**	6	0.20
JC7	185	7.40	**JC35**	1	0.05
JC8	1	0.05	**JC36**	5	0.20
JC9	17	0.70	**JC37**	10	0.40
JC10	104	4.20	**JC38**	15	0.60
JC11	718	28.70	**JC39**	11	0.40
JC12	107	4.30	**JC40**	1	0.05
JC13	58	2.30	**JC41**	5	0.20
JC14	13	0.50	**JC42**	300	12.00
JC15	50	2.00	**JC43**	138	5.50
JC16	4	0.20	**JC44**	1	0.05
JC17	1	0.05	**JC45**	122	4.90
JC18	15	0.60	**JC46**	112	4.50
JC19	104	4.20	**JC47**	16	0.60
JC20	3	0.10	**JC48**	1	0.05
JC21	49	2.00	**JC49**	2	0.10
JC22	7	0.30	**JC50**	2	0.10
JC23	14	0.60	**JC51**	1	0.05
JC24	3	0.10	**JC52**	1	0.05
JC25	7	0.30	**JC53**	41	1.60
JC26	19	0.80	**JC54**	1	0.05
JC27	2	0.10	**JC55**	1	0.05
JC28	15	0.60	**TOTALS:**	**2,499 pieces**	**100%**

Figure 9.1: JCPS lithic types by number of pieces.

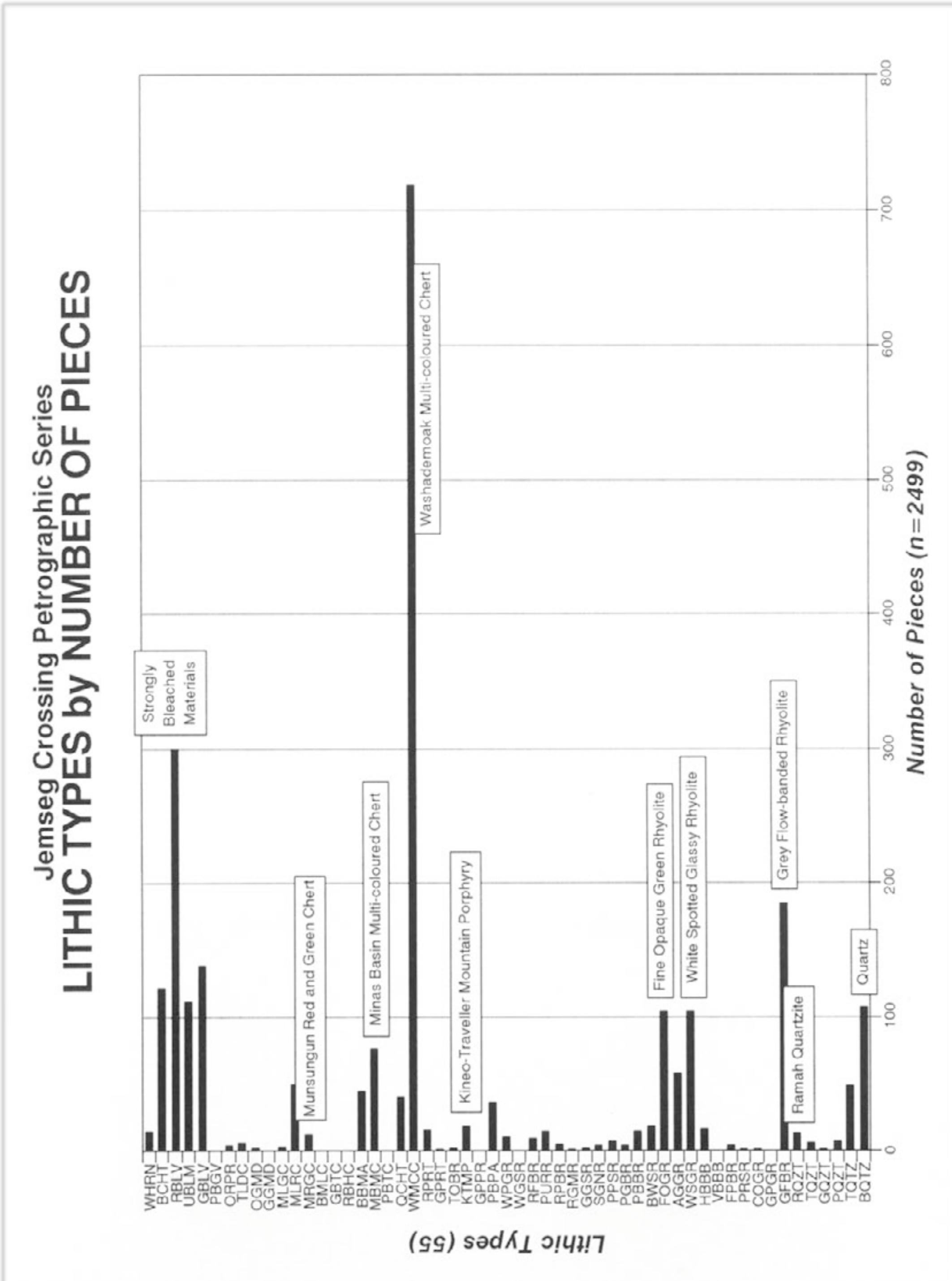


Figure 9.2: JCPS lithic classes by number of pieces.

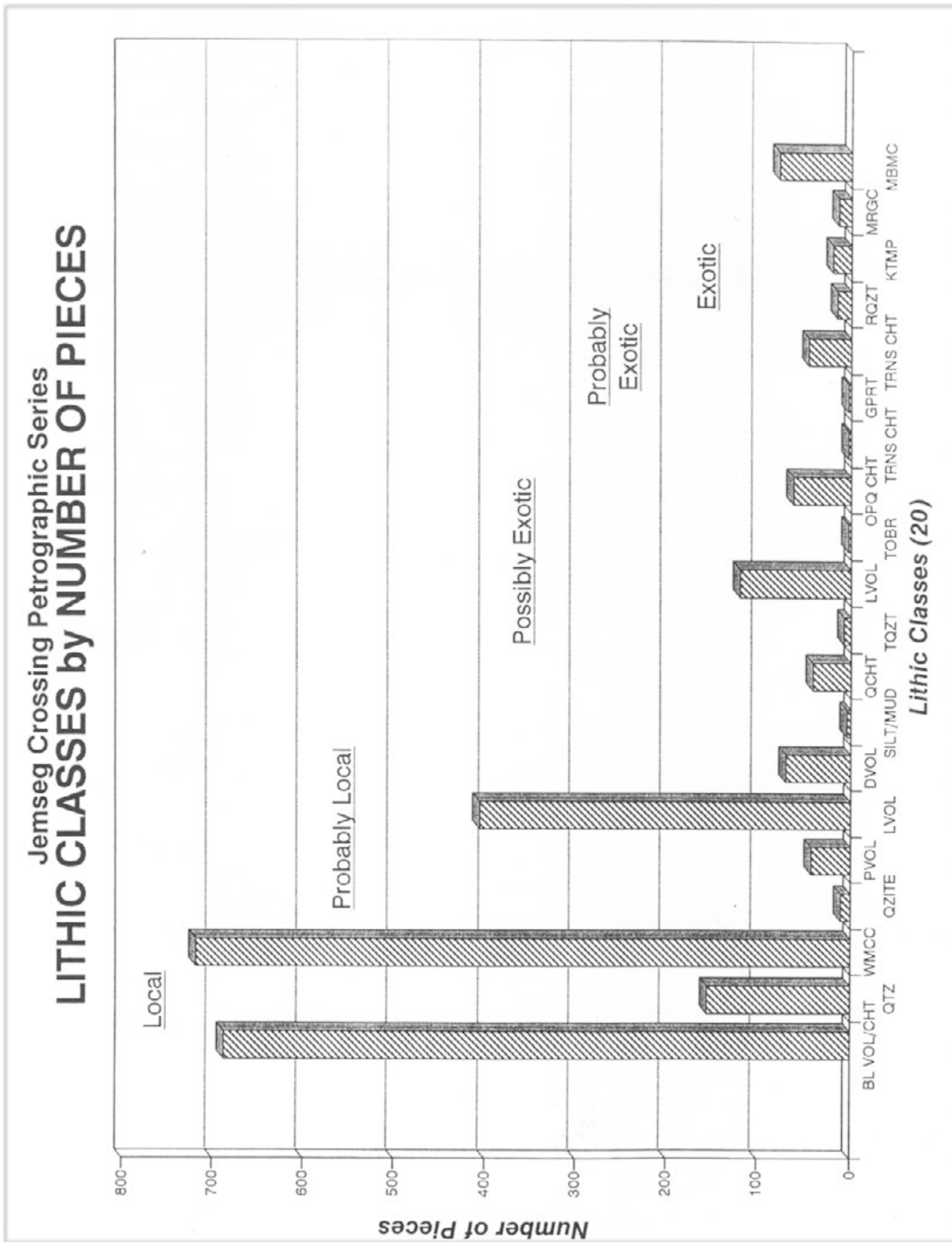
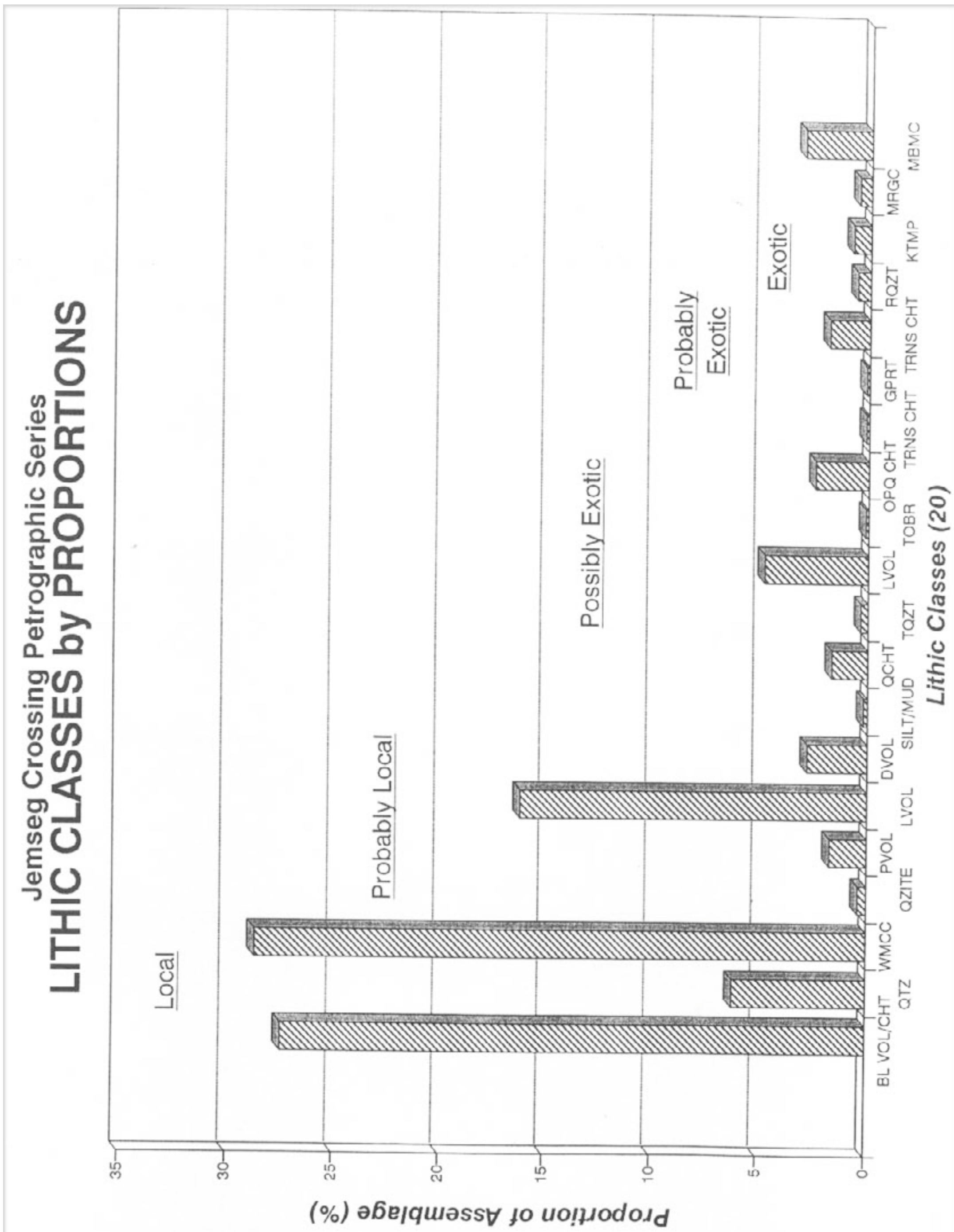


Figure 9.3: JCPS lithic classes by proportion of assemblage.



INTRASITE DISTRIBUTION OF LITHIC MATERIALS

A detailed examination of how various toolstones are distributed spatially at Jemseg is beyond the scope of the JCPS project. However, a series of graphs were generated to show that toolstones are not randomly distributed across the site.

A separate database including only specimens with feature provenances was created. Figure 9.4 shows distributions of lithic classes by proportion of assemblage for the six features that contain 10 or more flaked lithics. Most features contain high proportions of bleached materials, but here the overall similarities end. Features 20, 21 and 32 do not contain Washademoak Multi-coloured Chert; the other three features contain substantial proportions of this toolstone. Four of the features do not contain probably exotic or exotic toolstones. Of the two features that do contain exotics, the materials present are different: F8 contains Kineo-Traveller Mountain Porphyry, while F11 contains Munsungun Red and Green Chert and Minas Basin Multi-coloured Chert.

Figures 9.5 and 9.6 offer a comparison of two groups of features at Jemseg, showing distributions of lithic classes by number of pieces. Features 8, 9, 11 and 13 contain substantial amounts of Washademoak Multi-coloured Chert, and some of these features contain known or suspected exotics. Features 20-25 contain, for the most part, only bleached materials and fine-grained volcanics. Even F21, which contains the largest number of pieces associated with a single feature, scarcely deviates from this pattern.

Figures 9.7 and 9.8 were generated to determine whether patterns of lithic distributions in features reflect patterns of lithic distribution in the areas around them. Figure 9.7 shows lithic classes for units D43 and D44 including F8. Patterns for the two units are similar to one another, but taken together, they contain a wider range of materials and more exotics than does F8 alone. Figure 9.8 shows distributions for units B41, C41, B42 and C42 including Features 10-12. Again, distributions for the units are similar to one another, despite variations in assemblage sizes. Again, the range of types, and the number of exotics, is greater than for F11 alone.

Figure 9.9 shows distributions of lithic classes for three subareas of the Jemseg site: Subarea 1 includes Features 1-4; Subarea 2 includes Features 11 and 12; Subarea 3 includes TF1 and TF2. It is clear from these distributions that certain toolstones were used more frequently in some parts of the site than in others. For example, in Subarea 3 (near the Jemseg River) Washademoak Multi-coloured Chert is common, and bleached materials are uncommon, in comparison to other areas. Possibly exotic, light coloured volcanics are extremely common in this area as compared to the others. On the other hand, known and suspected exotics of other types are virtually absent in Subarea 3.

This discussion barely scratches the surface of differential distributions of toolstones at Jemseg. This phenomenon begs for further exploration in conjunction with cultural history and functional information about features and areas.

Figure 9.4: JCPS lithic classes for features with 10 or more lithics associated.

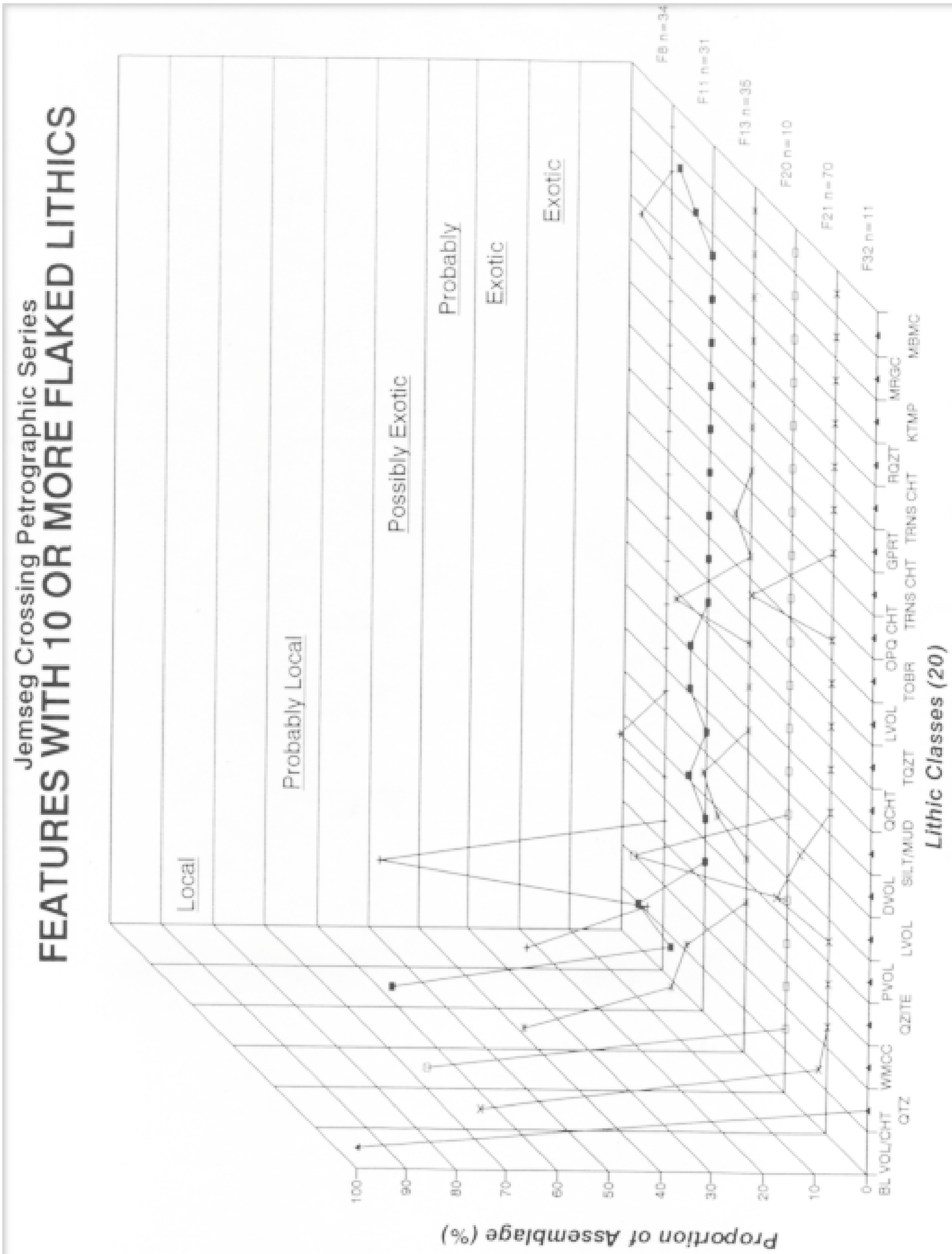


Figure 9.5: JCPS lithic classes for Features 8, 9, 11, and 13.

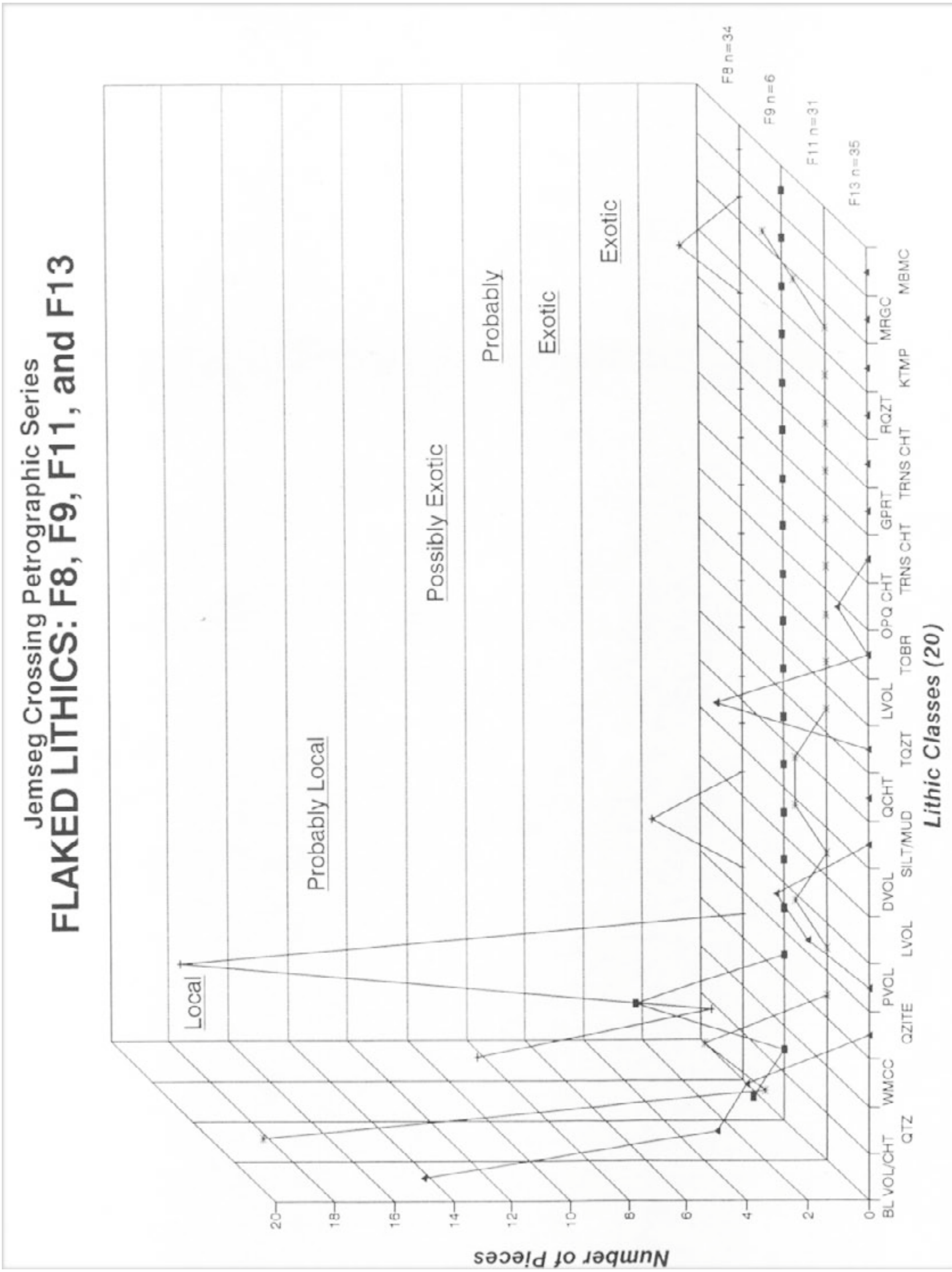


Figure 9.6: JCPS lithic classes for Features 20-25 inclusive.

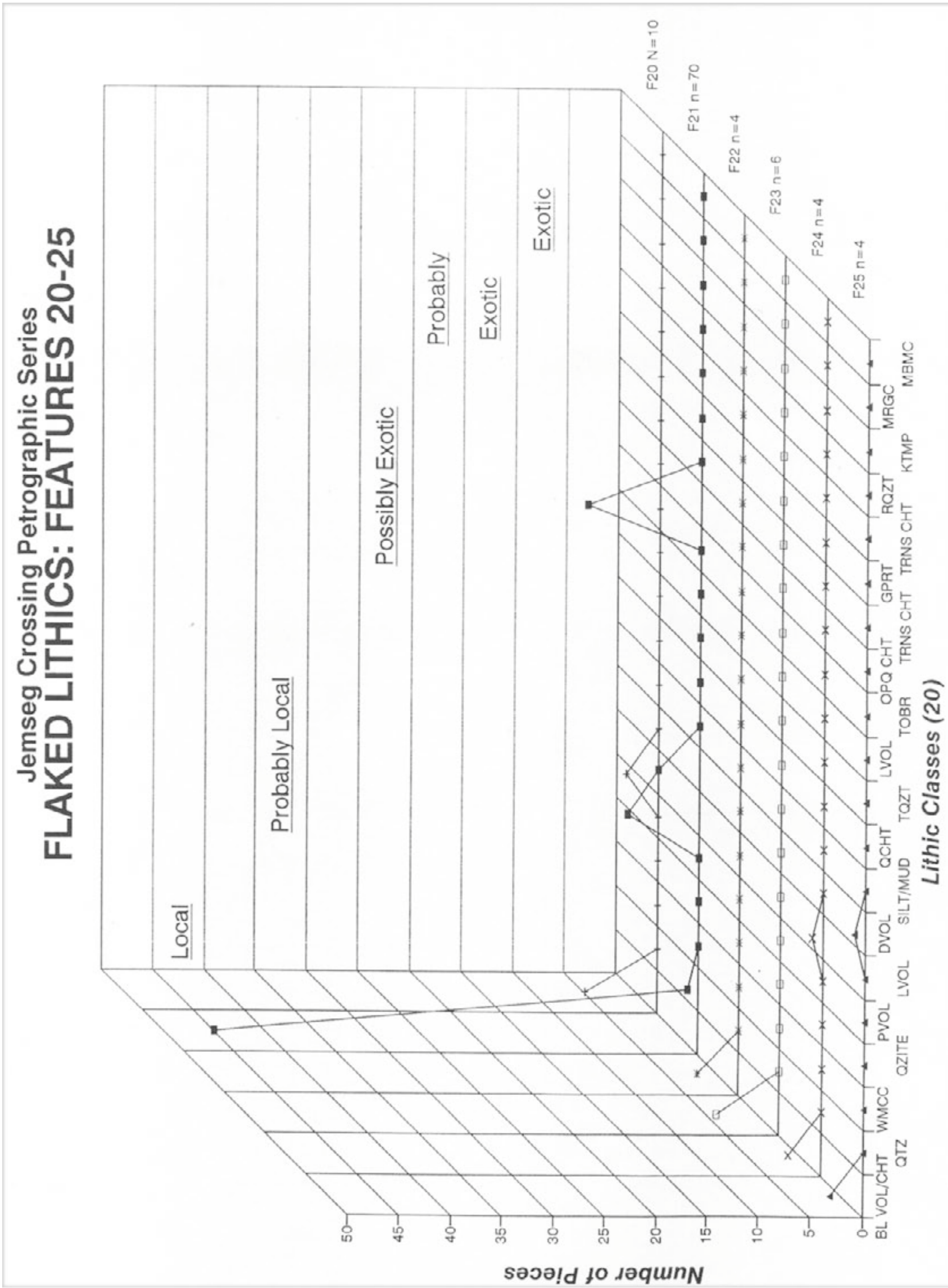


Figure 9.7: JCPS lithic classes for Excavation Units D43 and D44 including Feature 8.

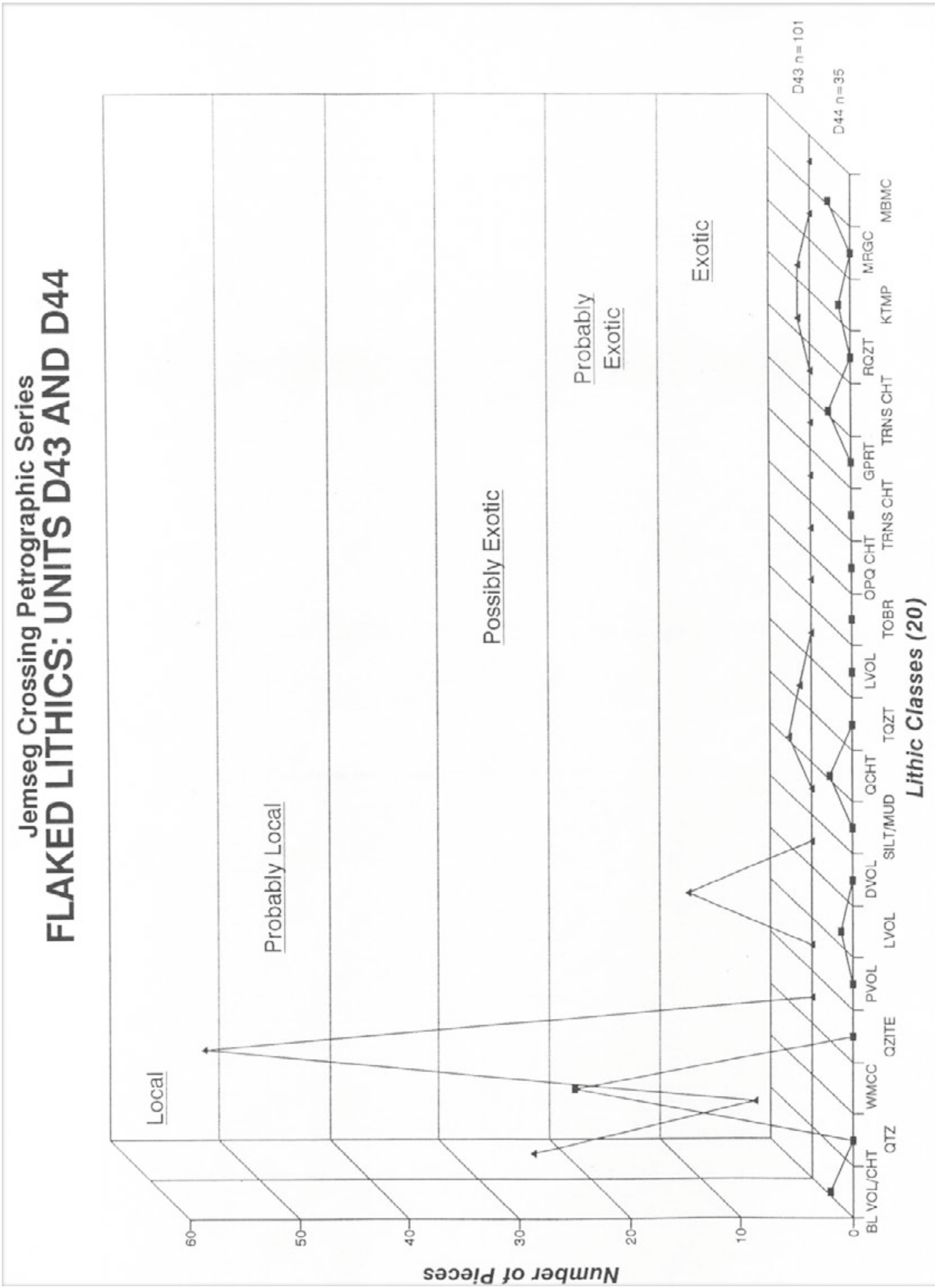


Figure 9.8: JCPS lithic classes for Excavation Units B41, C41, B42 and C42 including Features 10-12.

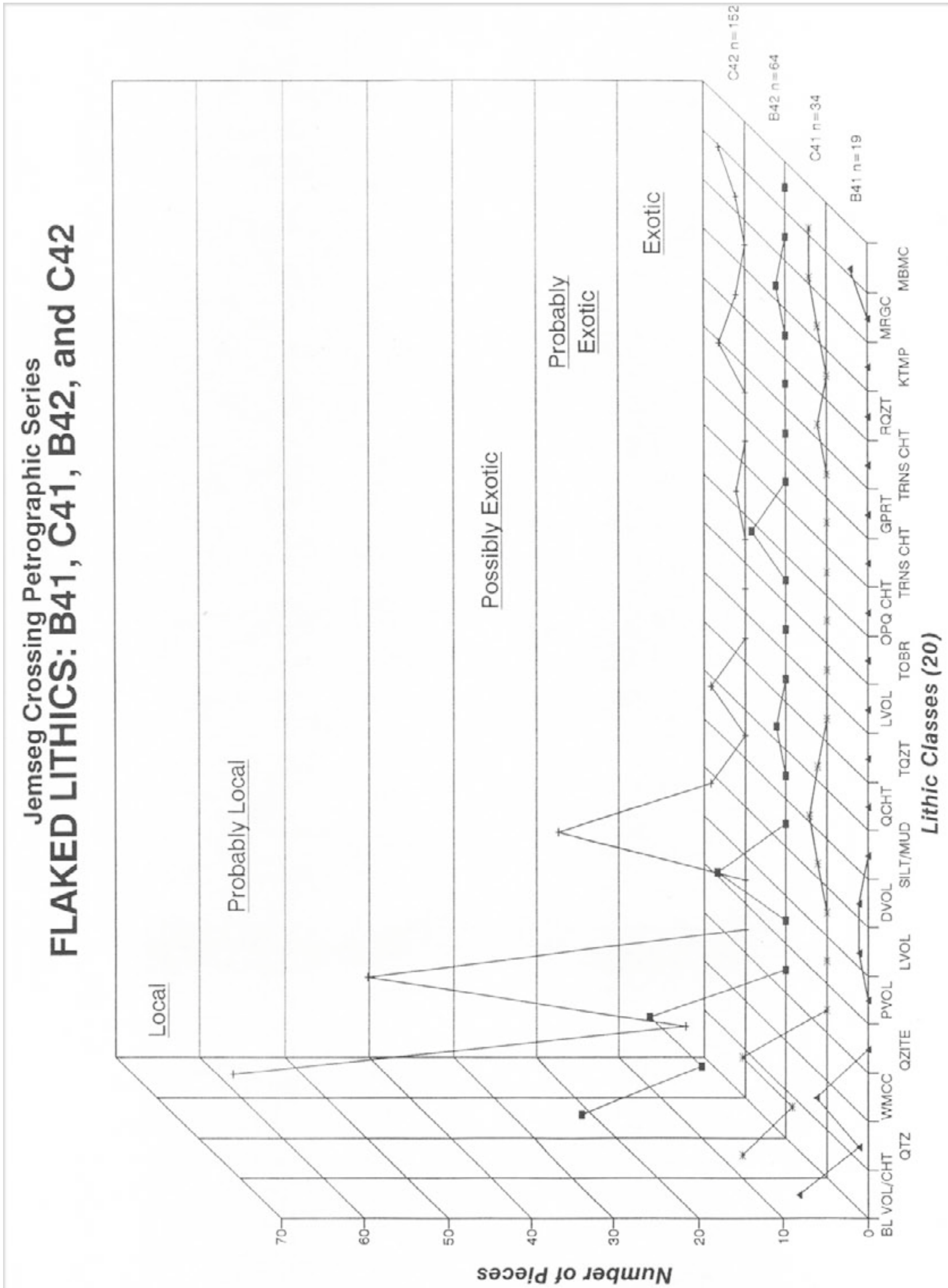
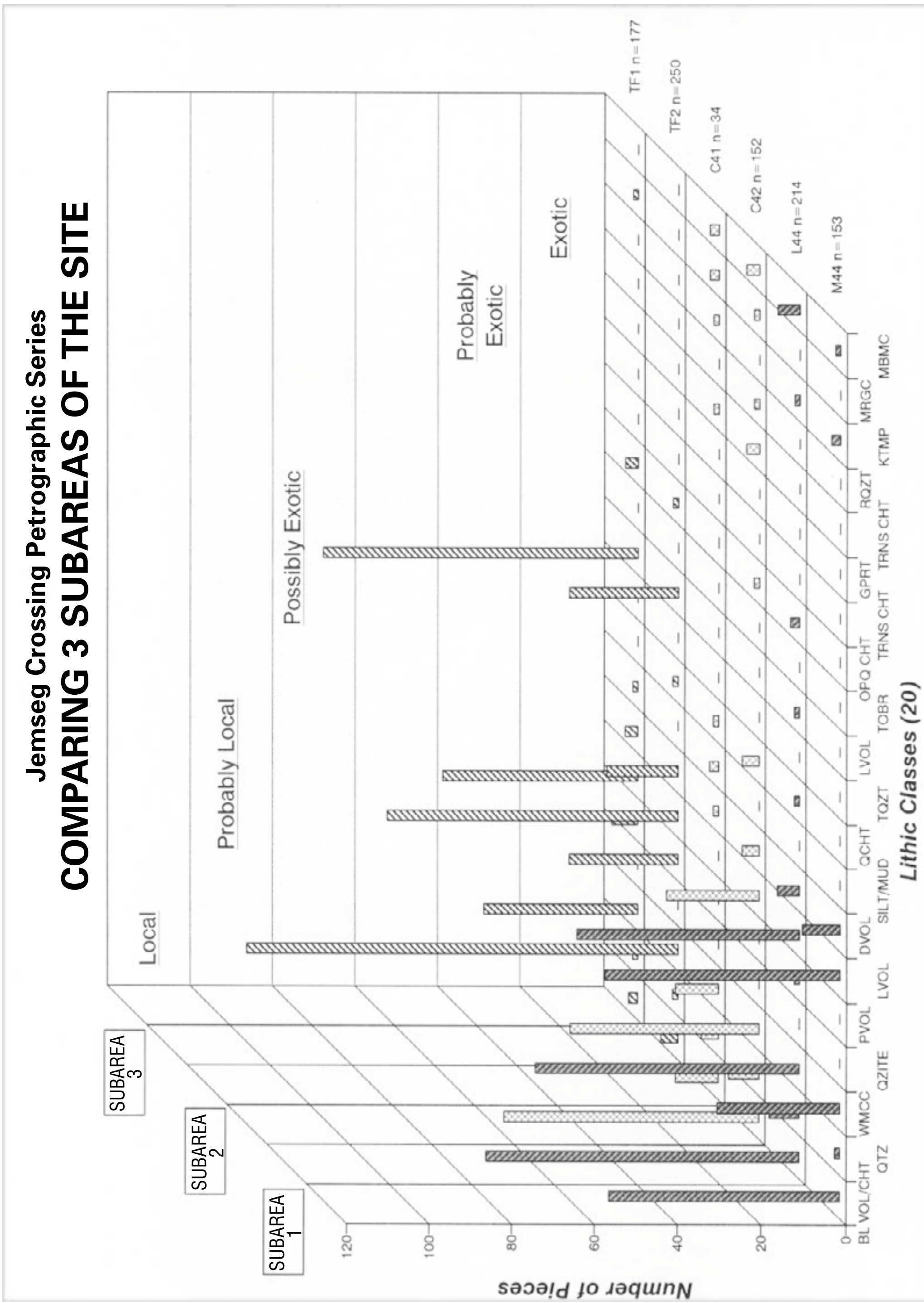


Figure 9.9: JCPS lithic classes for three areas of the Jemseg site. (Note: Subarea 1=Features 1-4, Subarea 2=Features 11 and 12, and Subarea 3=TF1 and TF2 (west of area shown on map).



ACQUISITION AND USE OF LOCAL LITHIC MATERIALS

The wide variety of local lithic materials in the Jemseg assemblage shows that Native people 'tried out' a range of materials for making flaked stone tools. However, most of the stone actually flaked falls into just two broad categories: fine-grained rhyolitic volcanics (used primarily to make bifacial tools) and Washademoak Multi-coloured Chert (used primarily to make scrapers). The Jemseg assemblage is unusual, in N.B., because it contains such a high proportion of high quality chert. This is mainly due to the site's proximity to the Washademoak Lake chert source. As G.F. Matthew (1900) observed a century ago, Native people valued the chert from this source enough to transport it considerable distances up and down the Saint John River system. However, at present, there is no evidence that this chert was transported or traded beyond the lower Saint John drainage.

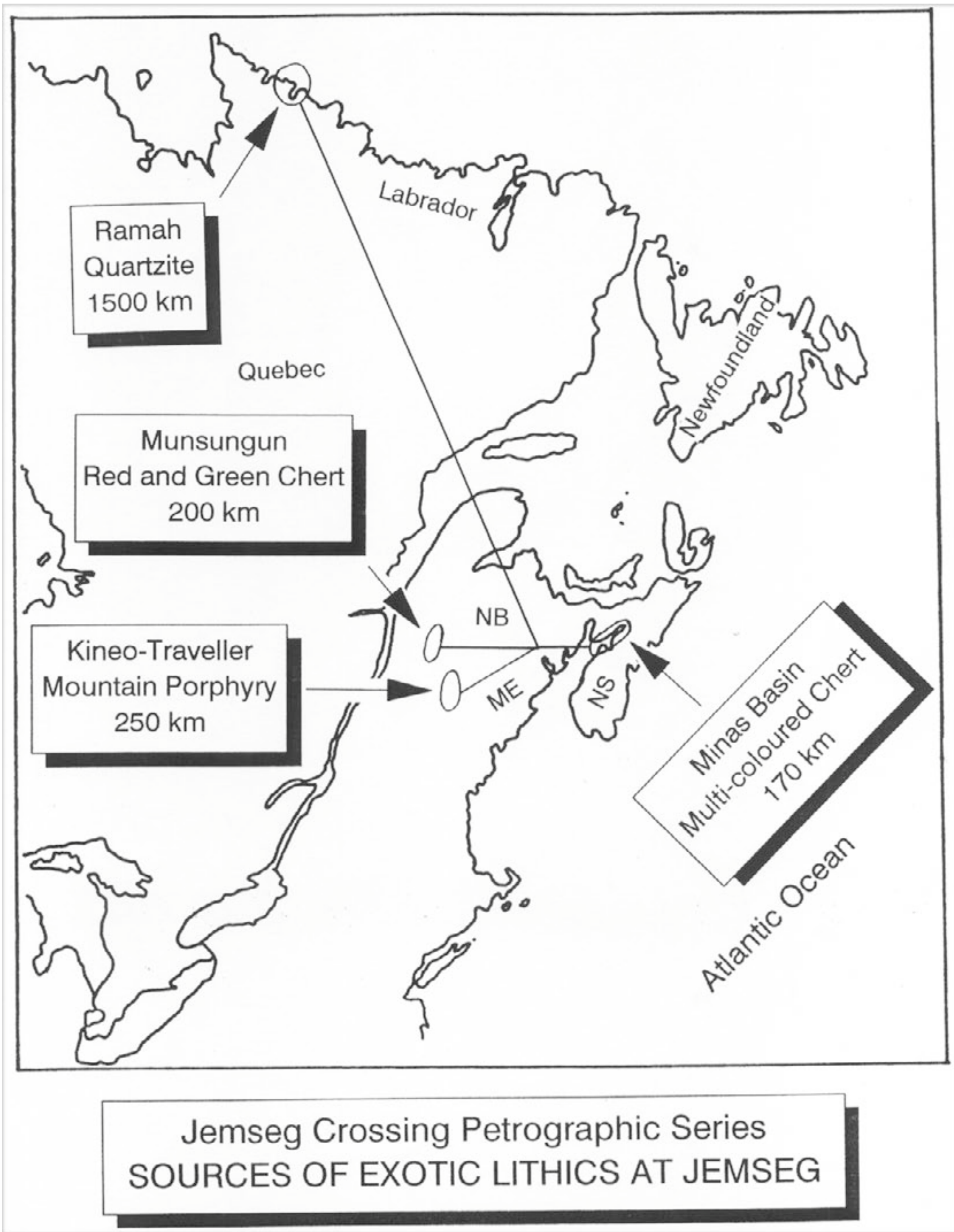
EVIDENCE FOR EXCHANGE, INTERACTION AND POPULATION MOVEMENTS

Exotic lithic materials have received considerable attention in recent years in the Maine/Maritimes area as indicators of pre-contact economics, social patterning and inter-group interactions. At Jemseg, exotic lithic materials show that Native people living there interacted with other Native groups at a distance. The nature of these interactions, however, is more difficult to establish. The possibilities include trickle-down exchange systems, long-distance exchange systems, long distance travel and contact, and acquisition by force, just to name a few. Figure 9.10 shows approximate distances from the sources of known exotics in the Jemseg assemblage to the Jemseg site. The distances range from more than 1500 km to less than 200 km. Actual travel distances, by foot or using small boats, would be much greater. In each case, routes between the Jemseg site and the sources cross significant ethnic and linguistic boundaries, at least from the perspective of the early historic period.

If one assumes that probably exotic translucent cherts mostly are Minas Basin Multi-coloured Chert-related materials, that possibly exotic opaque cherts mostly are Munsungun Red and Green Chert-related materials, and that Green Porphyritic Rhyolite Tuff and a few other pieces of porphyritic volcanics are Kineo-Traveller Mountain Porphyry-related materials (see Table 9.1 and Figure 9.1), then a fairly clear relationship between number of pieces in the assemblage, and distance from the source, emerges. The more distant the source, the smaller the amount of material present in the assemblage. Minas Basin Multi-coloured Chert is the most common exotic (from the nearest source), followed by Munsungun-like chert/mudstones, then Kineo-like porphyritic rhyolites and, finally, Ramah quartzite (from the most distant source). Quantification of the assemblage by material weights rather than piece counts would strengthen this relationship.

Unfortunately, in the absence of comparable information for many

Figure 9.10: Map of the northeastern North America showing sources of exotic lithic materials in relation to the Jemseg site (map adapted from Doyle 1995:307).



intervening sites, this type of pattern makes sense in terms of any theory about how Native people at Jemseg acquired exotic lithics. In pre-contact times, exotic lithics may have entered and have been transported around the Maine/Maritimes area through a variety of social processes, and may have been involved in several forms of social interaction with kinship, economic, political, symbolic and spiritual ramifications.

SUMMARY AND RECOMMENDATIONS

Summary

1) Native people living at Jemseg mainly used nearby sources to obtain toolstones for making flaked stone tools.
2) The single most important source was the Belyeas Cove area of the south side of Washademoak Lake, where Native people obtained high quality, multi-coloured chert/chalcedony/jasper.
3) Another important source area was the coastal belt of volcanic bedrocks, south of Jemseg on and near the Saint John River. In this area, Native people probably obtained much of the wide variety of rhyolitic/andesitic/basaltic toolstones they used.
4) Most of the bleached lithics found in the Jemseg assemblage also probably represent toolstones obtained from these nearby sources.
5) Native people at Jemseg had access to small amounts of desirable exotic toolstones from distant sources: Ramah quartzite from Labrador, multi-coloured chert/agate/jasper/chalcedony from Nova Scotia, Kineo-Traveller Mountain porphyry from Maine, and Munsungun red and green chert from Maine. These materials probably were obtained through exchange systems, long distance travel and other forms of social interaction.
6) Native people at Jemseg had access to small amounts of other desirable exotic toolstones from distant sources - Tobique rhyolite, coloured opaque chert/mudstones, and high-quality quartzites - from northern N.B. and Quebec. These materials also probably were obtained through exchange systems, long distance trade and other forms of social interaction. However, this cannot be stated definitedly because these materials could have been transported to the Jemseg area through glaciation and other geological processes.
7) It is possible to distinguish between archaeological specimens of Washademoak Multi-coloured Chert and archaeological specimens of Minas Basin Multi-coloured Chert in many cases. Criteria for making such distinctions have been developed. However, in some cases, especially where pieces are small, or exceptionally pure and clear silica, or extensively bleached, reliable distinctions cannot be made from hand specimen examination alone.

Recommendations

1) Intra-site distributions of lithic materials at Jemseg are complexly patterned and should be studied in the context of the culture historical and functional aspects of the site.
2) It should be possible to classify all of the flaked lithic assemblage from Jemseg using the JCPS. This would provide a more complete understanding of toolstone use at the site.
3) The JCPS could be extended to include materials used for ground stone tools and, possibly, to include materials reflected in the fire-cracked rock assemblage. These extensions would provide more complete understandings of toolstone use at the site.
4) The proximity of the Jemseg site to the Washademoak Lake chert source, and the large amount of Washademoak chert used at the site, indicate that these two archaeological phenomena should be examined and interpreted in conjunction with one another.
5) Attempts should be made to find non-destructive technical means to distinguish different types of toolstones from one another, and to match archaeological toolstones to their sources.

'Tahtuwalotewa Naka 'Katkuhkewa

10. Pre-contact pottery artifacts

THE JEMSEG SITE ABORIGINAL CERAMIC REPORT

Vincent Bourgeois

The Aboriginal pre-contact ceramic assemblage from the Jemseg site consists of 132 analyzable sherds. These were organized into 10 inferred vessels according to provenance and attribute similarities. Based on diagnostic attributes and supplemented by associations with radiocarbon dates, the Jemseg ceramic assemblage is representative of two distinct series or cultural components.

The first group (Series 1) represents the bulk of the assemblage in terms of sherd count. It consists of undecorated interior and exterior fabric and / or cord impressed ceramics diagnostic of the early Ceramic Period or Ceramic Period 1 (ca. 3050-2150 BP[1]). The second group (Series 2) is represented by thin walled, smoothed and / or burnished surface, stamp decorated ceramics, characteristic of early Middle Ceramic Period or Ceramic Period 2 (ca. 2150-1650 BP). The following report gives a brief overview of the regional Aboriginal ceramic sequence of the study area followed by a descriptive analysis of the Jemseg ceramic assemblage and how it relates to the regional sequence.

Overview of Regional Ceramic Sequence

The introduction of fired clay vessels into the material culture of Aboriginal populations in the broad Northeast is one of the key hallmarks indicating the beginning of the Maritime Woodland or Ceramic Period. Dated associations suggest the introduction of ceramic technology in the Northeast at ca. 3000 BP, although certain sites in southern New England contain ceramics that could date as far back as 3150 BP while in other areas to the north, evidence suggest a much later introduction (Petersen and Sanger 1991). In any case, subsequent to its introduction, ceramic

1 In this chapter and other parts of this report, BP indicates an uncalibrated radiocarbon date, with the number representing "years before present".

vessels continued to be manufactured and used by Aboriginal populations throughout the Northeast until the Contact period, when European trade goods appear to have replaced them.

Archaeologically, ceramics are viewed as sensitive temporal and spatial markers in that they can display variable attributes that are characteristic of certain populations in certain areas during certain periods. Prior to the introduction of absolute dating, a number of regional ceramic typologies and chronologies had been developed in the Northeast, making ceramics ideal for relative dating and identifying possible cross-cultural relationships with other pre-contact populations in other regions.

A recent effort to more clearly define a ceramic sequence for the far Northeast was begun in 1990 by Petersen and Sanger and is currently ongoing in the broader Northeast. The initial study by Petersen and Sanger (1991) focused on the development of a seven-part ceramic sequence (CP1 to CP7) for the Maine / Maritime region. This scheme supplements the traditional three part subdivision (early, middle and late Ceramic Period) and reflects more accurately regional attribute variations through time. Petersen and Sanger's chronology was based on 164 radiocarbon dates that span the entire Ceramic period (ca. 3050 to ca. 400 BP) and a portion of the early Contact period (ca. 400 to ca. 200 BP). Based on this model, the preliminary examination and comparison of the Jemseg ceramics suggest Ceramic Period 1 and 2 (ca. 3050 BP to 1650 BP) associations.

The Jemseg Site Ceramic Assemblage

The majority of the ceramic assemblage from the Jemseg site, with the exception of six sherds representing two vessels (v.6 and v.8), were recovered from within the 25 m X 25 m excavation area located on the upper terrace (Area A). Vessels 6 and 8 were excavated on the lower terrace, closer to the riverbank. All sherds were excavated in undisturbed contexts below or away from the plough zone.

The examination of ceramic distribution within Area A revealed two separate and slightly overlapping concentrations which I suggest may represent two separate cultural components. Based on comparisons with the Petersen and Sanger model and other regional ceramic studies, I identified these two components as relating to Ceramic Period (CP) - 1 and Ceramic Period (CP) - 2.

The analytical model I selected to examine the ceramic assemblage consisted of attribute analysis of inferred vessels. This technique provides a more accurate representation of vessel type and frequency in that a vessel may consist of a single, a few, or many sherds. In some cases, several otherwise unanalyzable sherds are grouped into a possible vessel solely according to provenance. Isolated ceramic fragments are disregarded in the analysis, since they lack analyzable attributes and can not be assigned to any specific vessel.

The most notable and temporally significant attributes present on the Jemseg ceramic assemblage consisted of surface treatment (cord / fabric impressed, smoothed, and burnished), decorative tool type and application (plain, rocker / simple dentate, and pseudo scallop shell), vessel thickness, and rim profile (rim shape, rim form and lip form).

Surface treatment or finish is commonly regarded as the method of surface preparation prior to decoration application. It can also refer to a lack of surface decoration. In this latter case, the vessel surface is left unmodified after the consolidation of the vessel walls, leaving a roughened surface from the cord or fabric wrapped paddle used to flatten or mend the coils together. The distinction between cord- versus fabric-impression is that the former leaves larger and rougher imprints than the latter. This distinction is of temporal significance, as we suspect that the former predates the latter.

The main decorative tool types observable in the Jemseg assemblage were dentate and straight-edged tools. A dentate tool consists of an thin implement with a serrated edge that leaves a linear series of square or rectangular impressions on wet clay. The straight-edged tool on the other hand simply leaves a linear impression. Evidence of a pseudo-scallop-shell tool was present on surface collected sherds found by a local collector in the Jemseg area, however their provenance was vague, and thus these sherds will not be considered in this analysis.

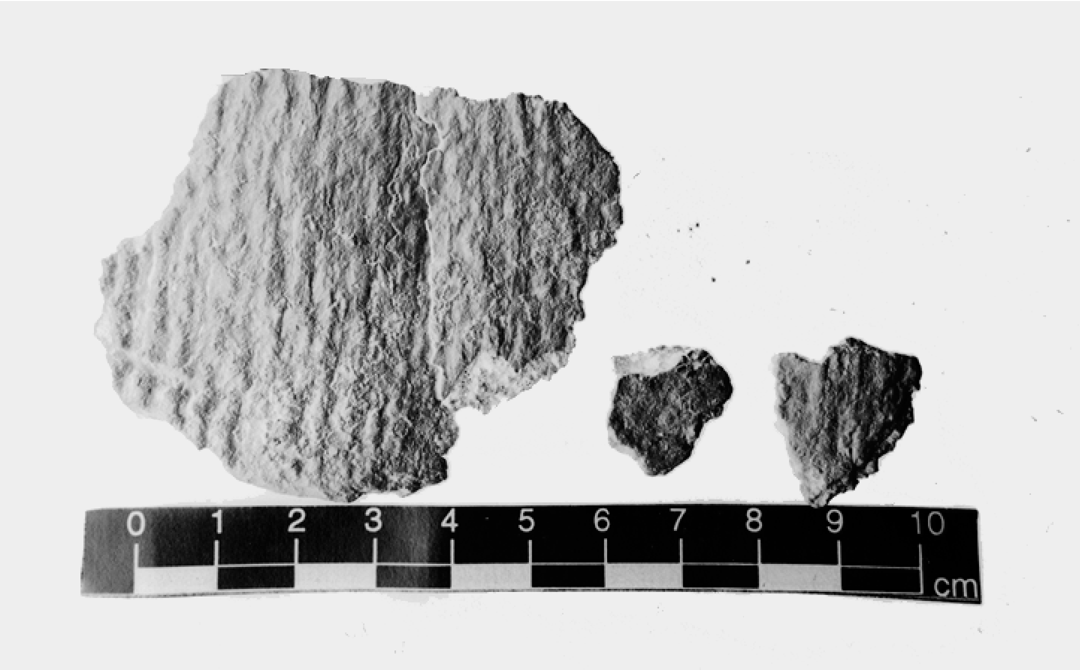
The two decorated vessels from Jemseg exhibit the rocker stamping technique of tool application, where the tool is impressed from one end and rocked towards the other end at which point the tool is pivoted a small degree, and the process is reversed. Other techniques which do not appear on any of the Jemseg vessels but are common in the region include: simple stamping, drag stamping, trailing and incising.

Measurements for vessel thickness were taken with a slide calliper at three points: the lip, the rim, and the wall. Lip thickness was measured at the maximum width of the lip surface and the rim thickness was measured one centimetre below the lip. The wall thickness was taken as the mean thickness of all the body sherds of the vessel.

Due to the descriptive nature of this ceramic report, the analysis focuses solely on decoration and morphology attributes. However, the significance of vessel function and manufacture are also of great interest and should be considered for further study if and when the resources become available. From what is currently known about ceramic use by Aboriginal populations in the Northeast, vessels were primarily used for cooking and / or food storage. Carbonised food residues which sometimes occur on the interior of sherds can permit testing to determine what types of foods were prepared. In the case of the Jemseg ceramics, future research into residue analysis should be taken into consideration, given that some sherds do display evidence of charred residues.

In terms of vessel manufacture, evidence of coil fractures on most of the Jemseg sherds, as well as most of the ceramics from the far Northeast, suggest a coiling method of manufacture. This was

Plate 10.1: Sherds of vessel 2 from Feature 13, Area A.



achieved by mending long thin coils or strands of clay into the desired vessel shape and then flattening them together with a smooth implement or by hand. Coil fractures represent linear breakage or failure between these strands of clay after the pot is completed.

At the present time, not much can be said about overall vessel morphology, size and vessel capacity of the Jemseg sample, due to the fragmentary nature of the sherds. Any attempt to mend sherds together in order to reconstruct the individual vessels would prove to be informative, and should be considered at a later date. Nonetheless, sufficient attribute information is displayed on the majority of sherds for the purpose of analysis and reasonably accurate relative dating.

Jemseg ceramic seriation

Series 1

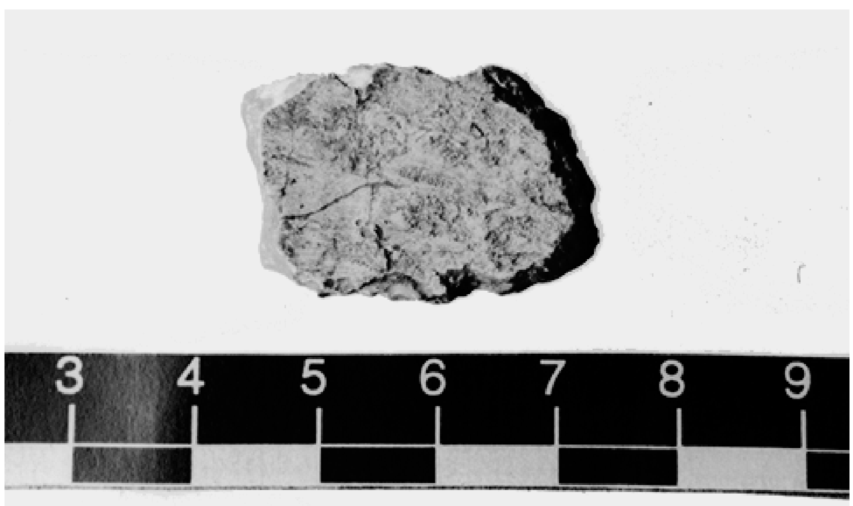
Ceramics from Series 1 are characteristic of early Ceramic period or Ceramic Period 1 (CP1). These consist of 5 vessels (vessels 1, 2, 4, 9, and 10; see Plate 10.1). These are undecorated, and have either cord- or fabric-impressed surface finishes on both interior and exterior surfaces. Rims are parallel and direct to slightly everted with rounded lips. The rims average 6.3 mm in thickness. It has been suggested that variation in rim and wall thickness within CP-1 ceramics is indicative of temporal variation. In general, thick CP-1 ceramics are often associated with earlier contexts than thinner CP-1 examples (Spence, Pihl and Murphy 1990). Vessel 2 from Jemseg measures between 7 mm and 8 mm in thickness, while the remaining vessels from this series measure between 6 mm and 7 mm. The perishable fibres used to paddle the surface of vessel 2 are also noticeably thicker than the other examples from this series. This supports the notion that cord-impressed CP-1 vessels generally predate fabric-impressed vessels (Spence, Pihl and Murphy 1990)[2].

Series 2

The ceramics from Series 2 are characteristic of Ceramic Period (or CP) - 2 or the Middle Maritime Woodland. These thin-walled ceramics have smoothed or burnished interior and exterior surfaces. Some have stamping decorations on their exterior portion of their rim. Five vessels (3, 5, 6, 7, and 8) fit into this series (see Plate 10.2).

Two of the vessels in Series 2 exhibited stamped decoration. Vessel 3 is rocker stamped with a dentate tool, and Vessel 5 is rocker stamped with a straight-edged tool. The remainder of the vessels from Series 2 were categorised based on their thickness

Plate 10.2: A sherd of vessel 6 from Feature 43, Area D, showing the burnished surface characteristic of this type.



2 Editor's Note: Following the production of the Jemseg Crossing ceramic report, we submitted additional charcoal for radiocarbon dating. Two new radiocarbon determinations were obtained from contexts associated with pottery. The relevant dates are 2460±60 BP (TO-9618) from direct association with Vessel 9, and 2870±70 BP (Beta-156019), from direct association with Vessel 2. When combined with the date of 2140±60 BP (Beta-105892) that was directly associated with Vessel 1, these dates provide additional support to the notions presented in this chapter. The later two dates are associated with thinner, fabric-impressed vessels (Vessel 1 and 9, respectively), while the earlier date is associated with Vessel 2, a thicker, cord-impressed vessel (S. Blair).

Plate 10.3: Series 2 decorated ceramic sherds.

and surface treatment. Vessel thickness range between 6 and 7 mm. Four of the five vessels in Series 2 are smoothed on both interior and exterior surface, and one (vessel 6) is burnished.

Three radiocarbon determinations are associated with two of the vessels from this series. Vessel 3, which is rocker stamped with a dentate tool, was recovered from a feature (Feature 21) which produced a radiocarbon date of 1650±40 BP. In addition, an AMS date was obtained from incrustations on the exterior of Vessel 3 of 1600±60 BP. Vessel 7, which consisted of an undecorated sherd with a smoothed surface, was in direct associated with date of 2230±50 BP.

Micuwakonuwa

11: Food and subsistence

PRELIMINARY REPORT ON THE PLANT MATERIALS

Stephen G. Monckton

Materials from the Jemseg site offer a unique opportunity to examine the subsistence patterns of pre-contact peoples of this region and to place their plant use into the broader perspective of Northeastern North America. Over 200 samples have been analysed revealing a wide range of plant materials representing food, possible ritual behaviour, and an assortment of fire fuels. The following is a brief preliminary report of the findings.

Analytical Methods

Materials were received in vials and resealable bags. Contents of these were individually weighed and every object was classified and counted. In some cases materials were unsorted and these were passed through a 2 mm and 300 micrometer screen for sorting. After identification and quantification charred material was segregated, and non-archaeological materials (rootlets, mineral, insect remains) were separately packaged for return to Archaeological Services. Finally, additional unsorted materials were submitted to me by the Archaeological Services in order to monitor potential biases of the original sorting procedures. Identifications were made with the assistance of an ST-300 stereo microscope at magnifications ranging from 7-40X. Seed identification manuals of Martin and Barkley (1961) and Montgomery (1977) aided the classification of some specimens. In cases where identification was uncertain, objects were taken to the Royal Ontario Museum comparative collection for verification. Data were tabulated on a Macintosh 180c computer using a Microsoft Excel spreadsheet.

Results

The most abundant plant materials are the wood charcoals of maple (*Acer saccharum*), beech (*Fagus grandifolia*), ash (*Fraxinus* sp.), oak (*Quercus rubra*), ironwood (*Ostrya virginiana*), pine (*Pinus strobus*), and spruce (*Picea* sp.). Judging by the composition of wood charcoals, these broadly conform to forest composition as opposed to deliberate wood selection. That is, fire wood was probably collected randomly from the forest floor (see Monckton 1992, 1994). Other plant materials include the remains of butternut (*Juglans cinerea*) shells. This appears to have been a very important source of plant food at Jemseg, and is typical of Archaic and pre-horticultural Woodland peoples in the Northeast. Remains of these highly fragmented nutshells not only represent the discarded remains of food, but the method of preparation. It would appear that nuts were roasted to make their shells brittle, and possibly rolled on a stone, causing the shells to break into rather small pieces. The cooked internal nut meat would have become rubbery and remained intact.

Beech (*Fagus grandifolia*) nutshell fragments were also recovered, although their economic significance is unlikely to have been great. In fact, given the remains of charred beech wood it seems more likely that nut fragments were incidentally charred with the fire fuel. Butternut on the other hand is not accompanied by its parent wood.

While nut processing appears to be the most important plant-related activity at Jemseg, it is clear that several other plant taxa were collected. These include a range of fleshy fruits such as cherry (cf. *Prunus serotina*), bramble (*Rubus* sp.), and elderberry (*Sambucus* sp.), in addition to several taxa whose purposes are not clear. These include bush honeysuckle (*Diervilla lonicera*), knotweed (*polygonum* sp.), and pondweed (*Potamogeton* sp.). Bush honeysuckle produces a dry multiseeded capsule, and it is possible that this or other parts of the plant was used for medicinal purposes (Kuhnlein and Turner 1991). Knotweed could have been used as a grain / green, and perhaps even a condiment. Pondweed may be an accidental inclusion with cooking water.

In addition to collected wild plants, there is also evidence for plant cultivation at Jemseg. Maize kernel and cupule (*Zea mays*) fragments were recovered from several features and are clearly from a later period than the Early Woodland deposits. A single possible tobacco (cf. *Nicotiana rustica*) seed was also recovered. These specimens could have been deposited at any time during the last thousand years. No charred cucurbit (Squash family) remains were encountered. Several samples did contain uncharred remains of squash seeds (*Cucurbita pepo*), but may be of historic origin. Uncharred plant materials do not generally preserve for long periods unless deposited in wet or extremely dry environments. A single charred barley (*Hordeum* sp.) seed is further evidence of European contact.

There are a number of unidentified objects which appear to be the remains of soft plant tissue, possibly of tubers. This, however, must be investigated further. Tuber fragments are inherently difficult to identify given their tendency to distort with exposure to fire.

The above preliminary report has reviewed the major findings after 40 days of laboratory analysis. The plant material from the Jemseg Crossing site possesses considerable scope for further analysis, and this research will contribute considerably to our understanding of the spatial distributions of plant materials, the relative quantities of plant foods, and the reconstruction of the palaeoenvironment and settlement patterns.

Micuwakonuwa

12: Food and subsistence

PRELIMINARY REPORT ON THE ZOOARCHAEOLOGICAL MATERIALS

Frances L. Stewart

The main purpose of the examination of the zooarchaeological remains from the Jemseg Crossing Site (BkDm14) was to determine if any were of human origin as soon after exposure as possible. This was accomplished by my visiting the excavations regularly and by being "on call" for questionable finds. This system worked very well for this purpose. While no human skeletal remains were excavated, some identifiable animal bones were. This resulted in a secondary interest which was to examine the bones to determine their origins as precisely as possible. As in most zooarchaeological studies, the purpose of this was to learn about the subsistence systems of the people who discarded these remains, particularly their diets and the season(s) they occupied the site. Since at the time of the excavations, the remains could not be removed from the site to a faunal reference collection for comparison, I transported sample animal reference skeletons to the site for better identification of the zooarchaeological material. This procedure was not very satisfactory. It was detrimental to the reference specimens and inevitably, I often found that I needed to compare the archaeological remains to reference skeletons that were back in the laboratory. Thus, only the most distinctive bones could be confidently assigned to the animal and skeletal elements from which they originated; many were only "probably" or "possibly" identified to species, and many were designated to class only. An examination of the some of the many small calcined pieces under a binocular microscope, to a magnification of 40 times, allowed classification of most of them and rejection of non-skeletal material initially thought to be bone. As a result of these confining methods, the identifications in this report are very conservative; more precise results could be obtained if the sample were examined in a faunal laboratory. Finally, the matrices of some features, including the red ochre feature (Feature 7, see Chapter 14), were floated using screens of decreasing mesh sizes (the method is discussed in Barefoot, this volume). The resulting float samples were examined for bone, again using a binocular microscope. This procedure while useful for collecting seeds, produced very few faunal specimens. However, the lack of bones was significant, particularly in the red ochre pit feature.

RESULTS OF THE EXAMINATION OF THE FAUNAL MATERIAL

The zooarchaeological remains from the Jemseg site totalled approximately 1750 specimens. Except for five invertebrate shell fragments and two possible bone or shell pieces, the remains were all from vertebrates. Mammalian specimens predominated, followed by those of birds, fish, and a few reptiles. Details on the individual identifications can be found in the JCAP Preliminary Technical Report, Volume 3 (Stewart in Blair 1997). The scientific names of the animals represented in the Jemseg sample follow Peterson (1966) for mammals and Godfrey (1986) for birds.

Mammalian Remains

Mammalian elements dominated the sample with a totalled 1054, excluding an estimated 150 articulated Raccoon (*Procyon lotor*) infracranial bones found on the surface of the site. In addition to raccoon, wild species included a mouse (*Microtus* genus) and Muskrat (*Ondatra zibethicus*) and probably Eastern Chipmunk (*Tamias striatus*), Red Squirrel (*Tamiasciurus hudsonicus*), and Beaver (*Castor canadensis*). There were several large herbivore specimens, some of which might have been Moose (*Alces alces*). Of the domesticates, Cow (*Bos taurus*) and Horse (*Equus caballus*) were definitely identified and there was a possible Pig (*Sus scrofa*) bone.

Non-Mammalian Remains

The 25 Avian bones included two or possibly three which were from turkey, presumably the Domesticated Turkey (*Meleagris gallopavo*). The four "large bird" bones might have included geese and loons. There were also three bones from medium-to-large sized birds. Reptiles were represented primarily by six, sun-bleached and articulated snake vertebrae. Because these were still held together by dried connective tissues, they must have been deposited recently on the site. Snakes were often seen at the site during the excavations. There was also one possible turtle shell fragment. Most of the ten fish specimens were small, calcined vertebrae but there was one unburnt quadrate skull bone which was very similar to those of catfish (possibly *Ictalurus*).

GENERAL PROVENANCES OF THE FAUNAL SPECIMENS

The faunal specimens can be sorted into four categories based on their provenances. The smallest group was the 84 pieces excavated from pre-contact features. Post-contact features yielded 815 specimens, excluding the recent raccoon bones found only partially buried on the site surface. Some of the 703 specimens from the disturbed plough zone could be further distinguished; 168 were found above or adjacent to pre-contact features and 180 were found above or adjacent to post-contact features. It was initially thought that these were displaced from the features by ploughing. Specimens associated with pre-contact features were uncommon at least in part because most skeletal materials deposited prior to contact would have disintegrated in the acidic soils. Only those which were calcined were preserved. Thus, most of the pre-contact specimens are small fragments which are difficult to identify. Although 39 could not be identified even to class, 37 were recognized as mammalian; four were from a large herbivore, and one was possibly beaver. The large herbivore specimens were probably moose, considering their provenance. Finally, there was one fish bone.

When those pieces found in the plough zone in close proximity to pre-contact features are considered, a slightly greater variety of species is represented. Again, those not identified to class (73) are common with nine additional bones which might have come from either a mammal or a bird. There were also 74 from mammals of various sorts, including one red squirrel specimen. Equally important was the inclusion of at least one cow specimen in this group. Finding a domesticated animal bone demonstrates that it cannot be assumed that all these remains were from nearby pre-contact features.

Although 100 specimens from post-contact features were not sorted to class, 16 were either bird or mammal pieces and 527 mammal specimens were not identified beyond class, many of the post-contact remains were recognized to species. In addition to the articulated raccoon remains on the surface, 118 calcined muskrat bones were concentrated in one feature. Six were from other squares but most of these were in adjoining or nearby excavation units. It appears that parts of at least two immature muskrats were deposited in the feature. It also yielded some burnt fish vertebrae, large bird bones and some possible cow bones as well as many others not identified to species. Thus, at least one use of the feature appears to have been disposal of animal wastes. Squirrels, cows, large herbivores (moose, horse or cow), smaller herbivores (deer, sheep or goat), possibly pig, large birds (turkey, goose or loon) and fish were represented in other post-contact features.

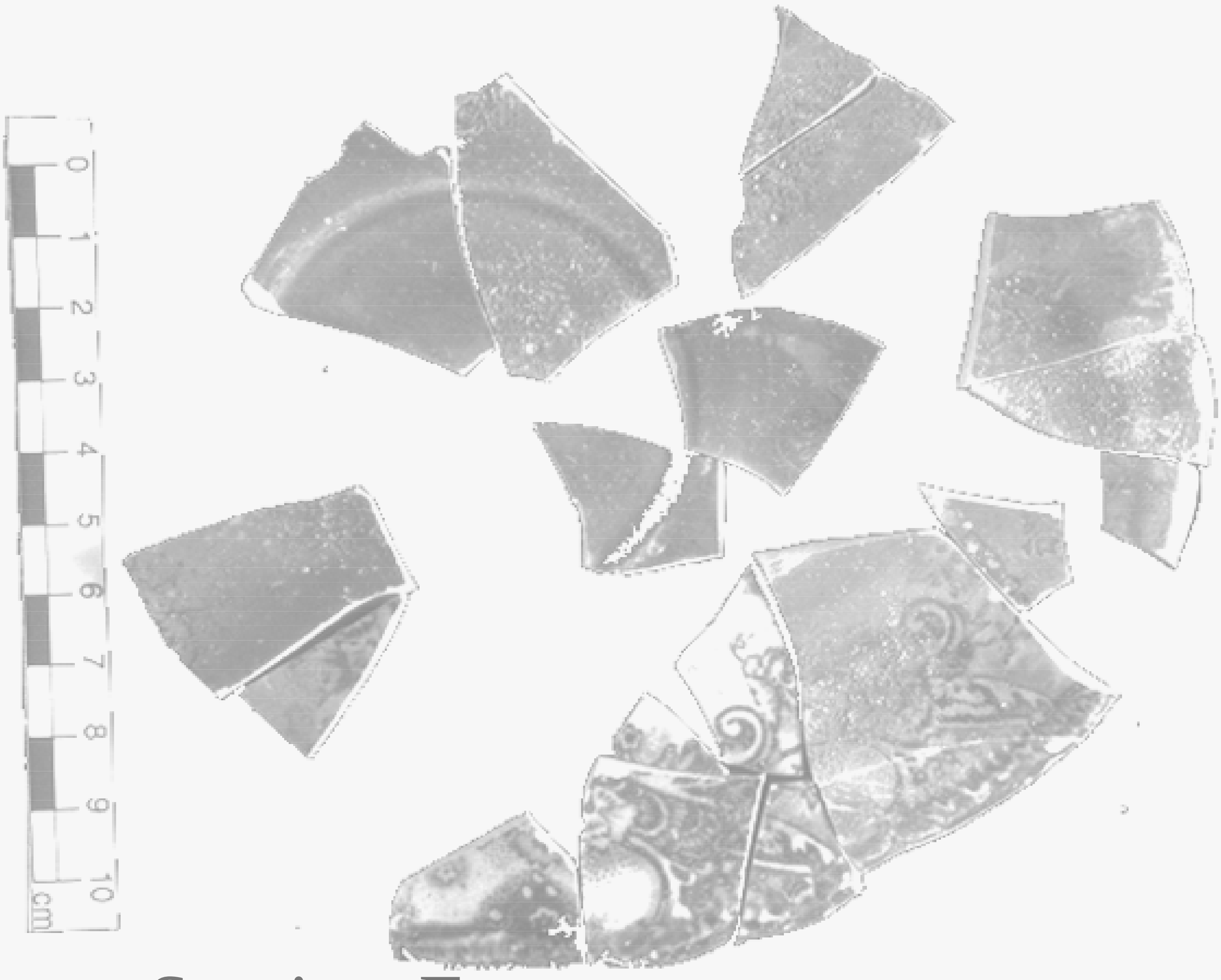
No previously unrecorded species were identified in the material from the plough zone above or adjacent to post-contact features. More muskrat and herbivore specimens were noted and there were 102 mammal specimens, two mammal or bird bones, and 73 unclassified fragments. As in the other samples, nearly all of these were calcined but some were not and many of these exhibited saw striations indicative of modern butchering practices.

The largest variety of species came from the plough zone. Most of the site was ploughed and large parts of the excavated area contained no features. From this disturbed matrix, there was one mouse bone which is probably a natural intrusion. The raccoon bones from the plough area are likely related to the almost complete skeleton. Some scavenger likely dislocated the hind limbs of the adult raccoon carcass which by either natural or human causes came to lie on the surface of the site. The single muskrat bone from the plough zone might be related to those in the post-contact feature in Unit C55. The cow and horse specimens reflect post-contact farming here and farming likely accounts for the other large herbivore remains found in the plough zone too. Similarly, the bird bones included two or three that were from turkey. Although there were no fish bones recognized in this provenance grouping, there was one possible turtle shell fragment and five invertebrate shell fragments.

CONCLUSIONS

The objectives of the faunal analysis of the Jemseg Crossing site were met. Most importantly, while excavation continued, there was regular monitoring of the skeletal material to determine if human burials were being disturbed. When a feature with ochre was located in early April, its matrix was examined, including sample floated lots, to see if any human remains were included. There were no human remains found on this site.

The secondary research aspects of the zooarchaeological analysis were not as conclusive. However, both wild and domesticated animals were found on the site, confirming its use for mundane purposes in both post-contact and pre-contact times. Cow, horse, turkey, and possibly pig and sheep or goat remains reflect post-contact farming. Muskrats were exploited in the historic period and raccoon hunting then is a possibility also. There is evidence for post-contact fishing on a modest scale. The post-contact faunal remains indicated that the Native population here exploited moose and possibly beaver as well as large birds and fish. Bones of these animals were sometimes burnt. Given the identification methods and the small sample, the portions of the diet these animals represent cannot be reasonably estimated. Similarly, the specific season or seasons of subsistence activities, such as hunting and fishing, cannot be established. More precise identifications of the faunal remains in a laboratory would likely result in additional species being added to the list of animals exploited from the ecologically diverse microenvironment around the Jemseg Crossing Site and might reveal the seasonality some of those subsistence activities.



Section Four

ANALYSIS

Aliwitahsik, Litahuswagon
13: Terminology and the Conceptual Framework

Susan Blair

One of the primary goals of archaeological analysis is the description of archaeological materials in a way that relates them to the passage of time (the temporal dimension) and their distribution over the landscape (the spatial dimension). This endeavour has served to break down the enormous stretches of time that are marked by human enterprise in the Maritimes into manageable units. Traditionally, archaeologists have used changes in archaeological materials (such as artifacts, features, bioarchaeological specimens) patterns of similarities and differences in both time, and over certain spaces, areas, or regions. In the preliminary stages of archaeological interpretation, these patterns are often integrated into sequences and schemes to identify potentially meaningful periods of change and interaction within and between groups of people. This approach has been most formally expressed as "culture history". This approach is often supplemented by a loosely-integrated ecologically-informed processual approach. While many reviews of archaeological theory frame these two approaches historically, as developments of one from the other, in many contexts, they coexist, often contentiously. This is particularly true of the Maritime Peninsula. When presented as contemporary alternative theoretical traditions, culture history and processualism can be contrasted not just in terms of opposing interpretations and conclusions, but as competing ways of viewing the past. Rafferty (1994) has described these contrary views as they are manifested in the treatment of cultural change over time. According to Rafferty, the definition of spatial and temporal units by culture-historians is not merely a technique for describing archaeological materials, but is a structuring principle which serves to capture moments of change (the boundaries between units) that punctuate long periods of stability (the culture-historical unit itself). The processual view emphasizes the definition of synchronic units of analysis, representing an integrated group of people within a particular ecological landscape (for e.g.: Binford 1980), with cultural change being gradual and transformational (Rafferty 1994: 407). Temporal and spatial units become ways of breaking down the subject into units of analysis, rather than means of defining the past.

Given these theoretical tensions, it is not surprising that there is a great deal of variation in the way that archaeologists have chosen to describe and delimit the passage of time. Although contrasting opinions about the significance or interrelationships between various spatial and temporal units are derived directly from this tension, a range of prosaic concerns also have significant impacts. These include debates over terminology (i.e.: what are the most appropriate terms to describe various culture historical units), and debates about the kind and quality of specific archaeological information pertaining to timing, or precisely when the various cultural historical units came to pass from one into another. Although theoretical perspectives underpin all interpretations, I will specifically address issues of the terminology that I employ in this report, and pursue some their implications.

"History" vs. "Contact"

At the broadest level, archaeologists have distinguished between the prehistoric and the historic period. This is an international terminology, and is meant to differentiate between the archaeology of people who were not recorded or described by any writing system (their own or others), and people who were. This is a useful division because the existence of a relevant written record informs our approach to the archaeological record in fundamental ways. Transitory and non-material subjects like personal perspective and emotion, the symbolic meaning of cultural objects, and social and cultural attitudes and biases present in groups and communities are accessible in written records. However, a written record is a double-edged sword, as it is usually representative of a limited set of opinions that can be expressed in a highly prejudicial manner, and as such can be a biased and misleading depiction.

Despite its utility from an archaeological perspective, some archaeological researchers (as well as archaeological critics) have suggested that the term "prehistoric" has developed pejorative overtones. They suggest that this term has come to denote all things crude and brutish. Indeed, the Microsoft Word thesaurus records the following terms for "prehistoric": primeval, antiquated, primitive, and superannuated. More extreme criticism suggests that the term implies that prehistoric peoples were "ahistorical", insinuating that they did not have a past worth recording. In part, these connotations arise from the misuse of the term in popular literature, as indicated by the juxtaposition of "prehistoric" and "dinosaur". Unfortunately, no other term conveys the distinction between the two periods (one with a written record and one without). The most widely accepted substitutions are the terms pre-contact and post-contact. Clearly, however, these two terms are not equivalent to prehistoric and historic. Contact, as defined by the point of initial interaction between Aboriginal peoples of North America and early European explorers, may have happened in this region as early as 1100 AD (see Whitehead 1991). The historic period, for which a written account exists relating to the people of this region, occurred some time in the 16th century, or early 17th century. Furthermore, these terms may be inadequate for other reasons. The adoption of terminology especially for this region may serve to set it apart from both other parts of North America, and a universal human past, suggesting that the people of the Northeast were different from people elsewhere. Furthermore, like “prehistoric”, the term “pre-contact” defines a very long and complex period of time by a criteria that had no inherent meaning in that past. Thus the notion of “contact” serves to define all of the people of the past. Some would argue that this approach establishes contact with European as the defining moment against which all of the accomplishments of the people of this region are measured.

These concerns have been at the crux of (and so derived in part from) many constructive discussions on terminology I have had with individuals such as Karen Perley, David Black, and Chris Turnbull. I have become aware that the nature of representations, and explorations of Aboriginal histories are of key importance to many in the Aboriginal and non-Aboriginal academic community. Most archaeologists (myself included) have long understood that language as it is spoken and understood by all speakers has a tremendous power, both negative and positive. It is for these very reasons that most modern archaeologists have eschewed other forms of biased terminology, such as masculine-oriented terms (e.g.: “man” the hunter), in favour of gender-neutral language.

In light of these considerations, and after a great deal of thought, in this report I have adopted a terminological framework incorporating pre-contact/post-contact as chronological designations, with the explicit recognition that they do not mean the same as prehistoric/historic. However, in future, these terminological issues must be more completely discussed between Aboriginal peoples and archaeologists, so that an appropriate and mutually satisfying terminology can be developed.

The Tripartite system

Most archaeologists in the Northeast distinguish between three major pre-contact periods of human activity as reflected in the archaeological record (see Figure 13.1). Based on the work of early culture historians such as Ritchie (1932, 1951, 1955, 1969, 1980), and echoing Eurasian tripartite systems (Trigger 1989), these periods have been called the Palaeoindian period (ca. 11,000 to 9000 years ago), the Archaic period (ca. 9000 to 3000 years ago), and the Woodland period (ca. 3000 year ago to the contact period). However, in the mid-seventies, a number of regional archaeologists began to express dissatisfaction with the application of this terminology in the Maritime Peninsula (Bourque 1995; Sanger 1974, 1979; Snow

1980). Many voiced concerns about the applicability of a culture historical framework developed in the central and northeastern United States to the "far Northeast". This dissatisfaction was fuelled by an epistemological shift towards a processual, ecologically-based archaeology, which led to a reformulation of the spatial and temporal framework towards one emphasizing subsistence and economy. The absence of agriculture in the Maritime Peninsula was felt to be a pivotal contrast, necessitating a special set of analytical tools reflected by terminology. As a result, a competing terminology was proposed, which replaced the Woodland period designation with "Ceramic" period. Indeed, the appearance of pottery in the far Northeast occurs some time after 3000 years ago (Bourque 1992, 1995). The Archaic period, it was proposed, would become the "Preceramic" (Sanger 1974).

In the years following this proposal, "Ceramic period" was adopted by some (but not all) regional archaeologists. Interestingly, however, the "Archaic period" is still widely used, with few (if any) researchers still using the term "Preceramic". Recently, however, there have been a number of archaeologists who have voiced concerns about the implications of "Ceramic period" in a region where ceramics are frequently only a minor component of artifact assemblages (Black 1992, 1995: pers. comm.; Blair 1997; Leonard 1995). An example of this unevenness is the Fulton Island site (Foulkes 1981). This deeply stratified site, located in the Grand Lake system of the lower Saint John River valley, spans most of the last 3000 years (the period normally considered the "Ceramic" period). Nonetheless, Foulkes (1981) defined three clear chronological components within the site, a preceramic component (prior to ca. 2200 years ago, a ceramic component (between ca. 2200 and 1400 years ago) and a post-ceramic component (after ca. 1400 years ago). Although archaeologists have accumulated evidence to suggest that ceramics were used in minor amounts before and after Foulkes' ceramic component (Bourgeois 1999, Petersen and Sanger 1991), her insightful analysis highlights some of the problems with this terminology.

Furthermore, some archaeologists have expressed the concern that if we eschew terminologies that are widely accepted elsewhere (such as in Québec, Ontario, New England, the mid-Atlantic, and the midwestern United States), and indeed were created with the intention of being widely applicable, we are increasing our own regional marginality. Marginality has been a prevalent regional narrative (Robinson and Petersen 1993), a narrative that has been informed by modern geopolitics as much as by archaeological research. The employment of special regional terminology also obscures the many archaeologically visible linkages between the Maritime Peninsula and the broader Northeast.

With many of these concerns in mind, David Keenlyside (1983) proposed the term "Maritime Woodland" to emphasize the maritime character of local adaptations, while acknowledging the macroregional

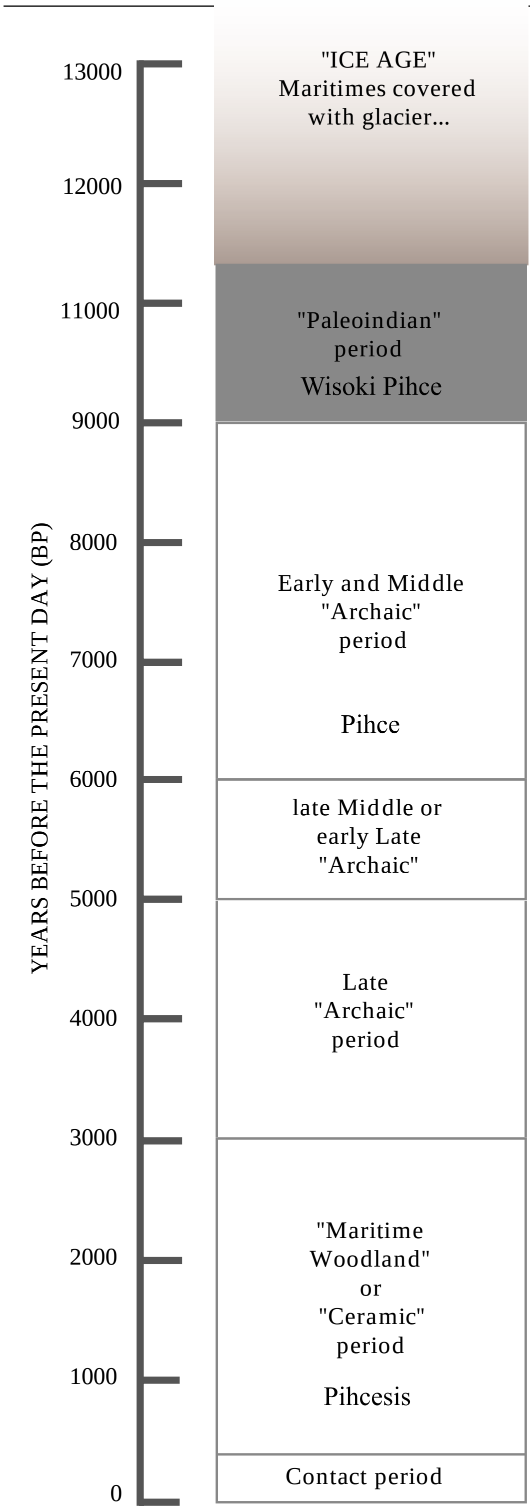
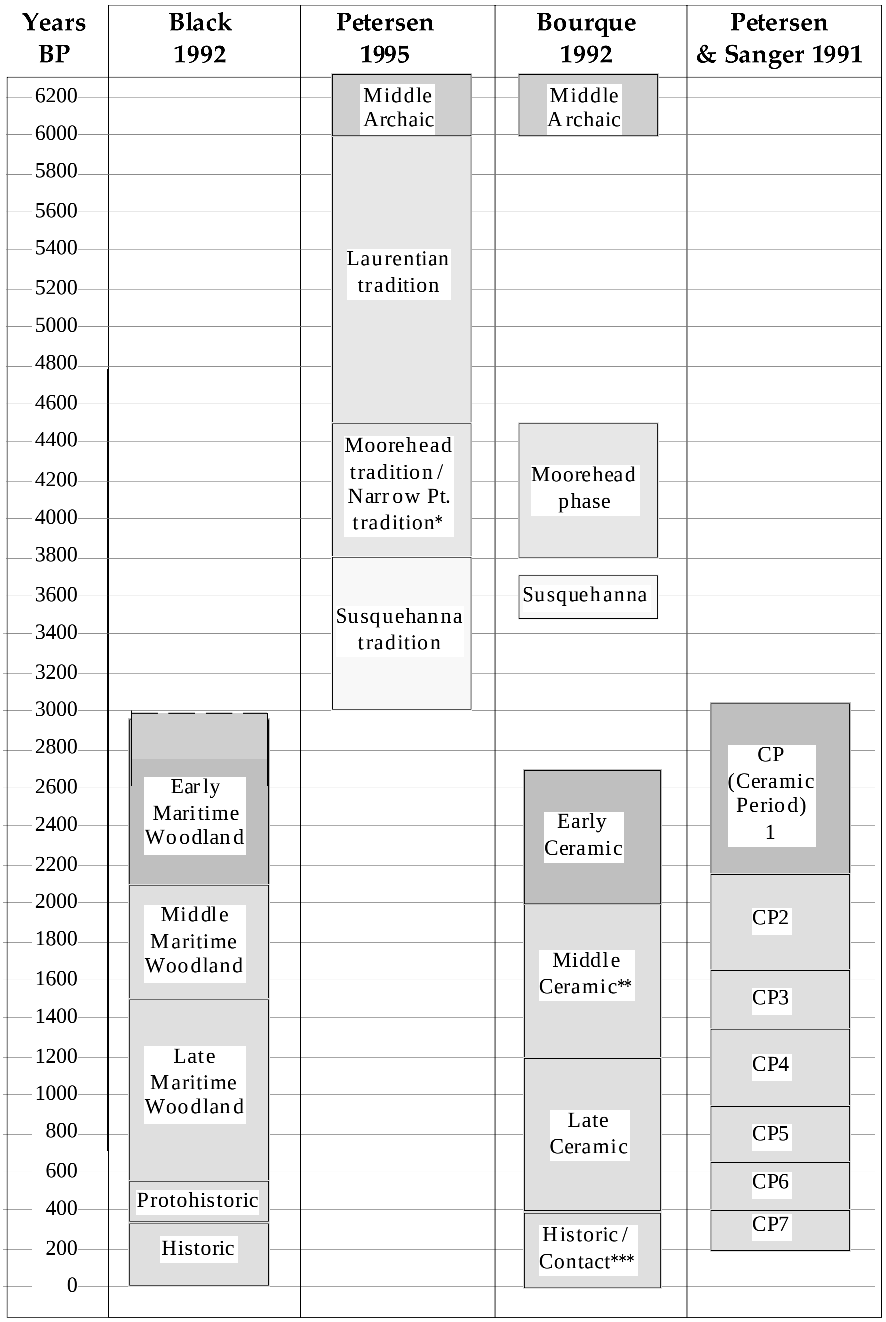


Figure 13.1: The Tripartite culture history framework

connections between the Maritime Peninsula and the rest of the Northeast. A number of archaeologists have now adopted this terminology (for e.g., Black 1992, Blair 1997). I believe that it is a satisfactory compromise between the two issues of local expression and regional integration, and it is the terminology that has been employed in this report. However, the Jemseg assemblage does introduce a certain complexity to this application. I have referred to archaeological manifestations that are similar to those occurring outside of the Maritimes by their own regional terminologies (i.e.: the Meadowood phase of the Early Woodland), while using our terminologies when referring to them as manifested locally (i.e.: the Meadowood-style artifacts of the Early Maritime Woodland component at Jemseg).

Finally, some have pointed to the inaccuracy and anachronism of "Palaeoindian" in a region where Aboriginal people have generally rejected the term "Indian" to described themselves, and the perjorative undertones of "Archaic". In this report we have employed Wolastoq'kew terms for chapter titles, in part to weave Wolastoqiyik themes into the text, and to emphasize the linguistic inequities that Wolastoqiyik endure in daily life. These translations were carried out by Karen Perley. During the course of the project, I asked Karen to translate Palaeoindian, Archaic and Maritime Woodland. She returned to me with *Wisoki Pihce* (very long ago), *Pihce* (long ago), and *Pihcesis* (not too long ago). In many ways this scheme reflects the original intention of

Figure 13.2: Culture history schemes for the Maritime Peninsula.



*Possibly contemporaneous but separate
** The Middle Ceramic is inferred in Bourque 1992, based on the gap between his Early Ceramic and his Late Ceramic.
*** Bourque (1992) places the Contact period specifically at AD 1580 - 1620

tripartite schemes, while unloading some of their theoretical baggage. Many will not regard these as adequate replacements for macroregional terms. After all, it may be equally unsound to impose Wolastoq'kew terms on other regions (like parts of the US). However, in the context of ongoing regional discussions on terminology, they present interesting concepts and talking points.

Culture history schemes

The final terminological issue relates to timing of these various culture historical units, and the identification of various subdivisions within them (usually called complexes, phases, or traditions, after McKern 1939; see also Willey and Phillips 1958). A brief examination of culture historical schemes from the Maritime Peninsula shows a considerable degree of variability (see Figure 13.2). Some of this variability is derived from a focus on one particular data set over others. Petersen and Sanger (1991), draw their schema directly from the changing pottery styles. Black's (1992) schema applies to the Quoddy region of southwestern New Brunswick, and is derived from structural changes in stratifed shell middens. Others, such as Bourque (1992, 1995) and Petersen (1995) incorporate a large number of archaeological attributes, and possibly broader inferences about adaptation, lifeways and sociocultural structures into their schemes. The former two may be more precise, while the latter are more encompassing. All of these are based on a current understanding of the archaeological record, as perceived from a particular perspective. However, they illustrate that all culture history units tend to be broadly construed and are therefore subject to local revision.

CHRONOLOGICAL COMPONENTS OF THE JEMSEG CROSSING SITE

I have attempted to isolate chronologically significant culture historical units within the Jemseg assemblage, and relate them to regional patterns of culture history. Due to the structure of the Jemseg site, the archaeological materials recovered during the JCAP were only rarely stratified (in the sense of being deposited sequentially, one over another). Instead, features tended to be horizontally distributed across the surface of the site, with subtle differences in depth occasionally noticed but rendered meaningless by the lack of correlation between units, and the potential for microtopographic features and alluvial deposition rates to influence these patterns. As a result, it should be noted that these are chronological components and not stratigraphic components. These cultural components have been developed through the identification and analysis of radiometrically-dated features and their contents, and through the use of temporally diagnostic artifacts.

The result is a set of eight archaeological components, seven of which are attributable to the pre-contact period, and one of which is attributable to the post-contact period (see Table 13.1). In the following chapter, I will discuss the basis for the chronological analysis of the Jemseg Crossing site, describe radiocarbon dated features, as well as features for which we can infer a possible age based on artifacts, stratigraphy, or other classes of archaeological material. In subsequent chapters, this information is integrated into a local and regional framework, and we pursue interpretations about the people who were living on the Jemseg site in the past.

Table 13.1: The archaeological components identified during JCAP.

Component	Culture history period	Design.	Approximate dates
Component 1	Palaeoindian period	PI	11000 to 9000 years ago*
Component 2	Middle Archaic / early Late Archaic	MLA	8000 to 5000 years ago
Component 3	Late Archaic	LA	5000 to 3100 years ago
Component 4	Terminal Archaic	TA	3300 to 2800 years ago
Component 5	Early Maritime Woodland I	EMW I	2800 to 2400 years ago
Component 6	Early Maritime Woodland II	EMW II	2400 to 2000 years ago
Component 7	Middle Maritime Woodland	MMW	1750 to 1500 years ago
Component 8	Post-contact period	PC	AD 1604 to present

* This report will use the standard archaeological convention of referring to time periods as “years ago”, or “BP” (before present). Radiometric dates may be uncalibrated ("raw") or calibrated (adjusted to account for temporal fluctuations in uptake of 14C to 13N). Uncalibrated dates will be referred to as a date before present (BP) with a plus / minus factor indicating a one standard deviation range. Calibrated dates will be indicated by BC / AD dates, indicated as "Cal BC" or "Cal AD".

Wikuwamul

14. Features

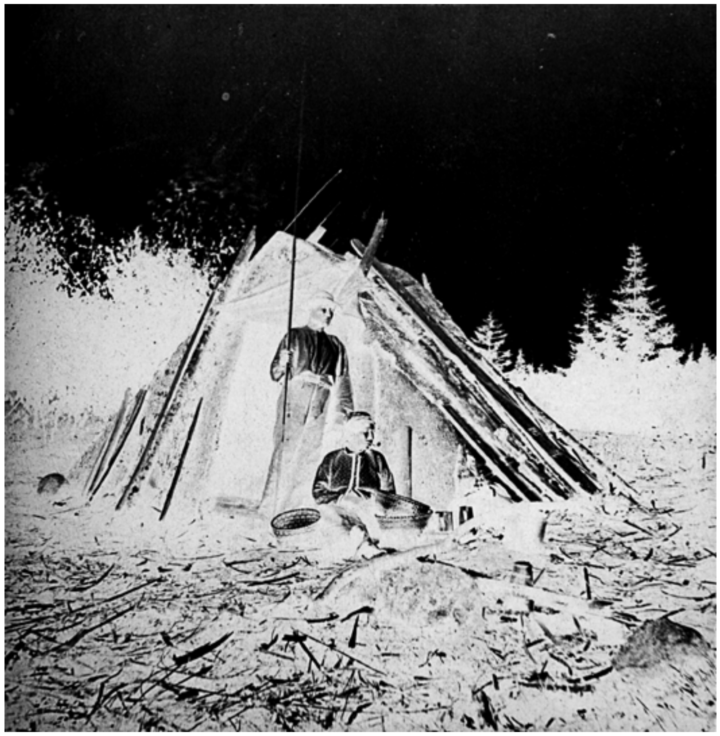
Text by Susan Blair
Photographs by Jason Jeandron

In addition to large quantities of artifacts, bioarchaeological specimens and ecofacts, a number of features were recorded at the Jemseg Crossing site. A feature, by archaeological convention, is any residue of human activity which cannot be removed from the ground intact, or maintain its structural integrity outside of the physical matrix in which it is found. Features represent a wide range of human activities and can be as small as post molds a few centimetres in diameter and as extensive as the roads that connect towns and cities. Features give insights into the activities that took place at a site and enable archaeologists to explore the distribution of these activities across the site. They also provide us with a context for the artifacts and ecofacts that are recovered during the process of archaeological excavation. The Jemseg Crossing site produced 80 archaeological features. However, many of them posed problems for interpretation and analysis, including disturbance and mixing between pre-contact and post-contact materials, disturbance by burrowing animals and plant roots, and limited associations of dateable artifacts and charcoal.

However, 23 of the features from the Jemseg Crossing site offered evidence of contextual integrity in association with artifacts and materials sufficient to allow chronological and functional analysis. We were able to make informed guesses about the age or function of 33 additional features. These latter assumptions may be viewed as hypotheses that can be tested through future research.

Some of cultural features from the Jemseg Crossing site represent simple open-air cooking hearths. Others represent complex aggregations of small hearths, artifact concentrations and living floors. I have described these as "feature complexes". These appear to represent small houses, similar to the *wikuwamul* or birch bark "wigwams" that were used by post-contact period Wolastoqiyik (see plate 14.1). Some of these feature complexes conform to "semi-subterranean houses" described elsewhere (see Sanger 1987, 1996).

Plate 14.1: Man and woman outside bark lodge, stereograph by Climo, 101 Germaine Street, Saint John, NB. August 1877 or before (Smithsonian photograph no. 56034).



We believe the Jemseg Crossing features represent the first inland recovery of this type of feature in the Maritimes.

The assignation of individual feature numbers to the constituent parts of these complexes varied depending on the ability of the field recorder to recognize broader associations. Some feature complexes were assigned a single designating number, while others were assigned separate numbers for different internal parts.

In the following sections, I will describe these features, and the archaeological materials that were associated with them. This description will focus on material within feature fill, and immediately adjacent to the feature (within undisturbed contexts and in a common horizontal plane). These materials were considered to be in direct association. However, in some parts of the site (especially Area A) we observed regular patterned relationships between artifacts in comparatively disturbed contexts (the plough zone), and features beneath the plough zone. These associations are more problematic, as we usually assume that plough zone artifacts might have been considerably moved from their original depositional position. However, when we plotted artifact frequencies in the plough zone in relation to underlying cultural features, we observed clear spatial relationships (Figure 14.1). Large productive features, such as Feature Complex 1, 2, and 3, lay immediately below the ploughzone containing high artifact densities. This is a problematic relationship, but in cases where there are few other clues to suggest the function or age of a feature, I have used them to propose hypotheses about chronological affiliations.

The distribution of features

Archaeological features were recorded in most of the excavation areas of the site. The extent to which we could discern stratigraphic relationships between features was inhibited in many parts of the site by a lack of alluvial deposition. This effect was most evident on the upper terrace, especially Area A (see Figure 14.2). In this part of the site cultural features were visible immediately above basal till, and within alluvial silty sand. In most parts of Area A, this soil was between 30 cm and 100 cm thick. This lack of depth suggests low or irregular rates of deposition, an observation confirmed by the lack of vertical separation between features of different ages. Instead, features in Area A were distributed horizontally. We recorded 62 features in Area A. All of these features were observed below the visible zone of disturbance created by early 20th century agricultural ploughing (a layer of homogenous dark brown silty sand less than 30 cm thick).

Figure 14.1: The density of pre-contact artifacts (pottery and lithics) in the ploughzone, in relationship to observed features.

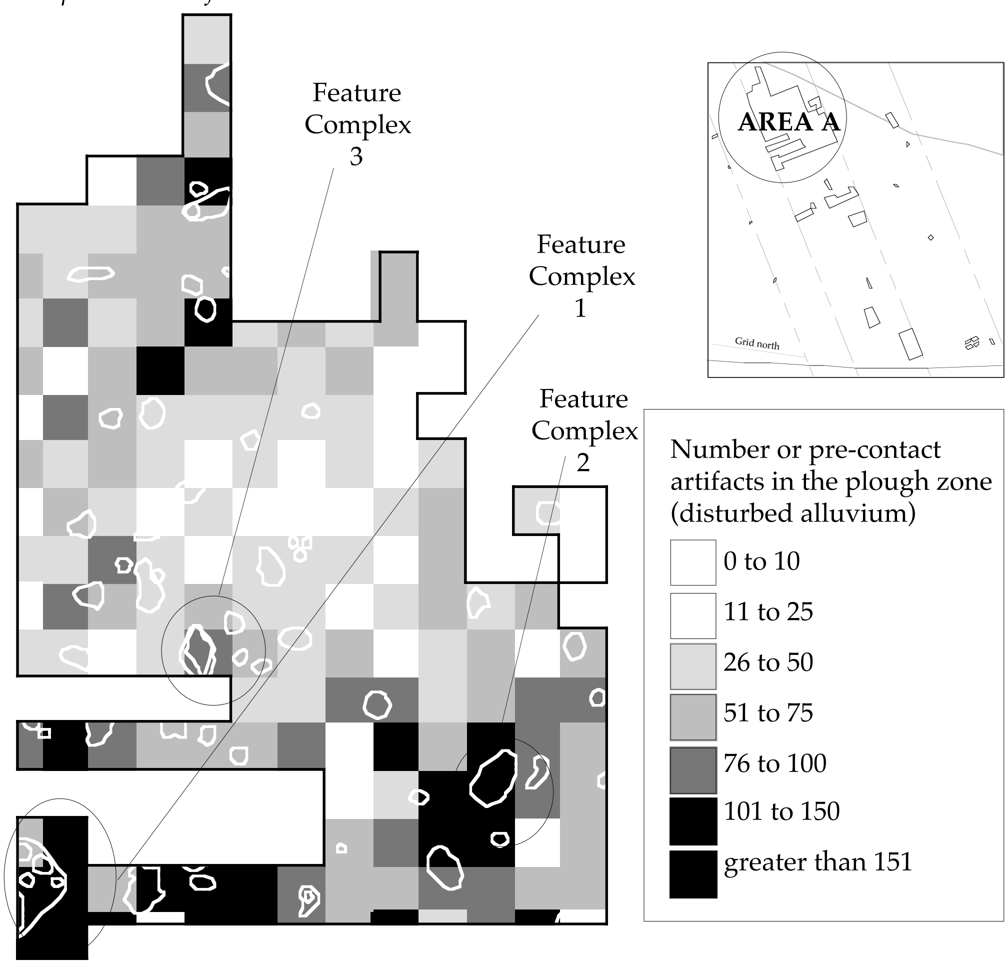


Figure 14.2: Features recorded in Area A of the Jemseg Crossing site (BkDm-14).

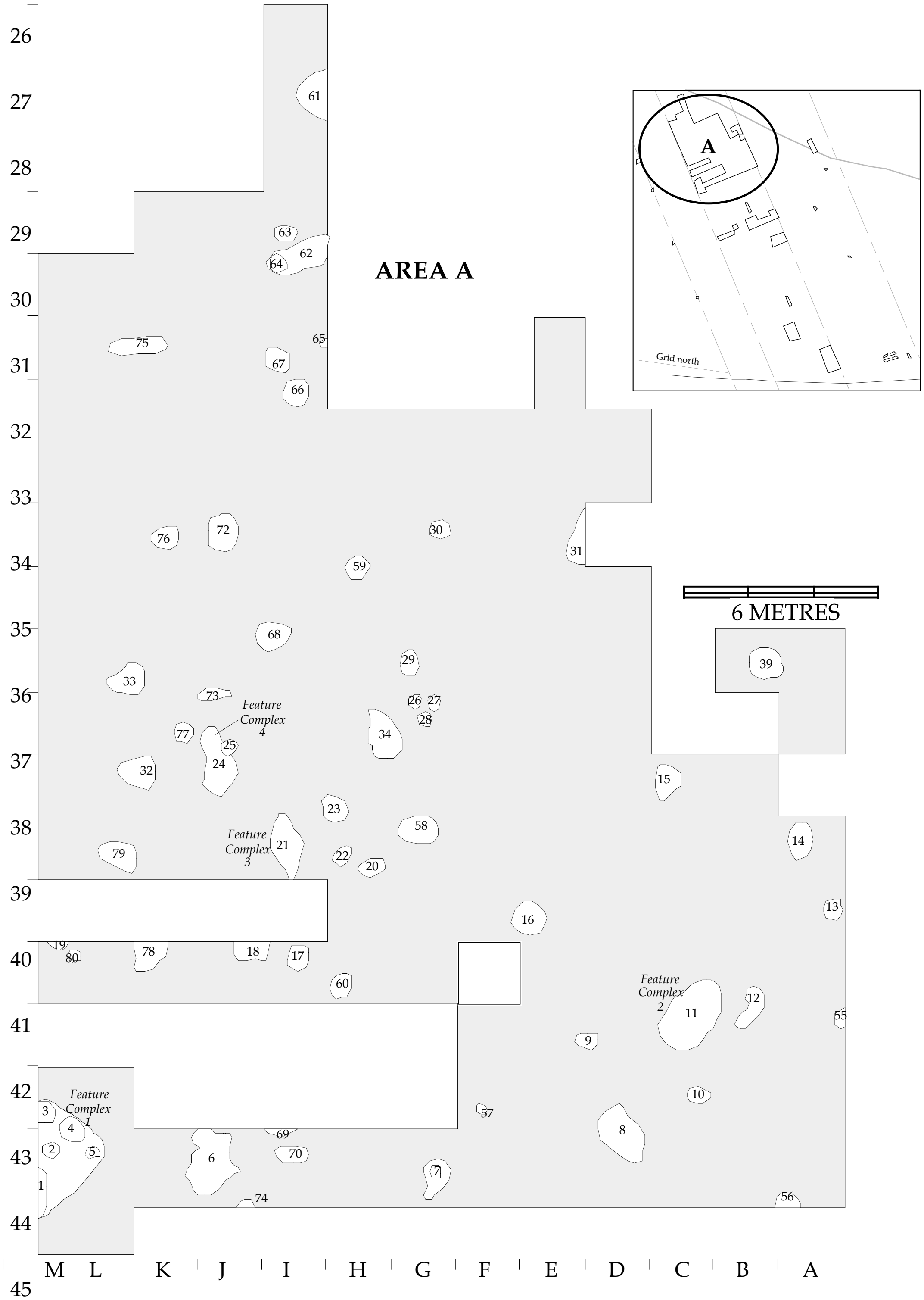


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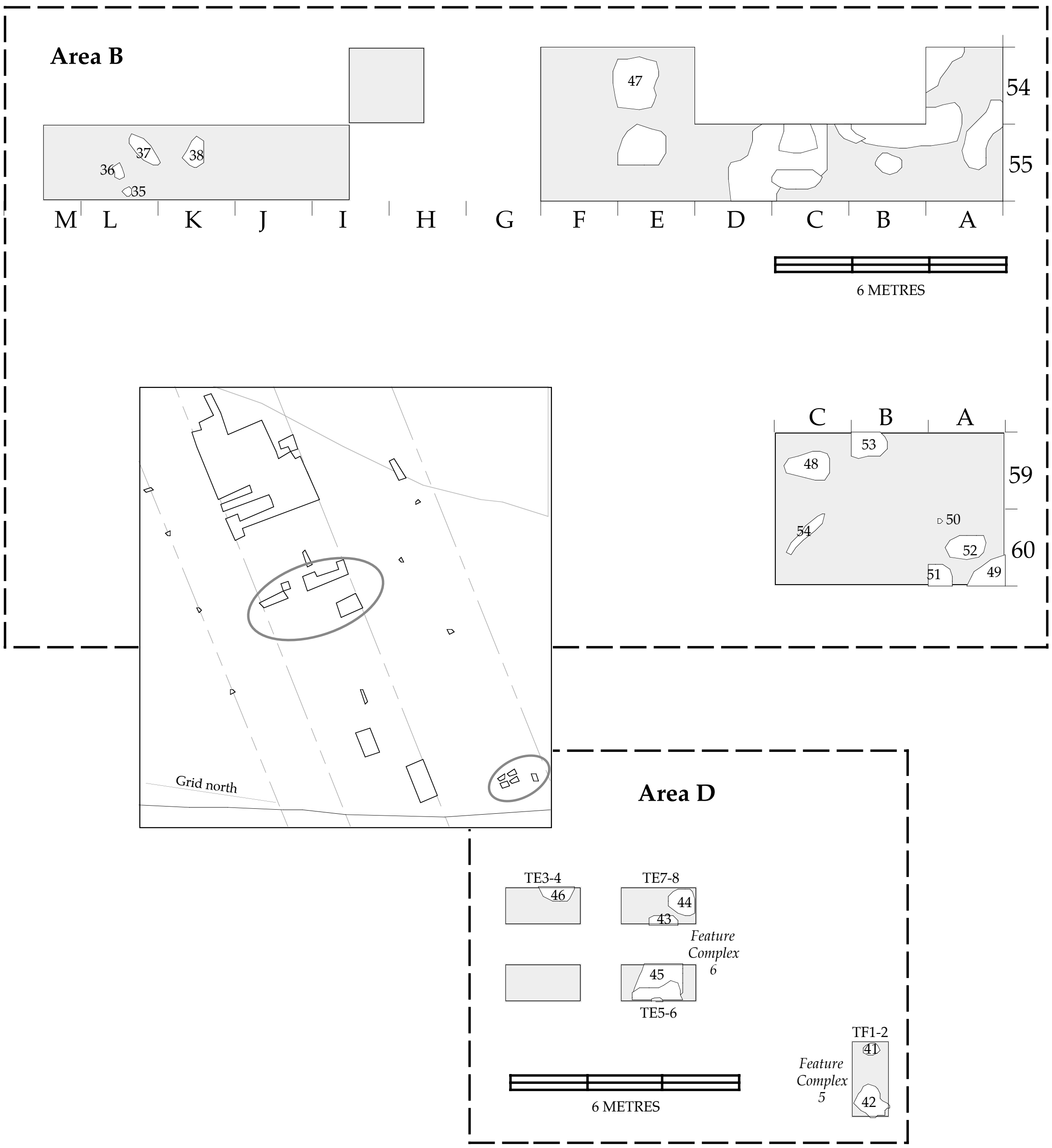
Figure 14.3: Features recorded in Areas B and D of the Jemseg Crossing site (BkDm-14).



Although the ploughzone had clearly experienced considerable mixing, alluvium below the ploughzone appears to have been comparatively undisturbed, and we rarely recorded the intrusion of post-contact artifacts, many of which were abundant within the plough zone itself. The plough zone in Area A produced 11312 post-contact period artifacts, but only 61 were recovered from the soil immediately below the ploughzone. Only one of these (a clay tobacco pipe bowl from Unit I-41), was recovered from a depth of more than 30 cm below the surface. This unit produced stratigraphic evidence of extensive bioturbation.

At least nine of the features recorded during JCAP were the result of natural processes (such as rodent burrows and natural soil processes). The remaining 53 features consist of hearths, living floors, and storage or refuse pits (see below).

We also encountered features on the break in slope (Area B) and in the levee (Area D). The break in slope has experienced variable rates of deposition, and Area B deposits ranged from thick (greater than 180 cm) to thin (ca. 30 cm). Although we recorded complex and deep layering with interleaving features in Area B, the features exhibited signs of being significantly disturbed. On several occasions we encountered 20th century artifacts at depths greater than 150 cm, beneath feature-like patterning (including on one occasion, a toy rubber duck). Based on these patterns, we have inferred that Area B may have been used as a garbage dump in the earlier 20th century, or may have received topsoil from other site areas. Although we recorded over 20 "features" in Area B, all of them were significantly disturbed, some may be the product of recent "dumping" activity, and few of them could be reliably analysed (see Figure 14.3).

Area D, however, was located on the bank of the Jemseg River, and provided evidence of significant rates of natural alluvial deposition. Cultural materials, including several feature complexes, were initially observed at depths of 40 to 90 cm below surface, and continued below the water table, at 130 cm, when we were forced to discontinue our excavations. The deep deposits of alluvium have served to cap and protect the features in this area, physically isolating features from each other, and from later intrusion. We identified 7 individual pre-contact cultural features in Area D, that appear to be derived from two distinct chronological components (see Figure 14.3).

Dating the Jemseg Crossing feature sample

During the course of excavation, we encountered wood charcoal in association with other evidence of ancient activity. In many cases, this charred organic matter was clearly the product of fires that had been carefully built and controlled for cooking and heating. This charcoal consisted of fragments of charred wood, often in association with concentrations of powdery grey ash, and in some cases, charred food such as animal bones and plant materials such as butternut shells and seeds (see Monckton, this volume). Charred organic

Table 14.1: The radiometric dates from the Jemseg Crossing site.

Uncal. date	Tech*	Lab #	Mat. **	Source	13C/12C ratio	1 sigma calibrated result
1600±60 bp	AMS	Beta-105891	wc	Feat 21	-32.9o/oo	Cal AD 410 to 550
1650±40 bp	AMS	Beta-106507	wc	Feat 21	-25.8o/oo	Cal AD 390 to 435
1940±90 bp	AMS	T0-9619	wc	Feat 5		Cal BC 90 to Cal AD 70
2060±40 bp	AMS	Beta-105999	wc	Feat 44	-30.5o/oo	Cal BC 100 to 5
2140±60 bp	AMS	Beta-105892	wc	Feat 11	-33.7o/oo	Cal BC 330 to 330 and Cal BC 205 to 60
2230±50 bp	AMS	Beta-105889	wc	Feat 25	-28.3o/oo	Cal BC 375 to 195
2460±60 bp	AMS	T0-9618	wc	Feat 56		Cal BC 760 to 570
2520±70 bp	RC	Beta-101508	wc	Feat 14	-25.8o.oo	Cal BC 795 to 515
2870±70 bp	RCx	Beta-156019	wc	Feat 13	-24.8o/oo	Cal BC 1270 to 850
2880±60 bp	AMS	Beta-104906	wc	Feat 7	-27.2o/oo	Cal BC 1130 to 940
2960±130 bp	RC	Beta-104907	nut	Feat 29	-22.9o/oo	Cal BC 1385 to 980
3000±90 bp	RC	Beta-104908	wc	Feat 41	-29.9o/oo	Cal BC 1385 to 1065

* AMS = Accelerator Mass Spectrometry, RC = Radiometric, standard, RCx = Radiometric, with extended counting.
** wc = wood charcoal; nut = butternut shells (*Juglans cinerea*), Monckton 1997.

materials provide opportunities for the application of radiocarbon dating techniques. However, while charcoal was widely distributed across the site in a range of contexts, a great deal of caution was exercised in the selection of charcoal for dating. We sought samples with particular associations and characteristics. While radiocarbon dating will provide a comparatively precise date for the age of ancient organic matter such as wood (an expression of the time of death of a living organism, such as a tree), only rigorous archaeological research can tell us whether a particular piece of wood was chronologically associated with other nearby archaeological evidence. To avoid spurious associations we rejected samples from contexts exhibiting significant post-occupational disturbance, from contexts where the presence of wood charcoal was not clearly related to particular past activities (such as scattered charcoal on a non-feature surface), and from artifact-poor contexts.

During the course of the JCAP we recovered numerous samples that conform to our criteria. We submitted 10 of these to the Beta Analytic radiocarbon dating laboratory, and two to the University of Toronto Accelerator Mass Spectrometry laboratory, for chronometric dating. We retain additional samples that could also be dated, and these offer significant future research potential.

The resulting radiocarbon dates are presented in Table 14.1. These dates are presented in several formats, following archaeological standards. The date is usually returned from the laboratory as a year followed by a range (e.g., 3000±90 bp). Beta Analytic Inc. provides the following description with their radiocarbon dating analyses:

> Dates are reported in RCYBP (radiocarbon years before present, "present" = 1950 AD). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid and calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) and are based on combined measurements of the sample, background, and modern reference standards" (Beta n.d.).

Thus, the conventional radiocarbon age of a sample is a statistical statement. Furthermore, we now understand that due to fluctuations in the heliomagnetic modulation of the galactic cosmic radiation, geomagnetic variations, burning events, and the recent testing and use of nuclear devices, radiocarbon years do not precisely conform to calendar years. We can calibrate radiocarbon dates using corrections obtained through the comparison of radiocarbon years to calendar years through precise tree-ring analyses. I have included both the conventional age and the calibrated age in Table 14.1. The calibrated dates were obtained using Intcal 98 and BCal calibration databases (Stuiver and van der Plicht 1998, Stuiver et al. 1998, Talma and Vogel 1993). Following international standards, I have presented conventional dates in radiocarbon years BP (before present), and calibrated dates as Cal BC and Cal AD dates.

These dates anchor the chronological framework for the Jemseg Crossing site (see Figure 14.4). When the calibrated date curves are arranged in a temporal sequence, they reveal dated occupations between ca. 3180 BP and 1480 BP (based on 2 sigma range of the uncalibrated dates), or between Cal BC 1390 and Cal AD 605 (based on 2 sigma range of the calibrated dates). As will be discussed in Chapter 15 and 16, these dates are not reflective of the maximal or minimal possible age of the site. Based on artifact typology, we suspect that the site may have been used during the Middle and Late Archaic (between 8500 and 3500 years ago), possibly during the Palaeoindian period (between 10500 and 10000 years ago), and also during the post-contact period (after 500 years ago). The radiocarbon sequence, however, is restricted in several ways. Post-contact period activity (as described in Chapter 18) is, in general terms, too recent for accurate radiocarbon dating. Furthermore, the post-contact materials from Jemseg were consistently shallowly deposited and therefore considerably disturbed. The lack of earlier radiocarbon dates is most likely due to the intersection of settlement patterns with site disturbance, and may reflect a focus on habitation of particular parts of the site during a particular time period. It may also be that ephemeral domestic features such as living floors, post molds and open hearths, are increasingly influenced by pedological processes such as leaching and soil horizonation. Finally, it is also possible that some of the charcoal

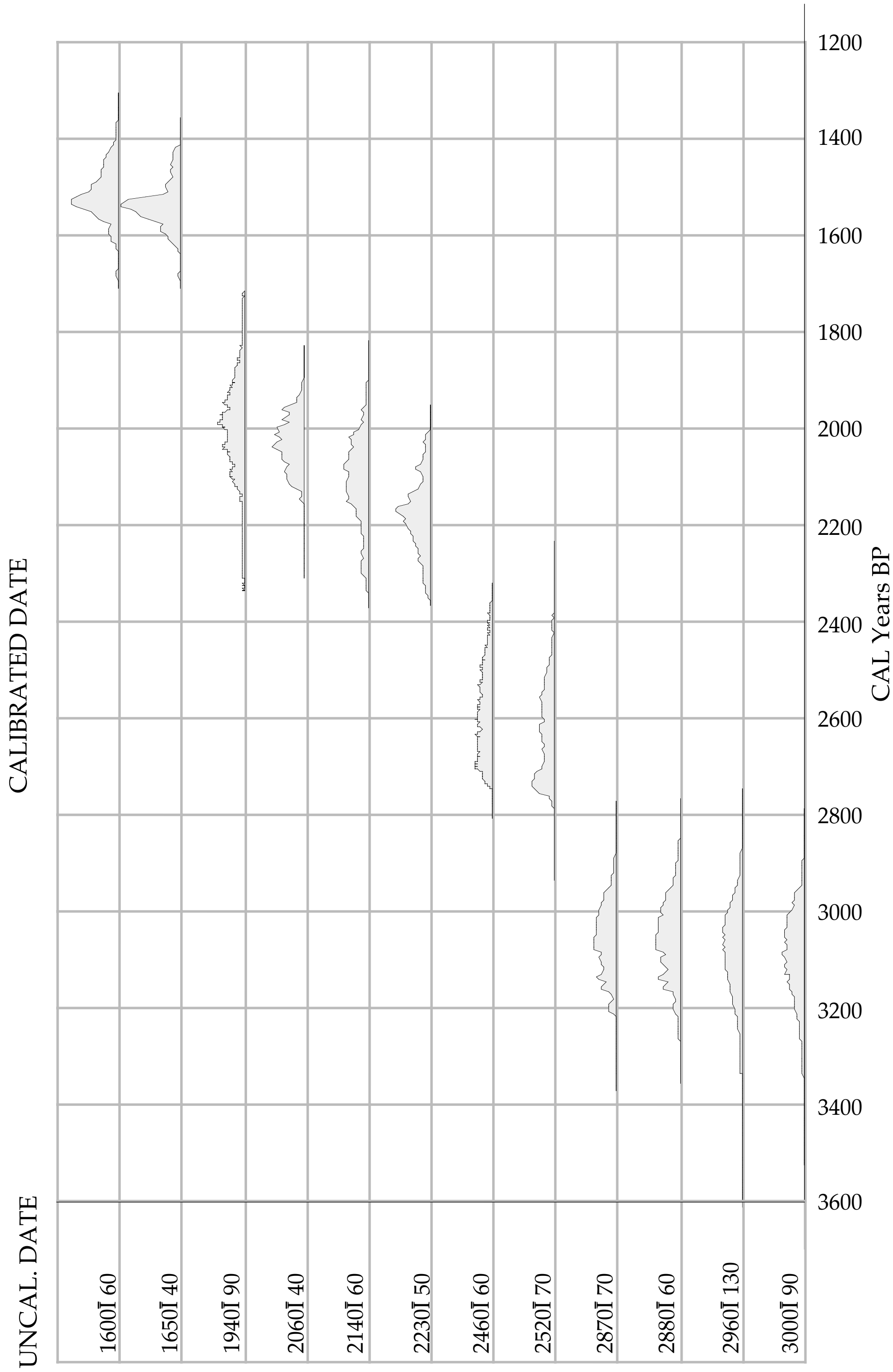


Figure 14.4: The calibrated date curves for radiometric dates from the Jemseg Crossing site, arranged in a temporal sequence based on the uncalibrated mean date.

samples from undated features will in the future return dates from these time periods.

During the period of time represented by the radiocarbon sequence, people lived in areas that subsequently were preserved by alluvial deposition. Earlier Archaic period and Palaeoindian habitation may have been too far upslope from the floodplain to have been capped by sufficient alluvium to prevent their disturbance by ploughing. Certainly this would explain the observed pattern of distribution of older material within the disturbed ploughzone, with intact, undisturbed later period material preserved below the ploughzone.

The radiocarbon sequence spans four different culture-historical periods. These are reflected in the distribution of dates in Figure 14.4. The oldest of these I have called the Late Terminal Archaic period. In Chapter 16, I designate this as Component 4. Although this is a period of considerable regional ambiguity (Turnbull 1990, see Chapter 16, this volume), there is a growing body of evidence in the Maritime Peninsula of habitation between 3400 and 2800 years ago. Four of the features from the Jemseg Crossing site have been dated to this time period. The Late Terminal Archaic is followed by the Early Maritime Woodland (EMW). Due to the range of material from the Early Maritime Woodland, I have distinguished between an earlier EMW (Component 5), between 2800 and 2400 years ago, and a later EMW (Component 6), between 2400 and 1900 years ago. The Jemseg site also produced a small Middle Maritime Woodland component (MMW), consisting of one feature dating to between ca. 1700 and 1450 years ago.

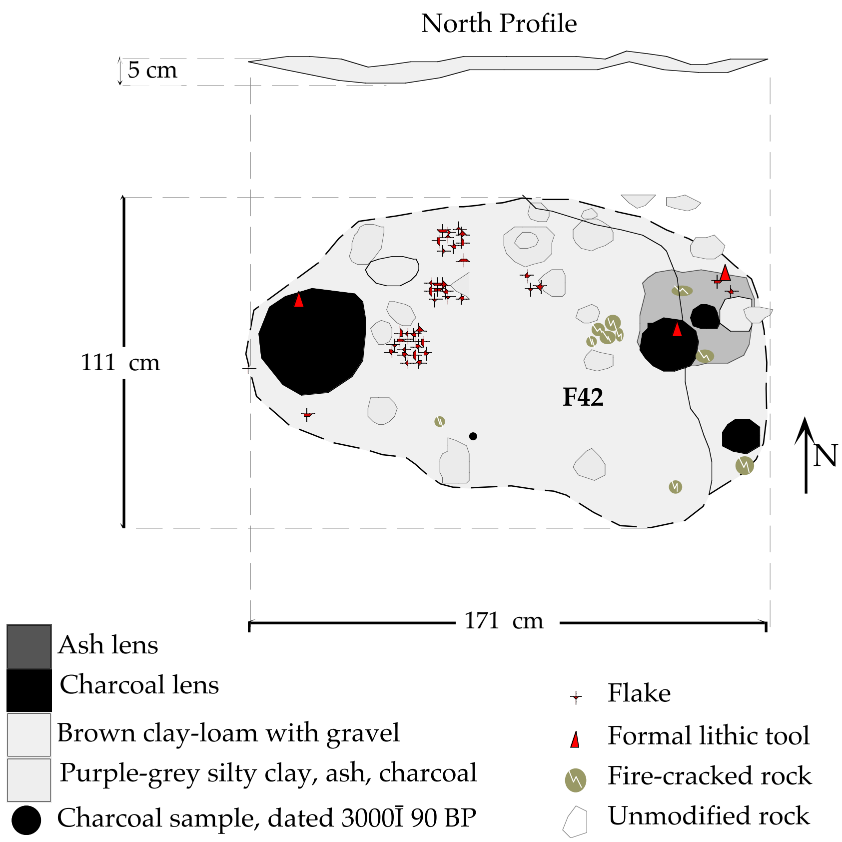
The features and feature complexes of the Jemseg Crossing site will be discussed in detail in the remainder of this chapter. Much of this analysis will focus on features that contain archaeological materials and can be chronologically analysed. I will first discuss features that have been dated by radiocarbon dating, organized by cultural component, then discuss features that are dated by relative dating or artifact typology[1].

LATE TERMINAL ARCHAIC (COMPONENT 4) - FEATURES WITH ABSOLUTE DATES

We obtained radiocarbon dates that correspond with the Late Terminal Archaic (Component 4) from four features or feature complexes. These are Feature Complex 5 (containing features 41 and 42), Feature 29, Feature 7 and Feature 13. These features and their contents will be described below, and integrated into a chronological and interpretive framework in Chapter 16.

1 Features that are dated by radiocarbon dating are not necessarily more accurately dated than those dated by other means. A single radiocarbon date may be erroneous due to many variables, including the burning of driftwood, forces of disturbance, and sampling errors. To confirm the date of a feature, and to control for use histories such as repeated or long-term occupations, it is important to run multiple dates (see Robinson 2000). This is outside of the scope of the current research, but offers future research opportunities.

Figure 14.5: Feature Complex 5 in plan and profile.



Feature Complex 5 (F41 and 42)

Feature Complex 5 was recovered from Area D, on the levee adjacent to the Jemseg River. It contained a flat, oval living floor (Features 42), with a small hearth area (Features 41) at one end. These were found in a 1 m by 2 m test unit, Unit TF 1/2 that was distant from other units, and so broader associations and patterning are unclear. The observed portions of these combined features had maximum dimensions of 111 cm by 171 cm by 5 cm deep.

Feature Complex 5 was capped by ca. 120 cm of silt and sand. The two features within Feature Complex 5 consisted of a thin lens of brown clay-loam with gravel (Feature 42) that contained a small depression containing dense concentrations of ash and charcoal (Feature 41; see Feature 14.5). Wood charcoal and butternut from this concentration produced an AMS date of 3000±90 BP (Beta-104908). In addition to the Feature 41, Feature 42 contained several smaller concentrations of charcoal, ash, charred butternut fragments, and clusters of cobbles and fire-cracked rocks. The feature fill also produced the highest density of flaked lithics on the site.

The structure of this feature complex, especially the presence of a possible hearth area in a living floor, is suggestive of a domestic structure. Although the presence of food remains such butternut reinforces this impression, the density of lithics suggests a secondary feature function as a lithic reduction area.

No pottery was recovered from this feature complex, but it produced abundant lithic artifacts. These consisted of two battered hammer stones, as well as 500 pieces of flaked stone, weighing a total of 425.6 g. A comparatively large proportion of these (58 pieces) were tools or tools fragments. These consisted of one biface with a haft element consisting of narrow side-notches, five biface tip fragments, one medial fragment of a biface, two large unifacial scrapers on side-struck flakes and one unifacial scraper bit fragment, four retouched flakes, and 44 utilized flakes (see Plate 14.2). In addition, Feature Complex 5 produced two multidirectional cores fragments, and 443 unmodified flakes.

The flaked lithic assemblage was composed of various raw materials. However, most of these types are represented by less than five specimens. Most of the petrographic types (consisting of 315 pieces, or 63% of the assemblage by piece count, weighing 317.6 g or 74% of the assemblage by weight) were various kinds of felsic (215 pieces, weighing 221.3 g), mafic (77 pieces, weighing 34.3 g) and porphyritic volcanic (23 pieces, weighing 62.0 g). The remainder of the assemblage consisted of various types of chert (consisting of 183 pieces, or 36% of the assemblage by piece count, weighing 97.5 g or 23% of the assemblage by weight). Quartz and mudstones formed a negligible component (two artifacts, weighing a total of 11.1 g).

Some of the individual types recovered from Feature Complex 5 were not found in other sample units in the LSJR. These included JC10, a glassy grey volcanic with occasional white spots (112 pieces, weighing 138.8 g) JC17, an opaque stoney light grey-green mudstone (one scraper, weighing 9.9 g), JC18, a white opaque hornfels (one piece, weighing 0.8 g), and JC 38, a purple to pink speckled volcanic (13 pieces, weighing 16.7 g). Others were very rare in other sample units.

We were able to correlate a fairly large number of the flaked lithic artifacts to particular sources or source areas. These were dominated by the local Washademoak chert, represented by 84 pieces, weighing 47.8 g. Tobique rhyolite was also well represented by 34 pieces, weighing 65.7 g. We attributed a few flakes to other source areas, including Minas Basin chert (one piece, weighing 0.2 g), Touladi chert (two pieces, weighing 0.3 g), and Kineo-Traveller Mountain Porphyry (one piece, weighing 0.4 g). A portion of a large mottled dark grey unifacial endscaper weighing 9.9 g may be made of Munsungun mudstone.

Feature 29

Feature 29 was near the middle of Area A, and consisted of a small oval hearth 19 cm deep. It was completely excavated, and was 106 cm by 71 cm in size. The hearth was composed of a dense layer of charred butternut shells and charcoal with fire-cracked rock, in a depression containing dark brown loamy sand and scattered flecks

Plate 14.2: Artifacts from Feature Complex 5; (a) a large mudstone scraper; (b) a side-notched projectile point of grey-green volcanic; (c) a grey-green volcanic biface tip; (d) distal fragment of a dark grey-green mudstone scraper.

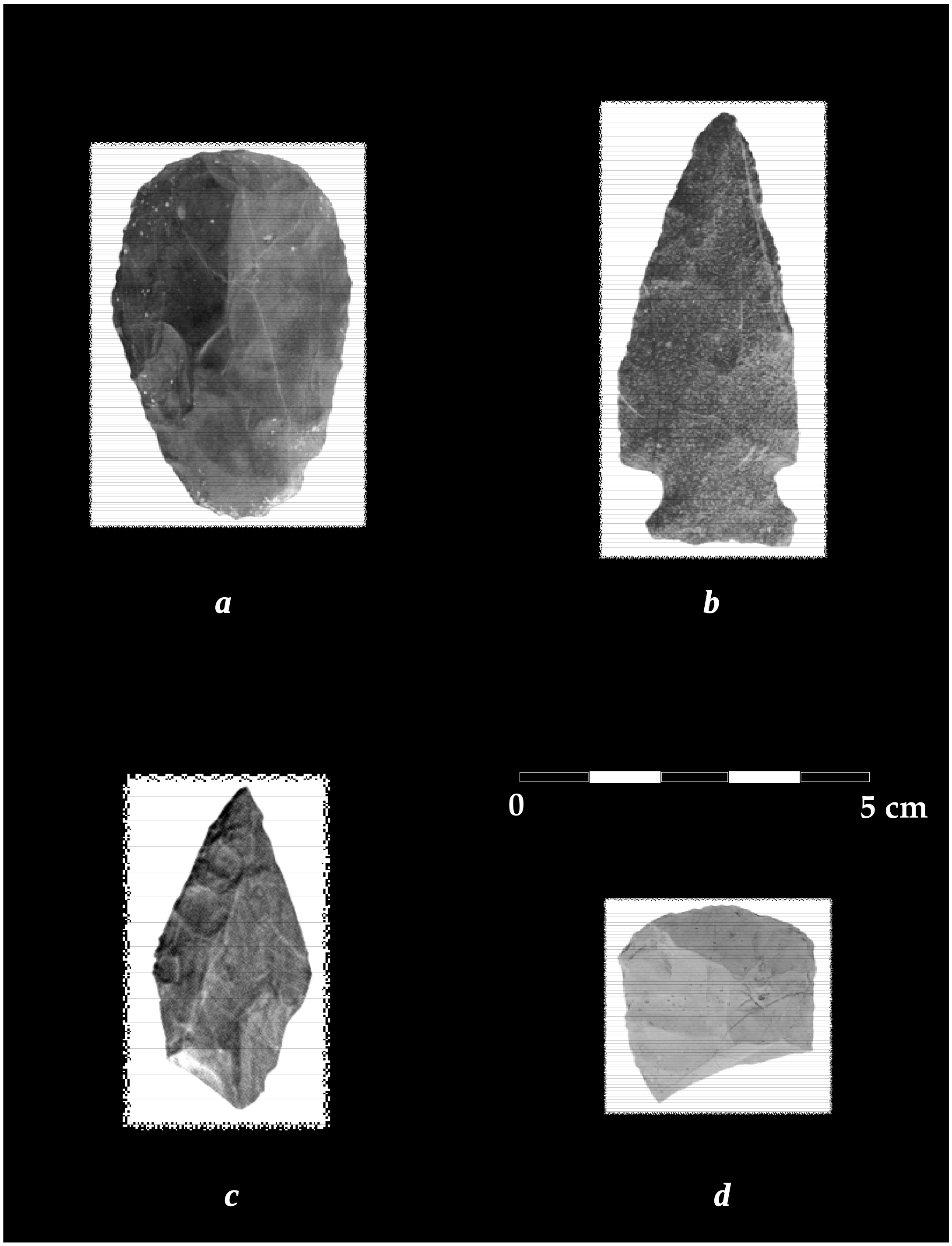
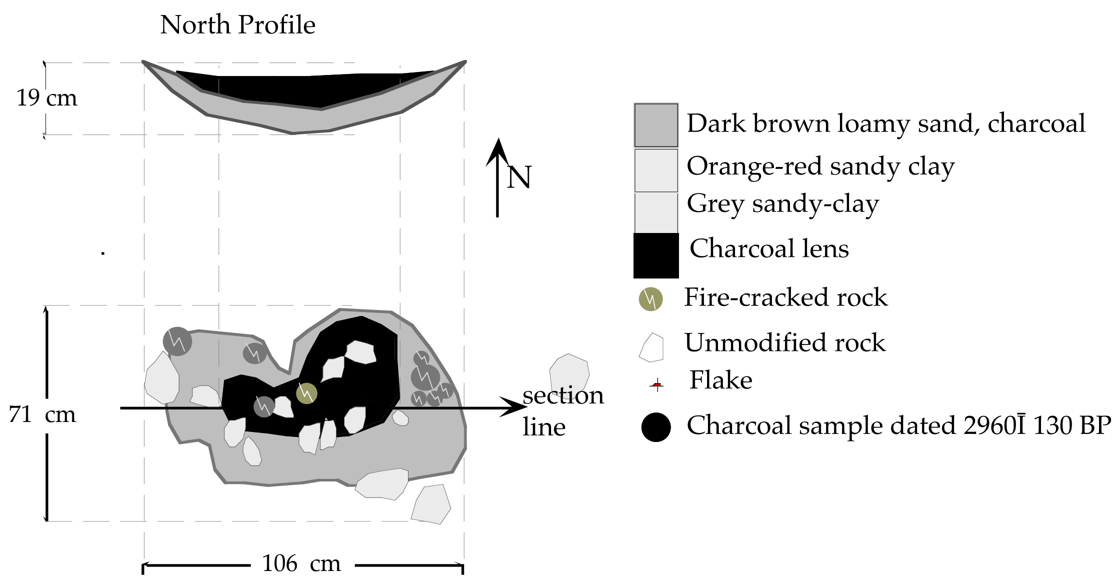


Figure 14.6: Plan view and profile of Feature 29.



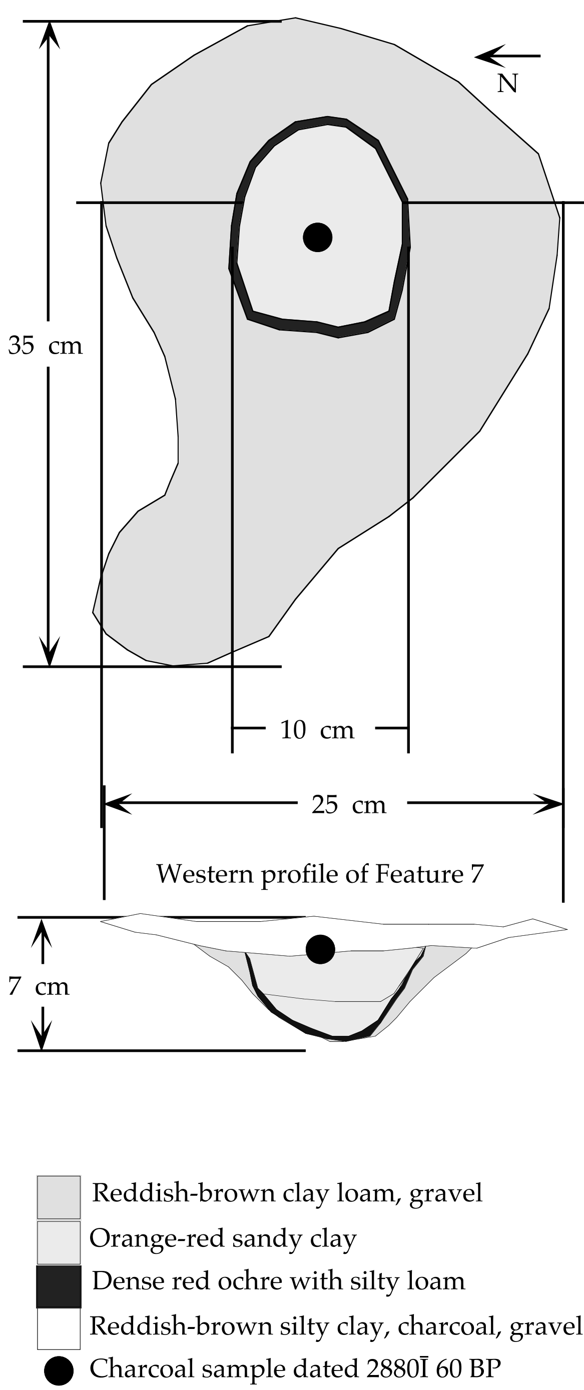
of charcoal (see Figure 14.6). Butternut shells from this feature returned an AMS date of 2960±130 BP (Beta-104907). The feature did not produce any pottery or heavy tools such as abraders, ground stone implements or hammer stones.

The feature produced a small assemblage of 14 flaked stone artifacts, weighing 17.0 g. These consisted of six tools, including one small unstemmed biface basal fragment, a bit fragment of a unifacial scraper, one retouched flake and three utilized flakes, as well as one core fragment and seven unmodified flakes. Most of these were varieties of felsic and mafic volcanics (consisting of 11 pieces, or 79% of the assemblage by piece count, weighing 11.0 g, or 65% of the assemblage by weight). The remainder of the assemblage consisted of one artifact made of porphyritic volcanic (weighing 2.2 g), and two artifacts made of chert (weighing 3.5 g).

Given the small size of the assemblage, we were able to suggest possible sources or source areas for a number the particular raw materials. These included the biface fragment, which is made of Kineo-Traveller Mountain porphyry, one small flake of Washademoak chert and one waxy red heterogenous chert core fragment, that may be either a variant of Tobique chert or Minas Basin chert.

Flotation and screening of the heavy fraction from the hearth matrix produced large quantities of microflakes which provided evidence of stone tool use and resharpening activities. The flotation also produced abundant evidence of food refuse (both plants and animal bone), primarily consisting of very large quantities of charred butternut fragments (over 2902 nut fragments weighing 161.10 g).

Figure 14.7: Feature 7 in plan and profile.



Feature 7

Feature 7 was the last feature excavated at the Jemseg site. It consisted of a shallow basin, that was 25 cm by 35 cm, and 7 cm deep. It contained a coating of red ochre. This red ochre consisted of culturally deposited hematite, likely processed to some extent. The surface of the feature contained a few small flecks of wood charcoal, and one of these allowed the feature to be dated using the Accelerator Mass Spectrometry (AMS) technique. The resulting date was 2880±60 BP (1130 Cal BC to 940 Cal BC). Although no artifacts or bones were observed within the pit, it is clearly a ceremonial feature. Red ochre is a material with special meaning for Aboriginal peoples in the Maritime Peninsula. It was used for a variety of sacred activities, such as healing and the treatment of the dead (see oral history section, above). Furthermore, although the feature was comparatively small, it was similar in shape and structure to red ochre burials that were recorded in the early 1970s at the Cow Point site, a Late Archaic cemetery five km northwest of the Jemseg Crossing site (Sanger 1973, 1991). Cow Point is considered to have been in use around 4000 years ago, almost 1000 years before the red ochre feature at Jemseg.

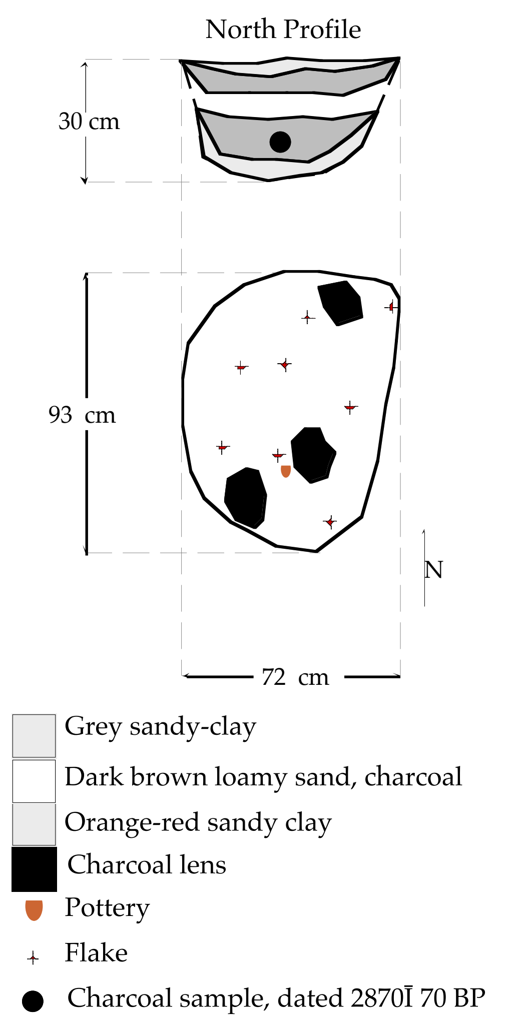
This feature was significantly different from any other feature excavated during the JCAP to that point. While we had clear evidence of habitation-related activity in other parts of the site, there was a pattern of cultural continuity visible in the Jemseg assemblage from the Late Archaic to the Terminal Archaic, and as a result we considered the possibility that this feature might be a Late Archaic-style red ochre burial. As a result, we halted all further excavation of the site. Subsequently, the Department of Transportation shifted the approach of the bridge to avoid the site completely.

Feature 13

Feature 13 was near the southern edge of Area A, and was completely excavated. It was a 30 cm deep basin-shaped feature that was 72 cm by 93 cm in size. It contained dark brown loamy sand with scattered charcoal flecks, with small lenses or discrete pockets of charcoal, capped with grey sandy clay (see Figure 14.8). This structure is suggestive of a domestic fire-pit, or an ash and charcoal refuse pit. The cap of grey sandy clay did not contain any artifacts, and may be a post-occupation deposit resulting from flooding. We recorded similar sterile clay layers capping basin-shaped features in other parts of the upper terrace (Area A), an observation that supports this inference (see Feature Complex 3, above).

Our initial interpretations, based on the presence of diagnostic pottery and the proximity of F13 to F14, a dated Early Maritime Woodland feature (see below), was that F13 could have a similar affiliation. However, wood charcoal from one of the lenses in the feature fill returned a radiocarbon date of 2870±70 BP (Beta-156019). This date suggests an affiliation with the Terminal Archaic. The dates from Feature 13 and 14 do not overlap at two standard deviations, either as uncalibrated or calibrated dates. In general terms, this signifies that the uncalibrated date from F13 is 95% likely to be older than 2730 BP (or if calibrated, is 95% likely to be older than 2800 Cal BP, or 850 Cal BC), while the uncalibrated date from F14 is 95% likely to be younger than 2660 BP (or if calibrated is 95% likely to be younger than 2765 Cal BP, or 815 Cal BC). Despite the lack of overlap between these dates, it remains possible that there is not a large gap between them. Furthermore, while we must consider the

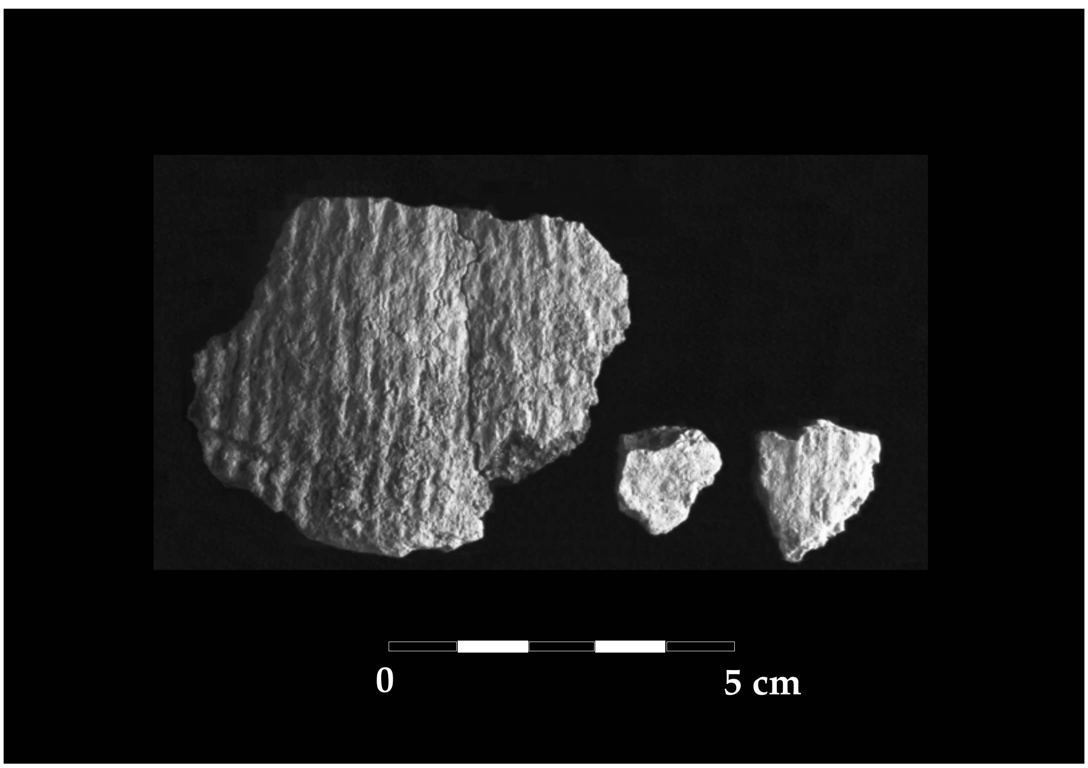
Figure 14.8: Feature 13 in plan and profile.



possibility of the “old wood effect” (resulting from the burning of driftwood, and other standing deadwood), presence at the Jemseg Crossing sites of components that bridge the Terminal Archaic to the Early Maritime Woodland requires that we consider the possibility that it is an accurate date. The only reason why we might consider this date to be anomalously old is the association with it of early types of pottery. However, we clearly do not have an explicit understanding of the appearance of early pottery types in this region to reject this date on these grounds. The implications of this date will be discussed in Chapter 16, below.

We recovered one large sherd of CP 1 (or "Vinette I" style) pottery from within the feature fill of F13, as well as four similar sherds from the undisturbed alluvium immediately adjacent to the feature (see Plate 14. 3). These sherds have been attributed to Vessel 2 (Bourgeois 1999, and this volume). Although we did not recover any ground stone tools, abraders or hammer stones from F13, this feature produced a small assemblage of 35 flaked stone artifacts. Only three of these are tools, consisting on two biface medial sections, as well as a single utilized flake. In addition, the unit produced one multidirectional core and 31 unmodified flakes.

Plate 14.3: Ceramic sherds (CP 1) recovered from within and adjacent to Feature 13.



The assemblage from F13 is dominated by felsic and mafic volcanics. These consist of 29 pieces (or 83% of the assemblage by piece count) weighing 15.1 g (or 55% of the assemblage by weight). The remainder of the assemblage is a few pieces of chert and quartz (six pieces, or 16% of the assemblage by pieces count, weighing 12.5 g, or 45% of the assemblage by weight). We related a few pieces to source areas, including two possible flakes of Minas Basin chert, and one Washademoak chert core.

The assemblage from the disturbed plough zone above the feature was uninformative, consisting of flakes (some utilized or edge-damaged) and a medium-sized, unstemmed biface of bleached volcanic.

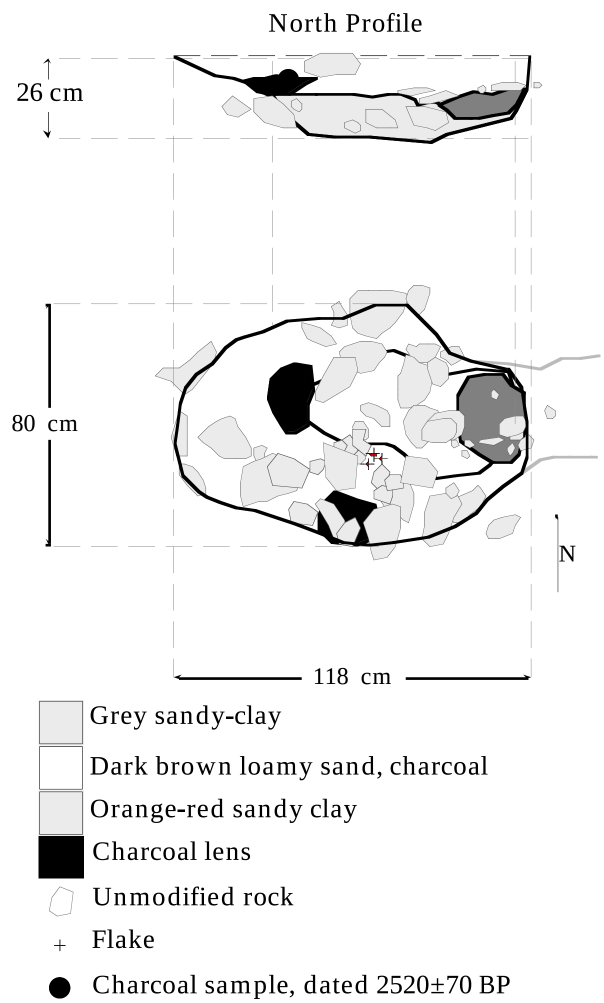
EARLY MARITIME WOODLAND 1 (COMPONENT 5) - FEATURES WITH ABSOLUTE DATES

Our initial view of the site was that it contained a sizeable component dating to the earlier Early Maritime Woodland, and in particular, to the Meadowood phase. This impression was based on the presence of Meadowood-like artifacts in the plough zone, and our first radiometric date from the site, the date from Feature 14 (below). However, as the project progressed, we observed that few intact archaeological features contained these kinds of artifacts, and despite numerous assays, only two features returned EMW1 dates, Feature 14 and Feature 56. The implications of this pattern will be discussed in Chapter 16, while these two features will be described, below.

Feature 14

Feature 14 was within two metres of Feature 13, near the southern edge of Area A. It was completely excavated, revealing a 26 cm deep basin-shaped hearth, that was 80 cm by 118 cm in size. The hearth contained abundant cobbles and fire-cracked rocks, in dark brown loamy sand with scattered charcoal, in flecks and in small concentrations (see Figure 14.9). Under the loamy sand was a layer of orange sandy-clay. The upper surfaces of Feature

Figure 14.9: Feature 14 in plan and profile.



14 showed some evidence of disturbance by ploughing, including a scatter of cobbles, fire-cracked rock and grey sandy clay trailing off to the east of the feature itself. In with the wood charcoal, we encountered scattered calcined bone, and a few charred plant materials including nut fragments. A pocket of wood charcoal from near the bottom of the dark brown loamy sand produced an AMS date of 2520±70 BP (Beta-101508).

Feature 14 did not produce any pottery or ground stone tools, abraders, or hammer stones. However, it did produce a very small assemblage of 13 flaked stone artifacts, weighing 18.9 g. Only one of these, a portion of a large heavily utilized flake, could be considered a tool. The remainder of the assemblage consisted of a fragment of a bifacial core, and 11 unmodified flakes.

The assemblage consisted largely of felsic and mafic volcanics (11 pieces or 85% by piece count, weighing 17.3 g, or 92% of the assemblage by weight). The remainder included a semi-translucent pink chert flake from an unknown source, and a flake of white quartz. All of these materials could be from local cobble sources, and none of them could be related to any of sources or source areas.

Despite the absence of analysable materials from within and adjacent to Feature 14, the disturbed plough zone immediately above the feature produced several formal tools, including the base of an unstemmed biface made of bleached volcanic, an opaque red volcanic or mudstone bifacial scraper, and four retouched or utilized flakes. These artifacts may or may not be functionally or temporally related to Feature 14.

Feature 56

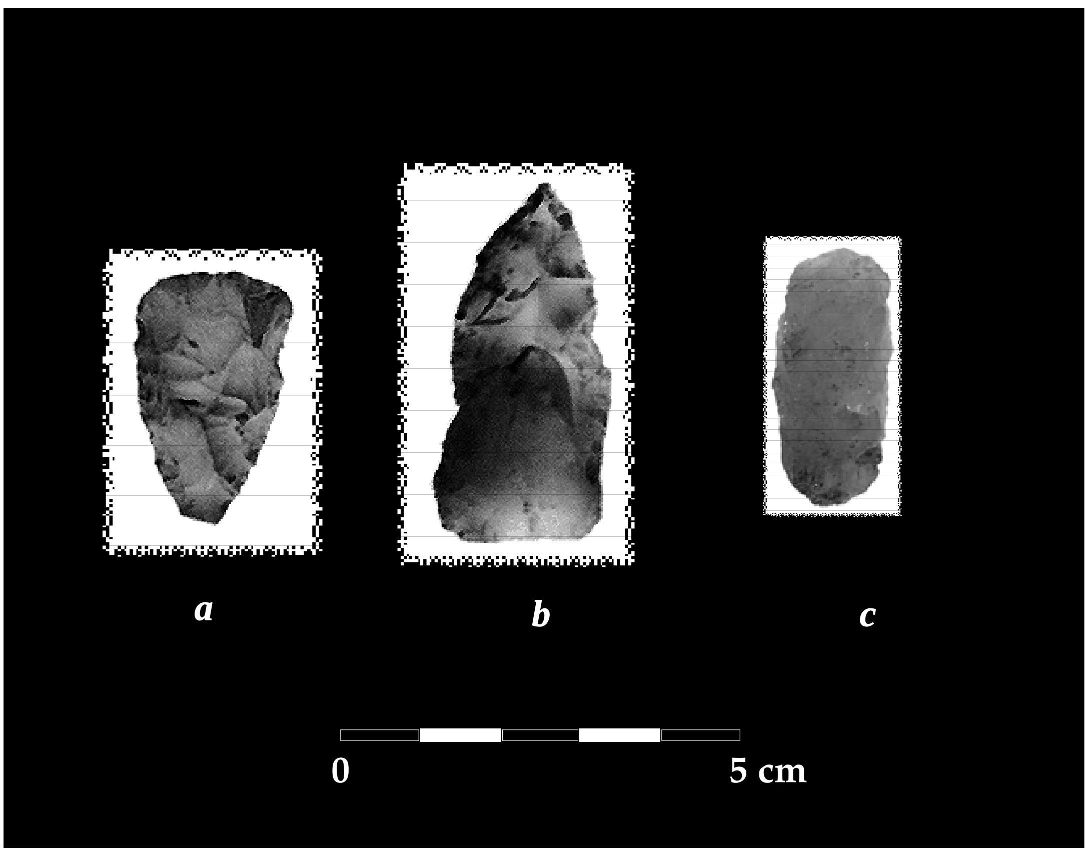
We found Feature 56 in the southwestern corner of Area A. It consisted of a small oval pit containing dark brown loamy sand flecked with charcoal and containing several patches of charcoal. Feature 56 was only partially excavated as it travelled into the unexcavated western edge of Area A, but it was ca. 100 cm wide, and ca. 25 cm deep. Based on its inferred size and contents, it may be a pit hearth or a refuse pit. One of the pockets of charcoal returned an AMS date of 2460±60 BP (TO-9618).

Feature 56 contained 80 sherds of CP1 fabric-impressed ceramics consisting of portions of at least two vessels (designated vessel 1 and vessel 10, Bourgeois 1999, and this volume). The lithic assemblage consisted of 46 pieces of flaked stone, weighing 158.8 g. Of these, seven were modified into tools. These included an unstemmed bifacial knife with retouch and polish on one margin near the tip, a medial biface fragment, a bifacial scraper, two medium-sized unifacial scrapers, one utilized or retouched core, and one utilized flake (see Plate 14.4). It also produced one very large, thick, bifacial core, and 38 unmodified flakes.

The lithic assemblage from F56 consisted of various types of cherts (24 pieces, or 52% of the assemblage by piece count, weighing 140.2 g, or 88% of the assemblage by weight) and volcanics (22 pieces, or 48% of the assemblage by piece count, weighing 18.5 g, or 12% of the assemblage by weight). Quartz, quartzite, mudstones and sandstones were absent. The most common material that could be assigned to a particular source was the local variant of chert, Washademoak chert (19 pieces, weighing 130.2 g). We were able to assign a few other artifacts to possible source. The biface medial section is made of a blue-grey heterogeneous moss agate or chert that may be from Minas Basin (weighing 0.7 g). In addition, a few other very small flakes may be assigned to Touladi chert (one piece, weighing 0.1 g), Minas Basin chert (one piece, weighing 0.2 g) and Kineo-Traveller Mountain porphyry (one piece, weighing 0.1 g).

When combined with the presence of CP1 pottery, this subassemblage is Meadowood-like in form and composition. However, the particular suite of raw materials in the F56 assemblage, with its

Plate 14.4: Artifacts from within and near to Feature 56; (a) a bifacial scraper made of Washademoak chert, (b) an unstemmed biface, with fine retouch and polish on one lateral margin, made of Washademoak chert, and (c) a bifacial scraper made of quartz.



focus on brightly coloured, local, translucent to semi-translucent cherts, is unlike Meadowood assemblages elsewhere.

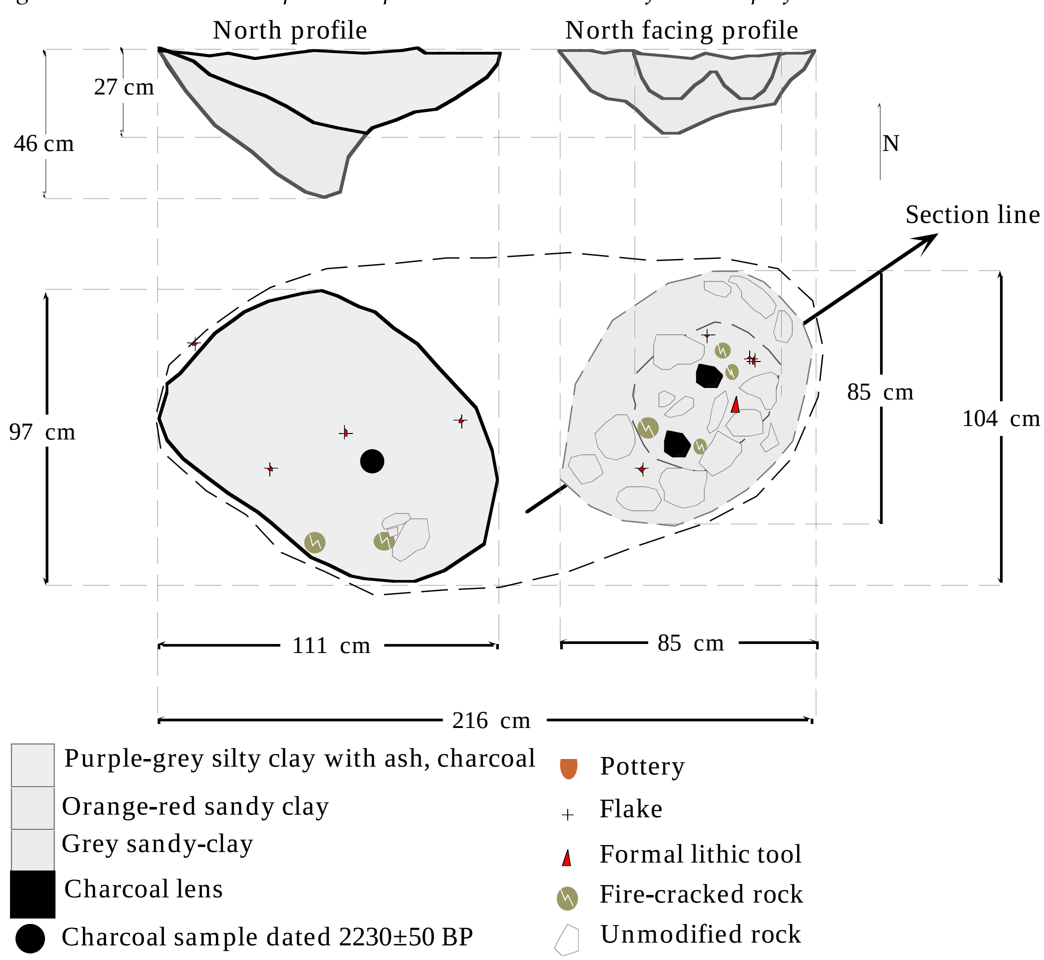
The plough zone above Feature 56 produced several unmodified flakes, a unifacial scraper of Washademoak chert, an oval bifacial scraper made of Washademoak chert (Plate 14. 4a) and a small bleached volcanic biface. This latter artifact is similar in morphology to bifacial scrapers encountered elsewhere on the site, but lacks a steep working edge. It may be a bifacial scraper preform.

The implications of this feature for our interpretation of the Early Maritime Woodland component at Jemseg will be discussed in Chapter 18, below.

EARLY MARITIME WOODLAND 2 (COMPONENT 6) - FEATURES WITH ABSOLUTE DATES

There is a significant increase in the available information about the later Early Maritime Woodland (EMW2 or Component 6), both in the number of features, and in their size, complexity and contents. We recorded four features that date to the later EMW, including Feature Complex 4 (feature

Figure 14.10: Feature Complex 4 in plan (at 30 cm below surface) and profile.



25), Feature Complex 2 (feature 11), Feature Complex 6 (designated by feature numbers 43, 44, 45 and 46), and Feature Complex 1 (designated by feature numbers 1, 2, 3, 4, and 5)

Feature Complex 4 (F25)

Feature Complex 4, a medium-sized bilobal, basin-shaped complex (designated by the feature number 25), was near Feature Complex 3, near the northern edge of Area A (see Figure 14.10). It was completely excavated, and its maximum dimensions were 104 cm by 216 cm, with a depth of 46 cm. The complex was composed to two discrete portions. The western portion consisted of purple-grey silty clay with ash, patches of charcoal and a few fire-cracked rock over a thick layer of orange sandy-clay, while the eastern portion consisted of orange sandy-clay surrounding concentrations of charcoal and fire-cracked rock. Parts of Feature Complex 4 were capped by a grey sandy-clay similar to the post-occupational clay observed in Feature Complex 3. Butternut fragments were found within the charcoal, and a concentration of charcoal from the western lobe produced an AMS date of 2230±50 BP (Beta-105889).

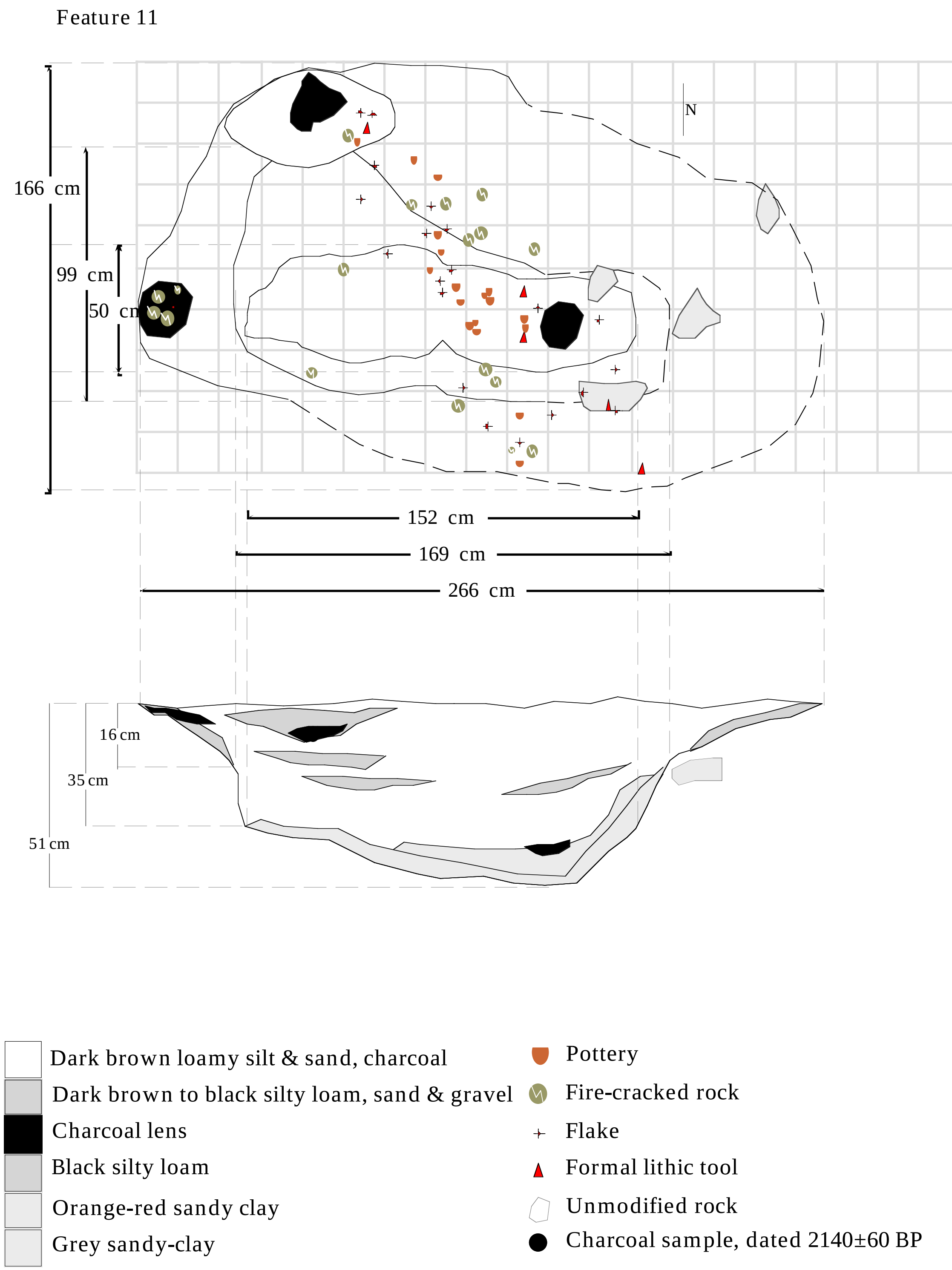
The feature complex did not produce any pottery, but a few lithic artifacts were recovered, consisting of nine pieces, weighing 51.8 g. These included a bifacial scraper, a large retouched flake, and a utilized flake, as well as six small, unmodified flakes. The lithic assemblage from Feature Complex 4 was dominated by felsic and mafic volcanics (seven pieces or 78% of the assemblage by piece count, weighing 41.1 g, or 79% of the assemblage by weight), and chert (two pieces or 22% of the assemblage by piece count, weighing 10.7 g, or 21% of the assemblage by weight. None of these artifacts could be firmly linked with known sources or source areas, although the bifacial scraper is made of a glassy black chert that may originate in the Tobique River watershed, in the middle SJR (Keenlyside 2001: pers. comm.).

Feature Complex 2 (F11)

Feature Complex 2 was located in the southeastern portion of Area A. It was assigned the feature number 11 during the preliminary analysis, with no designation of internal components. It was fully excavated, and had maximum dimensions 207 cm by 332 cm, and was 51 cm deep. Feature Complex 2 consisted of a deep, basin shaped complex of hearth areas with multiple lenses of dark, organic layers and charcoal-rich lenses (see Figure 14.11). We have interpreted this feature complex as representing a semi-subterranean house floor (see Sanger 1987, 1996b). The basin-shape of the feature may circumscribe the perimeter of the structure (in which case this feature represents a small wigwam), or the basin represents a communal domestic area in a larger structure that may have been flanked by sleeping "benches".

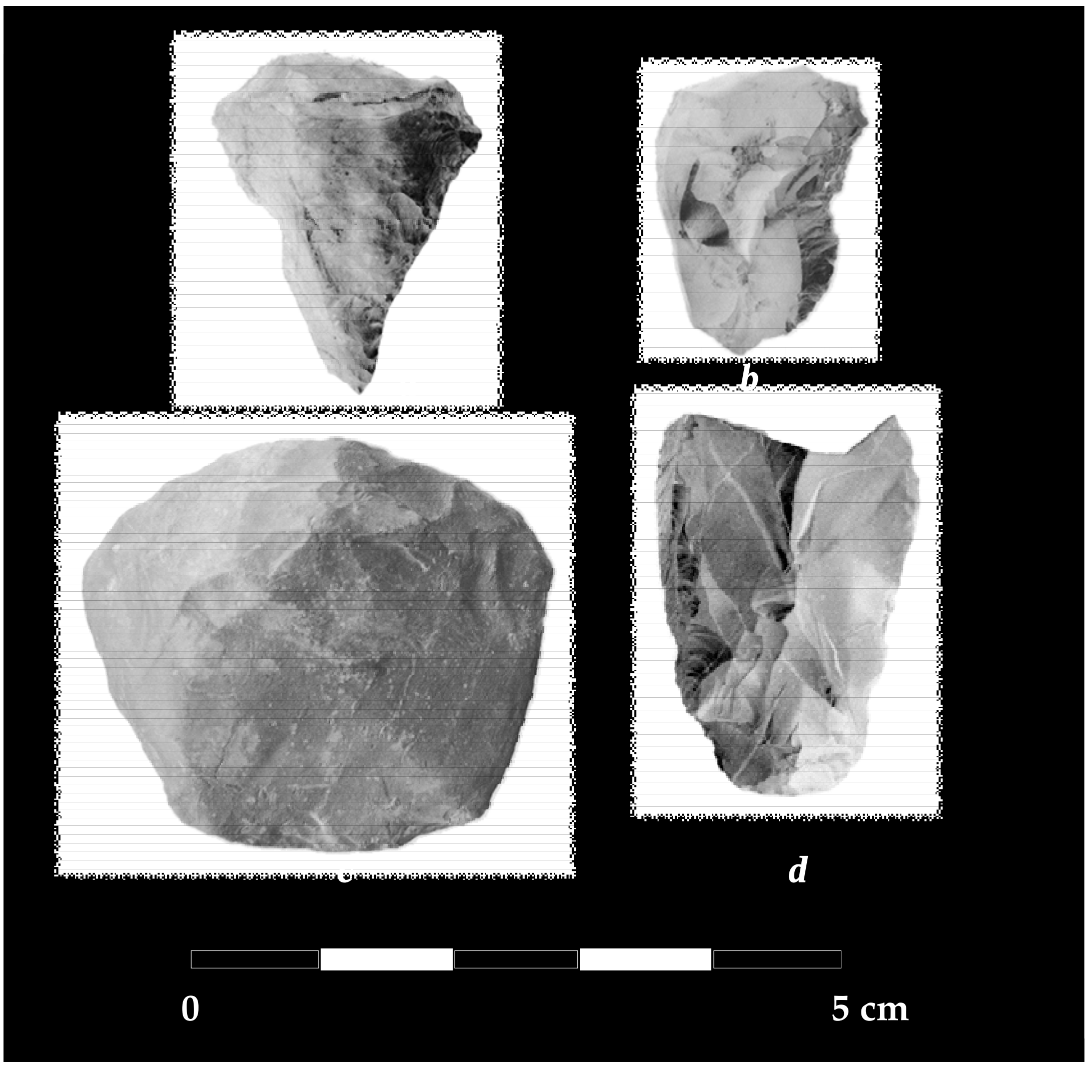
The internal layering within the basin-portion of the feature matrix may indicate that the feature complex was successively occupied and periodically abandoned. Three discrete hearth areas were encountered, consisting of dense deposits of

Figure 14.11: Feature Complex 2 (F11) in plan view and profile.



charcoal and ash with fire-cracked rock. One of these concentrations, from the top half of the feature, produced a radiocarbon date of 2140±60 BP (Beta-105892). Based on the location of the sample within the feature complex, the date likely represents a later period of use. The feature contains abundant lithic artifacts, as well as pre-contact pottery, unmodified cobbles and fire-cracked rock. Some of the lithic artifacts from within or near Feature Complex 2 may be anomalously old (especially a spurred endscraper, see Dickinson 2001, and Dickinson, this volume). Although the assignation of these artifacts to older periods is uncertain, older artifacts may

Plate 14.5: Tools from within or above Feature Complex 2 (feature 11); (a) a blue-grey mottled chert unifacial scraper with graving spurs and extensive margin retouch, (b) a small unifacial scraper with graving spurs, made of Washademoak chert, (c) a large, bleached volcanic unifacial scraper, and (d) a mottled chert unifacial scraper (possibly from Minas Basin), with bit broken.



suggest displacement during the construction of the feature, or may suggest that deeper parts of the feature are unrelated to more shallow portions.

Feature Complex 2 produced least two pottery vessels consisting of 80 sherds. Both of these are fabric-impressed pottery that conform to CP 1 (Petersen and Sanger 1991, see Bourgeois 1999, as well as Bourgeois, this volume), and are similar to Vinette I pottery types from elsewhere in the Northeast. This feature complex also produced calcined bone fragments, and a sizeable assemblage of charred plant material. These include elderberry, bush honeysuckle, and knotweed seeds, a delta seed (from an aquatic plant), 90 butternut fragments (31.16 g), a possible nicotiana (tobacco) seed , and charred hemlock and spruce needles.

Although Aboriginal people in the broader Northeast have been cultivating tobacco for very long periods of time, this is very early for the Maritimes. Unfortunately, given the fragmented nature of the specimen, and the presence of intrusive post-contact artifacts and modern seeds within the feature, statements about early tobacco use (either traded or cultivated) will depend on a future AMS date of the sample itself.

Monckton (pers. comm.) has suggested that hemlock and spruce needles are possibly indicative of kindling or firewood, although these materials could also be used in a number of other ways, including as medicines, structural elements (roofing), bedding or organic temper for pottery.

Non-flaked stone tools included an abrader and a hammer stone. The flaked lithic assemblage consisted of 101 pieces, weighing 342.6 g. This assemblage included 15 tools and tools fragments, weighing 116.5 g, and 86 unmodified flakes and cores, weighing 226.1 g. The tools are generally informally styled. Although five biface fragments were recovered, all of these had comparatively little surface thinning, with functional emphasis on bifacial margin retouch. The single formal scraper was a relatively large endscraper made of a heavily bleached material (Plate 14.5c). The remainder of the tools consists of one retouched chopper core, one retouched flake, two retouched or utilized core tools, and five utilized flakes.

The flaked lithic assemblage was made from a diverse array of raw materials. The assemblage was dominated by various types of felsic and mafic volcanics (73 pieces, or 72% of the assemblage by piece count, weighing 218.1 g or 64% of the assemblage by weight) and cherts (23 pieces, or 23% of the assemblage by piece count, weighing 91.9 g, or 27% of the assemblage by weight). Quartz and mudstones comprise the remainder of the assemblage (four pieces, or 4% of the assemblage, weighing 32.2 g, or 9% of the assemblage by weight). Comparatively few of the raw materials in Feature Complex 2 could be correlated to particular sources or source areas. Most of these were made of the local Washademoak chert (13 pieces, weighing 66.1 g). However, the feature complex also contained specimens that may be made of Minas Basin chert (two pieces, weighing 4.7 g), Munsungun mudstone

(one piece, weighing 30.1 g), Touladi chert (two pieces, weighing 1.2 g) and Tobique chert (one piece weighing 0.9 g).

The plough zone above Feature Complex 2 also produced abundant lithic artifacts, including 288 flakes, 10 unifacial scrapers, one quaternary unstemmed biface, one bifacial scraper, and 11 retouched flakes. Some elements of this disturbed assemblage may be anomalous, especially a spurred endscraper made of Munsungun chert (see Dickinson, this volume).

Feature Complex 6 (F43 to 46)

Feature Complex 6 was found in Area D, on the levee adjacent to the Jemseg River. Feature Complex 6 was only partially excavated through a scattering of 1 m by 2 m units impeding the analysis of extent and relationships. Nonetheless, we were able to identify four interrelated features consisting of feature numbers 43, 44, 45, and 46. The relationships between these features were inferred based on cross-mending artifacts (especially pottery), and through proximity, stratigraphic relationships, and intergrading feature boundaries. These features appear as patches of orange sandy-silt and dark brown loamy silt, with lenses of ash and charcoal, calcined bone fragments, charred nut fragments, and artifacts.

We could not infer a maximum size of this feature complex due to the scattered and minimal extent of excavation units, but it is minimally larger than 3 m by 4.8 m, the extent revealed within the test units. The heterogeneity of the internal structure of this complex of features, as well as its large size, is reminiscent of the large feature complexes from Fulton Island (Foulkes 1981). These may represent repeated small

Plate 14.6: Artifacts from Feature Complex 6; Specimen # 270, pecked and pitted stone tool ("nutting" stone).

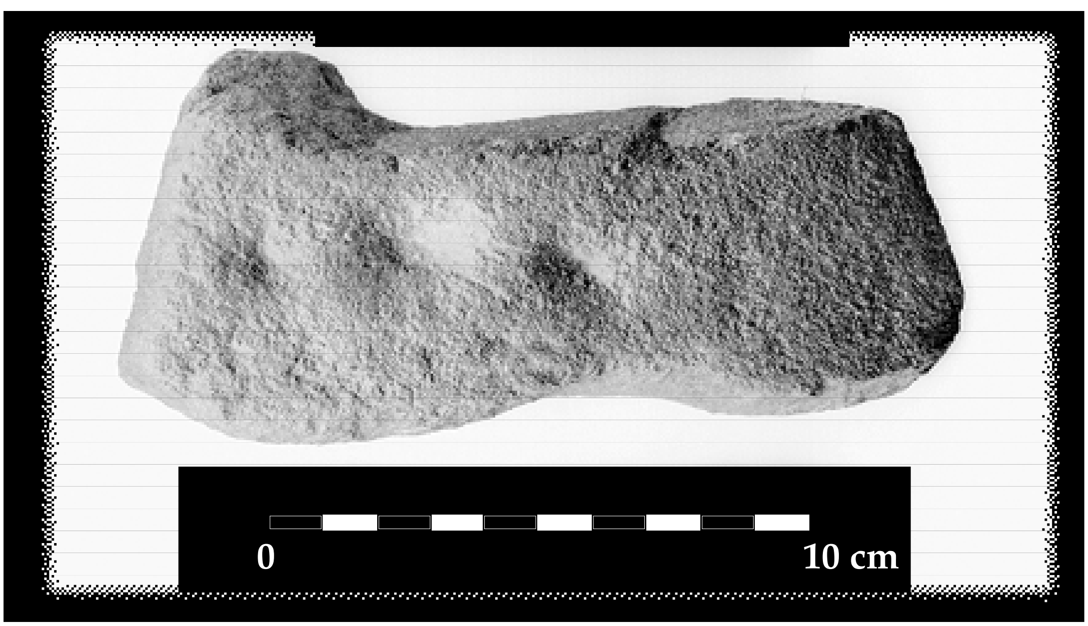
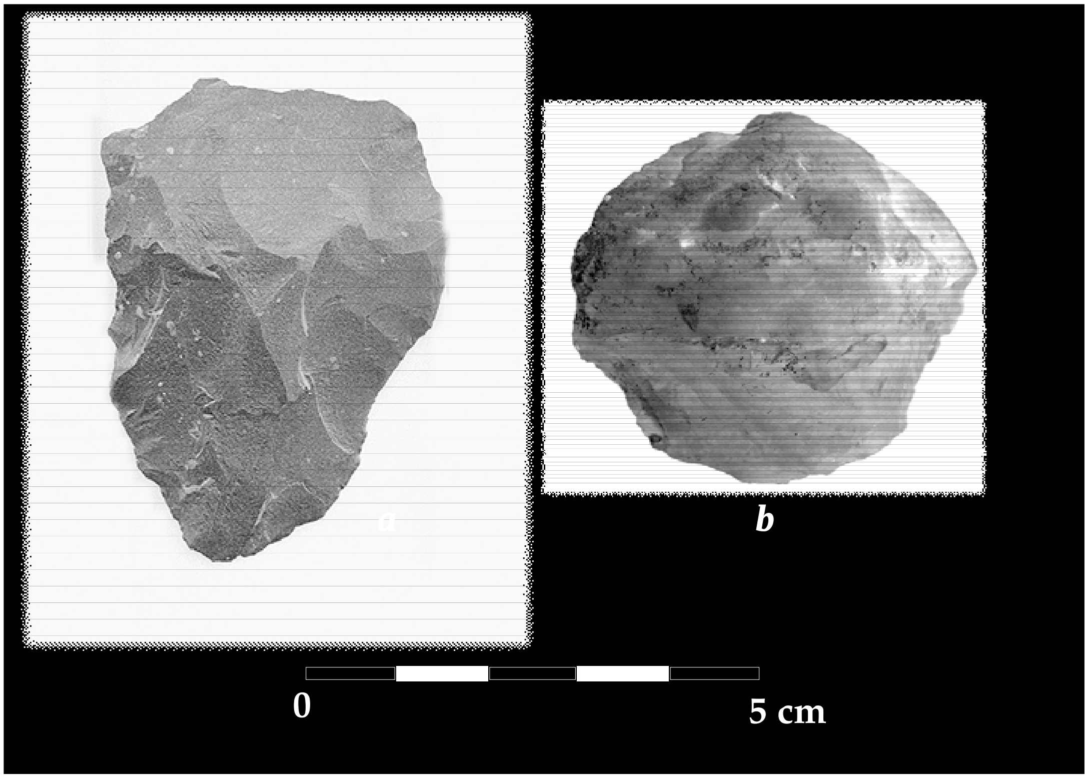


Plate 14.7: Artifacts from Feature Complex 6; (a) a large unifacial scraper with graving spur, made of bleached volcanic, (b) a unifacial scraper on a bipolar core made of quartz.



scale occupation, or a single campsite composed of related small wigwams, or may represent a single integrated large house feature. One of these features (Feature 43) produced wood charcoal, from which we obtained an AMS date of 2060±40 BP (Beta-105999).

Feature Complex 6 produced 50 sherds from two vessels (Vessel 6 and Vessel 11). Vessel 6 was found in Features 43 and 45, and Vessel 11 was found in Features 43, 44, and 46. It also produced an array of lithic artifacts, including one abrader and a medium sized assemblage of flaked lithics (177 pieces, weighing 198.7 g). Comparatively few of these artifacts had been modified into tools, with the exception of three medium-sized unifacial scrapers and six utilized and retouched flakes. Although the sample unit did not produce any cores, we recovered 167 unmodified flakes.

Given its moderate size compared to others in the sample, this assemblage was composed of a large array of raw materials. The assemblage is balanced between types quartzite, mafic volcanics, quartz, and chert, with felsic volcanics, porphyritic volcanics, and mudstones making up minority classes. The proportion of raw material classes present in the Feature Complex 6 sample are presented in Table

Table 14.2: Raw material classes from Feature Complex 6 at the Jemseg Crossing site.

Lithic class	No. pieces	% by piece count	Weight	% by weight
Quartzite	51	29%	50.6	25%
Mafic volcanics	51	29%	42.2	21%
Quartz	41	23%	76.0	38%
Chert	18	10%	20.5	10%
Felsic volcanics	4	2%	1.2	1%
Porphyritic volcanics	3	2%	0.7	0%
Mudstones	3	2%	1.3	1%

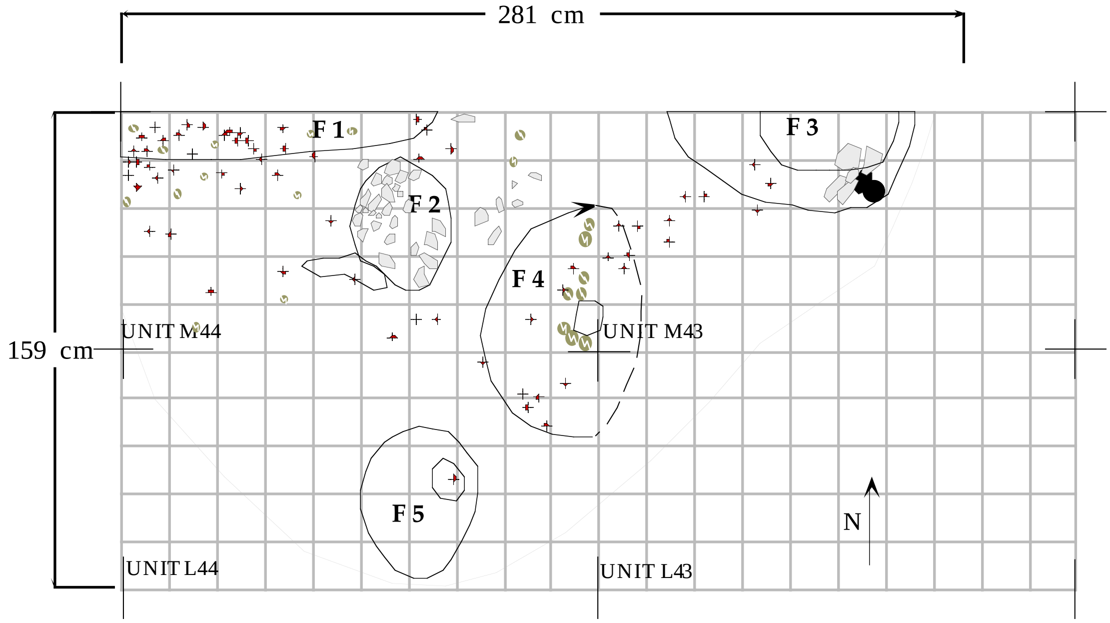
14.2. This pattern is contrary to the general trends observed elsewhere at the Jemseg Crossing site, where felsic volcanics are common, and quartzite and quartz is generally very rare.

We associated several artifacts from the Feature Complex 6 assemblage with known sources and source areas. These were not dominated by any particular type, but were distributed between a variety of types, including Kineo-Traveller Mountain porphyry (three pieces, weighing 0.7 g), Minas Basin chert (six pieces, weighing 0.7 g), Munsungun mudstone (one piece, weighing 0.5 g), Onondaga chert (two pieces, weighing 7.5 g), Ramah bay metaquartzite (two pieces, weighing 0.8 g), Touladi chert (two pieces, weighing 2.0 g), and Washademoak chert (four pieces, weighing 5.1 g). The composition of these "sourced" types is also somewhat anomalous, in both the range of types present, and in the apparent lack of focus on local and regional types, such as Washademoak chert and Tobique rhyolite.

Feature Complex 1 (F1 to 5)

Feature Complex 1 was encountered in the northwest corner of area A, and consisted of Features Nos. 1, 2, 3, 4, and 5. It was only partially excavated as it extended into the north and west walls of Area A. Even given these limitations, this feature complex minimally measured 200 cm by 350 cm in size. The separate feature numbers designated different parts of the feature complex. Feature 1 consisted of a 45 cm broad thick, basin-shaped lens of grey clay-sand with scattered charcoal, fire-cracked rock, and abundant lithic artifacts. Feature 2 was immediately adjacent to Feature 1 and consisted of an oval patch of flat cobbles and rocks lying in a single layer in a flat orientation suggestive of “paving”. Feature 3 consisted of a small shallow (ca. 9 cm deep) basin-shaped feature consisting of charcoal stained brown loamy-sand containing rocks, some fire-cracked and abundant flakes. Feature 4 was a deep (ca. 39 cm deep) basin-shaped pit containing

Figure 14.12: Plan view of Layer 3 (ca. 40 to 65 cm below surface) of Feature Complex 1 at the Jemseg Crossing site. This complex is comprised of Features 1 to 5, indicated by hatched area. This area was incompletely excavated, as indicated by the sharp boundary on the western margin (see Figures 14.13 to 14.17 for details and key).



flakes, calcined bones and charred butternut husks. The upper 10 cm of Feature 4 consisted of grey sandy clay with charcoal while the lower levels consisted of charcoal and patches of ash within orange-red sandy clay. Feature 5 was a very thin lens of grey sandy-clay, flecked with charcoal surrounding a small patch of hard-packed grey clay with gravel. Feature 5 also produced calcined bone fragments. The excavators noted patterns of soil compaction and the distribution of artifacts and crushed charcoal between the features of Feature Complex 1, leading them to infer a degree of contemporaneity.

Wood charcoal from Feature 3 produced a AMS date of 1940±40 BP (TO-9619). This places Feature Complex 1 in the later Early Maritime Woodland (EMW2). Given our assumptions of contemporaneity, Feature Complex 1 exhibits a significant degree of internal differentiation and complexity. These different parts may represent activity areas within a single domestic structure (a large *wikuwam* or wigwam), or a camp site composed of a number of smaller tents or wigwams.

Feature Complex 1 did not produce any ceramic artifacts, or ground stone tools, hammer stones or abraders. However, it produced abundant flaked lithics. These consisted of 420 artifacts, weighing 932.7 g. This assemblage produced a fairly high number of tools, including 48 tools and tool fragments (weighing 382.9 g), as well as 372 unmodified flakes and cores (weighing 549.8 g). The tools included three unstemmed bifaces and biface base fragments, seven biface tips and medial sections, one unifacial scraper, 10 retouched

Figure 14.13: Feature 4 of Feature Complex 1, which consisted of an upper layer 10 cm thick, of grey sandy clay with charcoal; lower levels consisted of charcoal and patches of ash within orangey-red sandy clay. Feature 4 contained flakes, calcined bone and charred butternut (see key, bottom next page).

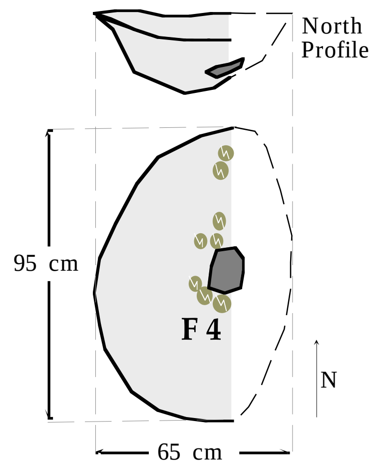
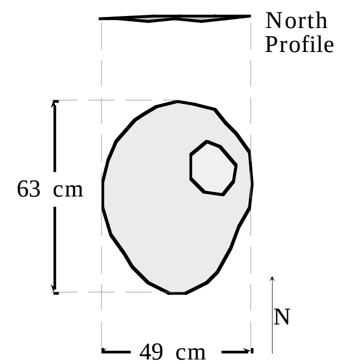


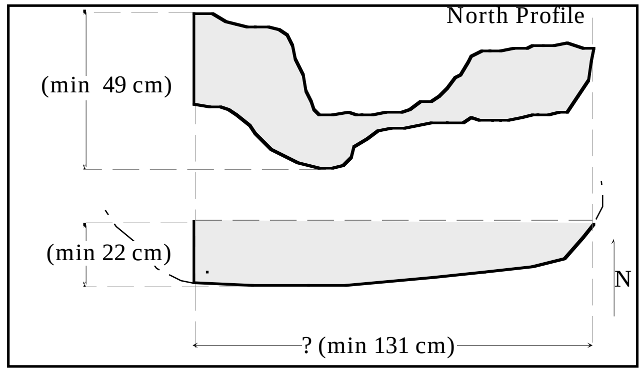
Figure 14.14: Feature 5 of Feature Complex 1 consisted of grey sandy-clay, flecked with charcoal; a small lens of hard-packed grey clay with gravel was found near the middle; calcined bone fragments and flakes were in direct association (see key bottom next page).



flakes, 23 utilized or retouched flakes, and four utilized or retouched core tools (Plate 14.8). In addition, Feature Complex 1 produced six core fragments that exhibited little evidence of modification for or by use.

The lithic artifacts in Feature Complex 1 were made of diverse raw materials. These materials were dominated by various types of felsic and mafic volcanic (consisting of 313 pieces, or 75% of the assemblage by piece count, weighing 365.8 g, or 39% of the assemblage by weight). Most of these appear to be local varieties that could be procured from both bedrock outcrops (primary sources) and cobble beds (secondary sources). Very few pieces could be attributed to more distant sources (with the exception of one small piece of Tobique rhyolite). The unit also produced quantities of chert, especially the local, semi-translucent, brightly-coloured, Washademoak chert (consisting of 72 pieces, or 17% of the assemblage by piece count, or 520.2 g, or 56% of the assemblage by weight). Other chert varieties (including five possible pieces of Minas Basin chert and four possible pieces of Touladi chert), added an additional 22 pieces, weighing 35.1 g. Many of the Washademoak chert pieces were large blocky, shattered fragments produced by primary stages of reduction, and core fragments, resulting in their high proportion of the assemblage by weight. The remainder of the assemblage consisted of negligible amounts of porphyritic volcanic (but notably including four small pieces of Kineo-Traveller Mountain porphyry), as well as quartz and

Figure 14.15: Feature 1 of Feature Complex 1, a broad irregular (slightly basin-shaped) lens of grey sandy-clay, containing abundant flakes, fire-cracked rock and flecks of charcoal (see key below).



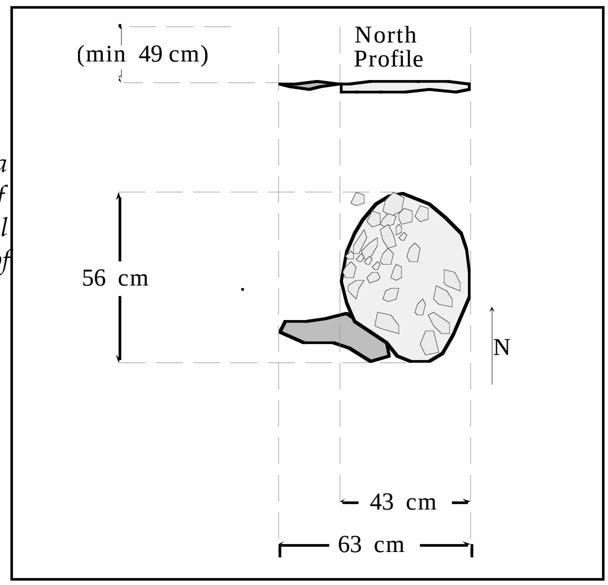
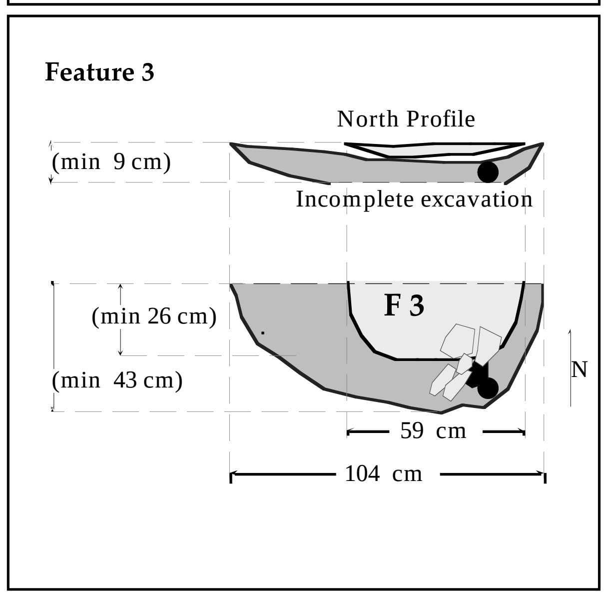


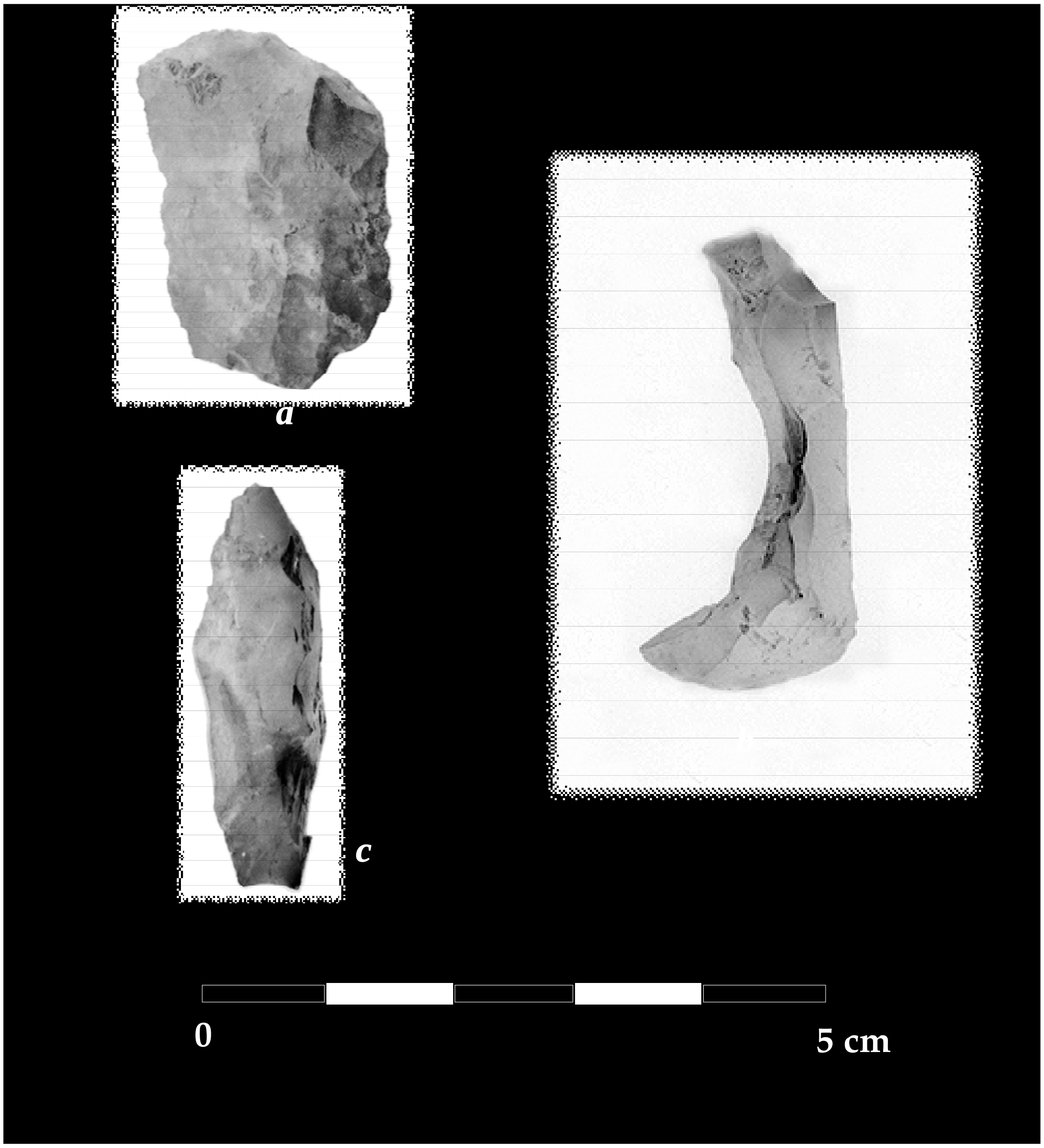
Figure 14.16: Feature 2 of Feature Complex 1, an oval patch of flat cobbles and rocks, lying in a single layer, in a flat orientation within a lens of grey sandy-clay with abundant gravel and small rocks. A few flakes and a broad irregular patch of charcoal flecked soil in direct association. The rocked area lay directly above a layer of shale and brown-grey gravelly clay which is culturally sterile (see key below).

Figure 14.17: Feature 3 of Feature Complex 1, a charcoal stained brown loamy-sand, containing rocks, some fire-cracked, and abundant flakes.



- Grey sandy-clay
- Grey sandy-clay with gravel
- Dark brown loamy sand with charcoal
- Orange-red sandy clay
- Ash lens
- Charcoal lens
- Brown clay-loam with gravel
- Fire-cracked rock
- Flake
- Formal lithic tool
- Unmodified rock
- Charcoal sample, dated 1940±90

Plate 14.8: Artifacts from Feature Complex 1, (a) a unifacial scraper, (b) a unifacial scraper fragment, and (c) a small drill-like biface, all of Washademoak chert.



mudstone (consisting of a total of seven pieces, or 2% of the assemblage by piece count, weighing 6.1 g, or less than 1% of the assemblage by weight).

This plough zone above Feature Complex 1 also produced abundant lithic artifacts. These include five unifacial scrapers, four retouched flakes, one biface tip, one edged biface, one tertiary stage unstemmed biface, one bit portion of a bifacial scraper, one hammer stone and 673 flakes.

MIDDLE MARITIME WOODLAND (COMPONENT 7) - FEATURES WITH ABSOLUTE DATES

We were able to assign only one feature, Feature Complex 3 (feature 21) to the Middle Maritime Woodland with radiometric dates. One sample from this feature was submitted from charcoal recovered from a lens within the feature fill, and a second sample was submitted from carbonaceous encrustations on the exterior of a pottery sherd found within the feature fill. These dates are highly likely to represent contemporary events, or events that took place within a short period of time.

Feature Complex 3 (F21)

Feature Complex 3 (designated by the feature number 21) was located in the middle of the northern half of Area A. It was almost completely excavated, except for a small portion that extended into an unexcavated unit to the west. The maximum dimensions of the excavated portions of the feature complex were 155 cm by 238 cm, with a depth of 57 cm. The complex consisted of a broad basin containing dark brown loamy sand with scattered charcoal, with layers of purple-grey silty clay with ash and pockets of charcoal (see Figure 14.18). Structurally, this complex appears to be a semi-subterranean house feature, similar to Feature Complex 2 (see above). The upper surface of the complex contained a layer of red-brown silty sand with gray, capped with a thin lens of grey silty-clay. The latter lens did not contain archaeological materials, and may represent post-occupational deposition or flooding. The purple-grey silty clay contained most of the cultural material, including three discrete pockets of dense charcoal and ash. One of these returned an AMS date of 1650±40 BP (Beta-106507). Feature Complex 3 produced 14 sherds of CP2b pottery (most assigned to vessel 3, Bourgeois, this volume, and 1999). To verify the date of the stylistic elements on the pottery, an encrustation from the interior of one of these sherds was submitted for AMS dating and returned a date of 1600±60 BP (Beta-105891). Both of these dates confirm our placement of the feature in the Middle Maritime Woodland. Feature Complex 3 was the only feature unit that could be firmly related to this time period.

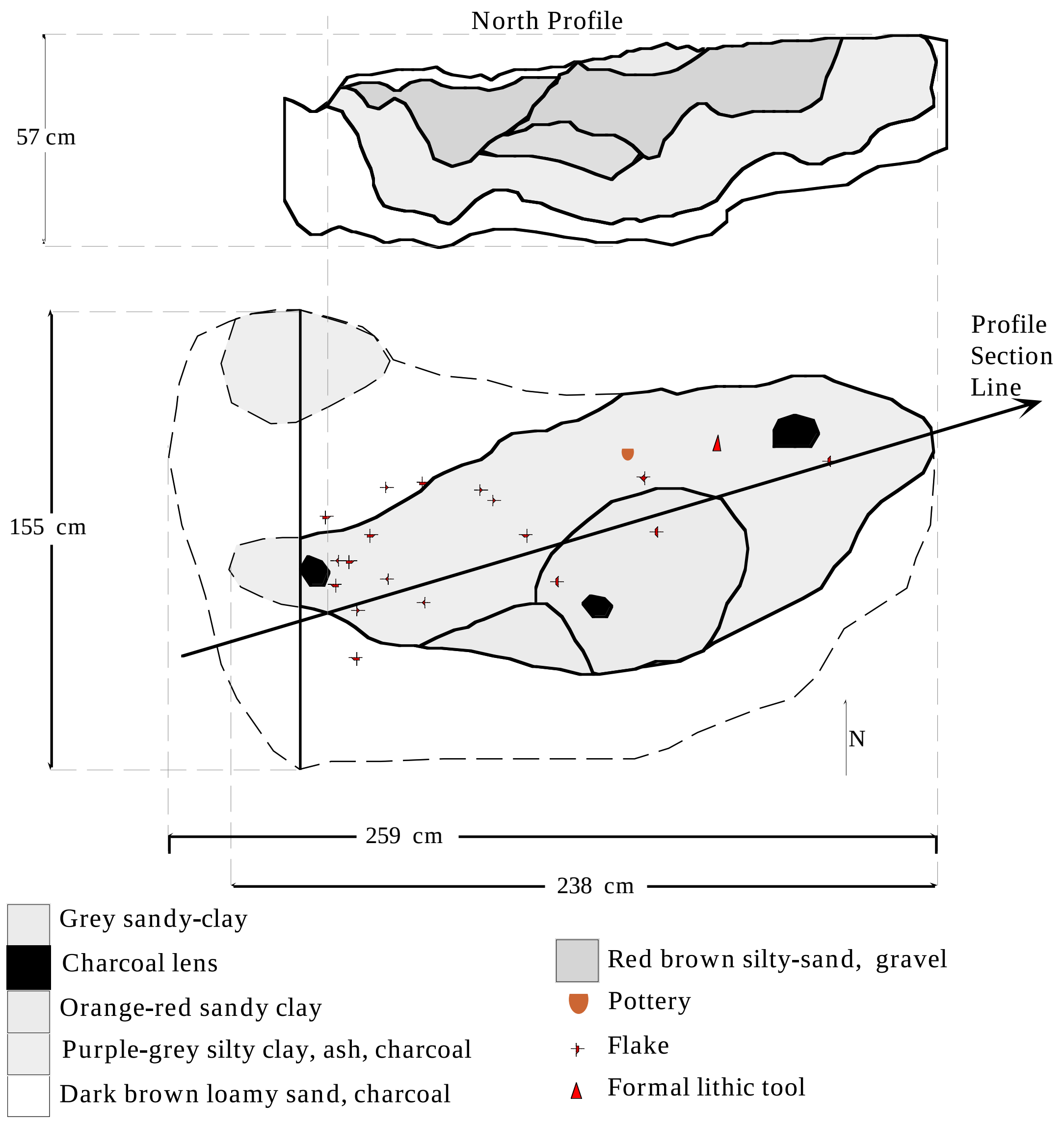
A single thin, tabular piece of slate with a ground edge was also recovered from Feature Complex 3. However, we did not recover any faunal or floral materials.

The complex also produced 91 flaked lithic artifacts, weighing 212.0 g. These included 10 tools, consisting of a pentagonal or contracting stem projectile point fragment, a biface medial fragment, one retouched core fragment, and nine retouched or utilized flakes, as well as 80 unmodified flakes and one split cobble that may have been a rejected core.

Although the assemblage from Feature Complex 3 was dominated by felsic and mafic volcanics (consisting of 64 pieces or 70% of the assemblage by piece count, weighing 175.3 g or 83% of the assemblage by weight), there was a secondary focus on mudstones, represented by two different types (a homogenous stoney brick-red variant and a waxy, mottled green-grey-black variant). There are 22 pieces of these mudstones (24% of the assemblage by piece count) weighing 31.3 g (15% of the assemblage by weight). Small amounts of chert, quartz and a bleached porphyritic volcanic completed the assemblage (five pieces, weighing 5.4 g). These raw materials appear to be overwhelmingly from local sources, and we could correlate only one small flake (possibly Touladi chert, weighing 0.1 g) to a distant source area.

The plough zone above the feature produced a bipointed or pentagonal biface fragment, one small unifacial scraper, one unstemmed biface, one biface medial

Figure 14. 18: Feature Complex 3 (comprised of Feature 21), in plan view and in profile.

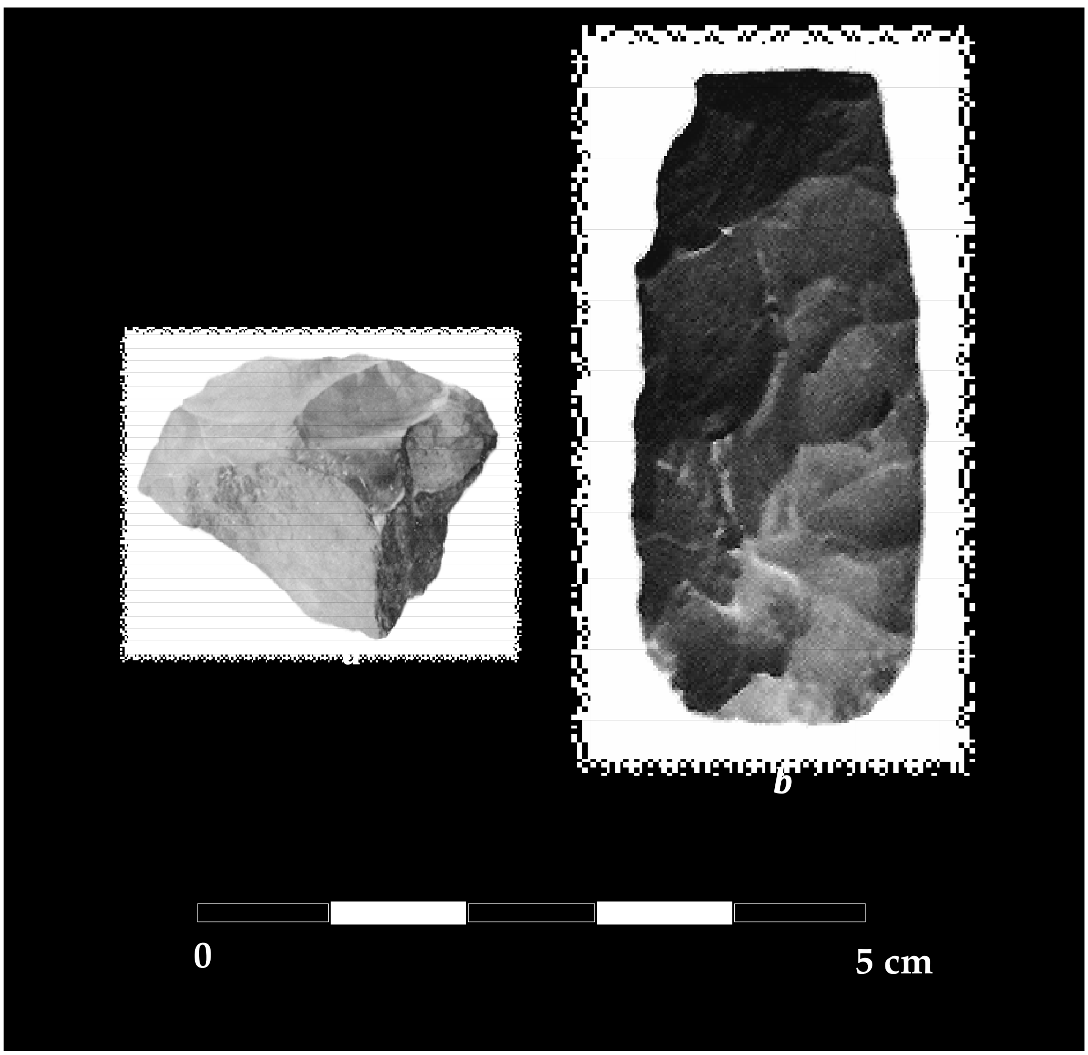


fragment, and several retouched flakes, as well as 89 unmodified flakes.

FEATURES DATED BY RELATIVE METHODS AND TYPOLOGY

While radiocarbon dating provides a technique for obtaining probablistic statement about the age of the feature, not all of the features observed during JCAP were dated by these means. However, some of the features that were not (or could not) be dated using these techniques contained materials or physical relationships that give insight into their possible age. These materials include particular artifacts with temporally sensitive, stylistic, morphological or technological attributes,

Plate 14.9: Artifacts from within and adjacent to Feature Complex 3; (a) a retouched flake of scraper from feature fill, of mottled grey-green mudstone, (b) an unstemmed biface from adjacent to feature.



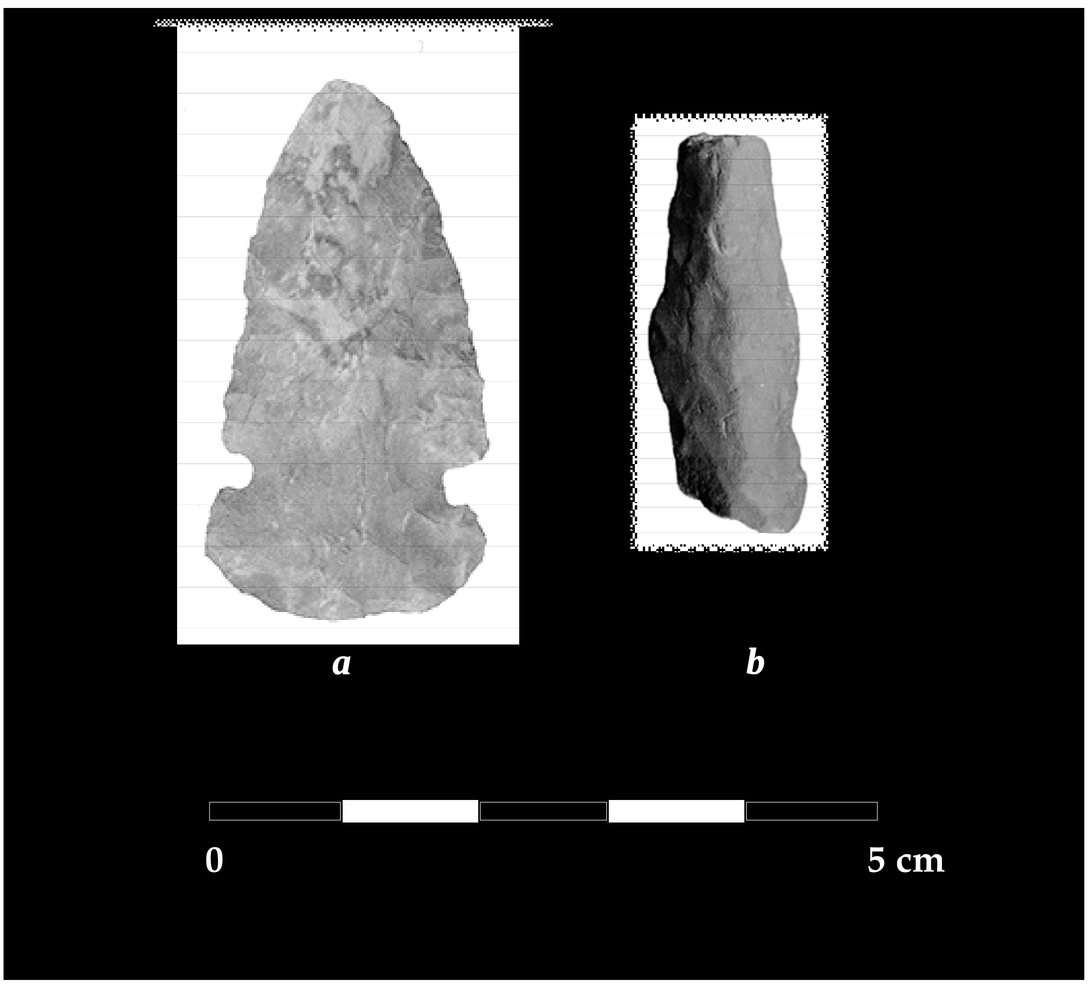
as well as temporally significant patterns in groups of artifacts, feature attributes and other classes of archaeological objects. In some cases, we were also able to use stratigraphic relationships and archaeological context to suggest the relative age of one feature to another. Through these methods, we can suggest possible ages for a range features. These will be described below.

POSSIBLE LATE ARCHAIC (COMPONENT 3) FEATURES

Feature 32

Feature 32 was recovered from Units L38 and K38, near the northern margin of Area A. Unlike many other features in Area A, Feature 32 first appeared below the lower limit of the plough zone (at 32 cm below surface), and was entirely within the undisturbed alluvium. This feature

Plate 14.10: Artifacts from adjacent to and above Feature 32; (a) side-notched projectile point made of grey mottled chert, and (b) drill bit, made of bleached volcanic.



consisted of a shallow, oval, basin-shaped depression, ca. 85 cm in diameter by 15 cm deep. Although the feature fill contained scattered flecks of charcoal, there were no significant charcoal concentrations. Given these attributes and its contents, the feature is likely a domestic activity area (such as a small storage or hearth pit). The feature fill contained one biface fragment and 58 flakes. In addition to these, we recovered one drill fragment, three bifacial cores or core fragments, and 34 flakes from alluvium immediately adjacent to the feature (Plate 14.10). Most of these (89 pieces) are variants of bleached volcanic, while local mafic volcanics comprise the remainder of the sample. In general terms, the assemblage seems to be significantly bleached compared to many lithics assemblages from other parts of the site. “Bleaching” of lithic artifacts is especially prevalent in this region, and is usually attributed to post-depositional weathering and damage from the acids normally present in the soil. Although soil pH is uniformly low (highly acidic) in the Maritimes, it varies considerably within soils, depending on microlocal factors such as soil depth and permeability. Furthermore, some lithic types may be more susceptible to the effects of soil acidity and weathering. Therefore the degree of bleaching is not necessarily directly correlated with length of time exposed to acids (i.e. age).

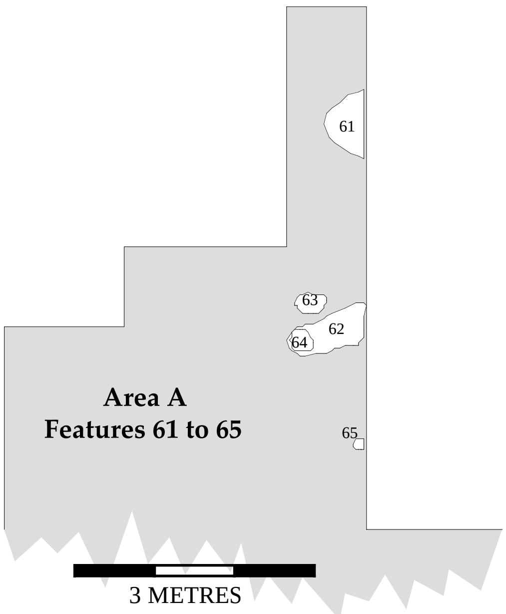
The depth of the feature and the nature of the artifact assemblage (especially the drill fragment and the absence of pottery) suggest a comparatively early age for Feature 32. Drills have been recovered from Meadowood-related sites (see Deal 1985, Clermont and Chapdelaine 1984) and on sites affiliated with the Susquehanna tradition, but they also occur in other Late Archaic contexts (such as the Moorehead phase, and some aspects of the Laurentian tradition). It is difficult without further analyses such as radiometric dating to determine a more precise date for this feature, but given the currently available data, it appears to be either related to Component 2, a Susquehanna- or Moorehead-related manifestation of Component 3, or the Early Maritime Woodland (Component 5).

Although I have inferred that this feature is below the disturbance of ploughing, the disturbed alluvium above the feature produced a ground stone plummet, a ground slate fragment, and three relatively large thick unifacial scrapers. These artifacts would suggest an Archaic affiliation, older than 3800 years ago (either Component 2 or Component 3). However, it also produced a classic “Meadowood” style point, similar to other from the Early Maritime Woodland (Component 5, Plate 14.10). While some of these artifacts may be derived from an upper portion of the feature, they may also indicate a degree of mixing in these upper layers, and a lack of correspondence to Feature 32, due to its depth (and presumably intact nature).

Features 61, 62, 63, 64, and 65

At the extreme eastern edge of Area A, the alluvium under the plough zone was thicker than elsewhere in most parts of Area A, and in some local areas, continued to a

Figure 14.19: The eastern edge of Area A, showing the distribution of Features 61, 62, 63, 64 and 65.



depth of more than 100 cm. This pattern suggests that the western margin of Area A, towards the break in slope was at one point in the past a small raised ridge. The land may have had a slightly lower elevation west of this ridge (away from the river), and indeed, small wet areas containing cattails persist around the edge of the fill. During periods of high water floods, this ridge may have acted as a sediment trap, and over time, the low area was largely filled in with alluvium. Within these areas of deeper alluvium we encountered several features. These initially appeared between 30 and 50 cm below the modern surface, and continued to almost 70 cm below surface. These features differ in several ways from other features from Area A, with the exception of Feature 32. They all begin well below the base of the plough zone, and they all appeared as clay layers containing scattered charcoal fragments and minor charcoal lenses. Dark organic soils, characteristic of many of the other features in Area A, are absent and may have been leached out. There are patterns of similarity in the contents of these features as well. They contain lithic assemblages dominated by highly bleached volcanic artifacts, and pottery is absent (although see description of Feature 65, below). Feature 32 shares these attributes with Features 61 to 65. Based on these commonalities, and on the presence of particular artifact attributes, we infer that these features collectively date to the Archaic period.

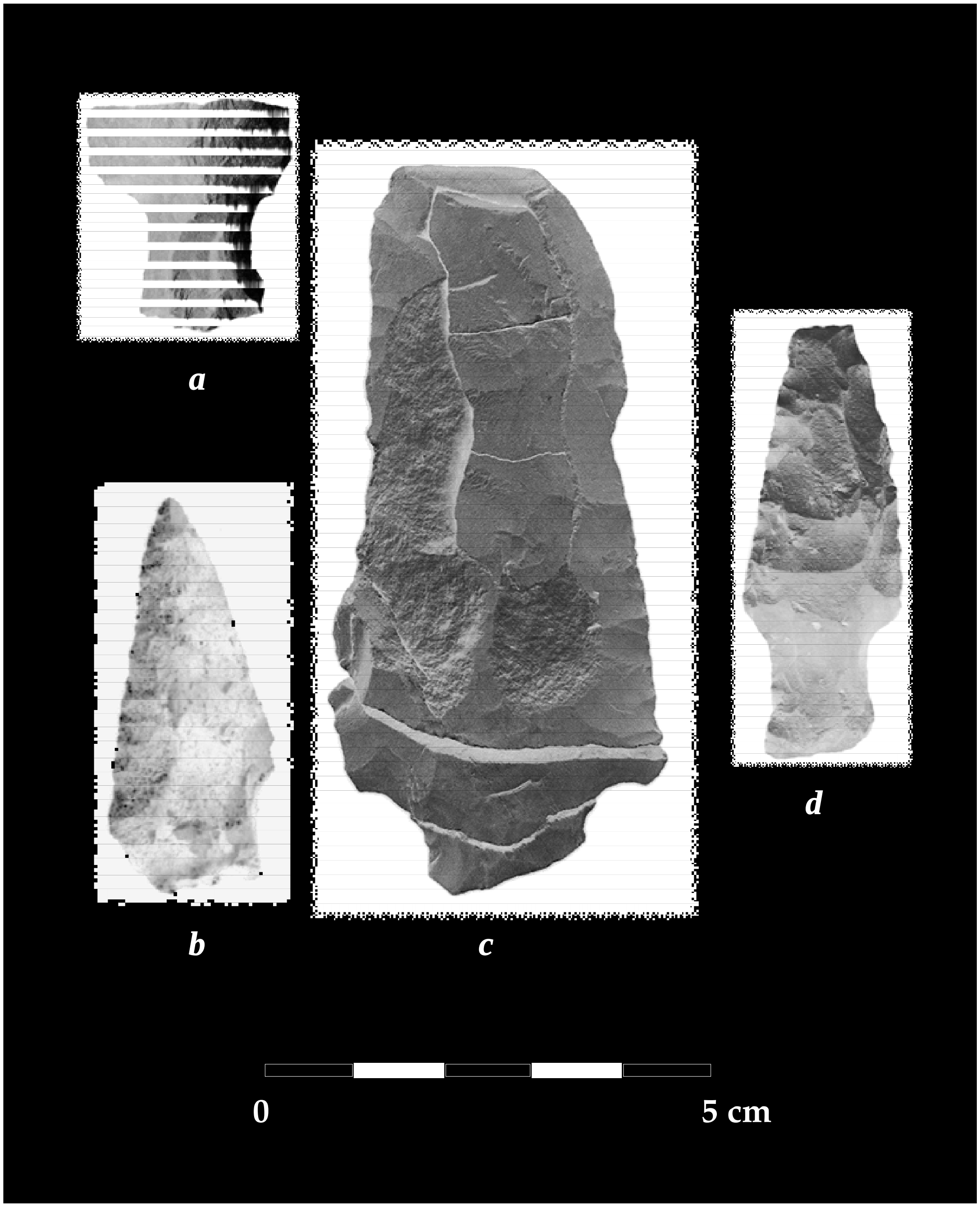
Feature 61

Feature 61, in Unit I27, was the easternmost feature observed during the JCAP. It was not completely excavated as it extended into the southern wall of the unit. The visible portions of the feature consisted of a large grey clay patch that was 130 cm wide in the southern profile, and extended 100 cm into Unit I27. Feature 61 first appeared at 30 cm below surface and continued to 56 cm below surface. It contained small flecks of charcoal but no sizeable concentrations or lenses. It also produced one large retouched or utilized flake and 25 unmodified flakes. In the absence of dense charcoal or fire-cracked rock it is not clearly hearth-related, and may represent a living floor, or an activity area, such as a tool knapping area.

Features 62, 63 and 64

Features 62, 63 and 64 were observed in Unit I29 and I30. Feature 62 consisted of a large oval area of sandy-clay, 110 cm by 190

Plate 14.11: Artifacts from the eastern margin of Area A; (a) a wide side-notched projectile point base fragment from above and adjacent to Feature 62/64, (b) a biface (base shattered) of Ramah Bay Quartzite from within Feature 63, (c) a large, fragmented projectile point from within Feature 64, and (d) a small, narrow bladed projectile point from above and adjacent to feature 62-64. All but (b) are made of bleached volcanic.



cm in size. It contained quantities of charcoal and fire-cracked rock. It was initially observed at 30 cm below surface, and continued to more than 57 cm below surface. Feature 64 was contiguous with Feature 62, and consisted of a small circular patch of charcoal, approximately 35 cm in diameter. Feature 63 was distinct from Features 62 and 64, and consisted of a circular patch of charcoal approximately 30 cm east of Feature 62. It continued to 62 cm below surface, slightly deeper than Feature 62 and 64. Feature 63 produced a biface with a shattered base and a thin and finely flaked blade (Plate 14.11b). The tool seems to have shoulders, and may represent a bipoint or contracting stemmed point. It is made of a fine-grained smoky grey quartzite that is similar to metaquartzite from Ramah Bay, Labrador. A single volcanic flake was also recovered from Feature 63. Feature 62 and 64 produced 21 additional unmodified flakes. The alluvium above these features also produced a range of artifacts, including a portion of a flat, thin flake with steep margin retouch, a medium-sized biface, with a narrow blade and long expanding- to widely side-notched stem, and approximately 160 flakes. These materials may have been impacted by ploughing, and may be more recent than artifacts from within and adjacent to the features.

These features appear to represent several discrete hearth areas, or a hearth-and-living floor complex.

Feature 65

Feature 65 was observed in the southeastern portion of Unit I30. It consisted of a small patch of charcoal and fire-cracked rock, approximately 25 cm by 25 cm in size. It first appeared at 50 cm below surface, and continued to 67 cm below surface. The form and content of this feature is suggestive of a small hearth area. Immediately adjacent to the feature at 53 cm below surface was a shattered biface, with a broad blade and small side-notches (Plate 14.11c). Four unmodified flakes were also recovered from this depth.

A number of artifacts were recovered from layers above the feature (especially between 20 and 40 cm below surface. These include a bleached, battered, flake core, and a pitted "nutting" stone, but also included two fragmentary (and thus, unanalyzable) sherds of pre-contact ceramic. These materials all seem to be vertically separated from the artifacts adjacent to Feature 65.

The materials from Features 61 to 65 appear to represent Archaic period activity. The three bifaces associated with them have attributes that have been linked to the Archaic, including the use of Ramah Bay quartzite (Bourque 1994), and the style of the haft element of the two volcanic points. The broad, fragmentary point (Plate 14.11 c) is reminiscent of Terminal Archaic points of the Susquehanna tradition. The narrow bladed point (Plate 14.11 d) is similar to Late Archaic points from south and central Maine (Bourque 1995, Sanger 1996, pers. comm.). These traits suggest a series of occupations of the eastern edge of the upper terrace between 4500 BP (the Late Archaic) and 3600 BP (the earlier Terminal Archaic). This hypothesis is supported by the distribution of Archaic style artifacts in

Figure 14.20: Feature 8 in plan and profile.

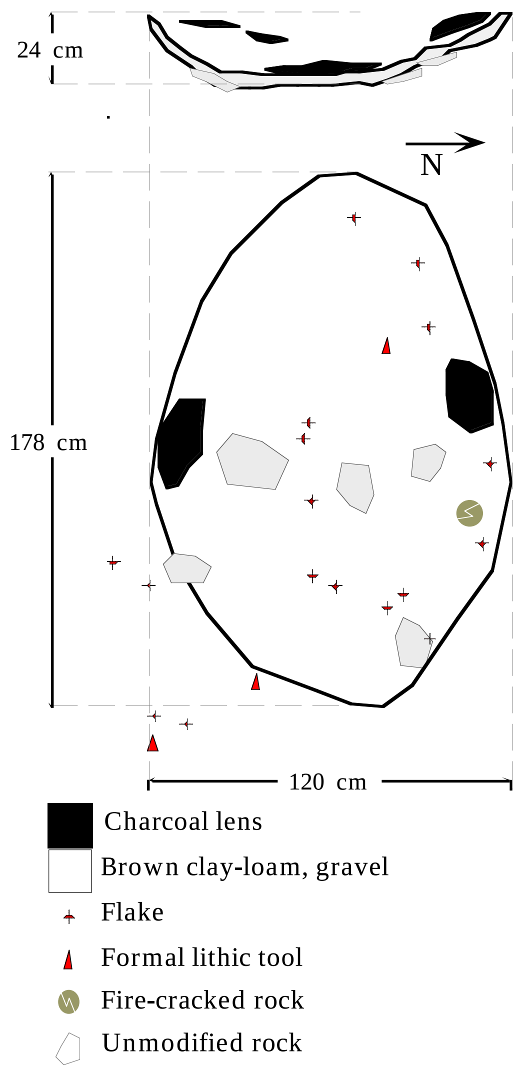
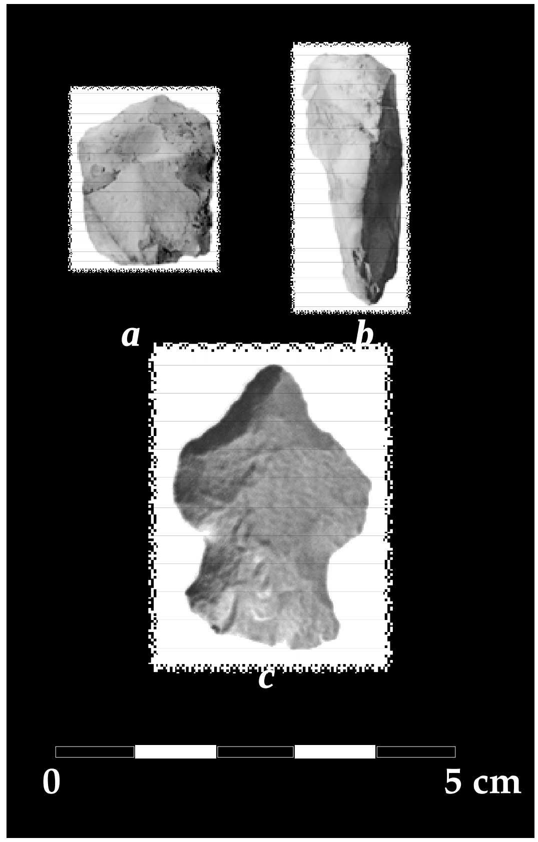


Plate 14. 12: Artifacts from within and adjacent to Feature 8; (a) a unifacial scraper with graving spur, from within Feature 8, (b) a small biface or "drill", from adjacent to Feature 8, and (c) a small projectile point/drill with wide side-notches, from within Feature 8.



the plough zone along the eastern margin of Area A (see Chapter 16). This hypothesis will be testable in the future, as we retain charcoal samples from these features that could be submitted for radiometric dating.

POSSIBLE EARLIER EARLY MARITIME WOODLAND (COMPONENT 5)

Feature 8

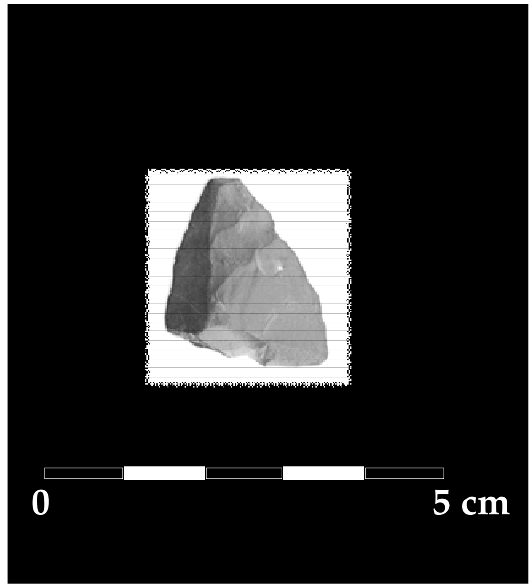
Feature 8 was found near the western edge of Area A, and was completely excavated. It was an oval, basin-shaped depression that was 120 cm by 178 cm in size, with a maximum depth of 24 cm. The feature consisted of a thin trampled layer of black organic soil mixed with charcoal coating the bottom of the pit. The fill within the basin is darker with a high content of organic matter than adjacent soil. There were patches of charcoal and rocks scattered in contact with the layer of trampled soil.

Several calcined bird bones were recovered from the feature fill. Based on artifact associations (a small projectile point and a bifacial scraper), we suggested a possible affiliation with the earlier Early Maritime Woodland (ca. 2800 to 2400 BP). We interpreted the feature as a large, simple, pit-shaped hearth.

No pottery was found within or adjacent to the feature, but the feature and feature area produced a variety of lithic artifacts. These included an abrader, and 96 pieces of flaked lithic, weighing 250.9 g. These included 15 tools (weighing 77.3 grams), and 81 unmodified flakes and cores. The tools include one wide side-notched projectile point similar to "Meadowood" drills reported from Québec (Clermont and Chapdelaine 1982: 64), and New York state (Granger 1978, Ritchie 1980), four biface tips and medial sections, one bifacial scraper, one unifacial scraper, six retouched flakes and two utilized flakes (Plate 14.12).

Overall, the assemblage from F8 was dominated by Washademoak chert (consisting of 39 pieces, or 40% of the assemblage by piece count, weighing 167.9 g, or 67% of the assemblage by weight). Most of these were represented by the grey and yellow-tinged translucent variants of Washademoak, with the red variety (designated RM 11.1) fairly rare (only six pieces, weighing 29.8 g). The remainder of the assemblage consisted primarily of various kinds of felsic, mafic

Plate 14.13: an unstemmed biface from above Feature 9.



and porphyritic volcanics (consisting of 46 pieces, weighing 48.4 g), and other kinds of chert (nine pieces, weighing 33.4 g).

Aside from the Washademoak chert, only a few pieces could be assigned to particular sources or source areas. These include six pieces of Kineo-Traveller Mountain porphyry (weighing 3.2 g), one small flake of Minas Basin chert (0.3 g), and one flake of Touladi chert (1.8 g).

Feature 9

Feature 9 was an oval feature in the southeastern portion of Area A. As measured near the upper surface, the feature was 75 cm by 68 cm in size. The upper surface had been truncated by the plough zone at 24 cm, and the feature itself continued another 21 cm to a depth of 45 cm below surface. The feature was irregular (sub-basin shaped) in profile. The fill was heavily stained with charcoal, with dense concentrations of unmodified flakes and microdebitage. These included 132 flakes larger than 5 mm in diameter, and 1190 pieces smaller than 5 mm in diameter (microdebitage). The only tools were a heavily pitted "nutting" stone, and one possibly utilized flake.

Feature 9 also produced an array of charred plant materials, including three bramble seeds, 39 knotweed seeds, one delta seed, 36 butternut shell fragments (14.92 g), one beechnut fragment, one charred maize kernel, five charred hemlock needles, nine charred spruce needles, and 15 unidentified seeds. However, it also produced an uncharred pin cherry pit and an uncharred chenopod, suggesting that some of these fragments may be intrusive. One piece of historic era ceramic was recovered from within the feature. Furthermore, this feature was located on the edge of one of our initial deep trenches, and as a result of these disturbances, we decided not to trust the age of the charcoal within the feature.

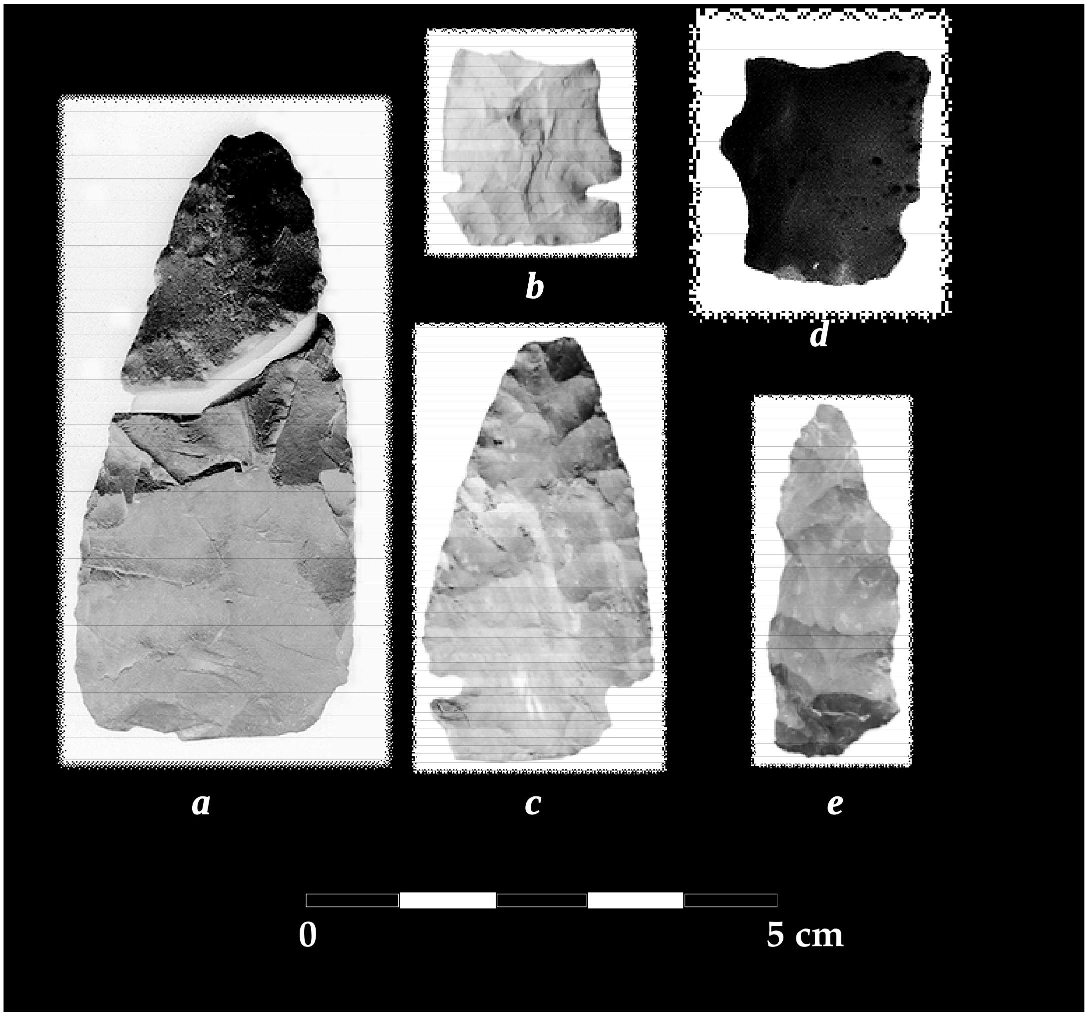
These disturbances impede the analytical utility of the contents of the feature. However, given the nature of debates about the presence of corn agriculture in the Maritimes (Leonard 1995, 1996), future AMS dates on the maize kernel may be warranted to determine whether or not this fragment is associated with this feature. If it returned a pre-contact era date, this would be a first for the region.

The plough zone above Feature 9 contained abundant artifacts, including one small thumbnail scraper made of Ramah Bay metaquartzite, one small, thick bleached volcanic biface, and two larger, thin unstemmed bifaces, as well as 231 unmodified flakes (Plate 14.13). Unfortunately, these artifacts are ambiguous temporal markers. However, we recovered a biface base from the plough zone adjacent to Feature 9 (less than 1 m away) that crossmends with a tip from Feature 8 (ca. 4 m away). Although it is a tenuous assumption that the base is related to Feature 9, it may suggest a functional relationship to Feature 8, and if our hunch about the age of Feature 8 is correct, would place Feature 9 in the Earlier Maritime Woodland. In coarse terms, this placement agrees with the artifacts within, adjacent to and above Feature 9.

Feature 16

Feature 16 was observed in the middle of the southern half of Area A. It was recorded as circular soil feature in plan, 90 cm by 90 cm in size, forming a 21 cm deep basin in profile. The feature fill consisted of dark soil with charcoal and grey clay inclusions (Varley and Howlett 1997). The feature appeared at 37 cm below the surface, which would appear to be somewhat below the base of the ploughzone. Through content analysis we can suggest that this feature may have functioned as a hearth area. As well as

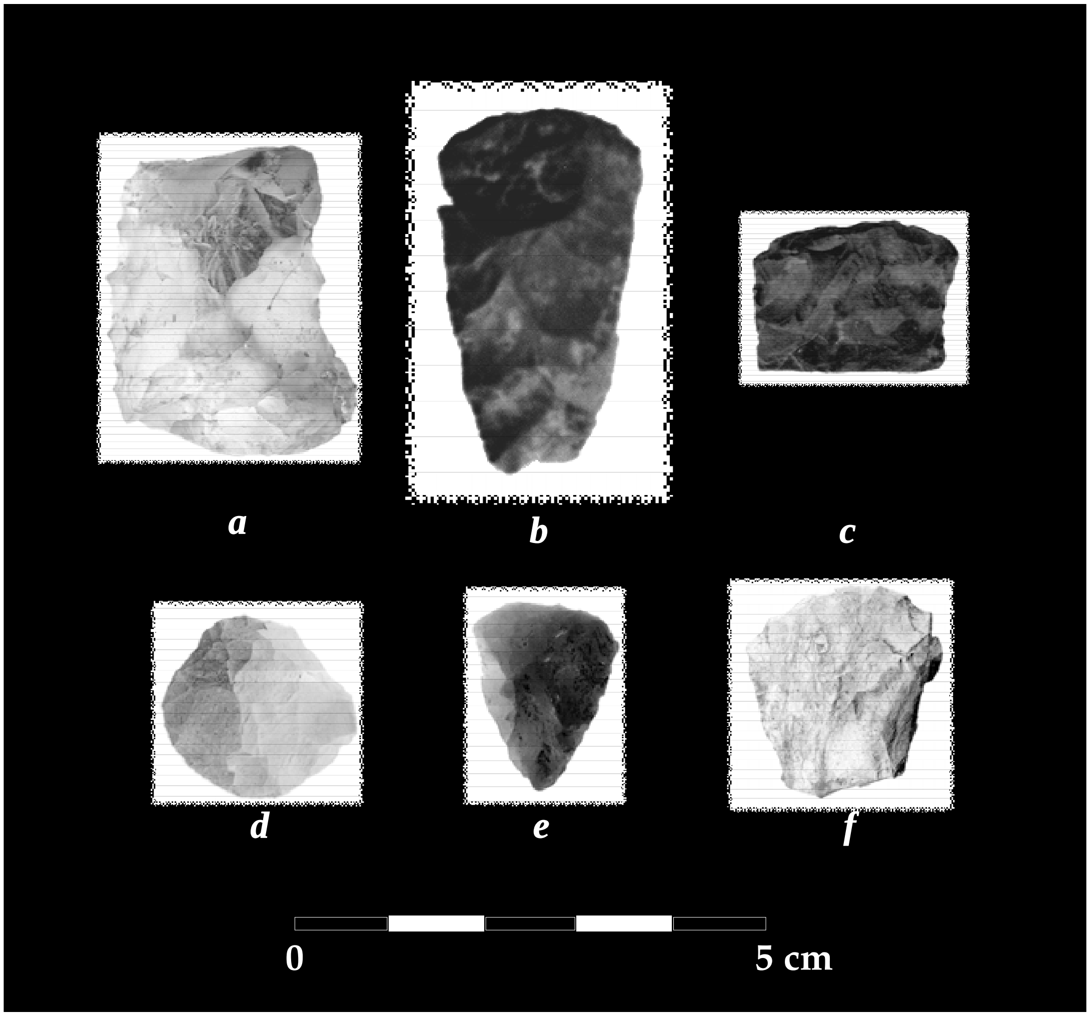
Plate 14.14: Bifaces from near or within Feature 16; (a)unstemmed biface, (b) and (c) side-notched projectile points, of opaque, mottled chert, (d) a quartz biface fragment, with a small, shallow (accidental?) notch, and (e) an unstemmed biface or "drill", of mottled grey chert.



abundant charcoal fragments, the feature contained 10 calcined animal bone fragments, 30 flakes, and a medium-sized oval unifacial endscraper made of green bleached volcanic. These materials were concentrated in the feature fill, and the undisturbed alluvium adjacent to the feature produced only one small flake.

Although Feature 16 did not produce any temporally diagnostic artifacts, we recovered a range of tools and debris from the plough zone immediately above the feature (Plate 14.14 and 14.15). These included one small fragment of ground stone, two projectile points with small side-notches, three bifacial scrapers, two

Plate 14.15: Scrapers from near or within Feature 16; (a) unifacial scraper of Washademoak chert, (b) bifacial scraper of bleached or burnt chert, (c) bifacial scraper of dark grey mottled chert, (d) unifacial scraper of opaque red chert or volcanic, (e) quartz bifacial scraper, and (f) bifacial scraper of dark mottled chert.

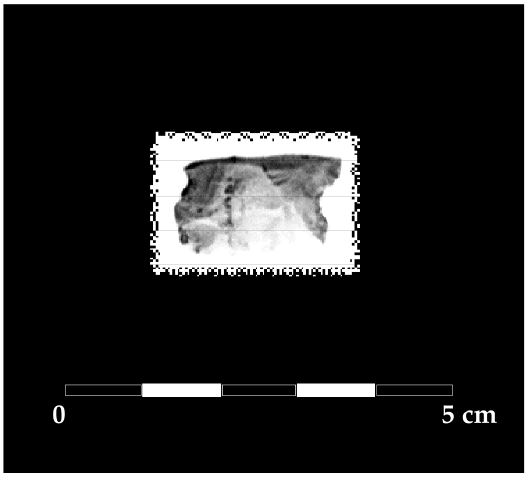


unifacial scrapers, three unstemmed bifaces, one bifacial core fragment, one biface medial fragment, and 167 unmodified flakes. This assemblage is similar to the assemblage from Feature 56, dated to between 2800 and 2400 years ago (Component 5). Although this unit did not produce any related ceramic sherds, this pattern corresponds to the other dated Component 5 feature, Feature 13.

Feature 47

Feature 47 was observed near the centre of Area B, at the edge of the break in slope

Plate 14.16: a side-notched point base fragment from within Feature 47.



between the upper terrace and the lower wet area. The break in slope appears to have been a zone of historic activity, some of which appears to be related to recent episodes of dumping. Over 150 pieces of post-contact material, such a scrap iron, nails, ceramics and glass, were recovered from adjacent to the feature, which is indicative of the level of disturbance in this area. Material from Area B cannot be assumed to be undisturbed regardless of how deeply they were recovered. These factors have made it difficult to isolate features that may date to the pre-contact period in this area. Nonetheless, an irregularly shaped series of charcoal lenses and fire-cracked rock were recorded between 28 cm and 36 cm below surface. These were subsequently designated Feature 47 (Varley and Howlett 1997). We recovered a number of pre-contact period artifacts from these lenses. These include the base of a side-notched point made of opaque red volcanic or mudstone (JC15, Plate 14.16), and 15 unmodified flakes. Adjacent to the feature we found three similar flakes, and a thick bifacial core of bleached green volcanic. Despite the degree of disturbance, the fire-cracked rock and charcoal suggests a hearth function. The side-notched point indicates affiliations with either the Early Maritime Woodland (Component 5, between 2800 and 2400 years ago), or the Late Maritime Woodland (between 1400 and 500 years ago). Although there is little evidence of this latter period from the Jemseg Crossing site (either in the form of dated features, or through artifact typology), private collections from several kilometres north of the site contain Late Maritime Woodland pottery and projectile points, suggesting a shift in settlement over time.

POSSIBLE LATER EARLY MARITIME WOODLAND (COMPONENT 6) FEATURES

Feature 10

Feature 10 appeared as a small oval pit in the southwestern portion of Area A. It was 28 cm by 24 cm, and was 16 cm deep. Although most of the feature fill was a reddish-brown sandy soil, there were quantities of fire-cracked rock and charcoal present as well. Given the lack of fire-reddened earth adjacent to and beneath Feature 10, it has been interpreted as a small refuse pit. Despite the presence of scattered charcoal in the feature fill, we did not submit any samples for radiocarbon dating, due to the presence of intrusive post-contact artifacts (a 19th century ceramic sherd and a fragment of iron) at a depth of 30 cm (beneath the plough zone). This intrusion suggests a degree of disturbance that may compromise the contextual integrity of the feature.

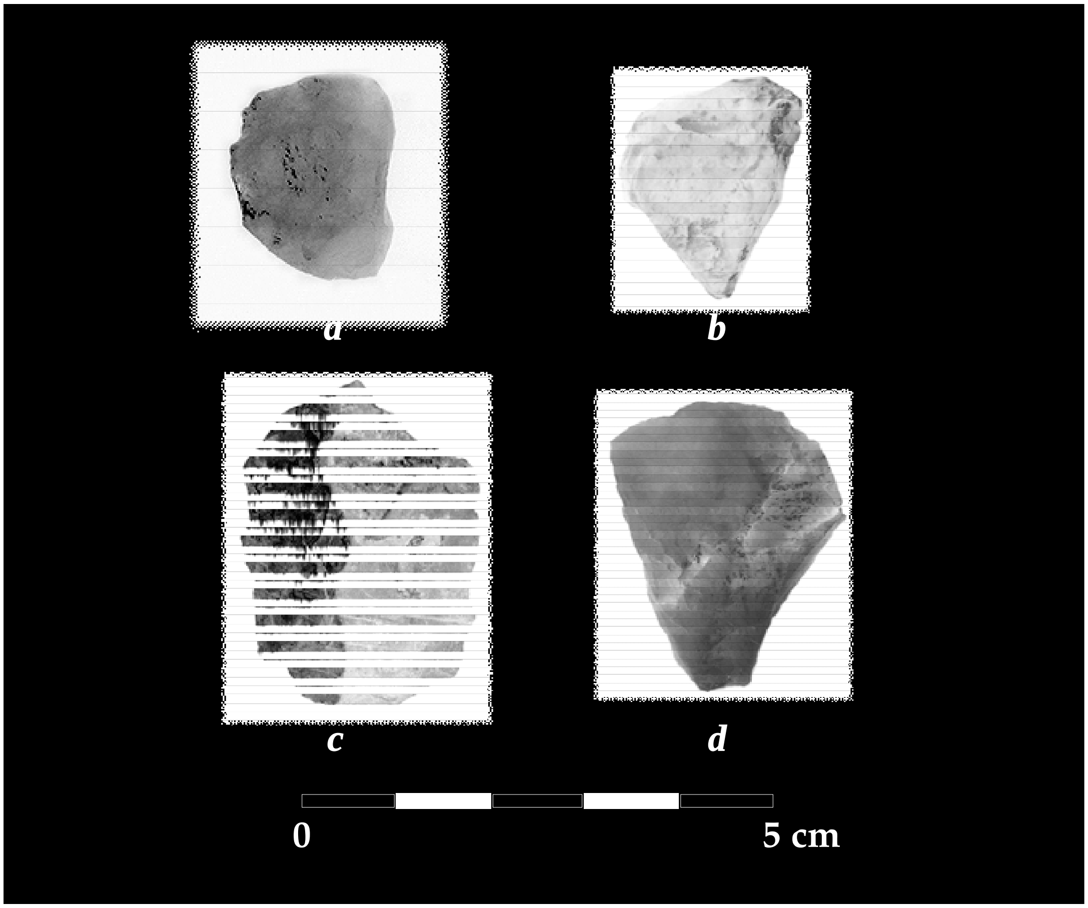
Based on the preliminary catalogue, the feature fill contained 25 unmodified flakes and two utilized flakes. It did not contain any pottery or other diagnostic tools. The alluvium adjacent to the feature produced the lateral section of a thick, unstemmed biface of Washademoak chert (JC11) and 50 flakes. The plough zone immediately above Feature 10 produced 111 artifacts, including a thick chert bifacial scraper (Plate 14.17), a bifacial preform, a few flakes that may have been retouched, and 106 unmodified flakes. Based on proximity to Feature Complex 2 (Feature 11), we may be able to infer a date in the later Early Maritime Woodland (between 2400 to 1950 BP), although the bifacial scraper from the plough zone (a disturbed context) might also suggest a slightly older affiliation.

Plate 14. 17: a spurred bifacial scraper of brown chert from above Feature 10.

Feature 12

Feature 12 is an elongated bilobal feature in the southwestern portion of Area A. It was 125 cm by 75 cm in size. The feature matrix consisted of patchy grey clay containing a fragment of an unstemmed biface, one medium-sized unifacial scraper of blue-grey agate (possibly from Minas Basin, Nova Scotia), one scraper bit fragment of grey rhyolite, one fragmentary sherd of unanalyzable native ceramic, and seven unmodified flakes. In the alluvium adjacent to the feature, we recovered five unmodified flakes, one utilized or retouched flake, and some charred butternut fragments. There was some evidence that the feature had experienced a minor degree of bioturbation (i.e., mixing through rodent burrowing). During the field assessment we concluded that the feature itself was likely the result of cultural activity, possibly representing from a refuse deposit, or structural elements relating to Feature Complex 2 (F11). Nonetheless, due to our concerns about the origin and integrity of the feature, we did not submit charcoal for radiocarbon dating. Based on the supposition that the feature represents a cultural deposit, we can infer from the

Plate 14.18: Scrapers from near and within Feature 12; (a) unifacial scrapers made of quartz, (b) unifacial scraper of Washademoak chert, (c) a unifacial scraper of multicoloured chert (possibly Minas Basin "agate"), from within the feature fill of Feature 12, (d) a unifacial scraper of white quartz.



presence of pottery a Maritime Woodland date. It may be that Feature 12 was functionally and temporally related to Feature Complex 2 (feature 11). This would place it in the later Early Maritime Woodland (EMW2, or Component 6). The plough zone above the feature produced considerable quantities of artifacts, given the densities within and adjacent to the feature, including one abrader, five unifacial scrapers, one biface tip, three retouched flakes, and 150 unmodified flakes. Some of these plough zone materials may be derived from surficial disturbance of Feature Complex 2, which is less than 1.5 m to the north of Feature 12. Unfortunately, none of these materials give further clues to the age of Feature 12 itself.

POSSIBLE MIDDLE MARITIME WOODLAND (COMPONENT 7) FEATURES

Feature 20, 22, 23

These three features were located near the middle of Area A, and are similar size and structure to each other. Based on this similarity and on proximity, they may be functionally and chronologically related to each other and to Feature Complex 3. They are all close together (F20 and F22 are 1 m apart, while F23 is less than 2 m from F22). All three were initially noted at the base of the plough zone (ca. 25 cm below surface), and all contained a similar feature fill, grey loamy-clay and charcoal.

Feature 20 was an oval pit, 72 cm by 80 cm in size, and 21 cm deep. The only artifacts we recovered from it were 33 unmodified flakes. Feature 22 was a smaller, deeper oval pit. It was 68 cm by 46 cm in size, and 32 cm deep. In addition to charcoal, Feature 22 contained calcined animal bones, including unidentified fragments, as well as several large herbivore (cow or moose) teeth fragments (see Stewart, this volume). Feature 22 also produced 65 unmodified flakes. Feature 23 was 100 cm by 75 cm in size, and was 41 cm deep, and was thus slightly larger than 20 and 22. However, it produced comparatively few artifacts, with a total of seven unmodified flakes. These features appear to represent hearths, or hearth-related pits (such as ash refuse areas). They are less than 2 m to the south of Feature Complex 3 (F21).

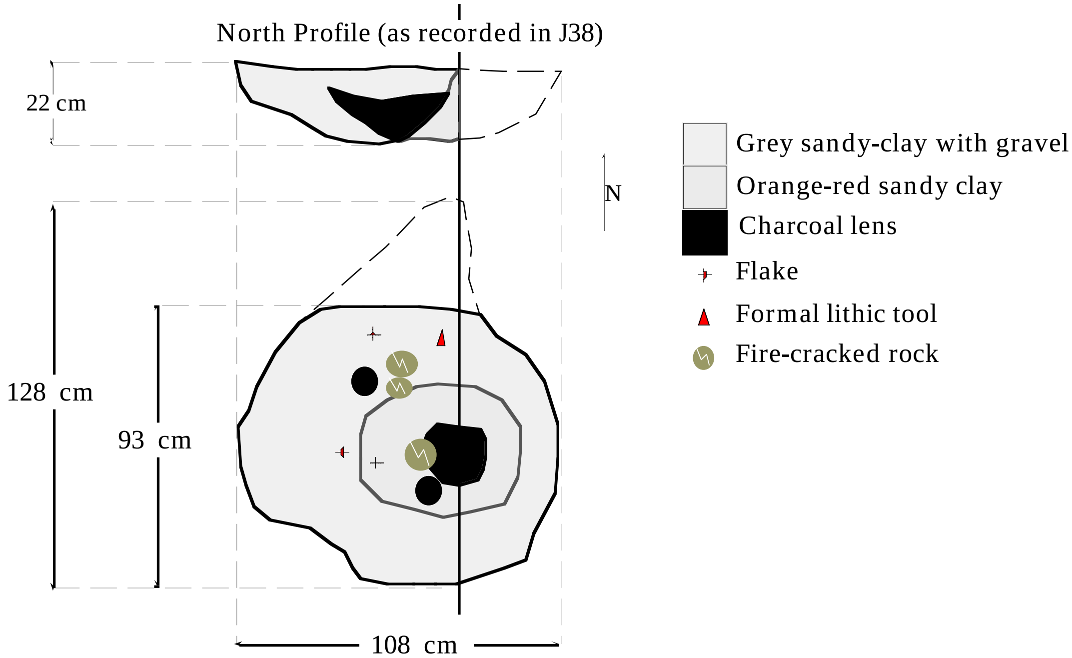
The plough zone above these features produced 77 flakes and one formal tool. This latter artifact is a classic Early Maritime Woodland artifact, consisting of a side-notched projectile point base that has been reworked into a scraper.

We may suggest several scenarios for the age of these features. Their contents are comparatively uninformative. Based on proximity, they may represent contemporaneous or successive activities relating to Feature Complex 3. This would suggest an affiliation with the Middle Maritime Woodland (Component 7, dating to between 1750 and 1500 years ago). However, the bifacial scraper would suggest an affiliation with the Early Maritime Woodland (Component 5, dating to between 2800 and 2400 year ago). Finally, we must consider to possibility that these three features are not chronologically related to each other, to Feature Complex 3, or to materials recovered from the plough zone.

Feature 24

Feature 24 was near the north edge of Area A, stratigraphically above Feature Complex 4. It was completely excavated, and consisted of a 22 cm deep basin shaped hearth that was 128 cm by 108 cm in size. The feature contained a layer of orange sandy clay with a dense charcoal lens and fire-cracked rocks, capped with a culturally-sterile grey-sandy clay with gravel (see Figure 14.21). Although the feature has not been dated, it is more recent than Feature Complex 4, which was dated to 2230±50 BP

Figure 14.21: Feature 24 in plan and profile.[o]



(Beta-105889, see above). Feature 24 contained two CP2a ceramic sherds (vessel 7, see Bourgeois, this volume). These reinforce the notion that F 24 was in use later than Feature Complex 4, and suggests a Middle Maritime Woodland affiliation. The feature also produced a calcined mammal bone fragment, as well as 33 butternut fragments (weighing 37.09 g).

The feature also produced a small assemblage of eight flaked lithics, weighing 6.3 g. All of these were unmodified flakes. A small quartz scraper was found adjacent to F24 (Plate 14.19). All of the lithic artifacts from within F24 were made of felsic and mafic volcanics, all of which may have been locally procured from secondary sources.

Plate 14.19: a unifacial scraper of white quartz, with a graving spur, from adjacent to Feature 24.

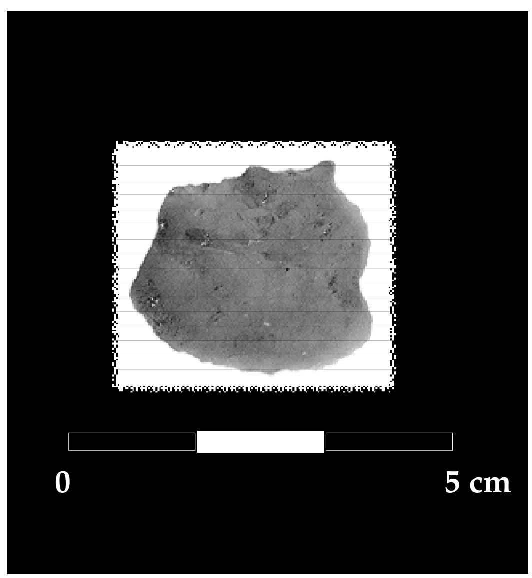
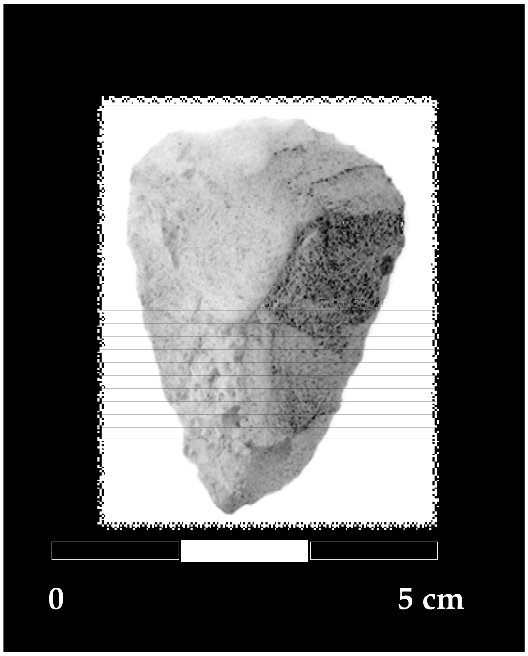


Plate 14.20: a coarse grey quartzite unifacial "thumbnail" scraper, from within Feature 40.



Feature 40

Feature 40 was encountered in a test unit to the north east of Area A. It consisted of a large oval, basin-shaped depression, containing lithic artifacts and with fine grey-brown silty loam with small rocks and charcoal. The feature was first noted near the base of the plough zone (ca. 25 cm below surface), and continued for 7 cm to 32 cm below surface. The form and content of the feature suggests that it may have resulting from a living floor, or the accumulation of habitation-related material in a small shelter. The feature fill contained 73 flakes. We recovered a unifacial "thumbnail" scraper of coarse grey quartzite (Plate 14.20), a bleached volcanic biface tip, a heavily retouched flake, several unanalyzable pre-contact ceramic sherds, and 76 unmodified flakes from the surface of the feature. In addition, the plough zone (layer 1) produced 30 unmodified flakes. We decided not to radiocarbon date this feature due to its proximity to the plough zone, but the native ceramic and the thumbnail scraper suggest a Maritime Woodland date, probably between 2200 and 1400 years ago.

Feature 48

Feature 48 was encountered in Area C, between the break in slope and the low wet marshy area. It consisted of a dense area of lithic artifacts with cobbles and brown loamy sand. Unlike most other features in the Jemseg Crossing sample there was little evidence of charcoal or fire-cracked rocks.

Although the density of lithic artifacts suggests that F48 may represent a lithic reduction area, the high proportion of utilized and retouched flakes suggests that reduction was oriented towards the facilitation of a secondary manufacturing or processing activity, such as woodworking or butchering. This latter pattern may suggest that related domestic features remain unexcavated in adjacent site areas. A small sherd of ceramic was recovered from the feature. This sherd and the composition of the lithic assemblage, suggests relationships to the Middle Maritime Woodland and Feature Complex 3 (above), although in the absence of radiocarbon dates, this association is tenuous. Further research into lithic refit analysis may provide insight into temporal relationships between F48 and other site areas.

The lithic assemblage consisted entirely of 437 flaked lithics, weighing 459.8 g. Of these, 64 artifacts (weighing 117.1 g) had been modified into tools. The tools consisted of one thinned but unretouched bifacial blank, two partially finished medial biface fragments, and 61 retouched or utilized flakes. The non-tools consisted of two core fragments (one thick bifacial core, and one small unidirectional core), and 371 unmodified flakes.

The assemblage was overwhelmingly dominated by one particular type, a mottled green-grey-black mudstone initially designated JC7, but subsequently assigned a separate designation, RM62. Feature 48 produced 364 pieces of this particular raw material type (83% of the assemblage by piece count, weighing 341.7 g, or 74% of the assemblage by weight). However, this raw material type was comparatively rare in the remainder of the LSJR assemblage, and only 16 pieces, weighing 30.3 g were found outside of F48. Interestingly, over half of these were recovered from Feature Complex 3, above (nine pieces, weighing 20.5 g). Almost as striking is the complete absence of the local Washademoak chert. Although Washademoak was absent from a number of the smaller assemblages, the only other large feature assemblage from the Jemseg Crossing site (i.e., producing more than 20 pieces) that didn't produce any Washademoak was Feature Complex 3.

While RM 62 was the only variety of mudstone encountered in the Feature 48 assemblage, there was an array of felsic, mafic and porphyritic volcanics (60 pieces, weighing 110.2 g), as well as a few chert and quartzite flakes (three pieces, weighing 2.1 g).

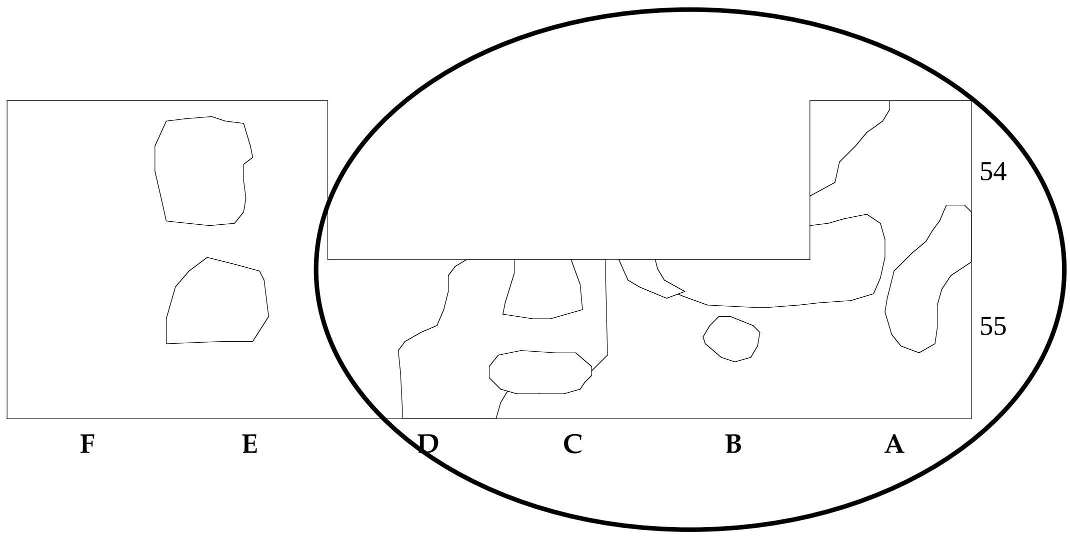
We could related only three of the artifacts in this feature assemblage to known sources or source areas. These consist of one medium-sized flake of Kineo-Traveller Mountain Porphyry, one medium-sized flake that may be Onondaga chert, and a large flake that may be Tobique rhyolite.

POSSIBLE POST-CONTACT PERIOD FEATURES

Area B, Units A54, A55, B55, C54, C55, D55

The southern edge of the Area B, on the break in slope, produced abundant evidence of historic period activity, but also of historic period disturbance and intrusion. This zone encompassed six 2 m by 2 m units, Units A54, A55, B55, C54, C55, and D55. This part of Area B comprises only 3% of the area excavated during the Jemseg Crossing project. Despite this small area, these 6 units produced 29% of all the artifacts from the site that were classed as either “historic” or “unknown” (see Blair, Chapter 8, this volume), and 16% of the total assemblage of all artifacts recovered from the site.

Figure 14.22: Area B, showing the distribution of "features"; the circle shows the southern portion of this Area, and the area of post-contact period artifact concentrations.



Although we observed a number of overlapping and intersecting features, it was difficult to discern whether they were the result of primary site activity, or dumping and ploughing. Nonetheless, we observed some regular patterns in the artifact classes in this area, including concentrations of small beads, worked glass, and muskrat bones, suggestive of fairly restricted activity during the historic period. These artifacts suggest that in the 19th century or early 20th century there was a Wolastoqiyik *wikuwam* or house in this area. The analysis of these materials is described by Blair, Dickinson and Blair, Chapter 19 of this Volume.

UNDATED FEATURES

In addition to features with absolute and relative dates, a number of features were recorded that could not be dated by means currently available, beyond determining whether they are the product of pre-contact era activity or post-contact era activity. In the absence of dates, we cannot place them in a chronological framework, nor can we integrate any of the information within them into models for settlement, seasonality, and subsistence.

Nonetheless, we retain material from many of these that may be amenable to radiocarbon dating, such that future research is possible. Furthermore, future advances in techniques for dating archaeological materials will likely occur, and these may impact on features that are not candidates for dating with current techniques. These features will be summarized in Table 14. 3, below.

It also is probable that the total range of features observed at the Jemseg Crossing site and presented in this chapter are but a small sample of the features that existed there before site disturbances in the early to mid-20th century. These include agricultural ploughing, the bulldozing of part of the levee for pasturage, and the removal of site material to create a level place next to the old highway. Archaeological features (especially from the pre-contact era) are extremely susceptible to destruction from these kinds of activities.

Table 14.3: Features that are not currently dated by chronometric techniques or associations.

Feat.	***Area***	***Description***	***length***	***width***	***start dbs****	***end dbs****
6	A	a widespread lens of clay; likely non-cultural	200	90	25	51
15	A	oval of compact clay with charcoal flecking surrounded by orange sandy clay; no artifacts associated	80	40	30	(35)
17	A	oval; areas of red soil, charcoal & ash lenses; 6 flakes, microflakes, calcined bones associated	90	75	28	48
18	A	large basin shaped pit; 1 flake associated	(105)	(50)	48	64

* *dbs=depth below surface*

Feat.	*Area*	*Description*	*length*	*width*	*start dbs*	*end dbs*
19	A	small round feature; probably cultural but no artifacts associated	(60)	(32)	33	48
26	A	small round pit with grey loamy clay fill; probably cultural but no artifacts associated	36	36	(25)	38
27	A	oval feature with gray loamy clay fill; probably cultural but no artifacts associated	52	46	(25)	36
28	A	oval feature with dark red loamy clay basin shaped fill; probably cultural but no artifacts associated	52	32	(25)	40
31	A	irregularly shaped large charcoal- rich lens; 17 flakes associated; living floor?	(200)	50	(25)	(55)
33	A	irregularly shaped feature with grey sandy clay and gravel fill; no artifacts; non-cultural?	90	90	(25)	-
34	A	irregularly shaped with dark red sandy fill, grey clay & charcoal lenses; flakes and glass associated	170	110	(25)	-
35	B	small oval pit with medium brown fill with charcoal flecks; probably cultural but no artifacts associated	16	28	43	50
36	B	irregular pit with medium brown fill with charcoal flecks; one flake associated	60	(6)	42	47
37	B	irregular pit with elongated hourglass shaped, with medium brown fill with charcoal flecks	38	30	45	68
38	B	basin shaped pit with greasy grey-brown clay, charcoal lenses; flakes, clay pipes & nails assoc.	55	30	27	43
39	A	small round feature, no pre-contact artifact associated, but abundant historic artifacts from unit	65	65	(25)	(30)

Feat.	*Area*	*Description*	*length*	*width*	*start dbs*	*end dbs*
49	C	partially excavated dark brown loamy soil feature, flakes associated	(90)	(90)	-	-
50	C	possible post mold (a small circular stain); probably cultural but no artifacts associated	5	5	-	-
51	C	partially excavated dark brown loamy soil feature, flakes (and historic artifacts) associated	(25)	(25)	-	57
52	C	concentration of medium sized cobbles in centre of pit; metal recovered from surface	100	75	-	-
53	C	cobble feature, partially excavated; pre- and post-contact artifacts associated	(100)	(75)	-	-
54	C	small lithic concentration, no soil change	150	30	-	-
55	A	rock pile; no artifacts or charcoal associ-ated; related to ploughing? or cobble feature	40	30	-	-
57	A	possible post mold; small circular stain of charcoal; no artifacts in associated	12	12	-	33
58	A	gray clay patch, associated with fire-cracked rock and flakes	120	100	35	-
59	A	gray clay patch, associated with lots of fire-cracked rock and some charcoal; no artifacts	30	30	24	36
60	A	charcoal patch; interpreted as natural root burn	30	35	38	-
66	A	fire-cracked rock and charcoal; not associated with artifacts	40	50	-	-
67	A	hearth feature; concentrations of dark charcoal-rich soil and fire-cracked rock	30	40	40	59

Feat.	***Area***	***Description***	***length***	***width***	***start dbs***	***end dbs***
68	A	grey clay patch below ploughzone; no artifacts or charcoal; probably non-cultural	110	95	25	32
69	A	grey clay patch below ploughzone, no charcoal or artifacts; may be an anthill (non-cultural)	(100)	(10)	-	-
70	A	grey clay patch below ploughzone, no charcoal or artifacts; non-cultural	105	50	-	-
72	A	possible rodent hole; associated with fire-cracked rock, 2 pre- contact artifacts & charcoal	105	100	-	-
73	A	charcoal lens below the plough zone, associated with fire-cracked rock, flakes and hammerstone	105	30	27	35
74	A	oval clay and ash patch with fire-cracked rock; probably cultural but no artifacts associated	(60)	(15)	65	-
75	A	long narrow grey clay band, 1 flake associated at 38cm; may be non-cultural	200	55	-	-
76	A	grey clay feature; no charcoal or artifacts associated; probably non-cultural	80	60	25	35
77	A	possible hearth feature; fire- cracked rocks and 9 flakes; no charcoal	55	55	-	-
78	A	possible tree burn, 1 flake, calcined bone associated; but also 1 iron spike	(110)	(100)	30	60
79	A	grey clay patch; associated with artifacts; may also be associated with fire-cracked rock	120	95	25	-
80	A	thin grey clay patch, associated with 6 flake; no charcoal or fire- cracked rock; may be cultural	20	20	18	30

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15: Component 1, the Palaeoinian Period

Pam Dickinson

The Palaeoindian culture period is not well represented in prehistoric chronological sequences for the Maritime Provinces. However, an understanding of Palaeoindian cultural traditions has grown significantly in recent years, largely due to the excavation of sites like the Debert site in Nova Scotia. The Debert site was the first locality that clearly placed Palaeoindian people in the Maritimes region (MacDonald 1968).

There have been 7 isolated Palaeoindian projectile points found in New Brunswick. Unfortunately, all of these projectile points were found on the surface, and we have been unable to associate them with intact cultural deposits. There also have been a number of excavated multicomponent sites in New Brunswick that hold potential to have Palaeoindian components. Two of these sites are the Jemseg Crossing site and the Bentley Street site (Figure 15.1). Although it is possible that the location of the Jemseg Crossing site was inhabitable during the Palaeoindian period, no fluted projectile points were found at the site.

One of the major problems pertaining to Palaeoindian research involves the problem of Palaeoindian site recognition in the absence of fluted projectile points. Therefore, I conducted research on another lithic tool that is often found in the Palaeoindian tool kit, the unifacial spurred end scraper (see Figure 15.2). In this research, I defined unifacial spurred end scrapers as multipurpose tools made by unidirectional retouch flaking along the margins of a flake from the same face to

Editors Note: We agree that it remains to be established whether or not there is a Palaeoindian component at Jemseg, but as I have used typology as a tool for the construction of other chronological components (especially during the Middle and Late Archaic), I have elected to identify the artifacts discussed herein as Component 1. This is also a statement of faith and optimism, as it will make integrating future Palaeoindian materials identified in the Jemseg assemblage easier to integrate into the analysis.

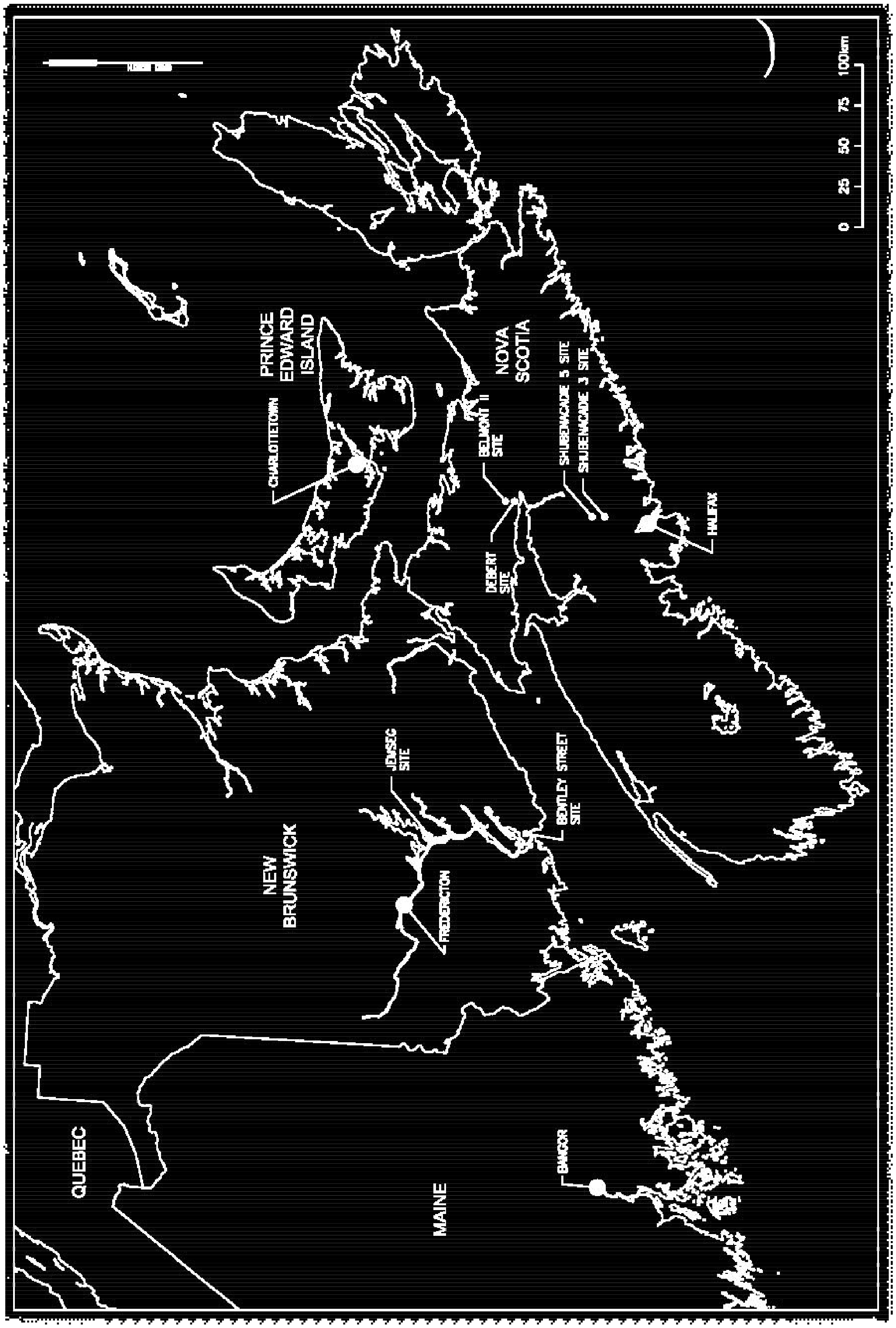
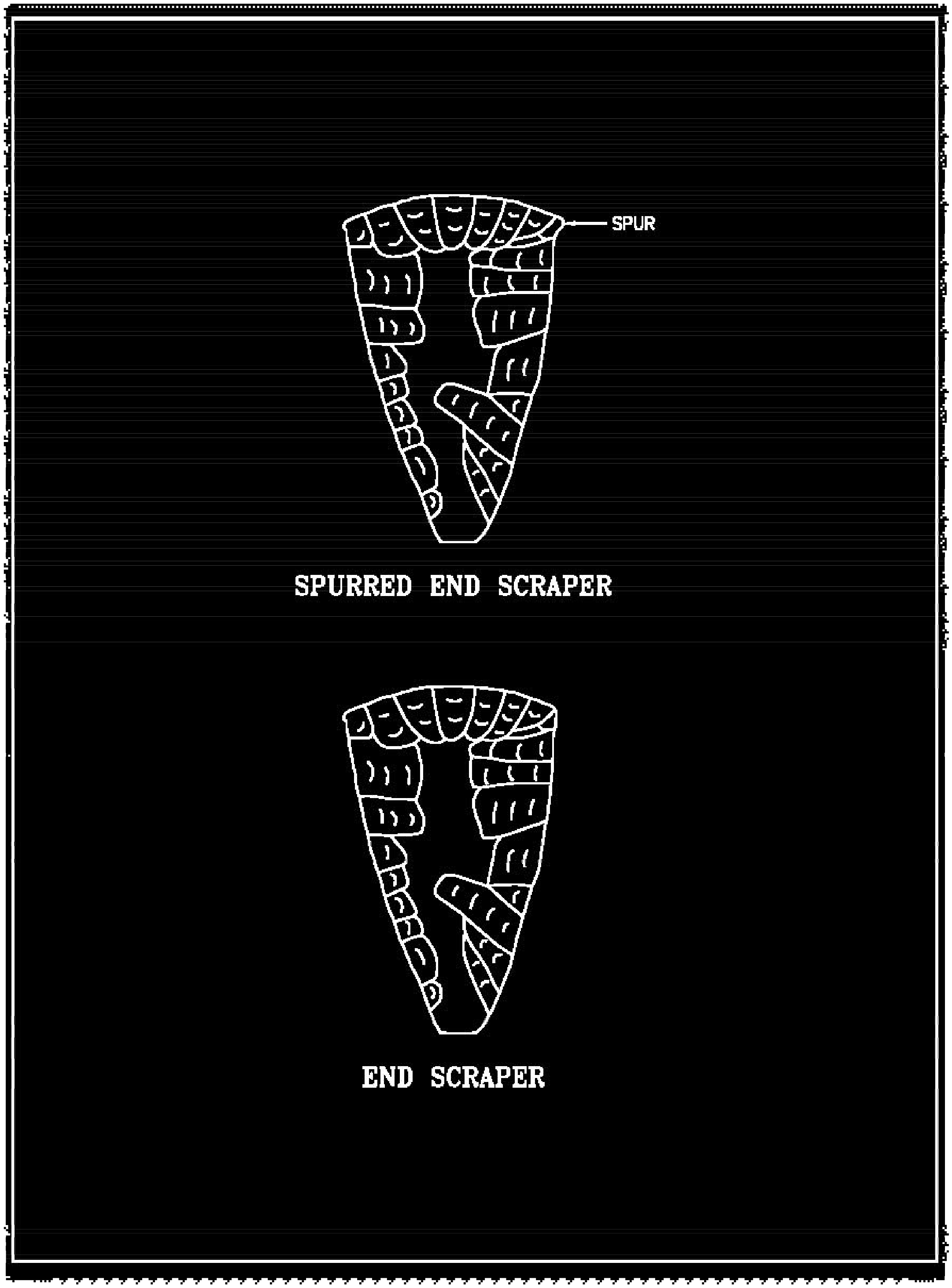


Figure 15.1: Palaeoindian Sites in the Maritimes

Figure 15.2: The morphological difference between an end scraper and a spurred end scraper.



form a steep-edged working end that includes a pointed projection or 'spur'. Unifacial tools such as end scrapers are often finished with a minimum amount of modification. As a result, attributes that indicate the technological process stemming from the formation of the tool are often present on the finished product.

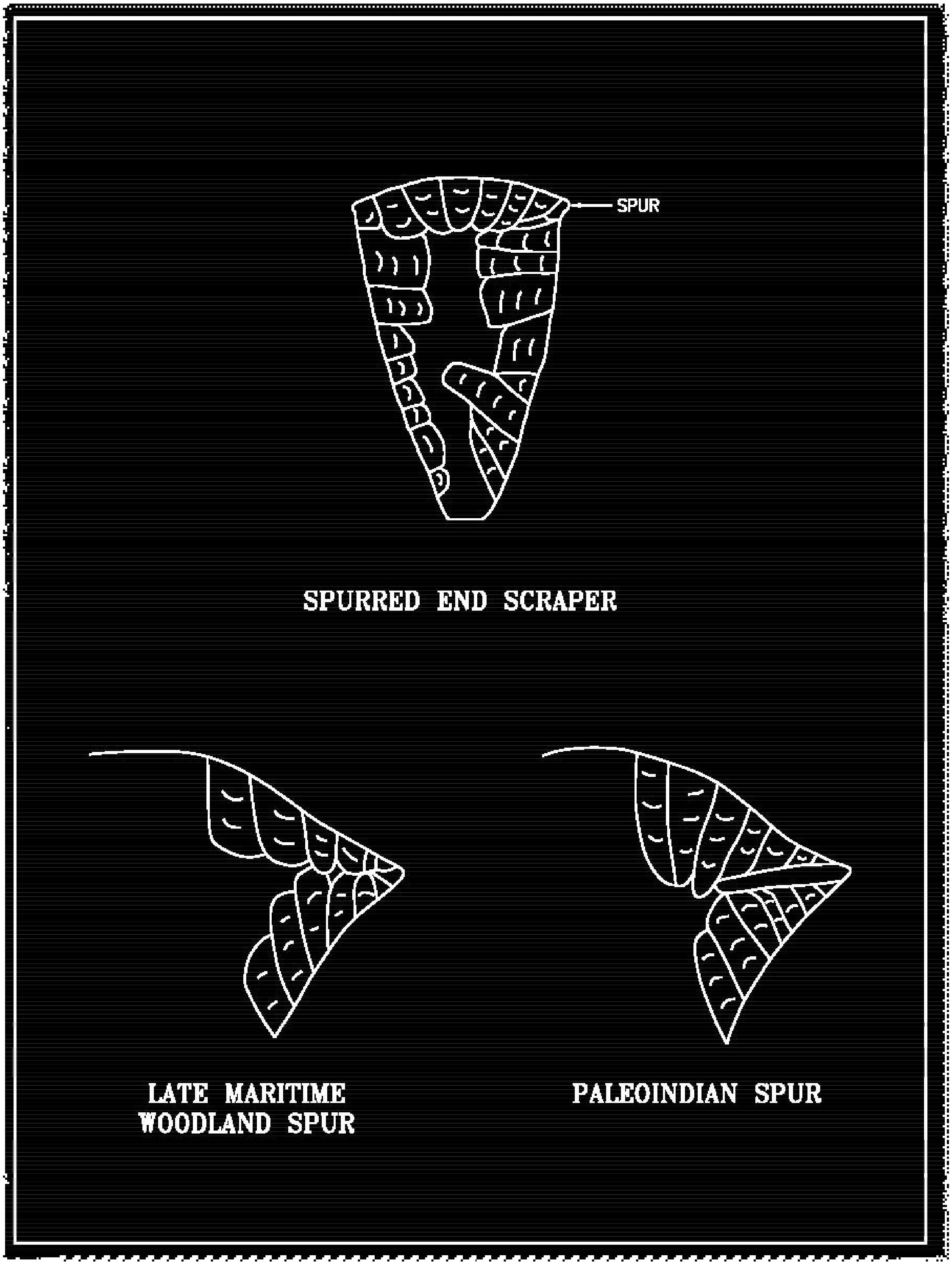
The analysis began with a multivariate approach to analysing spurred end scrapers. In this analysis, I worked toward recognising continuity and variability within samples from two Palaeoindian sites in Nova Scotia, the Debert site and the Belmont II site. To help determine if the assumption that spurred end scrapers are diagnostic of the Palaeoindian period, I analysed two Maritime Woodland site samples from Nova Scotia, the Shubenacadie 3 and Shubenacadie 5 sites. After determining that the presence of spurs on end scrapers is not solely a Palaeoindian attribute, I analysed the technology used to produce the spurs.

From this analysis it became evident that we cannot distinguished between cultural groups based solely on the morphology of spurred end scrapers. All the tools used in this research had a similar morphology and were made from similar lithic materials. However, after completing a technological analysis it was possible to determine that although the morphology of the tool may be similar between culture groups the technology may not.

From the analysed samples of Palaeoindian and Maritime Woodland spurred end scrapers, it was determined that there are two attributes that suggest patterns of similarity between the Early Palaeoindian and Middle to Late Maritime Woodland spurred end scrapers. These attributes include the choice of lithic material and the type of core that was utilised. However, I determined that flaking patterns identified on spurs were dissimilar between culture periods. The presence of a longitudinal microflake down the centre of the spur may be used as an indicator of a possible Palaeoindian component at a site (Figure 15.3). The flaking pattern on the spurs of the Palaeoindian samples indicated this longitudinal microflake, as well as a focus on retouch along the side of the spur. Aside from one specimen that was found in each of the two Maritime Woodland site samples, Maritime Woodland scrapers were only flaked along the sides of the spur.

During this research I determined that the production technology on the spurs held the greatest potential as a diagnostic attribute of a Palaeoindian spurred end scraper. Spurred end scrapers from two sites in New Brunswick, the Jemseg site and the Bentley Street site, were tested against these attributes. The results are not definitive but do indicate that we should consider it possible that the Jemseg and Bentley Street sites may have an as yet unidentified Palaeoindian component. However, this research indicated that we cannot determine if a site has a Palaeoindian component based solely on the presence of spurred end scrapers, but that the temporal range of technological variation of spurred end scrapers is very small. The flaking pattern on the spurs may help to indicate a Palaeoindian presence

Figure 15.3: The flaking pattern on the spur, showing an end scraper from the Late Maritime Woodland (Ceramic) and the Palaeoindian period



when considered with other indicators found within the site.

At the end of the Jemseg project, 746 square metres of the site had been excavated. These excavations revealed Middle and Late Archaic habitation material and a significant Early Maritime Woodland camp (Blair 1997, and Chapter 16, this volume). In general terms, the cultural components got older with distance from the Jemseg River. As the highest elevations at the site contained Middle, Late and Terminal Archaic components, as well as a portion of the Early Maritime Woodland components, it is probable that there would be a mixed sample of scrapers present.

I selected 14 scrapers from the total sample of 203 scrapers. This selection process did not take into account the provenance of the artifact, and was based solely on morphological attributes (especially the presence of a spur). However, all but one of these was recovered from the upper terrace of the site. Within this sample, three specimens had side flaking around the spur and a longitudinal microflake removed from the centre of the spur. All of these were recovered from within a small area on this upper terrace. Unfortunately, the back of the upper terrace has been covered by four to five meters of fill since the 1980s, and some of the oldest archaeological materials recovered from the site seem to continue under this fill.

From the analysis discussed above there were at least two attributes that were considered similar between the Palaeoindian and Maritime Woodland spurred end scrapers. These two similarities relate to the choice of lithic material and lithic core type. There was one attribute that was identified as dissimilar between these culture periods and that was the flaking pattern on the spurs. All of the Jemseg specimens analysed were classified as cherts. However, they exhibit some variations in the type of core that produced them. In the Palaeoindian and Maritime Woodland control samples, attributes such as platform angle, type of platform, and the presence or absence of a lip on the striking platform helped to determine the type of core. Six of the 14 Jemseg site spurred end scrapers did not have a striking platform present. Of the eight specimens with a platform, five had been produced on a bifacial core, and three on a tabular type core. This difference in core type may be related to lithic raw material and the form in which it is available as tool stone.

The flaking pattern on the spurs can be determined on 11 of the 14 specimens from the Jemseg site. Of these 11 specimens, the flaking pattern on three of them conforms to the Palaeoindian pattern with flaking along the side of the spur with a longitudinal microflake down the centre. The attributes mentioned above, together with the distribution of the artifacts within the site, suggest that these spurred end scrapers have the potential to be Palaeoindian in age and further investigation is warranted.

Often highly visible artifacts, such as projectile points, do not occur on small sites. Given the potential for small Palaeoindian sites, other evidence must be considered. End scrapers are one of the most frequent artifacts found in Palaeoindian sites. In this research I have suggested that they should be viewed more critically to determine their potential as distinctive and culturally diagnostic artifacts. As the Jemseg site appears to have a potential Palaeoindian component, further excavation in the general site area may produce a diagnostic fluted point.

However, we can pursue this possibility further without additional excavation, through an analysis of the total excavated assemblage for other tools that may be found within the Palaeoindian tool kit. The Jemseg Crossing site produced approximately 16,000 lithic artifacts. A full technological analysis of all of these artifacts has not yet been completed, and further Palaeoindian attributes may be present in this collection. However, a preliminary analysis identified denticulates (also referred to as gravers by MacDonald, 1968) and bipolar cores. Both tool types have also been identified at many Palaeoindian sites across Maine, as well as at the Debert site in Nova Scotia (MacDonald 1968). However, their presence in other time periods is not known. It should be noted that this analysis is preliminary in nature, and is intended as a framework on which to build future research.

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16. The Archaic Period

Susan Blair

In the Maritime Peninsula, the Archaic period is considered to extend from ca. 9000 years ago to ca. 3000 years ago. With an extent of 6000 years, it is the longest culture history unit, and yet it remains one of the most enigmatic. As a practical measure, archaeologists have distinguished between the Early, Middle and Late Archaic period, but there is little consensus about the basis for these divisions. Prior to the 1980s, the periods between 9000 and 5000 years ago were so poorly known that many researchers considered the possibilities that either no sites had been preserved from this period, or that the Maritime Peninsula was unpopulated at this time (Fitting 1968, 1970; Sanger 1979, Tuck 1984, 1991). However, in the 1970s and 1980s, excavations of Early and Middle Archaic stratified sites in southern New England began to guide regional archaeologists in the identification of the types of sites and artifacts that might be expected (e.g., Dincauze 1976). At the same time, researchers in Labrador and Newfoundland began to explore Archaic components as old as 8000 years, leading to the definition of a long-lasting Maritime Archaic tradition (Tuck 1975, 1984, 1991).

More recently, our understanding has been greatly expanded by the excavation of a series of sites in the State of Maine (e.g.: Site 95.20, Cox 1991; Morrill Point, Robinson 1992; Brigham and Sharrow sites, Petersen 1991, Petersen and Putnam 1992; Gilman Falls, Sanger 1996a; see also Robinson and Petersen 1993, Robinson 1996, 2001). Analyses of these sites have allowed researchers not only to develop an understanding of the appearance and nature of Early and Middle Archaic sites and artifacts, but they have allowed the re-analysis of previously excavated (but poorly understood) collections, and the generation of regional syntheses (Robinson 1996; see also Petersen 1995).

The development of long-term Archaic research in adjacent regions (Maine, on the one hand, and Newfoundland/Labrador, on the other) has had the effect of generating two competing culture historical schemes. It is clear that Jemseg is in a position to be linked to both of these regions, and it seems impossible that the pre-contact record of this larger Atlantic/far Northeastern region cannot be integrated at some scale, although this is beyond the scope of the current research. Most of the known Archaic assemblages from the local area (e.g., the Cow Point site) have been integrated into the Maine framework. Furthermore, the Jemseg Crossing Archaic assemblages (Components 2 and 3) show strong affinities to sites in northern and central Maine, so it is these commonalities that will be most closely explored herein. The integration of these analyses into Maritime Archaic sequences from Newfoundland/Labrador is a very important project that must be undertaken in the future.

Regional interpretations

Regional syntheses from Maine suggest that the Early and Middle Archaic periods were characterized by a long-term cultural stability, and a dispersed, mobile population clustered in small scale social units (Robinson 1996: 140). Based on the evidence of regional continuity, Robinson (1992) has defined the Gulf of Maine Archaic tradition (extending from ca. 10,000-6000 BP). This tradition is characterized by "...flake core/unifaces, tabular choppers, full-channelled gouges, adzes, ground stone rods and, in later periods, ground slate points, but with a near absence of bifacial projectile points" (Robinson 1996: 104). Indeed, it appears that the lack of projectile points from Early and Middle Archaic sites has been the main factor impeding their identification (Sanger 1996a).

Following the Gulf of Maine Archaic, there is evidence within artifact assemblages (mainly manifested in dual trends of standardization and diversification of types), and in settlement patterns (such as site location and size), of population increase and aggregation, and more inferentially, of subsistence intensification and increasing social complexity (Robinson 1996: 140). This regional diversity of artifact types has been sorted into several phases, complexes and traditions (sensu McKern 1938). These include:

(i) the Vergennes phase of the Laurentian Archaic, from ca. 5000 to 5200 years ago, and extending over the northern portions of the Maritime Peninsula (Cox 1991, Funk 1988, Robinson 1996, Tuck 1991),

(ii) the Small Stemmed Point tradition, from ca. 4200 to 5200 years ago, and restricted to the southern portions of the Maritime Peninsula (Bourque 1995; Petersen 1995; Robinson 1996, Tuck 1991),

(iii) the Moorehead phase, ca. 3800 to 4400 years ago, distributed over much of the Maritime Peninsula (Bourque 1995, Sanger 1973, 1991, Robinson 1992, Tuck 1991), and

(iv) the Susquehanna tradition (occasionally manifested as Atlantic phase assemblages), from ca. 3800 to 3500 years ago, and concentrated largely in the southern portions of the Maritime Peninsula (Bourque 1995, Robinson 1996, Tuck 1991).

The significance of these different phases and traditions is the source of some debate (e.g., Bourque 1995, Petersen 1995, and Robinson 1996). Do they reflect the distribution of different cultural groups, or are they the result of functional variables, such as might result from a single cultural group carrying out different activities at different sites? Are shifting patterns over time due to the movement of people or the diffusion of artifact types? As much of the current debate is structured around the evidence from Maine (and from some time periods this evidence is scant), the further accretion of evidence from sites such Jemseg Crossing will undoubtedly refocus some parts of these debates.

Local manifestations

The evidence for the Archaic period in the Jemseg area is largely derived from three sources:

(1) artifacts recovered by private collectors in the greater Jemseg area over the last 150 years,
(2) previously excavated archaeological sites (especially the Cow Point site, Sanger 1973, 1991), and
(3) archaeological material recovered during the Jemseg Crossing Archaeology Project.

Private collections from the Grand Lake area contain abundant evidence of Archaic activity. Indeed, ground stone artifacts outnumber flaked stone artifacts in some extant collections. However, many of these collections were created through the surface collection of ploughed fields. Ground stone tools may have been more easily observed and selected in this type of collection process due to their comparatively higher visibility.

The private collection most closely linked to the Jemseg Crossing site, that of the Dykeman brothers, was assembled during the early 20th century largely through their surface collection of the site area (R. Dykeman 1996, pers. comm; Dignam 1997). In addition to the Dykeman brothers' collection, several 19th century collections (notably those of W. McIntosh, A. Loring and A. Bailey) contain artifacts from the Jemseg area. These late 19th – and early 20th – century collections contain both flare bit and parallel-sided, fully channelled gouges, ground stone rods, ground slate semi-lunar knives, partially-channelled gouges, and assorted Archaic projectile points types (e.g., Otter Creek and Bradley types; see Figure 16.1, Plate 16.1).

Figure 16.1: A red mudstone Otter Creek projectile point collected "near Fredericton" in the mid-19th century, held by the Smithsonian Institution (98 mm long)

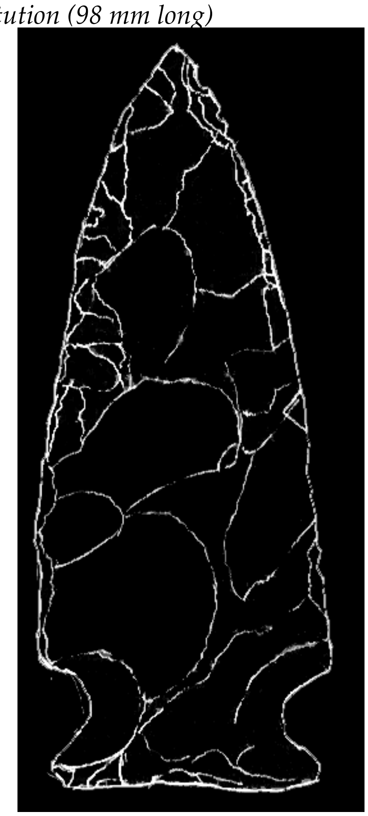


Plate 16.1: Artifacts from private collections housed at New Brunswick Archaeological Services, recovered from the Jemseg area. Upper row: left and centre, ground slate semi-lunar knife fragments; right, flare bit gouge. Lower row: far left, celt; centre left, partially channelled gouge; centre right, partially channelled gouge; far right, parallel-sided fully channelled gouge.

Despite the rarity of Archaic period habitation sites in New Brunswick, the occurrence of Late Archaic artifacts in this area is not surprising given the proximity of Jemseg to a significant Late Archaic cemetery, the Cow Point site (BlDn-2), 5 km distant from the Jemseg Crossing site (Sanger 1973, 1991). However, the quantity of Early and Middle Archaic artifacts (and the implications of these finds for interpretations of the regional distribution of earlier Archaic sites) in locally generated collections has only recently been appreciated (for a more complete discussion, see Murphy 1999). Until the Jemseg Crossing Archaeology Project, no Early and Middle Archaic components had been professionally excavated in the Canadian Maritimes. Generally, the private collections suggest that the lack of known Archaic habitation sites in the area is an attribute of our current state of knowledge (in particular, the lack of regional survey and archaeological research) rather than the absence of sites. The archaeological assemblage from the Jemseg Crossing site supports this observation.

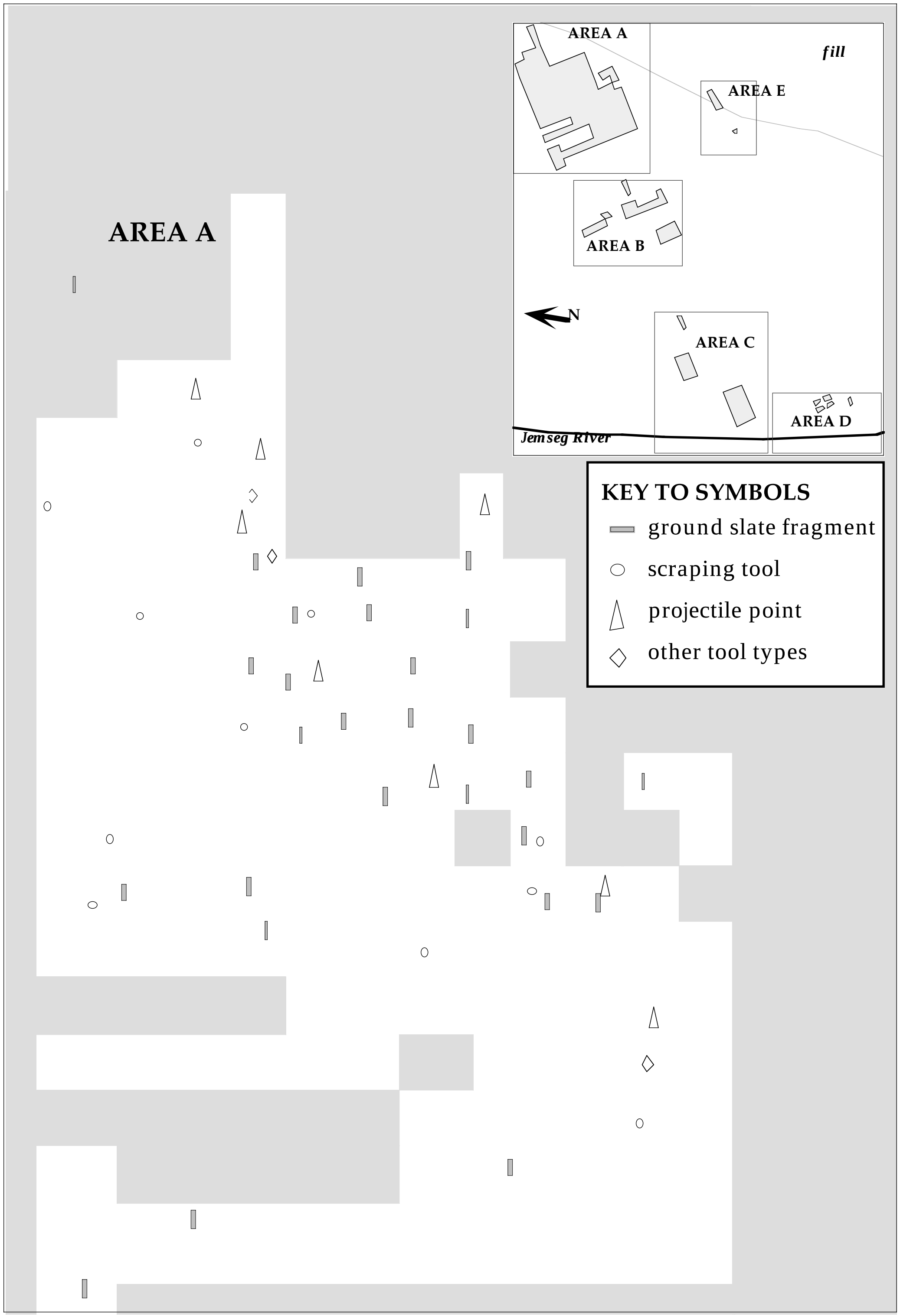
THE JEMSEG ARCHAIC ASSEMBLAGE

Although archaeological materials attributable to the Archaic were proportionally less dense than later Woodland and post-contact period materials at the Jemseg Crossing site, they were regularly distributed, particularly on the upper terrace. These Archaic materials include both flaked and ground stone artifacts. Unfortunately, the vast majority of the diagnostic Archaic period artifacts were recovered from poor contexts, primarily from the disturbed alluvium (ploughzone) on the upper terrace, and occasionally from the river banks. From an archaeological perspective, this phenomenon seems counterintuitive. Older materials should be more deeply buried and therefore less disturbed than more recent materials. Given that these artifacts appear to be the oldest from the Jemseg Crossing site, why are they concentrated in the uppermost layers?

The answer may lie with site formation processes. Closer to the Jemseg River, most of the pedogenic forces are alluvial, with the annual spring flood or freshet being the major source of long-term soil build up on the lower part of the site. However, this factor diminishes with distance from the river. Higher portions of the site have received less silt and sand from flooding, an effect that creates a wedge-shaped stratigraphic profile. Closer to the water the alluvium is very thick (over 2 m), while on upper terrace it is thinner (as thin as 30 or 40 cm, see Figure 3.3). The lack of alluvium in the upper field, where most of the Archaic material is concentrated, causes this older material to come into contact with the ploughzone, from whence it can be distributed in the direction of the river over more recent material. This suggests that the bulk of the Archaic material may originate to the east of Area A, perhaps even under the fill, and that it was distributed westward by post-contact period ploughing. The distribution of artifacts that are potentially attributable to the Archaic period is presented in Figure 16.2. This figure shows that most of the diagnostic Archaic materials are concentrated in a band running north-south, in the easternmost portion of Area A, a distribution that correlates well with the hypothesis above.

Due to the significant degree of post-occupational mixing, I could not identify any features that were older than the Terminal Archaic (see below). The analysis is impoverished by a lack of information about settlement, intra-site patterning, and broad technological inferences. Furthermore, the disturbed nature of the Archaic component affords few opportunities for detailed analysis and interpretation, since only the most diagnostic artifact types (those that can be assigned with confidence to the Archaic period) can be discussed. These criteria exclude many potentially illuminating artifact classes like unmodified and utilized flakes and cores, ‘expedient’ flake and core tools, and ubiquitous tool classes like scrapers, choppers, celts, and unstemmed bifaces. As a result, I will limit the following discussion to particular subsets of the assemblage, and correlations that can be drawn between them and similar, less

Figure 16.2: The distribution of diagnostic Archaic artifacts, showing the zone of concentration in the eastern portions of Area A; inset map shows excavated areas of the site.



disturbed assemblages from elsewhere in the Maritime Peninsula.

COMPONENT 2: MIDDLE TO EARLY LATE ARCHAIC

I have tentatively ascribed Component 2 to either the Middle Archaic period or the early Late Archaic period (between ca. 9000 and ca. 5000 years ago). Because there is so little known about these time periods in the Canadian portion of the Maritime Peninsula, local variations have not been explored. In effect, almost all of our knowledge of the Archaic period is derived from sites in Maine. This must serve as a note of caution, as the assumption being made here is that the material from Maine can be used as a guide to recognizing such components in the Maritimes, an assumption that future research may prove to be over-simplistic. A further complicating factor is that the Early and Middle Archaic periods have only recently been clearly defined in Maine (Robinson 1996: 95). These analyses have suggested that some Middle Archaic traits (from as early as 8500 years ago) may persist in time into the Late Archaic (up to 3700 years ago; Robinson 1996, see also Petersen 1995).

Broadly, diagnostic Middle Archaic artifacts may include ground stone rods, fully channelled gouges, heavy scraping implements (particularly large "humpbacked" variants, as well as large- and medium-sized scrapers made on cortical quartz nodules), notched pebbles, and rarely, bifaces. Ground stone rods are a somewhat enigmatic artifact class that has only recently be recognized as diagnostic of the Middle Archaic. Although they have been found in a variety of contexts, one of the more widely accepted explanations of their function is that they are an abrading tool used to sharpen fully channelled gouges. The frequent association of rods and gouges in Middle Archaic components supports this conclusion (Petersen 1995: 216; Robinson 1996).

Component 2 Artifacts

The Jemseg Crossing site produced a number of potentially diagnostic Middle and early Late Archaic artifacts, including five medium- to large-sized scrapers made on cortical quartz nodules and two ground stone rod fragments (see Plate 16.2). In addition, we recovered a number of less diagnostic artifacts that might be attributable to the Middle Archaic, including over 50 fragments of ground slate. All of the ground slate pieces are thin (average 3.7 mm thick), and some have worked (bevelled) edges (see Plate 16.3, 16.4). Few of the pieces could be cross-mended, although the fragments themselves suggested that the original tool shape was large with straight edges. Although these slate artifacts could be semi-lunar knife (*ulu)* or gorget fragments, or even slate-working debitage, the closest correspondence I have encountered are slate knives recovered from Site 95.20 in eastern Maine. This site was attributed to the Vergennes phase (ca. 5000 years ago). None of the Jemseg Crossing slate fragments were perforated or incised in any apparently purposeful fashion, although some exhibit some scratches and abrasions

Plate 16.2: Possible Middle to Late Archaic artifacts from the Jemseg Crossing site; upper left: side-notched point base; lower left: asymmetrical biface; centre: stone rods; right: quartz scrapers

Plate 16.3: Thin ground state fragments; note smoothed upper and lower edges and linear patterns of scratches parallel to the lower edge on left piece, and bevelled lower edge on the piece to the right.

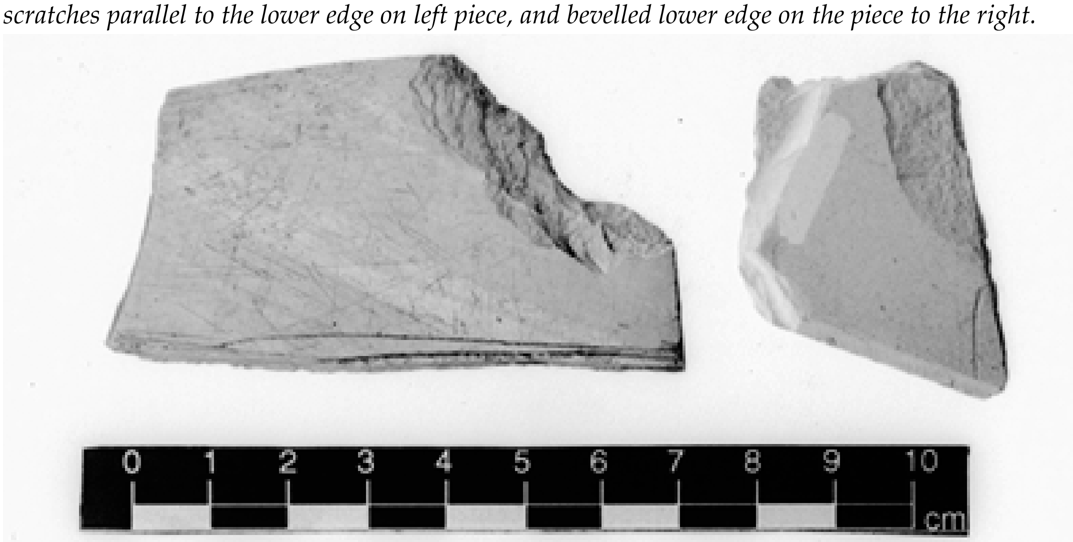


Plate 16.4: Ground slate fragments from Jemseg Crossing.

on surfaces that could be incidental or post-depositional, or the result of use-wear.

Other artifact classes in the Jemseg assemblage that are loosely associated with the Middle Archaic (but also could date to other time periods) include battered, flaked cores (1), net-sinkers (3), adzes (4), and celts (4; see plates 16.5 and 16.6). In addition, a variety of large humpbacked scrapers and informally styled "expedient" flake and core tools may be also attributable to this component. These artifact types are consistent with our expectation of earlier Archaic period artifacts, but also occur as minority tool types in most other stone tool-using time periods.

The only *in situ* Component 2 artifacts consisted of a ground stone rod fragment, found adjacent to an unstemmed biface (plate 16.2) and 24 unmodified bleached

Plate 16.5: Artifact classes recovered from Jemseg Crossing that are typical of Archaic components; left: peck axe or adze preform, upper centre: notched pebble; lower centre: large flake chopper; right: pitted anvil or "nutting" stone.

volcanic flakes. These were recovered in Unit TB1, one of the first test units placed during the Jemseg Crossing Archaeology Project (JCAP), from a depth of 30 cm, within a few centimetres of the basal till (see Chapter 3, the section on site stratigraphy). They were not correlated with visible features or material amenable to radiometric dating. Given the proposal that these artifacts have been minimally disturbed, their position supports the inference of minimal early Holocene soil development on upper terrace. Unit TB1 is at the extreme southeastern edge of the proposed highway footprint (see Figure 8.2), and corresponds well to the thin edge of the hypothetical alluvial wedge.

The contextual integrity of these artifacts is suggested by stratigraphic evidence and site history. A burnt and shattered plate of 19th century white refined earthenware was recovered from under the sod of this unit, with the majority of the 19 sherds recovered from the same horizontal plane and within 20 cm of each other. This distribution suggests a relative lack of the kind of disturbance that might be expected as a result of agricultural activity such as ploughing. All such post-contact period materials were concentrated in the top 5 cm of TB1, and were vertically separated from the pre-contact artifacts by at least 25 cm. Furthermore, a local resident with a knowledge of patterns of site use over the last 70 or 80 years indicated that this section of the site was beyond a property line, and had never been ploughed (R. Dykeman, pers. comm., Dignam 1997).

Plate 16.6: Plummet from Jemseg Crossing.

If the rod and the biface were in a relatively undisturbed context outside of the area of site ploughing, we can hypothesize that they might share a common use history and age. Although bifaces are unusual in Middle Archaic contexts, recent excavations in Maine have produced similar asymmetric bifaces in association with more classic Middle Archaic artifacts, such as stone rods (see Cox 1991, and discussion below).

The Jemseg Crossing artifact assemblage was also lacking particular classes of Archaic artifacts. Although we recovered a variety of broken ground stone implements in various stages of manufacture (including many that were functionally ambiguous), we did not encounter any gouges, finished plummets, or ground slate points.

Discussion

These finds confirm that there was discernible Middle to early Late Archaic period activity in the area. Unfortunately, almost all of the artifacts that could be attributed to this time period were recovered from disturbed contexts. This greatly impedes the analysis and more precise dating of these artifacts, an issue that can only be resolved with further excavation of intact deposits. The artifact classes (both present and absent), the utilitarian nature of recovered specimens, and the absence of Archaic period red ochre features suggest habitation-related activity.

The Component 2 assemblage presents research opportunities, but also poses many interpretive problems. Clearly, there are elements of this assemblage that carry the distinctive characteristics of the Middle Archaic, as it is currently understood in Maine. Artifacts from private collections corroborate this interpretation. However, sorting out the precise nature of this assemblage is difficult. Although the various phases and complexes proposed for Maine suggest ways to both comparatively identify and date the Jemseg Crossing assemblage, the research in Maine is in a preliminary state.

Generally, there are (at least) two possible dating schemes for Component 2.

(1) Given the current information available from Early and Middle Archaic components in Maine, Archaic artifacts from Jemseg (in particular, ground stone rods and some of the expedient scraper and knife classes) could date to the early Middle Archaic (perhaps as old as 8500 years old). Under this scheme, this period of activity was followed by a series of minor Middle and Late Archaic activities (potentially including ground slate fragments and artifact classes identified in private collections). In this scenario, the plough zone contains the remnants of as much as 3000 to 5000 years of activity (from up to 8500 years ago to 3500 years ago), which as been inextricably mixed by recent agricultural activity.

(2) The second scenario attributes all of the earlier Archaic material to a period of time around 5000 years ago, similar to Cox’s interpretation of Site 95.20 (1991). This suggests an affiliation with the Laurentian Archaic. Through this scenario we can integrate some more anomalous artifact classes into a more unified occupation of the site (especially the ground slate fragments and the associated rod and biface). However, this is not necessarily a more accurate interpretation than the first, given the wide distribution of artifacts, and the lack of contextual information. Furthermore, many archaeologists are cautious about the adoption of macro-regional culture historical manifestations, such as the Laurentian Archaic (see Cox 1991: 151, Sanger 1976, Wright 1999). Some have suggested that this notion has been misapplied and abused in the Maritime Peninsula, especially as a mechanism for typologically identifying flaked stone tools (Tuck 1991: 51).

Unfortunately, these two scenarios also suggest different levels of regional activity. The first scenario suggests long-term but very low intensity site use, resulting in a "palimpsest" deposit. The latter scenario suggests a temporally restricted but more intense period of use. In either scenario, the focus of this activity was likely just outside the highway footprint, to the south and east of Area A. This is suggested by the band of Archaic artifacts in the eastern half of the upper terrace. Furthermore, we can infer that these materials were dispersed from their original associations by post-depositional disturbance (ploughing). However, these issues will only be resolved with further local and regional research.

Given the difficulties discussed above, it is impossible to determine any patterns of seasonality, mobility, subsistence and settlement from these materials because of their lack of association with features. The relationship between the Archaic populations of the Lower Saint John River valley and coastal and interior groups also remains poorly understood.

In the larger region, it has been suggested that the Middle and early Late Archaic was a time of small, mobile, foraging groups. By assuming this pattern holds, we may suggest several testable suppositions about the nature of settlement at Jemseg Crossing. The Jemseg area may have been one of many stops on a seasonal round such that people came for a specific set of resources or activities, and stayed for short periods of time. However, the position of the Jemseg Crossing site area on the web of interconnected interior waterways may suggest its enhanced standing in regional Archaic activity. Given inferences by Robinson (1996) of the importance of these interior water systems for expressions of territoriality and regional interaction, the Jemseg Crossing site may have been a place where groups came together to socialize, perform ceremonies, trade and exchange goods, stories, and ideas, and to strengthen familial and social relationships.

COMPONENT 3: THE LATE ARCHAIC

The Late Archaic is generally considered to extend from some time between 5000 and 6000 years ago to some time about 3800 years ago. In this research, I have incorporated the early Late Archaic material (attributed by Cox, 1991, to the Laurentian tradition / Vergennes phase) into Component 2. As a result, I distinguish it from later material by treating it as separate from later Late Archaic manifestations, such as the Moorehead phase (or the Cow Point phase, Robinson 1996). However, in the context of the Jemseg Crossing site, the distinction is entirely superficial. I have distinguished between the Middle to early Late Archaic (ca. 8000 bp to ca. 4500 bp) and the Late Archaic period (ca. 4500 to 3800 bp) for several reasons. Prior to the Jemseg Crossing site, the earlier Archaic activity as described above (Component 2) had been unexplored locally. In contrast, there is good evidence in the St. John drainage for later Late Archaic activity (primarily from sites such as Cow Point, Sanger 1973, 1991 and Portland Point, Harper 1957, Jeandron 1996). Furthermore, there appears to be enough understanding of Late Archaic manifestations to distinguish them from earlier periods, perhaps because of the degree to which the latter have been studied. Finally, given its proximity to the Cow Point cemetery (ca. 5 km away), the presence of Late Archaic habitation material at Jemseg Crossing may offer us a glimpse of a previously unexplored dimensions of regional Late Archaic activity.

However, for all intents and purposes, both Component 2 and Component 3 are identified typologically, and cannot be differentiated within the Jemseg context either stratigraphically or behaviourally. In effect, we could regard Components 2 and 3 as a continuum of site activity, manifested in intergrading artifact types and local cultural developments. They might equally consist of a series of components representing different kinds of activities in different time periods, the divisions between which are obscured by the lack of stratigraphic separation and the resulting analytical “coarseness”.

Regional Late Archaic manifestations

As discussed above, several local phases or complexes followed the Laurentian tradition. These include the Moorehead phase, the Small-stemmed point tradition, and the Susquehanna tradition. Of these, the Moorehead phase material was the earliest to be regionally analysed, primarily through a series of sites in Maine (Willoughby 1922). This phase has also been well documented through the excavation of the Late Archaic cemetery at Cow Point.

The Cow Point cemetery (BlDn-2) is also located in the Grand Lake system, ca. 5 km northwest of the Jemseg Crossing site. It was excavated in the 1970s by the Archaeological Survey of Canada (Sanger 1973, 1991). This excavation revealed red ochre features containing burials and burial objects. These included an array of ground stone implements, especially thin slate “bayonnets”, with exquisite patterns engraved on their surfaces (Sanger 1991: 86). Initial radiocarbon dating, consisting of two dates from two different site loci, suggested that the cemetery was in use between 4000 and 3700 years ago (Sanger 1991: 87). Subsequent re-dating of feature material from Cow Point has led to a reassessment of the accuracy of the later date, indicating that the burials at Cow Point may have occurred during the earlier portion of this range (Robinson 2001). It is clear that such a cemetery suggests a local resident population. Nonetheless, very few habitation sites from this period have been documented for the Maritimes. However, diagnostic artifacts in surface- and beach-collected private collections confirm the presence of a significant Late Archaic population (e.g., Sanger 1975). Archaeologists have also regularly encountered the phenomenon of probable Late Archaic artifacts without associated features underlying later Maritime Woodland period sites (e.g., Black 1992, Tuck 1991).

Unfortunately for those of us who would distinguish between them, many of the classic traits associated with Moorehead phase material have antecedents in earlier periods. These include fine ground slate tools, plummets, heavy ground stone implements, and a variety of flaked stone tool classes (Tuck 1991, Sanger 1973, 1975, 1991). More informally, heavy choppers and large scraper-like tools are also associated with the Moorehead phase. These commonalities make it difficult to distinguish potential Moorehead phase material from earlier (or later) artifacts. Material types (especially Ramah quartzite from northern Labrador) and artifact forms (such as stemmed points) suggest long-distance linkages with the north, and particularly with Newfoundland and Labrador. These attributes led Tuck to postulate that Late Archaic variation could be integrated into the Maritime Archaic tradition (Tuck 1991: 51). However, many consider the Moorehead phase or complex to be limited largely to the state of Maine and north and east of it (Petersen 1995).

The Small Point tradition is a more elusive Late Archaic manifestation, which appears to be largely defined in terms of projectile point typology (Bourque 1995: 38; Tuck 1984: 19). Generally, it is characterized by small, narrow-bladed projectile points with poorly-defined haft elements. It is considered to be a southerly manifestation that is roughly coeval with Moorehead (Petersen 1995). This distribution is reinforced by the lack of Small Point tradition material from the Jemseg Crossing site.

The final significant Late Archaic manifestation in the Maritime Peninsula is the Susquehanna tradition, which appears in southern Maine and in parts of New Brunswick between 4000 and 3000 years ago (Allen 1998, Black 2000, Bourque 1995, Davis 1982, Deal 1984). Although there are many debates as to the origins of this manifestation and the nature of Susquehanna economy and subsistence practices (e.g. Bourque 1995, Petersen 1995, Robinson 1996, Tuck 1991), it is clear that the Susquehanna tradition represents a distinctive Late Archaic pattern. The use of soapstone bowls (often considered to be the technological antecedents of low-fired clay pottery), broad bladed points, distinctive lithic materials, and grooved axes are all characteristic attributes.

Like the Middle to early Late Archaic component (Component 2), the Late Archaic component at Jemseg is largely restricted the upper terrace. However, as discussed in Chapter 14, several intact features were observed and recorded below the plough zone during JCAP that may date to either the Late or Terminal Archaic. Furthermore, many other features lack diagnostic artifacts, and remain undated. Some of these may be dated in the future to the Late Archaic. I will discuss below the content and structure of features that may be associated with Component 3. In addition to these features, we encountered an array of artifacts within the disturbed alluvium (or plough zone) that have Late Archaic attributes. These will also be described below.

Late or Terminal Archaic Artifacts

A number of artifacts could be ascribed to the Late and Terminal Archaic. These consist of two tool categories: heavy woodworking, chopping and scraping implements; and projectile points. Most of these are projectile points that have been correlated with regionally documented Late / Terminal Archaic contexts. However, some of these types have long periods of use that may continue into adjacent time periods, while in other cases superficially similar variants reappear in much later time periods. For the purposes of this discussion, these point types were grouped according to superficial or stylistic attributes (such as the size, degree of expansion / contraction of the stem, the presence and nature of notching, material classes) into 6 broad types. In all, 12 points are potentially attributable to Component 3, and so will be discussed according to this classification scheme.

(1) Medium-sized narrow bladed points with straight to slightly expanding stems.

(2) Medium-sized narrow bladed points with wide side-notches and well-defined necks.

Two medium-sized projectile points were recovered from the site that had long, straight (slightly expanding) stems, and triangular blades, both of highly bleached volcanic (JC42). The base of the stems are unmodified, and retain the striking platform of the original flake (plate 16.7 e). Similar to these points, but with more modified bases are four exhibiting what appear to be wide side-notches (plate 16.7 a-d). In most cases notches delimit a well-defined straight neck. This is in contrast to other side-notched variants. The blades for both of these types range from very long, narrow and leaf-shaped, to shorter and triangular. These points are also made of a variety of light or bleached volcanics (JC33, JC42, JC43), with the exception of a single grey Munsungun-like chert point (JC51). The unmodified bases present on the straight stemmed points are considered a diagnostic attribute Late Archaic points, including Moorehead phase points (Bourque 1971: 262, and Sanger 1997: pers. comm.). Straight-stemmed points that are very similar to the Jemseg (1) type were recovered from the Cow Point site area (Sanger 1973: 208). Both Jemseg types (1) and (2) can be loosely lumped under the definition of “Bradley” type points, as described by Bourque (1971: 262) based on sites in the central coast of Maine. “These points are large and fairly thin, with well defined shoulders and either a straight stem with ears at the base or a flared stem, at times approaching corner notching. Rarely the stem will be almost completely straight. Striking platforms are occasionally evident on the bases of these points”.

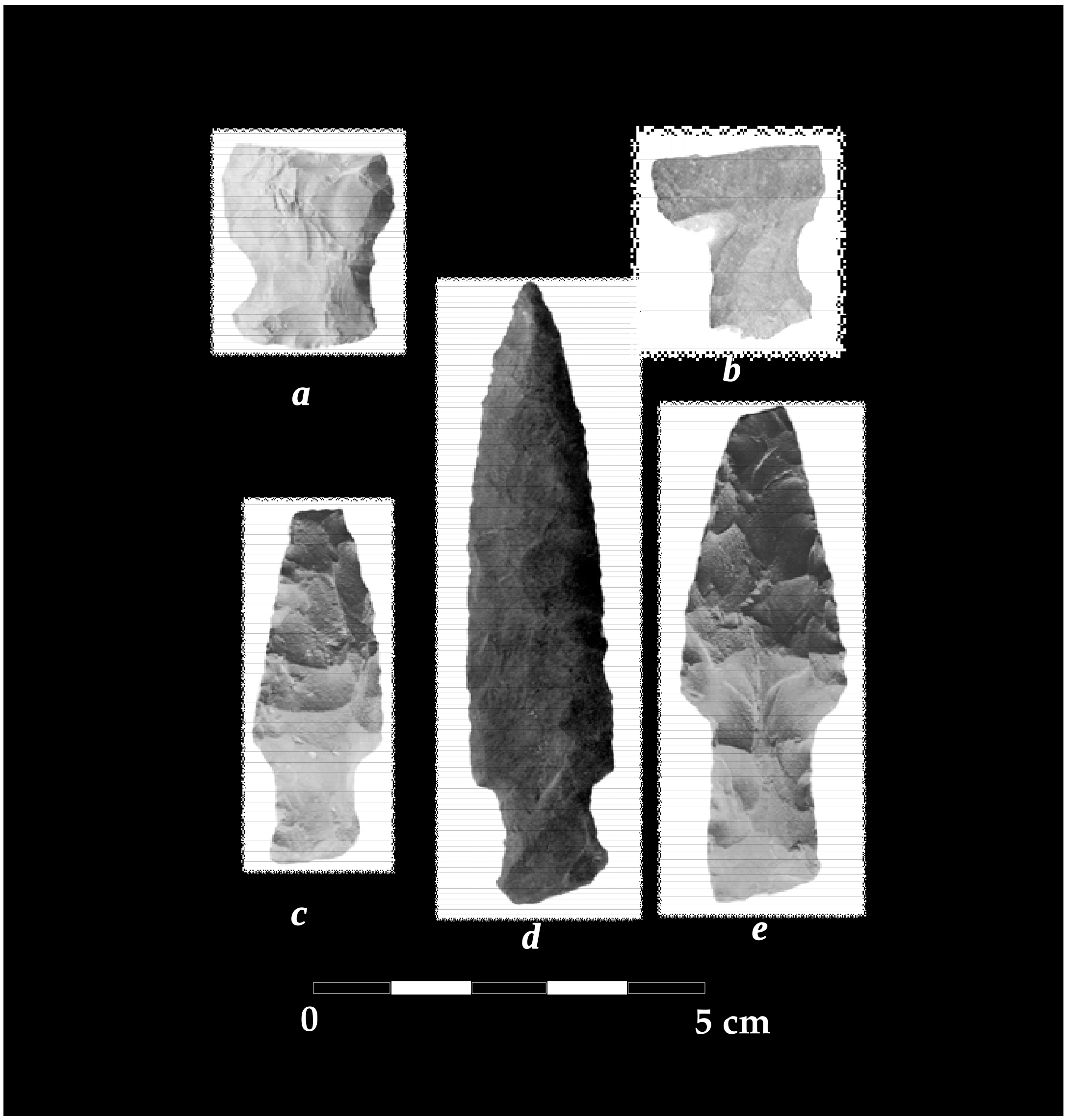
The “Bradley” type is widely considered to date between 3700 and 4500 years ago. However, there are numerous cases of similar points in more diverse associations both in Maine and in the broader Northeast. In Maine, Cox (1991: Figure 5:F,G) has documented two similar points from a possible Vergennes component (ca. 5000 years ago), while Petersen (1995: 221) has correlated similar specimens to the Terminal Archaic (ca. 3500 years ago). Bourque, who originally attributed narrow-bladed, straight-stemmed point to the Late Archaic (Bourque 1975: 37), has reclassified some of them as Ceramic period artifacts (Bourque 1995: 181).

Similar associational variation has been documented further afield. Based on work in New Hampshire, Dincauze (1976: 36) suggests that such points be generally attributed to the Late Archaic, in agreement with Tuck and McGhee’s (1975: 85, 87) data from Labrador. A Late Archaic date is further supported by Clermont and Chapdelaine (1982: 32) based on points from near Montréal. However, in parts of southern New England and New York state, similar points have been found in Early Woodland components (see Granger 1978: 387, 394, and Funk 1988).

Given the relatively solid regional association of this point type with the Late Archaic Moorehead phase, Jemseg types (1) and (2) suggest a link to local developments between 3700 and 4500 years ago. Unfortunately, all of these points were recovered from disturbed contexts, with three from Area A, one from Area D, and two from the beach in Area F.

(3) Wide side-notched points with a flaring stem.

Plate 16.7: Jemseg projectile point types (1) and (2); specimen d, e, below; type 1, specimen a, b, c and d, type 2, specimen e.



This point type, represented by two artifacts, is distinguished from (2) by the lack of a well-defined neck, and a shorter, broader blade with convex margins (plate 16.8). One of these points, made on a red flow-banded rhyolite, is extremely worn, apparently by water action, so is difficult to classify more clearly (Plate 16.8 b). The other, a green bleached volcanic (JC43) point, is similar to Orient style points, a variant common to the Late Archaic (Ritchie 1971), but also persisting into the Terminal Archaic (Black 1992, 2000, Plate 16.8 a). Generally, Orient points are associated with the Orient phase of the Susquehanna Tradition, a southerly late Terminal Archaic phase (Petersen 1995). However, there is evidence from central Maine (Rutherford 1989:3) of similar points from presumed Early Woodland contexts. Alternately, however, similar points have been related to Laurentian Archaic contexts (Tuck 1991: 54), as variants of Otter Creek. Certainly both specimens have some smoothing apparent on their surfaces and edges (an attribute of Otter Creek type Laurentian points), although this modification could be post-depositional (weathering and natural abrasion or water action). Generally, however, both of these specimens are too small to easily fit into the category of "Otter Creek".

Plate 16.8: Type (3) projectile points; wide-side-notched points with a flaring stem.

Despite these associations, the most widely expressed view is that side-notched points similar to Jemseg (3) types are typical of the Orient phase of the Terminal Archaic (after 3500 years ago, Black 2000), and so may represent a minor Susquehanna-related presence on the site. The water-rolled point was recovered from the beach, while the other was recovered from the disturbed alluvium in Area A.

(4) Medium sized, thick, contracting stemmed points

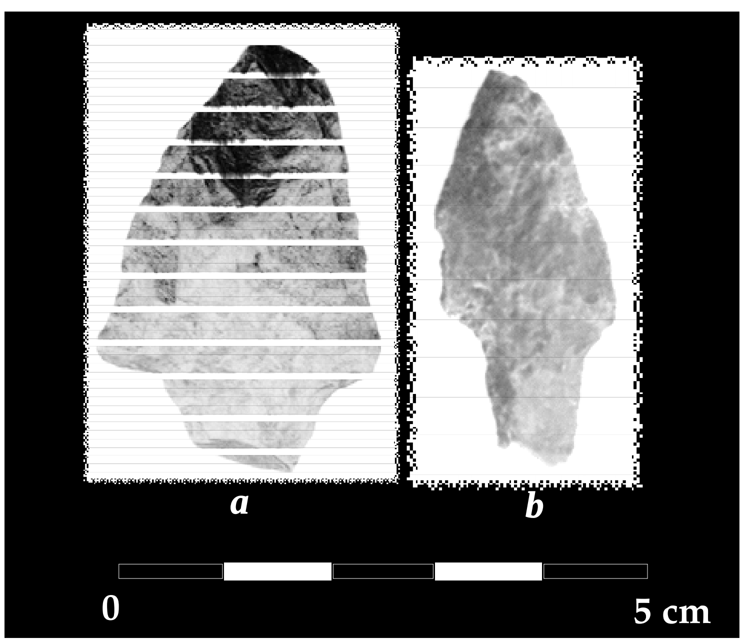
These two points are medium-sized, with roughly triangular, very thick, short blades, and long, tapering (contracting) stems (see plate 16.9). One was identified during the JCPS (see Black, this volume) as being made from Kineo-Traveller Mountain porphyry (JC29), a material that originates in central Maine, and could only have been brought to the site through the actions of the people of Jemseg.

Both points exhibit little thinning or finishing. One was recovered from the beach, while the other was recovered from the disturbed alluvium in Area A. This point style is an example of one that is characteristic of several time periods, and reoccurs in a coincidental fashion, unrelated to cultural continuity. Such points are encountered in Archaic contexts (Bourque 1995: 45, Ritchie 1971: 46), but also occur locally in Early and Middle Woodland contexts (Allen 1980: 113, Foulkes 1981: 94; Buchanan 1999, pers. comm.). The Woodland contracting-stemmed points appear to be varieties of bipoints, or lozenge shaped bifaces; the Jemseg points have clear shoulders, which distinguish a shorter, triangular blade from a long tapering stem. Furthermore, the Jemseg pieces have little pressure-flaking or thinning, which is evident on some of the Woodland pieces. Neither point was recovered near the Middle Woodland component, and seem to cluster near the other potentially Late Archaic artifacts. Some of this variation, such as the shortened, triangular blade could be the result of use and resharpening of the blade, rather than stylistic attributes.

(5) Broad bladed small-stemmed points

A single broad, small-stemmed point was recovered from Area A, at a depth of 53 cm, which is well below the zone of disturbance (0-30 cm below surface) associated with ploughing. This projectile point, made of a highly weathered porphyritic rhyolite tuff (JC47), was broken into 7 fragments (plate 16.10). The pattern of breakage is suggestive either by a strong vertical force (as might occur if it was stepped on), or may be due to spalling from freezing and weathering. Generally, the point is long, with a broad, irregular blade, and a small stem. Although the stem is incomplete (a fact which hinders precise identification) it appears to have small side-

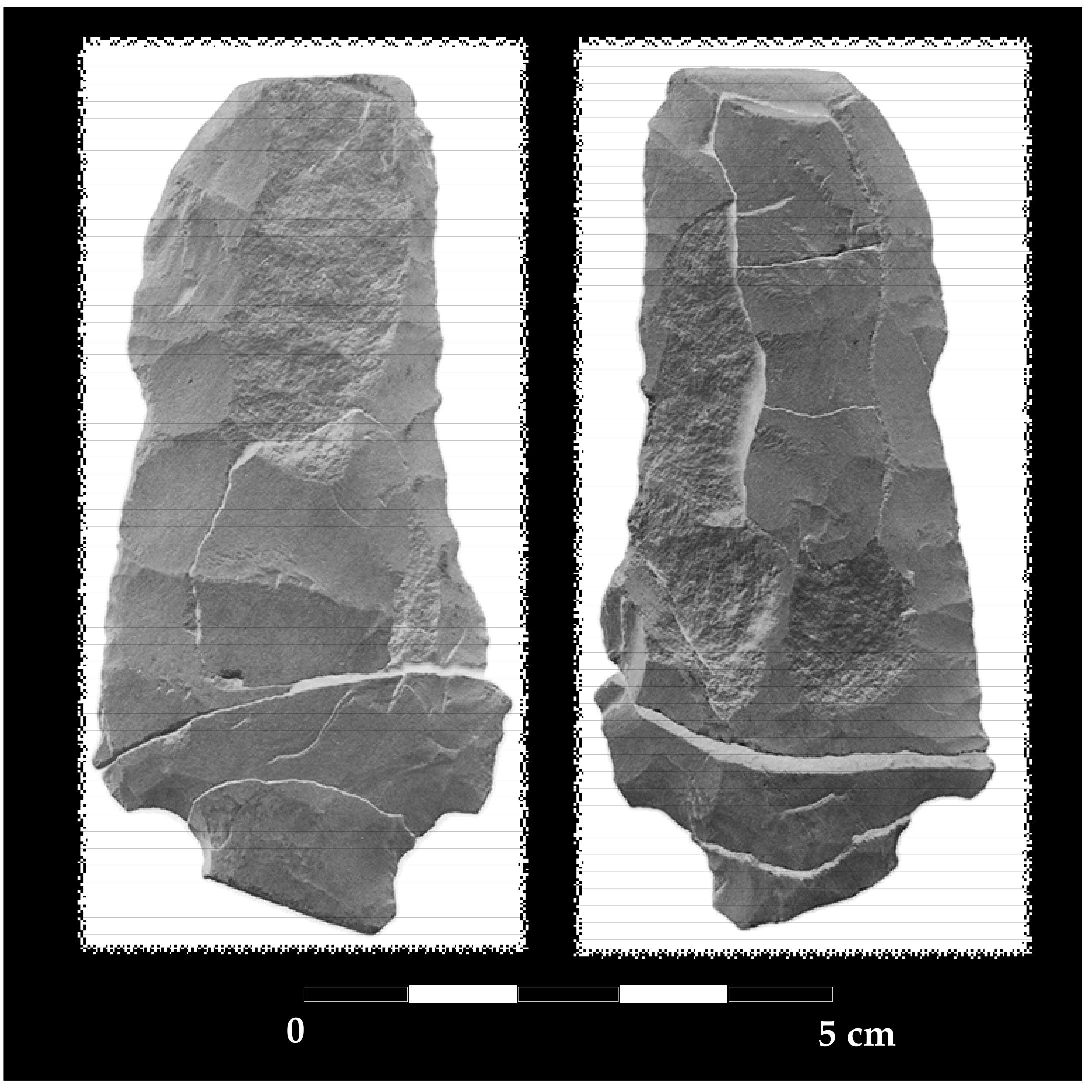
Plate 16.9: Type (4) thick, contracting stemmed points.



or corner-notches. Generally, the point is similar to broad-bladed Middle Archaic variants identified elsewhere in eastern North America (Benton, e.g., Dragoo 1991: 17; Snook Kill variants, e.g., Ritchie 1971: 47; Stark, e.g., Dincauze 1976: 28; Tuck 1991: 39), of which few or none have been recovered from Maritime contexts. Given the poor condition of the stem, it is possible that it is an Otter Creek variant, which has had the tangs of the base destroyed. This would affiliate it with the material from Component 2 (the earlier Archaic).

Finally (and given its well-documented regional presence, perhaps most likely), the point could be related to Susquehanna "broad spear" points (Bourque 1995: 110). The blade is not as triangular, nor the base

Plate 16.10: Type (5) projectile point, a broad bladed, small-stemmed point, showing both surfaces of the same artifact.



as well-defined, as typical "broad spears". This may be due to the unfortunate tendency of archaeologists to illustrate only the best examples of artifact classes. According to an analyst of extant Archaic collections, this point is similar (even including its poor condition) to identified Susquehanna points (Murphy 1998: pers. comm.). Certainly, the depth of the point is suggestive of a comparatively older component, although, as discussed elsewhere, this is a problematic inference.

(6) Small straight-stemmed with triangular blades

One small, straight-stemmed point was recovered with a short, triangular blade, made of a semi-translucent chert (JC53; see plate 16.11). As with the points discussed above, similar types are evident in the literature, assigned to a variety of contexts. Bourque (1995: 109), Tuck (1991: 63), Deal (1986: 64), Sanger and Davis (1991: 78) have locally attributed similar types to the Susquehanna period. Sanger (1971) assigned similar points to the Tobique complex, a nebulously defined manifestation then tentatively defined as an easterly extension of the Shield Archaic, a tradition parallel but distinct from Laurentian. In a recent reconsideration of the Tobique complex, Turnbull (1990: 15) has suggested that these types may be Early Woodland. Finally, further afield, similar types have been related to the Middle Archaic, such as Neville points of New Hampshire (Dincauze 1976: 28).

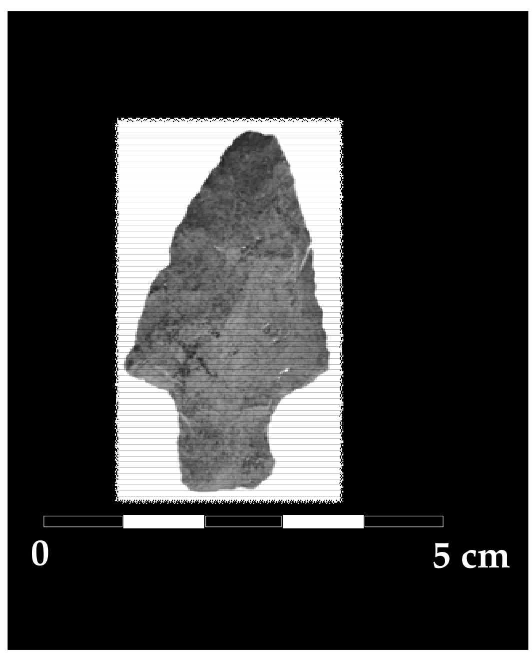
Other possibly Late Archaic artifacts

There are a range of non-point artifact classes that occur on the site, which are in a general sense considered to have Archaic qualities. These include roughly formed plummets (3), adzes (4), celts (4), ground slate tools (50 fragments), "nutting" stones (4), as well as quantities of broken and unidentifiable groundstone (16), abraders (20), hammerstones or pecking stones (23), drills (12), and a variety of large choppers and scraping tools. However, some of these materials could also be related to an earlier Middle or early Late Archaic component, or to later Woodland period components.

Discussion

There is clearly an irregular and somewhat intangible Late Archaic presence at the Jemseg Crossing site. These finds suggest that, like the earlier Archaic material, the bulk of the Archaic habitation

Plate 16.11: Type (6) projectile point, small, straight-stemmed.



and activity areas were adjacent to but not within the highway footprint. These similar patterns further obscure these two components. Generally, however, Middle to early Late Archaic materials seem concentrated to the south and east of Area A, while Late and Terminal Archaic materials seem concentrated in the northeast part of Area A.

One of the problems with this component is that there are few artifacts that one can singled out as being the diagnostic Late Archaic element. With the exception of Jemseg types (1) and (2), which appear to be well-correlated with Moorehead phase components in Maine, all of the points are incidental types (which are frequently assigned only a few lines in a report) or are in some way "non-typical" of the type as it is defined elsewhere. This suggests a number of possible interpretations.

With such a large Terminal Archaic and Early Maritime Woodland component within the footprint, and immediately to the west of most of these finds, it is reasonable that some or most of these vaguely Archaic points are simply minor variants of Early Woodland points that are poorly defined in regional literature. There is a tendency in archaeological reporting to focus on the diagnostic elements, while ignoring or glossing over the more subtle variations. This would suggest either that the Early Maritime Woodland is a continuation of earlier Late Archaic manifestations, or that these are Early Woodland points that were erroneously ascribed to the Late Archaic in the first place. However, given the wide variety of contexts in which they occur in the Northeast, and the widespread and diverse nature of the non-point Archaic assemblage, it seems unlikely that this explanation accounts for all of these artifacts.

It could be that these are all Archaic types that are poorly identified as such, and so frequently get mixed in with later Woodland period materials. After all, Components 5 and 6 feature construction often involves basin-shaped pits as floors for domestic structures, and as storage and refuse facilities. The construction of such features is frequently found to intersect earlier layers (see Granger 1978). It is known from the presence of earlier points in later contexts that pre-contact people did occasionally collect and use what would have been, to them, archaeological finds (Varley 1997 pers. comm.). Some of the difficulty in assigning such points to a single period may result from these factors.

Alternately, it may be that some of these types were in use for long periods of time. This would suggest that there is a great deal of continuity between the various complexes and phases that have been isolated archaeologically, or that these point types originate outside the region with a long-developing group that the Jemseg people interacted with over a very long period of time.

If it is accepted that some of these artifacts are derived largely from the Late Archaic period (as I suspect that some of them are), to what aspect of the Late Archaic can they be related? Most of the clearest connections are with Moorehead phase material from Maine, which would relate this assemblage with the day to day activities of the people who maintained the Cow Point cemetery. This is logically satisfying, because it is obvious from the presence of a site such as Cow Point in the local area that there would have been people in the area carrying on every day activities. Unfortunately, with such a fragmentary and dispersed assemblage, and without related features containing evidence of foodways and settlement patterns, there is little further that we can say about them.

Although there is little in the Jemseg Crossing assemblage that can be correlated to Bourque's Small Stemmed Point tradition, there are several points that could be seen to be related to the Susquehanna (for example the broad bladed point type 5, and the triangular bladed straight stemmed point type 6). No other Susquehanna artifacts (such as grooved axes, corner removed, large bladed points, diagnostic drills, or artifacts made of Vinalhaven striped rhyolite) were recovered. The presence of a few possible Susquehanna point types may indicate either an interaction with Susquehanna people to the south in the Terminal Archaic, or a very limited local Susquehanna presence. These issues are relevant to a wider regional debate about the nature of Susquehanna (and whether or not it represents the movement of a group of people into the region), and the nature of the relationship between people using Susquehanna and Moorehead material culture (see Robinson 1996). The presence of both in the Jemseg area would have implications for this debate. However, since much of this discussion relies upon the determination of contemporaneity between Susquehanna and Moorehead, it is clear that further research will be necessary to resolve these issues. Indeed, without a larger assemblage and identifiable features with radiometric dates, it may be difficult to draw further inferences about the lifeways of the people of the Jemseg site during the Middle and Late Archaic.

This discussion has been very typologically oriented. Ideally, we would expand the discussion to include technology, lifeways, subsistence practices and settlement patterns. Unfortunately, with almost all of these artifacts restricted to disturbed contexts, there is little more that can be done. However, given that so few Late Archaic habitation components have been excavated in the Maritimes, it was necessary to consider as many of the possibilities for identifying such a component as possible.

COMPONENT 4: THE TERMINAL ARCHAIC

Although there is considerable debate about the nature of its termination, most archaeologists working in the Maritime Peninsula acknowledge the significant differences between the Late Archaic at Cow Point, and the succeeding Archaic tradition, the Susquehanna (Bourque 1995, Dincauze 1972, 1975, Petersen 1995, Robinson 1996: 137, Snow 1980: 244). The Susquehanna Tradition is considered by many to contain several phases, ranging from the oldest, the Atlantic phase, through the Watertown phase, to the final Archaic manifestation in the Maritime Peninsula, the Orient phase (Black 2000: 90, Petersen 1995: 221).

The earliest phases of the Susquehanna of the Maritime Peninsula are perhaps best known from research conducted at the Turner Farm site of the central coast of Maine (Bourque 1981, 1995). Following Dincauze (1972, 1975), Atlantic phase assemblages contain large, broad-bladed bifaces and projectile points ("Atlantic implement blades"), endscrapers, drills and strike-a-lights. The subsequent Watertown phase is similar, and is often distinguished from the Atlantic phase by a shift from Atlantic implement blades to the manufacture of broad-bladed, corner-removed Mansion Inn points. Earlier Susquehanna sites (relating to the Atlantic and Watertown phases) are widely distributed in southern and central Maine (Borstel 1982, Bourque 1992, Cox and Kopec 1988, Holmes 1994, Mitchell 1992, Spiess 1997, Spiess and Hedden 2000, Spiess and Cranmar 2000, Spiess et al. 1988, Trautman 1996, Trautman and Spiess 1992). Many have maintained that there are few or no sizeable Susquehanna sites in the northern portions of the Maritime Peninsula (Tuck 1984: 21), although some have challenged this view (see Deal 1985, 1986). This absence is often cited as support for the theory that the Susquehanna tradition represents an intrusive migration of people from the south into Maine around 4000 to 3700 years ago (Sanger 1973, 1975: 69, Bourque 1995: 252-253, Robinson 1996, Snow 1980: 247).

However, some private collections, many from parts of southern New Brunswick (but frequently unprovenanced), contain Susquehanna artifacts such as fully grooved axes, steatite pots and broad, stemmed and notched points (Murphy 1999). Indeed, the sample of steatite pots from the lower Saint John, consisting of one whole pot recovered by Moses Perley in the French Lake area (Turnbull 2002, pers. comm.), as well as several pot fragments from other sites and locales, is larger than steatite assemblages from most parts of Maine (Bourque 2000). The Portland Point site, in the city of Saint John, New Brunswick, has produced an array of possible Susquehanna artifacts (Harper 1957, Jeandron 1996, Jeandron et al. 2000, Murphy 1999), including broad-bladed projectile points.

At the Jemseg Crossing site, we encountered a series of small hearth features near the eastern edge of Area A (designated Features 61 to 65, see Chapter 14). A few artifacts were found in direct association with them (see Chapter 14), including a fragmentary broad-bladed, corner-removed projectile point (see Plate 16.9, above), and a biface with a shattered base of fine-grained, smoky grey quartzite, possibly of Ramah metaquartzite[1]. While this latter raw material type is not

1 Ramah metaquartzite is a raw material from Northern Labrador. Artifacts from archaeological sites in the Maritimes have been identified as Ramah. Although it is considered to be visually distinct and therefore a comparatively easy raw material to identify in hand specimen, some archaeologists have suggested that local varieties may present a similar macroscopic appearance.

considered to be typical of Susquehanna patterns of raw material use, it may represent linkages to the north not normally encountered in more southerly Susquehanna components. It may also be that these features are only chronologically related at a scale measured in decades or centuries, a significant interval in terms of the relationship between the Moorehead phase and the Susquehanna. A number of artifacts were recovered from the ploughzone above and adjacent to these features. These include two wide side-notched points, and may suggest that they are stratigraphically above Feature 61 to 65, and therefore are more recent. I will discuss some of the implications of this separation below. We are pursuing funding for AMS dates from these features. In the absence of dates, the presence and nature of an earlier Susquehanna component at Jemseg remains poorly understood.

Furthermore, we have yet to identify any intact deposits producing unequivocal early Susquehanna-related components in the densities reported in southern and central Maine, although Susquehanna tool forms have been observed in collections from the Maritimes. Even if these are Susquehanna-related, they may not be like those to the south. As a result, I have been unable to explore the relationship between the Cow Point site and later Archaic manifestations in the lower Saint John river valley. This is unfortunate because the Cow Point site figures significantly in regional interpretations about the end of the Archaic (Petersen 1995, Robinson 1996, Sanger 1973: 136). In this sense, there remains a significant gap in the local archaeological record between Cow Point and subsequent manifestations, although it is not the same gap that is reported elsewhere at the end of the Archaic[2]. However, many of us who work in this region suspect that it is premature to view the lack of early Susquehanna sites in New Brunswick as indicative of their actual absence, given the underdeveloped state of regional testing and survey (see also Turnbull and Allen 1988).

Regional Approaches to the Late Terminal Archaic

The latest phase of the Susquehanna in the Maritime Peninsula is the Orient phase (Snow 1980: 239). Some archaeologists have argued that the region was depopulated after the Atlantic and Watertown phases (Bourque 1995: 167, 253-254, 2000), initiating the hiatus observed during the "Little Gap". Proponents of this view have suggested that wide side-notched projectile points (the diagnostic Orient Fishtail point) are ambiguously associated with archaeological deposits, and that steatite vessel fragments, a key attribute of the later Susquehanna in other parts of the northeast, are very rare or completely absent from regional inventories (Bourque

2 The "Little Gap" (Turnbull 1992) usually refers to the gap between the Susquehanna tradition and the onset of Maritime Woodland traditions, not the gap between the Moorehead phase of the Late Archaic, and later sites.

2000). They also suggest that there is a lack of dated archaeological sites and features from the period between 3600 and 2700 years BP (Bourque 1995: 167, 2000). Others have refuted this evidence, pointing to dated components from stratified contexts in Maine (Petersen 1991, Spiess and Petersen 2000), the occurrence of steatite vessels and vessel fragments in southern New Brunswick, and especially, in the lower Saint John River, and the recovery of diverse lithic assemblages, with a range of potentially diagnostic artifact forms. Based on an intertidal site in the Quoddy region of southwestern New Brunswick, Black (2000) has suggested a persistence of earlier Susquehanna projectile point forms, supplemented with new forms (such as Orient Fishtail points), as well as the employment of a technological system incorporating macroblades. Petersen (1995) has also suggested that there might be a persistence of technological systems from the earlier Susquehanna through the Terminal Archaic to the Early Maritime Woodland, especially in the development of technological systems organized around bifacial blanks as a platform for various tool forms.

The evidence for Late Terminal Archaic activity in the northern portions of the Maritime Peninsula differs from the evidence cited for the southern regions. Several sites have produced radiocarbon dates between 3600 and 2700 years ago, including a small camp and lithic reduction area in the middle Saint John river valley, and one of several ceremonial site in the Miramichi River basin. The Boulder Camp site, located near the mouth of the Tobique river, was a habitation site containing the remnants of a small shelter or camp in the lee of a large glacial erratic boulder (Keenlyside, n.d.). Although the site produced abundant flake debris, it was lacking in formal tools. Wood charcoal from a small hearth produced a radiometric date of 2840±370 BP. Unfortunately, due to the large standard deviation of this date, the actual age of the feature is difficult to determine. We can only suggest that the site is 95% likely to date to between 3580 years ago and 2100 years ago. The Boulder Camp site contrasts with Terminal Archaic mortuary sites on the Miramichi. These have been named the Quarryville site (Allen 1988) and the Gaugenn site (Keenlyside and Turnbull, 1999 pers. comm.). The Quarryville site produced a small pit feature filled with red ochre that was discovered (and partially destroyed) during the placement of poles for power lines. Within the pit were four exceptionally large thin, unstemmed bifaces, unlike any reported for the Terminal Archaic in the southern Maritime Peninsula (see Figure 16.3). The ochre also contained scattered charcoal and burnt human bone fragments, which have subsequently been repatriated and reburied. A private collector recently discovered another red ochre burial site on the Miramichi that was very similar in form and content to the Quarryville site. A charcoal fragment recovered from a sample of ochre from this site returned an AMS date of 2890±60 BP (Beta-80069, Keenlyside 1998: pers. comm.). Despite the occurrence of red ochre-filled cremation pits in the

Susquehanna, and despite the correspondence of the date to the time of the late Susquehanna, the Quarryville material is distinctive from the contemporaneous Orient phase. The artifacts, extremely large thin bifaces made of unusual or exotic, fine-grained cherts (Allen 1988, Turnbull 2002: pers. comm.) bear little similarity to the Susquehanna artifacts in form, material or technology. The Jemseg Crossing site, poised between these two different patterns, produced a comparatively large assemblage of material that we radiocarbon-dated to this ambiguous period.

The Component 4 Assemblage

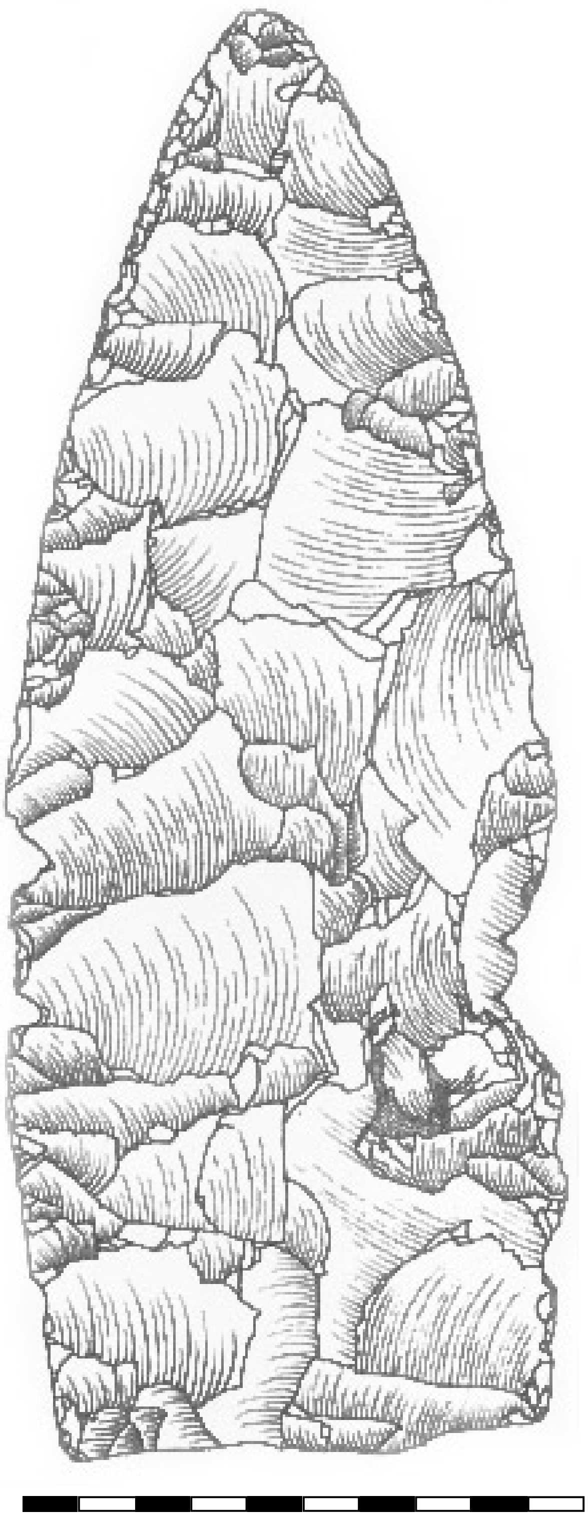
The Jemseg Crossing late Terminal Archaic component is represented by radiocarbon dated features associated with artifacts. Dated features include a small feature complex in the levee (FC 5 in Area D), containing features 41 and 42, two small hearths in the middle of the upper terrace (F29 and F13 in Area A), and the red ochre feature (F8). The radiocarbon dates from these features are summarized in Table 16.1.

These features were diverse in size, form and content. Feature Complex 5 was a medium-sized, oval, flat living surface with a small, off-centre hearth. It contained butternut shells, charcoal, ash, and 502 lithic artifacts, including 59 tools and tool fragments, 2 core fragments and 443 unmodified flakes. By comparison, the two small hearths in Area A were not associated with identifiable living floors, and produced much smaller assemblages of artifacts. Feature 29 was a small basin-shaped pit hearth, containing a dense area of butternut shell (totaling 161.1 g) and scattered calcined bone. Within and immediately adjacent to Feature 29, we recovered one fragment of ground slate and 14 flaked stone artifacts, consisting of six tools and tool fragments, one core fragment and seven unmodified flakes. Flotation and screening of heavy fraction from the hearth matrix revealed large quantities of microflakes suggesting a focus on stone tool use and resharpening activities. Feature 13 was a 30 cm deep pit containing charcoal, a few charred nut fragments, and sand, and may represent a primary or secondary deposit from a hearth. It also contained three tool fragments, one core and 31 unmodified flakes. Feature 13 also produced a large sherd of pottery. More sherds of the same pot were recovered from

Table 16.1: Terminal Archaic radiometric dates from the Jemseg Crossing site.

Feature	Date (BP)	Lab No.	Calibrated (2 sigmas)	Dimensions
FC 5	3000±90	B-104908	1430-940 Cal BC	171 cm by 111 cm by 5 cm
F29	2960±130	B-104907	1450-825 Cal BC	106 cm by 71 cm by 19 cm
F7	2880±60	B-104906	1250-900 Cal BC	35 cm by 25 cm by 7cm
F13	2870±70	B-156019	1270-850 Cal BC	93 cm by 72 cm by 30 cm

Figure 16.3: A biface from the Quarryville site (illustrated by Alexandra Sumner).



the undisturbed alluvium immediately adjacent to the feature (see Plate 14. 3; see Chapter 14, and below for further details).

The range of features may reflect patterns of seasonality. Although the density of lithic debris in Feature Complex 5 may superficially suggest a tool making activity area, the mix of lithic production material and patterns of use-wear, breakage and rejuvenation suggests additional activities. The hearth-and-living-floor structure of the feature, and its location in the floodplain (on the levee adjacent to the river) may represent a fall or winter house. The density of lithic material in it may suggest concentration of debris inside a structure, and kit retooling during winter "downtime". The hearths on the upper terrace, above the floodplain may likewise represent open air, spring and summer structures. However, the abundance of nuts in Feature 29 may suggest either a late fall occupation, or the storage of nuts over long periods of time. Unfortunately, inferences of seasonality and subsistence are greatly impeded by the lack of preserved organic material, such as food refuse. There is little information about the relationship between the habitation features and the red ochre feature, with its clear ceremonial nature. It may be that these features represent a sequential low intensity use, and that the habitation of the site had passed or had not yet begun when the red ochre feature was created. It may also be that the red ochre feature is directly related to the habitation activities, and represents the integration of ceremonial activities into the everyday lives of one family group.

Component 4 Lithic Technology

The artifact assemblage from Component 4 features is also diverse. Feature Complex 5 produced a very large lithic assemblage, while Features 29 and 13 produced small quantities of artifacts, and Feature 7 produced none (see Table 16.2, below).

In general terms, the assemblage from Component 4 is balanced between biface use and production, and the use of more 'informal' classes of tools, such as retouched and utilized flakes. Bifaces are thin and generally small. The only stemmed point was recovered from Feature Complex 5. This artifact is thin and medium-sized with narrow, asymmetrical side-notches. Its overall length is 58.8 mm, and its maximum width is 23.8 mm. Its neck width is 14.5 mm wide, and its base width is 20.5 mm. An unstemmed biface base was also recovered from Feature 29. This highly weathered specimen is thin and comparatively narrow, weighing 2.2 g. Biface tips and medial sections were also common (5 tips and 2 medial portions). Some of these may represent production-related shattering, but at least one shows evidence of damage from loading force onto the tip of a hafted tool (Specimen 3515 from Feature Complex 5), suggesting use-related activities. While most of these fragments are from well-shaped, thinned bifaces, one (Specimen 2684 from Feature Complex 5) has a bifacially retouched margin, but has not been thinned. The bifacial tools are made of a range of raw materials, but are dominated by a mix of mafic, felsic and porphyritic volcanics (see Table 16.3). One of these

Table 16.2: Artifacts associated with Component 4 features.

Tool	FC5	F29	F7	F13	Total
Stemmed Bifaces	1	0	0	0	1
Unstemmed bifaces	0	1	0	0	1
Bifacial scrapers	0	0	0	0	0
Biface fragments	6	0	0	2	8
Unifacial scraper	3	1	0	0	4
Retouched flakes	4	1	0	0	5
Utilized flakes*	44	3	0	1	48
Core tools	0	0	0	0	0
Unmodified flakes	440	7	0	31	478
Unmodified cores	2	1	0	1	4
Hammer stones	2	0	0	0	2
Pottery	0	0	0	5	5
Ground stone	0	1	0	0	1
Total	502	15	0	40	557

* I used macroscopic ("eyeball") identification, coupled with low power microscopy (5X) to identify use-wear. This analysis focused on pieces with evidence of heavy use, showing the following attributes: localized, unidirectional patterning, edge polish, and tiny flake scars. Recent research has suggested that trampling or post-occupation damage may look like use-wear (Bamforth 1988, Levi-Sala 1986, Newcomer et al. 1986). To attempt to control for this, I discounted possible use that occurred on extremely thin or fragile edges, (especially on very small pieces, whole pieces less than 10 mm in length), pieces that had fractures indicating widespread crushing or snapping forces such as "half-moon" fractures, and pieces with dispersed, randomly distributed patterning. I was more successful at identifying use on extremely fine-grained pieces such as homogeneous cherts and glassy volcanics, and less successful with hard, heterogeneous or grainy materials, such as quartz and quartzite, and the sample reflects this bias.

appears to be from a source in central Maine, in the Mount Kineo-Traveller area.

In addition to bifacial tools, Component 4 contained several large unifacial scrapers. Two of them were bit fragments (one of bright red Washademoak chert, weighing 0.7 g, and one of medium-grained homogenous mafic volcanic, weighing 0.4 g). However, the other two were complete enough to analyze. Specimen 827 was a large, thick unifacial scraper made of an opaque, stony light grey-green mudstone (JC 17, see Figure 16.4). The artifact was whole, and weighed 24.9 g. It was 51.7 mm long, 34.3 mm wide and 12.5 mm thick. It had been made on a large, thick flake, and the bulb of percussion and ripples of force visible on the ventral surface indicated that the striking platform had been along one of the lateral margins. This platform had been carefully removed during the manufacturing process. It seems likely that the scraper was not produced on a flake from a bifacial core, but may have involved a specially prepared core. Specimen 794 shows similar technological processes. It

Table 16.3: The raw materials of Component 4 bifaces, including tips, medial fragments, unstemmed, whole bifaces, and projectile point fragments (RM=raw material).

Spec#	Type	Feat	RM	RM description
2561	tip	42	11	Washademoak chert (dark grey-brown variant)
7894	medial	13	12	White quartz
18914	unstem	29	29	Bleached grey-green with quartz crystals (Mt. Kineo)
2684	medial	42	38	Purple to pink speckled volcanic
3515	tip	41	7	Grey-green volcanic with black dendritic veins
3516	point	42	7	Grey-green volcanic with black dendritic veins
2681	tip	42	19	Medium-grained homogenous mafic volcanic
2740	tip	42	19	Medium-grained homogenous mafic volcanic
8026	medial	13	43	Bleached green volcanic

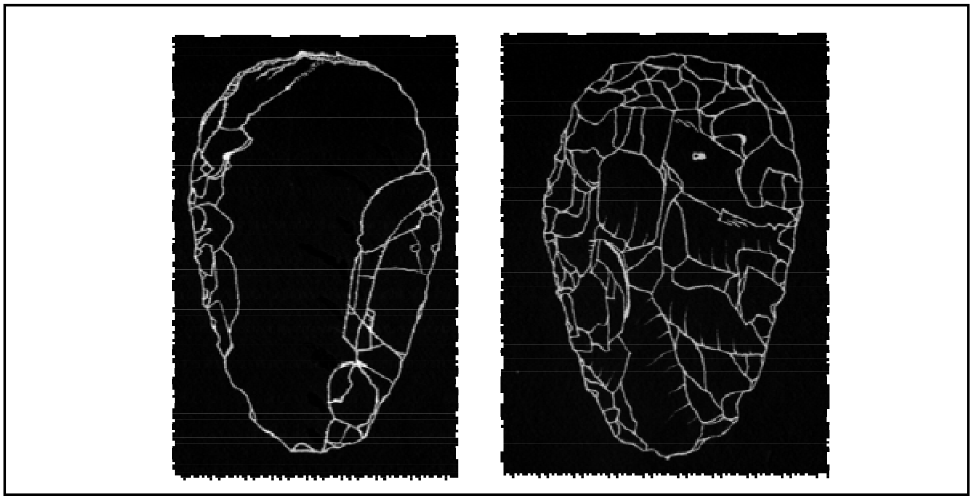
was made of a sugary brown semi-translucent chert with patches of chalcedony alternating with bands or zones of stoney, opaque or sugary material (JC 53.3). This specimen was broken across the midsection, but generally appears to be slightly smaller than Specimen 827. It weighs 9.9 g, and its maximum dimensions are 28.2 mm long, 30.6 mm wide and 9.8 mm thick. Although the break passes through the middle of the lateral margin, it also has a remnant striking platform on this margin, and like 827, this platform was carefully removed during manufacture.

This pattern of scraper production is not similar to patterns evident in other parts of the site, and is significantly different from Early Maritime Woodland bifacial and unifacial endscrapers, and Middle and Late Maritime Woodland unifacial endscrapers and “thumbnail” scrapers.

I also analyzed the flakes from Component 4. The flake assemblage also reflects a focus on biface production and use. I distinguished between eight types of flakes. As is often the case with flake typology, I have attempted to structure my classification to reflect technological processes (see Shott 1994, Andrefsky 1998). We assume that a flint knapper approached the task similar to the way a wood carver might. The initial stages of work involves transforming the unshaped trunk into workable pieces. The project then shifts to roughing out a form. As this form become progressively more shaped and detailed, the removals become smaller, more controlled and more delicate. Unlike wood, stone tools may also be resharpened over time, requiring further removals and shape alterations.

My classification scheme reflects these general processes. The initial transformation of a cobble, slab or chunk of toolstone will produce decortication flakes (DCT) and core reduction flakes (CRD). These often have large (both thick and wide), unfacetted, flat platforms, and may show the pebble cortex (like the bark of the

Figure 16.4: Unifacial scraper, ventral and dorsal view (actual size; illustration by A Sumner)



tree). They may be large, and have large bulbs of percussion that reflect the use of hard hammer percussion. Initial stages may also involve bipolar reduction, where the objective piece is placed on an anvil and struck. This technique may produce an object with two platforms visible (one from the hammer and one from the anvil). There may also be compression wave, or crushing on opposing ends of the piece.

If the intent is the manufacturing of a biface, the knapper may shift to soft-hammer percussion, and orient the exercise towards producing a disc-shaped flaked object, called a preform. The early shaping stages will produce biface production flakes (BPR) with unfacetted angled platfoms. Often the removal will be oriented to a ridge on the objective piece, creating a raised crest or arris running lengthwise down the flake. As the process continues, the knapper shifts from shaping the blank to thinning it. These removals produce long, thin, arched biface thinning flakes (BTH) with relatively small, angled, facetted platforms.

The final stage may involve the application of pressure flaking. The identification of pressure flakes (PRS) is more difficult, but generally pressure flakes are very small, and are thin, narrow, and often long relative to size. They have very small platforms that may be angled and facetted. They may also have a slight twist along their length. This process completes one stage of the production cycle. However, tools become dull through use, and resharpening may produce biface sharpening flakes (BSF). These are small, short flakes, with relatively large platforms. The crest of the platform and the surfaces near the platform may be worn, crushed, or polished with use.

Finally, tools may be used and then reworked into entirely new shapes. This may occur for different reasons, such as need, or due to breakage (Granger 1978, Nelson 1991).

The sequence for producing unifacial flake tools is somewhat different. Although some unifacial tools may be carefully shaped, we generally consider the manufacturing sequence to be considerably shorter. I have inferred that, as in biface production, decortication and early core reduction may also have been oriented towards the preparation of cores to create large, carefully struck flakes as blanks for scrapers. This core preparation would produce debitage similar to the earliest stages of biface production, and so may be difficult to distiguish from biface production flakes. However, following this stage, the knapper would have produced small, unfacetted angled pieces during the creation of the steep, working edge of the scraper, and during the removal of the platform. Although I looked for such flakes, I did not identify any.

This typology is clearly oriented toward key characteristics of the striking platform. Many of the flakes in the assemblage were fragments, and were lacking platforms. In all, Component 4 contained 257 pieces that retained some part of their striking platform. However, a number of these had crushed or damaged platforms, and were thus ambiguous in terms of their attributes. I classed these as “indeterminate”. The remaining 198 identifiable flakes represent all stages in the biface manufacturing processes (see Table 16.4). Although uniface manufacturing processes likely also took place, they are less visible, which may, in part, be due to the lower volume of flakes that result from uniface production.

However, a secondary trend suggests that while biface production may have proceeded through various stages, the purpose may not have been solely the production of the biface as a final tool. The large number of informal tools (retouched and utilized flakes) suggests that the flakes themselves were being produced as tools. In all, 48 flakes showed evidence of heavy use. Some of these were broken and lacked platforms. Of the remaining 32 utilized flakes, 4 were classed indeterminate, and 7

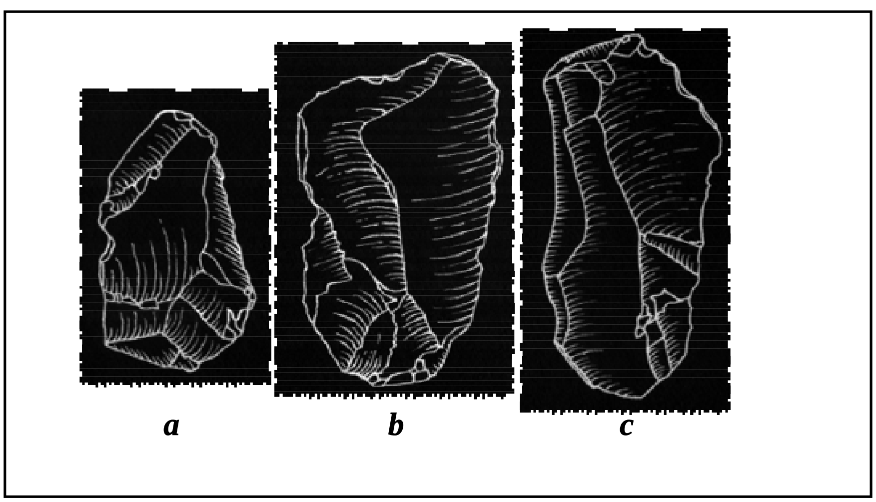
Table 16.4: Technological analysis of flakes from Component 4.

Phase	Type	Number pieces
Initial	Decortication (DCT)	9
	Core reduction (CRD)	49
	Bipolar reduction (BIP)	2
Medial	Biface production and shaping(BPR)	24
	Biface thinning (BTH)	102
Final	Pressure flake (PRS)	9
Secondary	Biface sharpening (BSF)	3
Other	Indeterminate (IND)	59

were flakes from initial phases of reduction (2 decortication flakes, 4 core reduction flakes and 1 bipolar reduction flake). However, 21 of the utilized flakes were biface production and shaping flakes (6) and biface thinning flakes (15) (Figure 16.5). This suggests that bifaces may have been used as cores for the production of particular flake types.

These utilized biface reduction flakes are generally very large, thin flakes, with very small platforms, when compared to flakes from other assemblages. The average length of the 22 utilized biface reduction flakes is 31.4 mm, and the average weight is 4.0 g. I conducted similar measurements on flakes from other components of the Jemseg Crossing site. The average length of whole flakes from the site is 18.5 mm, with an average weight of 1.9 g. Despite their large size the Component 4 utilized biface reduction flakes have small platforms[3], with an average platform width of 8.5 mm, and an average platform thickness of 2.3 mm. The average platform width of all of the biface reduction flakes from the Jemseg Crossing site is 8.2 mm, and the average platform thickness of these flakes is 2.5 mm. We can infer from this that the preferred bifacial core was a very wide very thin biface, perhaps similar in size to the Quarryville bifaces. Indeed, the negative flake scars on the Quarryville biface in Figure 16.3 are very similar in size to the utilized flakes from the Jemseg Crossing site. As would be expected, we were unable to refit any Jemseg Crossing flakes to any of the extant Quarryville bifaces. The Jemseg Crossing site did produce a large thin biface or bifacial core from the ploughzone on the eastern margin of Area A (Plate 16.13). It is has been thinned considerably, in a fashion

Figure 16.5: Utilized flakes from Component 4; a) from Feature 29, b) and c) from Feature Complex 5 (actual size; illustration by A. Sumner).



3 I have measured these following criteria established by Andrefsky 2000.

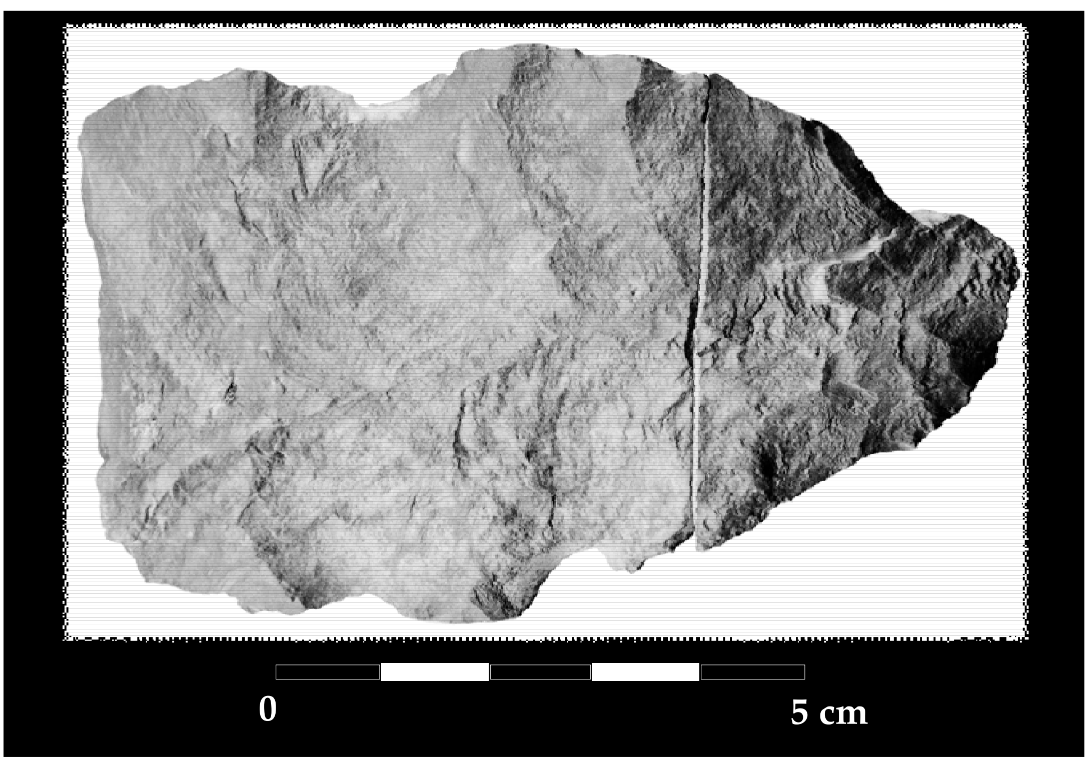
that has created an undulating margin and an irregular bifacial form. It is possible that it represents an exhausted Component 4 bifacial core.

Component 4 Lithic Procurement

We attributed the raw materials for Component 4 to 21 different raw material types. During my dissertation research, I analyzed additional pieces, allowing me to further divide some of these types into subtle variants and subtypes, but in this report I have generally followed Black (Chapter 9, this volume). The exception is JC 53, which Black intended as a catch-all category to contain a great deal of variation. The subdivisions below accommodate newly examined pieces, and ongoing investigations into the potential range of Washademoak chert by Black and his colleagues (Black and Wilson 1999, Black et al. 2003).

The flaked lithic assemblage from Component 4 is dominated by various kinds of volcanics and cherts (Table 16.5). Some of these, such as JC 10, JC 17, JC 38 are only found in Feature Complex 5, and were not encountered in any other components or features. Others, such as JC 2, JC 7, JC 53.2, and JC 53.3, are rare in other components and features. This may reflect several processes, including: (1) procurement oriented towards source areas with highly variable, low yield materials (such as cobble beds), (2) a pattern of single episode reduction to exhaustion of cores, or

Plate 16.12: Bifacial core from the ploughzone of Area A.



(3) a change over time in procurement patterns and reduced access to previously utilized source areas.

In some periods, researchers have noticed particular patterns of raw material selection, such as the preference in Late Maritime Woodland populations for brightly coloured cherts, quartz and mudstone. The knappers during Component 4 seem to have been preferentially selecting brown, black and dark grey cherts and volcanics for reduction. To test this notion, I distinguished between Washademoak artifacts that were made of bright red pieces, translucent to yellow pieces, dark brown to black pieces, and light blue-grey pieces. I then classed all of the material recovered from dated features by these criteria. If one assumes that all colour variants were available to knappers in the past (as is now the case), colour preference

Table 16.5: Raw material (RM) classes from Component 4.

RM	# pieces	weight	description
Light coloured (felsic) volcanics			
6	18	19. 7 g	Homogeneous felsite
7	62	51.8 g	Grey-green veined volcanic
10	112	138.8	White spotted glassy volcanic
38	13	16.7 g	Purple speckled volcanic
42	20	7.0 g	Bleached reddish volcanic
Dark coloured (mafic) volcanics			
9	7	8.0 g	Homogeneous blue-black volcanic
13	7	5.7 g	Sugary dark green volcanic
19	33	11.4 g	Dark brown –green volcanic
20	3	3.6 g	Dark grey veined volcanic
43	7	1.9 g	Bleached green volcanic
50	36	21.2 g	Coarse dark volcanic
Porphyritic volcanics			
2	39	71.9	Brown heterogeneous andesite or porphyry
29	2	2.6 g	Mount Kineo / Traveller porphyry
Chert			
11	84	55.7 g	Washademoak chert
30	4	6.3 g	Minas Basin chert
53.1	2	0.3 g	Mottled opaque grey chert
53.2	41	15.4 g	Brown mottled chalcedony
53.3	55	18.8 g	Brown semi-translucent chert
Quartz			
12	4	1.8 g	Quartz
Mudstone			
17	1	24.7 g	Grey-green mudstone
Other / untyped			
misc	3	1.4 g	

may be one way to explain interassemblage variation. While red variants make up 39% of the total Jemseg feature assemblage by piece count, or 70% of the total assemblage by weight, brown to black pieces make up only 11% by piece count and 5% by weight. In Component 4, red variants make up only 35% of the assemblage by piece count, and 55% of the assemblage by weight, while brown to black pieces make up 44% of the assemblage by piece count, and 31 % of the assemblage by weight. The reasons for the colour preference remain unclear, but future research may show differences in flaking characteristics, availability or may highlight further social or symbolic relationships. It may also be that colour preference is epiphenomenal, and tells us little about other aspects of past material culture, but nonetheless, it is a pattern that bears closer examination.

Finally, it is possible that the raw materials in Component 4 provide a further link to the Quarryville bifaces. The brown mottled chalcedony (JC 53.2) is a waxy to glassy, mottled brown chert with grey to black patches. It has zones of cryptocrystaline translucent material and bands of stonier material. In my examination of raw material procurement, I compared these flakes to collections held at Archaeological Services, including the Quarryville bifaces. One of the bifaces is made of a macroscopically similar material. Coincidentally, while I was conducting lithic analyses on the Jemseg Crossing assemblage, Pam Dickinson was conducting archaeological research on the Debert Palaeoindian assemblage for her MSc research (Dickinson 2001). In macroscopic inspection, both the Quarryville biface and the JC53.2 flakes from the Jemseg Crossing site are almost indistinguishable from "brecchiated" chert artifacts in the Debert assemblage. Previously, some researchers had considered this chert to be only found in Palaeoindian assemblages (MacDonald 1968). Further research into the sources and distribution of this chert would be beneficial to both Palaeoindian research and Terminal Archaic research.

Pottery Technology

The artifacts from Component 4 features include a small assemblage of CP1 (Vinette I) pottery. This feature and the remainder of its contents are nondescript from a chronological perspective, and so it is difficult to support or refute the inference of association between the pottery and the date of 2870±70 BP without further evidence. If this date is taken as accurate, these are the oldest sherds of pottery in the region, and raise questions of the spread and development of ceramic technology in the Maritime Peninsula and the Northeast. However, it is also possible that this date is a poor reflection of the actual age of the pottery. Although we attempted to select "young" wood (butternut), from well below the plough zone and visible disturbance such as intrusive materials and rodent holes, it is possible that the relationship between charcoal and pottery is spurious. Furthermore, while the date is 95% likely to be between 3010 years ago and 2730 years ago, it remains possible that the date is younger than 2730 years ago. However, calibration of this date reduces the range, and pushes it slightly older (see Table16.1). The only resolution of this issue is the submission of additional material from the feature for radiocarbon dating. Multiple dates have effectively resolved similar issues on other sites in the region (see Robinson 2001).

Discussion of Component 4

The Jemseg Crossing site provides a window into the Terminal Archaic, a period of considerable regional ambiguity. However, while the content of the Component 4 assemblage resolves some issues, it raises other.

Typologically, the formal tool assemblage is not distinctive. There are very few formally styled tools (such as projectile points) in direct association with dated Component 4 features. The exceptions are the side-notched point and the CP 1 pottery. Despite our poor understanding the Terminal Archaic and the Early Maritime Woodland, most would affiliate these with a period after 2800 years ago. Although the presence of narrow side-notches is often thought of as either an Early Maritime Woodland trait, or a Late Maritime Woodland trait, this artifact is not clearly typologically like either early or late Maritime Woodland point types. On the other hand, it does not have clear antecedents or contemporaries in regional inventories. While it is possibly related to Meadowood, it is older than Meadowood-related material from elsewhere on the Jemseg Crossing site, in the Maritime Peninsula, or even elsewhere in the Great Lakes basin (Blair 2002). Furthermore, the date from the feature that produced this projectile point (3000±90 BP, Beta-104908) is supported by stratigraphic relationships (it is 70 cm deeper than the nearby Middle Maritime Woodland Feature Complex 6), and artifact associations.

As discussed above, the pottery poses similar problems. Indeed, our initial interpretations of the Jemseg Crossing site placed these features in the Early Maritime Woodland, based primarily on these two artifacts (Blair 1997, 2000). I have reconsidered this view as we have continued to accrete dates older than 2800 bp, and in light of the absence in this period of other characteristic attributes of the ‘Meadowood’ and other Early Woodland manifestations. Typical Early Maritime Woodland artifacts, including bifacial scrapers and drills, are completely absent from Component 4. Furthermore, bifacial scrapers do occur on the site in association with CP 1 pottery and dates later than 2600 years ago. There is further evidence to suggest that cord- and fabric-impressed (CP 1) pottery types are not exclusively Early Maritime Woodland artifacts. We have recovered such pottery in association with dates as recent as 2160±40 BP (see Chapter 10 and 14), in contexts that did not produce “typical” Early Maritime Woodland artifacts. This discomfort in the date of two “key” artifacts arises from the articulation of culture history frameworks and index fossils (Wright 1999). However, the link between early pottery and Early Woodland projectile point types is weak in many sites in the Northeast (Heckenberger *et al.* 1990a, 1990b, Hoffman 1998, Loring 1985).

I have suggested in this analysis that there may be technological processes and patterns of raw material procurement and exchange that relate Component 4 with Terminal Archaic expressions on the Miramichi and to the north. The low densities of regionally "exotic" raw materials, such as Minas Basin chert and Mount Kineo/Traveler porphyry suggest some kind of low intensity integration of the people of the Jemseg area into regional interaction networks. There is a significant contrast between the distribution of Orient phase material (characterized by medium-sized broad-bladed points, 'fish-tail' points, drills and macroblade technology, Black 2000), and Quarryville material (characterized by exceptionally large thin bifaces in red ochre contexts). This pattern suggests some kind of cultural interface or 'boundary' between the northern and southern portions of the Maritime Peninsula during the late Terminal Archaic. The Jemseg Crossing site produced several projectile points with wide side-notches (most from disturbed contexts), as well as artifacts and technological attributes similar to those of evident in the Quarryville material. This may suggest that the people of Jemseg mediated this boundary, or that the boundary is a product of poor archaeological resolution.

Pihcesis
17. The Maritime Woodland period

A BRIEF LOOK AT MEADOWOOD IN THE MARITIME PROVINCES

Paul McEachen

The purpose of this summary is to provide a context for the interpretation of the Meadowood component at the Jemseg Crossing site. Further coverage of this material can be found in McEachen (1996), while general summaries of the Woodland (Ceramic) period include those written by Davis (1991a), Rutherford (1991) and Tuck (1984).

The Late Archaic-Early Woodland interface, or Terminal/Transitional Archaic, is one of the most confusing periods in Maritimes prehistory due to the lack of a distinctive cultural tradition between about 3500 and 3000 B.P. (Davis 1991a; Rutherford 1990a; Spiess et al. 1983; Tuck 1991). Several scenarios have been proposed as to which of the Late Archaic traditions, including the Maritime Archaic (Rutherford 1990a), Susquehanna (Petersen 1995) and "Shield Archaic" traditions (Tuck 1984: 40; Turnbull 1990), or a combination of them, developed into later populations, but this issue is far from being resolved. Likewise, the Early Woodland period is poorly understood in the Maritime Provinces. The explanations for this are numerous, and have been dealt with in general overviews of Maritimes archaeology (Deal and Blair 1991; Shimabuku 1980), but two trends are worth mentioning. First, most Maritimes sites have extensive Middle and Late Woodland (2000-500 B.P.) deposits and more limited evidence of Early Woodland occupations (e.g. Melanson, St. Croix, Eel Weir VI, Rafter Lake, Partridge Island). Second, the preponderance of ceremonial sites and lack of intact habitation sites makes it difficult to reconstruct aspects of Early Woodland lifeways, including, among others, settlement/subsistence patterns, mobility strategies, and lithic technology.

While these problems continue to plague Early Woodland research in the Maritimes, there is reason for optimism. Archaeological activity has increased due to the proposed construction of the Maritimes and Northeast and Sable Offshore Energy Project natural gas pipeline and TransCanada Highway expansion projects.

Cultural resource management surveys allow archaeologists to identify sites in areas that would otherwise not be examined. The Jemseg Crossing is one such site. It is a site occupied over several millennia that contains an Early Woodland habitation component, a rarity in the Maritimes.

The Early Woodland Period (3000-2000 B.P.)

A perplexing development in Maritimes archaeology is the appearance of two cultural manifestations from the Great Lakes region during the Early Woodland period (Rutherford 1990b, 1991). These cultural manifestations are known as Meadowood and Middlesex, or Adena. It is assumed that Meadowood is slightly older than Middlesex (Ritchie 1969; Spence et al. 1990), but new radiocarbon dates and the recovery of Middlesex style artifacts on Meadowood sites (such as Jemseg Crossing) suggests that the relationship between these cultures may be much more complicated. While Meadowood burial and habitation sites have been encountered in the Maritimes, the only Middlesex sites yet identified are mortuary in nature (Davis 1991b; Sanger 1987; Turnbull 1976, 1986). In addition, a separate, local population(s) may have been present during the Early Woodland period (Allen 1981; Bishop and Black 1988).

Maritimes Meadowood Manifestation

Until recently, few archaeologists outside the region knew that Meadowood materials exist east of New England (Wright 1987). In the last twenty years, excavations in New Brunswick and Nova Scotia have resulted in the recovery of several Meadowood components and sites. Currently, Meadowood sites extend from New York, Ontario, Quebec and Michigan to the Atlantic coast, represented by Maritimes components as well as those in Maine (Belcher 1989; Kopec 1985) and New Jersey (Kraft 1989). Meadowood sites have yet to be located on Prince Edward Island.

The first Meadowood site in the Maritimes was found when two mortuary features were excavated in eastern New Brunswick in 1928 (Wintemberg 1937). The recovery of Meadowood style projectile points and other artifacts from the Tozer, Wilson, Howe and Hogan/Mullin sites suggests a focus of Early Woodland activity in the mid-reaches of the Miramichi River (Allen 1982). Investigations at Mud Lake Stream, on the Maine/New Brunswick border, have recovered intact Meadowood features as well as Late Archaic and later Woodland occupation debris (Deal 1985, 1986a, 1986b). Meadowood-like artifacts have also been identified in site assemblages from Tabusintac Bay, Saint John, the Tobique River, and Tracadie (A. Ferguson 1988; Harper 1957; D. Keenlyside, personal communication 1994; Turnbull 1990) and extant artifact collections such as that amassed by R.P. Gorham in the Red Bank area (McEachen 1996). Meadowood style artifacts from south central New Brunswick include two birdstones from an unknown location (Turnbull and Allen 1988), and Meadowood-like projectile points from Maquapit Lake, Grand Lake, and the Saint John River. Meadowood-related artifacts were also recovered from the Temiscouata region of eastern Quebec (Chalifoux and Burke 1995).

Nova Scotia Meadowood sites are found primarily in the southwestern corner of the province, west of the Shubenacadie River. These include St. Croix, Rafter Lake, Eel Weir VI, and BaDd-4. Meadowood surface finds are widely distributed in areas such as Bear River, Enfield, Gaspereau Lake, Lake Rossignol, Mersey River, and Port Joli (McEachen 1996).

Maritimes Meadowood sites generally consist of habitation and ceremonial types. Habitation sites are situated primarily at inland locations on floodplain, hillside, and raised terrace topographic settings. Sites are recorded along the mid-reaches of tidal rivers, stream confluences, and interlocking lake chains. At St. Croix, a location at the head of tide suggests a spring and fall occupation for procuring spawning fish (Deal and Butt 1991; Deal et al. 1994). Meadowood ceremonial or mortuary sites are distributed at interior and coastal locales.

Meadowood Material Culture

Meadowood Early Woodland material culture, or technology, consists of chipped and ground stone tools, similar to those found on Great Lakes Meadowood sites. Chipped stone tools consist of finely made narrow side-notched and boxed-base style projectile points, cache blades in a variety of sizes, numerous unifacial and bifacial end scraper types, including thumbnail and double ended scrapers, notched drills, bipolar cores and serrated bifaces that may have functioned as knives. An important Meadowood trait is the reduction of exhausted artifacts into new forms. For example, a broken projectile point could be reworked into a notched scraper (or "bunt"), or drill (Granger 1978: 18). Flake tools are represented at BaDd-4 (McEachen 2000). The presence of formal tools, such as bifaces and bifacial scrapers, and less formalized flake tools suggest the use of curated (i.e. bifacial industry) and expedient (i.e. core and flake industry) lithic technologies during the Early Woodland period (see Parry 1989).

Meadowood chipped stone artifacts appear to be made primarily from local materials (McEachen et al. 1998). The possible exceptions are a projectile point from St. Croix of Mistassini quartzite from Quebec (M. Deal, personal communication, 1996), and a projectile point from BaDd-4 made of a material that closely resembles Onondaga chert from southern Ontario/northwestern New York. This distinguishes Maritimes Meadowood sites from those in the rest of the Northeast where Onondaga chert tools are the norm (Ritchie 1969; Spence et al. 1990; but see Loring 1985).

Ground stone tools include pecked and polished ungrooved celts, pop-eyed birdstones, trapezoidal one- and two-hole slate gorgets, abraders, and possible pestles. Copper artifacts, such as awls, are represented from BaDd-4 and Tozer. Flat copper pieces of unknown function were recovered at BaDd-4. The sole bone artifact in the Meadowood repertoire is a calcined, barbed bone point from Mud Lake Stream.

Meadowood Early Woodland Pottery

The first pottery produced in the Northeast, known as Vinette 1, is associated with Ceramic Period 1 (C.P.1) of the Maine/Maritimes ceramic sequence (Petersen and Sanger 1991). This thick, highly fragmented, cord or fabric impressed pottery is not represented in large quantities in the Maritimes. It has been found at Mud Lake Stream and Six Mile Brook in New Brunswick, and at the St. Croix, Rafter Lake, Gaspereau Lake and Melanson sites in Nova Scotia (Allen 1996; Kristmanson and Deal 1993). Vinette 1 pottery is frequently associated with Meadowood components in the Maritimes. However, early dates associated with dentate stamped and pseudo-scallop shell ceramics suggest that Early Woodland peoples may have been experimenting with a variety of decorative styles simultaneously (Allen 1981; Godfrey-Smith et al. 1997; see Petersen and Sanger 1991).

Meadowood Settlement Patterns in the Northeast

Thus far, the only fully developed Meadowood seasonal round is that devised for the Niagara River area of northwestern New York. Joseph Granger's (1978) settlement system consists of a number of settlement types used in a seasonal cycle. These settlement types include a base camp, extractive camps, a chert resource site and a mortuary site (Granger 1978: 290). Granger (1978) asserts that Meadowood base camps were occupied by local bands (approximately 150 individuals) over the fall and winter, with a dispersal into smaller microbands during the spring and summer to fishing and other resource extraction camps. In the spring, Meadowood regional groups (approximately 500 individuals) came together at mortuary sites to inter the dead, and renew social and exchange relationships.

The Meadowood seasonal cycle was crucial for the distribution of Onondaga chert cache blades. These blades were exchanged to outlying groups, in parts of Ontario, Quebec, and New England, who transformed them into workable tools, such as projectile points, drills, scrapers and bifacial knives (Fox and Williamson 1989; Granger 1981). Some items that may have been obtained by New York Meadowood groups include marine shell beads, steatite, native copper, slate, Indiana hornstone, exotic chalcedonies and jaspers, and "marriageable women" (Granger 1978: 283-284). While Maritimes Early Woodland groups were involved to some degree in this trade network, it appears that Meadowood technology reached the Atlantic coast more so than actual artifacts (Black and Wilson 1999; Chretien 1995; McEachen et al. 1998).

Despite notions that Meadowood settlement consisted of movement between base camps and extractive, special purpose sites (Granger 1978), Meadowood base camps are elusive in the Northeast (Lewis 1986). For instance, in Ontario, Meadowood is represented by every settlement type except the base camp (Ferris and Spence 1995; Spence et al. 1990), and only two Early Woodland sites in New York are believed to be Meadowood base camps (Granger 1978). Establishing settlement/subsistence patterns for Meadowood sites is a lingering problem in Northeastern prehistory. Poor organic preservation, among other issues (see above), has been frequently cited as prohibiting the collection of settlement data (Davis 1991a; Rutherford 1991: 101). Another difficulty may lie in the attempt to construct a generalized settlement pattern that represents all Meadowood components. As recently proposed by Versaggi (1999: 55): "...no one model can be expected to fit all situations, especially when those models were developed at limited regional scales and extrapolated to other areas".

An associated problem is the scattered and uneven distribution of Meadowood components, which precludes the integration of data from contemporaneous sites situated in close proximity. These difficulties could potentially be overcome by a: "…multi-site, regional approach to archaeology" (Sanger 1996: 512). In such an approach, discrete areas, such as watersheds with Meadowood components, are intensively surveyed with the goal of identifying and sampling several sites representing a broad range of site types in varying ecological and topographic settings (see Granger 1978). Several Maritimes settlement models exist including the "Contiguous Habitat Model" (Davis 1991a), the "Central Place Model" (Nash et al. 1991), and models derived from research in Passamaquoddy Bay (Bishop and Black 1988; Rutherford 1991; Sanger 1987) and Patricia Allen's (1981) work in the Miramichi River drainage. The applicability of these models, if any, for Meadowood components requires additional data before they can be adequately tested. However, the limited available data suggests that Early Woodland groups used a generalized riverine/lacustrine settlement pattern focusing on seasonally abundant aquatic resources in spring and fall, and the procurement of terrestrial animals and gathering of wild plant foods such as berries and nuts. Based on site distributions, it appears that Meadowood groups participated in a seasonal cycle that included interior and coastal locations (McEachen 1996).

Summary

The presence of Meadowood artifacts and sites in the Maritimes raises several questions. Why were Native groups in eastern Canada making tools the same way as groups from the Great Lakes? Does Meadowood represent the movement of a new group to the Maritimes, or wide-ranging exchange or interaction networks? What is the relationship between the local, resident Early Woodland people and Meadowood? Is tangible evidence available to support in situ development, thus linking Early Woodland groups with descendent Late Archaic populations?

The Jemseg Crossing excavations and analysis allow the opportunity to re-evaluate current ideas about chronology, culture history, ceramic and lithic technology, settlement/subsistence patterning, raw material acquisition and use, and residential mobility. This new data represents comparative material for future use by Early Woodland researchers, and archaeological evidence that will undoubtedly produce valuable insights into New Brunswick and Maritimes prehistory.

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Pihcesis Ajemseg
18: The Maritime Woodland period at Jemseg

Susan Blair

The Late Archaic is viewed in most regional syntheses as the culmination of long-standing Archaic developments (Robinson 1996), which ushers in at its end a period of uncertainty and variation (Sanger 1991, Snow 1980: 188). Although some researchers have emphasized continuities in the archaeological record (Petersen 1995: 221, Rutherford 1989, 1991: 112, Sanger 1974: 129), many researchers have suggested that the Maritime Woodland period represents a significant shift from the Archaic pattern (Tuck 1991: 65). This shift includes a reduced technological focus on heavy ground stone tools (Wright 1999: 574), changes in bifacial tools and projectile points (Petersen 1995: 221), changes in unifacial scrapers, and the development of ceramic based technologies (Bourque 1971, Sanger 1974, 1979). These changes are often thought to be concomitant with shifts in settlement and socioeconomic systems (Bourque 1994, Sanger 1987, Petersen 1995: 221). This view is reflected by the common use of the term Terminal Archaic to describe the Susquehanna tradition — it terminates the Archaic pattern. In essence, one long-standing internally homogeneous pattern (the Archaic) is replaced by another (the Maritime Woodland) (Fiedel 2001, Snow 1980: 208-209). The period between the Archaic and the Early Maritime Woodland remains poorly understood. This lack of knowledge creates discontinuity in the archaeological record. Some have referred to the period between 3500 bp (the end of the early Susquehanna) and 2800 bp (the onset of the Meadowood and Adena/ Middlesex phases) as a cultural hiatus (Keenlyside 1984: 2) or the "Little Gap" (Turnbull 1990: 15). As summarized by Tuck:

> The centuries around 3,500 years ago are very problematic to prehistorians. The hallmarks of three (or four) traditions disappear at that time. The influence of the Laurentian tradition on more recent cultures seems to have been negligible. While it is difficult

> to see how either the Maritime Archaic or Susquehanna *people*, both of which appear to have been well adjusted to at least parts of the Maritimes could have disappeared completely, although archaeology suggests that their distinctive technological and mortuary complexes ceased to exist after 3500 BP (Tuck 1991: 65, emphasis in original).

Turnbull presents a similar view:

> There is a major problem in defining the cultural sequence between the end of the Susquehanna and the beginning of the Ceramic or Late period (about 2500 to 3000 years ago)... The basic problem seems to do with the anonymity of the local cultural traditions after the Susquehanna and before we see the continuous sequence to the historic peoples of the region as found in stratified sites [such] as Oxbow and Fulton Island (Turnbull 1990: 16).

As discussed above, the Early, Middle and Late Archaic periods are gradually becoming understood, while the debate about the Middle and Late Maritime Woodland periods has proceeded to some of the finer points of archaeological interpretation. The Early Maritime Woodland, however, has been glimpsed only in a few cemetery sites (e.g., Turnbull 1976, McEachen *et al.* 1998) and a scattering of elusive (and contentious) habitation-related artifacts (such as side-notched points and bifacial scrapers; for a more complete review of Early Maritime Woodland research, see McEachen 1996). Elsewhere in northeastern North America, the Early Woodland has been the focus of a great deal of attention, because of its association with increasing cultural complexity, interregional interaction and, in the southern portions of the northeast, the development of agriculture.

Generally, at least three Early Maritime Woodland manifestations have been identified in the Maritime Peninsula, two of which correspond to developments occurring in the broader Northeast: (1) Meadowood, (2) Adena/Middlesex, and (3) a locally developed tradition (e.g. Allen 1980, Belcher 1989, Black 1992). There is a great deal of confusion about the nature and relationship of these manifestations.

Earlier in this century, archaeologists explained the wide distribution of “Meadowood” and “Middlesex/Adena” through notions of a core cultural area (such as the Adena “homeland“ in the Ohio River Valley) from which cultural traits diffused into the peripheries. Later, interpretations such as migration and core/periphery interaction were proposed. More recently, the explanations for the widespread nature of Early Woodland manifestations range from economics, to ideology, to demography. Granger (1978) has focused on economic behaviour. He refutes the notion of a widespread “cult”, and has constructed an elaborate argument for the movement of ideas and materials as attempts to maintain boundaries while accessing important goods (Granger 1978). Granger is, in part, reacting to the notion of an ideological core. Nonetheless, the idea that there was a common and widespread ideology, symbolic language, or religion, that formed a platform upon which interaction and exchange could take place continues to find supporters (Turnbull 1998: pers. comm.).

Demographic or migration explanations were widely cited earlier this century. These have recently reappeared, 'retrofitted' in an ecological conceptual framework that suggests that widespread population pressure after the Early Holocene pushed people to the carrying capacity of the landscape. This resulted in both regular population readjustment, and pressure for people to rapidly move into any newly depopulated areas (Snow 1992). These accounts suggest that a regional depopulation may have occurred in the Northeast after 3000 years ago (Fiedel 2001). This was concomitant with population increase in the Great Lakes region, and triggered the widespread movement of peoples, who carried an essentially Great Lakes tool kit with them, into the north and east, and subsumed or replaced local populations (Fiedel 1997, 2001, McEachen 1996).

Finally, others have suggested that culture is a medium for the transmission of materials and ideas. This medium often is manifested in stylistic elements over very broad regions, but is expressed and acted upon locally (Heckenberger *et al*. 1990a). Proponents of this view have argued for the disentangling of Early Maritime Woodland stylistic forms (as expressions of ideas and communication) from the concept of a particular population. In other words, they attack the underlying normative views of style, and argue that people may have adopted particular artifact forms from time to time for particular reasons. In this sense there is not a 'Meadowood' population or people, but rather people who may adopt and produce Meadowood-style material culture in varying intensities. They cite as evidence both problems with dating characteristic Meadowood and Adena traits, and their co-occurrence over much of the Northeast (Heckenberger *et al.* 1990a, 1990b, Loring 1985).

Much of this research is impeded by the fact that the relationship between radiocarbon dates and actual age varies over time due to global physical variables. When radiocarbon years are plotted in relation to calendrical years, this relationship is expressed as an undulating or 'wobbling' slope. At particular points in time, radiocarbon years correspond well to actual years (and the slope of the line corresponds to that of calender years), but at other points in time, a wide range of radiocarbon years may represent fewer calendrical years (a steep slope in the curve), or a small range of radiocarbon years may represent a broad range of calendrical years (a plateau in the curve). Unfortunately for Early Maritime Woodland researchers, a plateau in the radiocarbon curve occurs between 2800 and 2400 years ago (see the difference between uncalibrated dates and calibrated dates in Table 18.1).

Finally, some researchers have challenged the notion of Meadowood on methodological grounds. This challenge rest on both the importation of macroregional terminology, and the way this is applied to materials in the Maritimes (Wright 1999: 576). For example, regional archaeologists have developed the practice of referring to box-based projectile points, a distinctive narrow bladed biface with small regular notches that are often placed a considerable distance up from the base, as "Meadowood" points (McEachen 1996). This term is in use elsewhere for side-notched points that are morphologically dissimilar to box-based points (see Ritchie 1971). This practice is even more dubious given the that there are few, if any, direct radiocarbon associations for box-based points. Some have also decried the practice of "typing" sites on the basis of a few artifact class or "index fossils": "The near absence in the Maritimes of the Vinette I pottery type characteristic of the Meadowood complex reinforces the questionable nature of this cultural assignment to certain materials in New Brunswick" (Wright 1999: 583).

The Maritime Woodland at Jemseg

A significant portion of the pre-contact archaeological material found during the Jemseg Crossing Archaeology Project can be attributed to the Early Maritime Woodland period. This is does not necessarily mean that the Jemseg area was used most intensely during the Early Maritime Woodland, but rather that the proposed highway footprint passed through areas that were used during this period. It seems likely from examination of private collections, the richness of the local environment, and the presence of earlier and later materials in low densities in most excavated areas, that pre-contact materials from other time periods might be widely distributed in the Jemseg area.

In past decades, there has been little consensus about either the appearance of Early Maritime Woodland traits, or their development from the Terminal Archaic to the Middle Maritime Woodland. By archaeological convention, the Terminal Archaic and Early Woodland have been differentiated by the development of pottery as a supplement to organic vessel cooking[1]. Although the development and spread of pottery technology has been the focus of much research, it is debatable to what extent pottery-making was ever a central activity for pre-contact Aboriginal peoples in the Maritime Provinces. Indeed, pottery was only intensively used in the Maritime Peninsula during the Middle Maritime Woodland (see Foulkes 1981).

1 Organic vessel cooking refers to the use of bark, wood, hide or textile containers, and is accomplished with the use of boiling stones. Stones, usually medium-sized round cobbles, are heated in a fire, and when hot, carefully placed into a container full of the food to be heated. These boiling stones occasionally break or shatter as they are being heated or in the food container due the sudden change in temperature; this breakage pattern is often recognizable, allowing us to identify boiling stones on sites. The presence of boiling stones on sites from which pottery is recovered suggests either that this technique was used for pottery cooking as well, or that organic vessels continued to be used alongside pottery. The tremendous skill and versatility that Wolastoqiyik and other Algonquian speaking people applied to the working of birch bark for such tools, has caused some researcher to refer to a widespread "Old Birch-Bark Hunting Culture" (Butler and Hadlock 1957: 11).

Clearly it is problematic to place too much emphasis on the first appearance of pottery, if people adopted it marginally or irregularly. I have placed my division between Archaic and Woodland at about 2800 years ago, based on the association of artifacts older than 2800 years ago with Terminal Archaic patterns, and associations of artifacts younger than 2800 years ago with Early Maritime Woodland patterns. However, as indicated by the discussion in Chapter 16, these are not universal patterns, and in the context of Jemseg, this boundary is entirely arbitrary.

The end of the Early Maritime Woodland is equally problematic. Some have emphasized the shift in pottery manufacture from fabric-impressed surface *treatments* to the appearance of an array of surface *decorations* (Petersen and Sanger 1991, Bourgeois 1999). Others have sought patterning in lithics and settlement. In light of considerable continuity in pottery and other materials from the Jemseg Crossing site between 2800 BP and 1900 BP, and given a small break in the sequence after 1900 bp, I have placed the end of the Early Maritime Woodland at this latter date. This boundary is also arbitrary, and it may be that future research will suggest the incorporation of the later Early Maritime Woodland into the Middle Maritime Woodland.

Based on three clusters of dates within the eight Maritime Woodland period radiometric dates (Table 18.1), and subtle difference in the assemblages that can be related to these dates, I have divided the Maritime Woodland period at the Jemseg Crossing site into three components: Component 5 (Early Maritime Woodland 1 or EMW1), ca. 2800 to 2400 years ago; Component 6 (Early Maritime Woodland 2 or EMW2), ca. 2400 to 1900 years ago; and Component 7 (Middle Maritime Woodland, or MMW), ca.1750 years ago to 1450 years ago.

I have highlighted some of the subtle changes in the Jemseg Crossing assemblage, in part because I believe the Jemseg Crossing material is large and diverse enough to pinpoint some of these patterns. However, it is important to note that the continuities within the Maritime Woodland

Table 18.1: Maritime Woodland radiocarbon dates and chronological components.

Comp	Feature	Date	Lab. No.	Calibrated (2 Sigma)
5	F14	2520±70	B-101508	815 Cal BC to 405 Cal BC
5	F56	2460±60	T-9618	790 Cal BC to 460 Cal BC
6	F25	2230±50	B-105889	390 Cal BC to 165 Cal BC
6	F11	2140±60	B-105892	330 Cal BC to 20 Cal BC
6	FC6	2060±40	B-105999	175 Cal BC to 45 Cal AD
6	FC1	1940±90	T-9619	170 Cal BC to 150 Cal AD
7	F21	1650±40	B-106507	340 Cal AD to 530 Cal AD
7	F21	1600±60	B-105891	350 Cal AD to 605 Cal AD

are more significant than these changes. It should also be noted that my components are primarily based on the radiometric dates, and the assumption that they are accurate at least within their 2 sigma ranges. There are many possible sources of contamination or skewing of radiometric dates, such as the use of old wood (e.g., driftwood) for firewood, which will result in an erroneous date. With a dependence on such relatively subtle differences in dates, these factors should always be kept in mind, with the hope that further evidence or refinement of techniques will pinpoint some of these errors before they become embedded in regional interpretations.

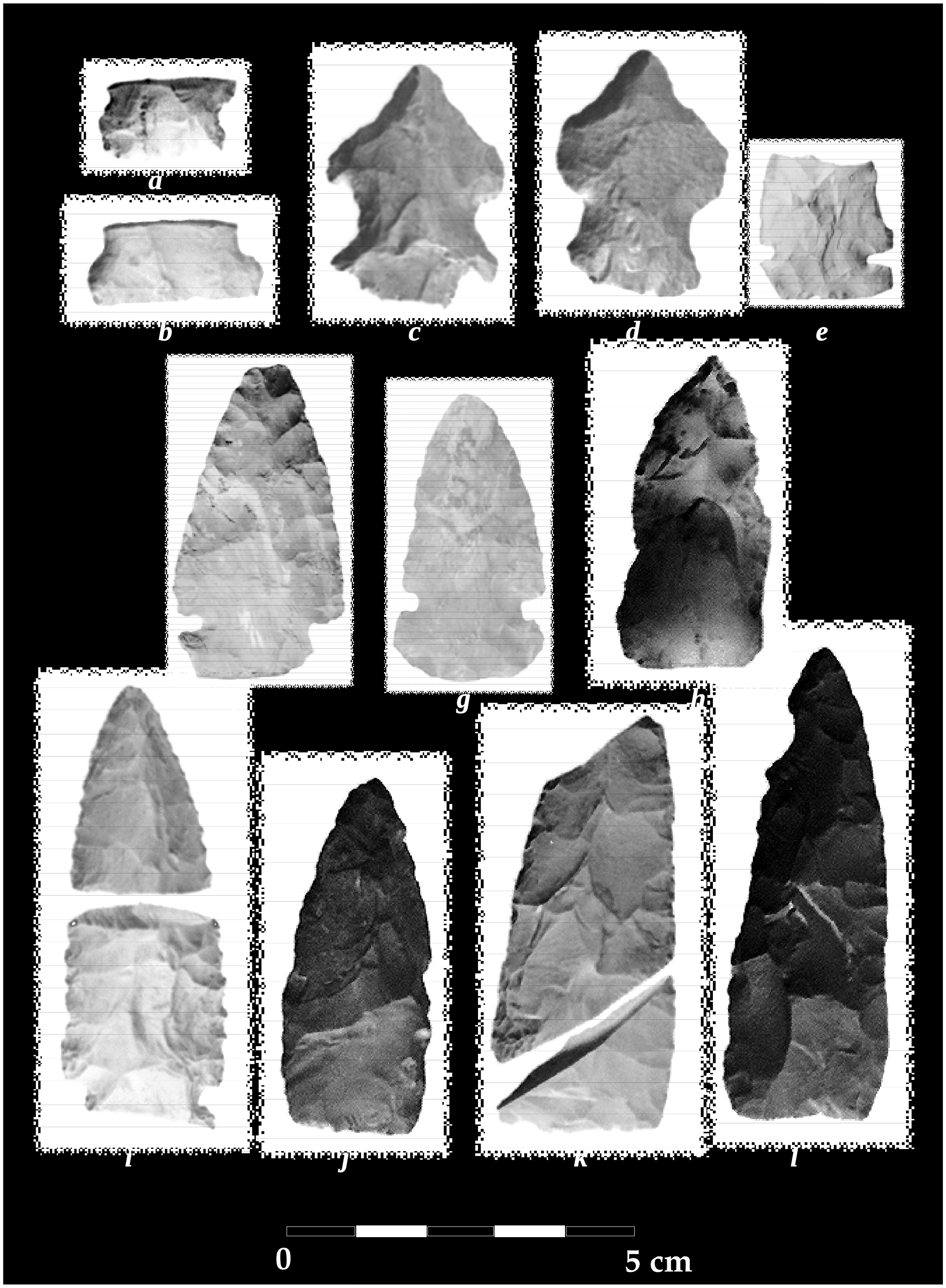
COMPONENT 5: THE EARLIER EARLY MARITIME WOODLAND (EMW1)

The earlier Early Maritime Woodland period (EMW1) directly follows the Terminal Archaic, beginning ca. 2800 years ago and continuing to 2400 years ago. Materials in this component exhibit many of attributes of the Meadowood phase (after Granger 1978). This Early Woodland manifestation was first identified at a series of sites in New York State (Ritchie 1980), and has since been described in Southern Ontario (Spence and Fox 1982, Spence, Pihl and Murphy 1990, Williamson 1978, 1997), New England (Heckenberger et al. 1990, Loring 1985), Quebec (Clermont and Chapdelaine 1982), and the Maritimes (McEachen *et al.* 1998, McEachen 1996). Material attributes considered qualities of "Meadowood" include a bifacial technology oriented toward the manufacturing of thin, finely-made bifaces (quaternary blanks) that serve as the base form for small- to medium-sized projectile points with narrow, carefully made side-notches, bifacial scrapers, knives and drills (Granger 1978), and the use of pottery (and especially, the earliest identified pottery in the Maritimes, Vinette I or CP1; Petersen and Sanger 1991, Bourgeois 1999). In more general terms, "Meadowood" is also related to elaborate symbolic and ideological expressions, including the use of red ochre and the manufacturing of "ritual" objects (often informally defined as artifacts without clear functional utility), such as slate gorgets and 'birdstones'.

The Jemseg Crossing site produced an array of possible Early Maritime Woodland artifacts. These consist of (CP1 or "Vinette I" pottery (120 sherds)) narrow side-notched projectile points (8), thin, well-made unstemmed bifaces (38), bifacial scrapers (68), two made on reworked projectile points, gorgets (1) and blocked-end tubular pipes (1) (Plate 18.1). Most of these artifacts were recovered from disturbed portions of the site, especially the plough zone of the upper terrace and on the beach near the proposed centre line. Based on these finds and initial results of radiocarbon assays, we formed a preliminary opinion that there might be a significant Meadowood component at Jemseg (Blair 1997). However, subsequent research and radiocarbon assays have moderated my view of local Early Maritime Woodland manifestations.

In his definition of the Meadowood technological system of New York State, Granger (1978) described Meadowood

Plate 18.1: Component 5 bifaces; (a, b) basal fragments, (c, d), drill-like wide side-notched points, (e, f, g, i) side-notched points, (h, j, k, l) unstemmed bifaces.



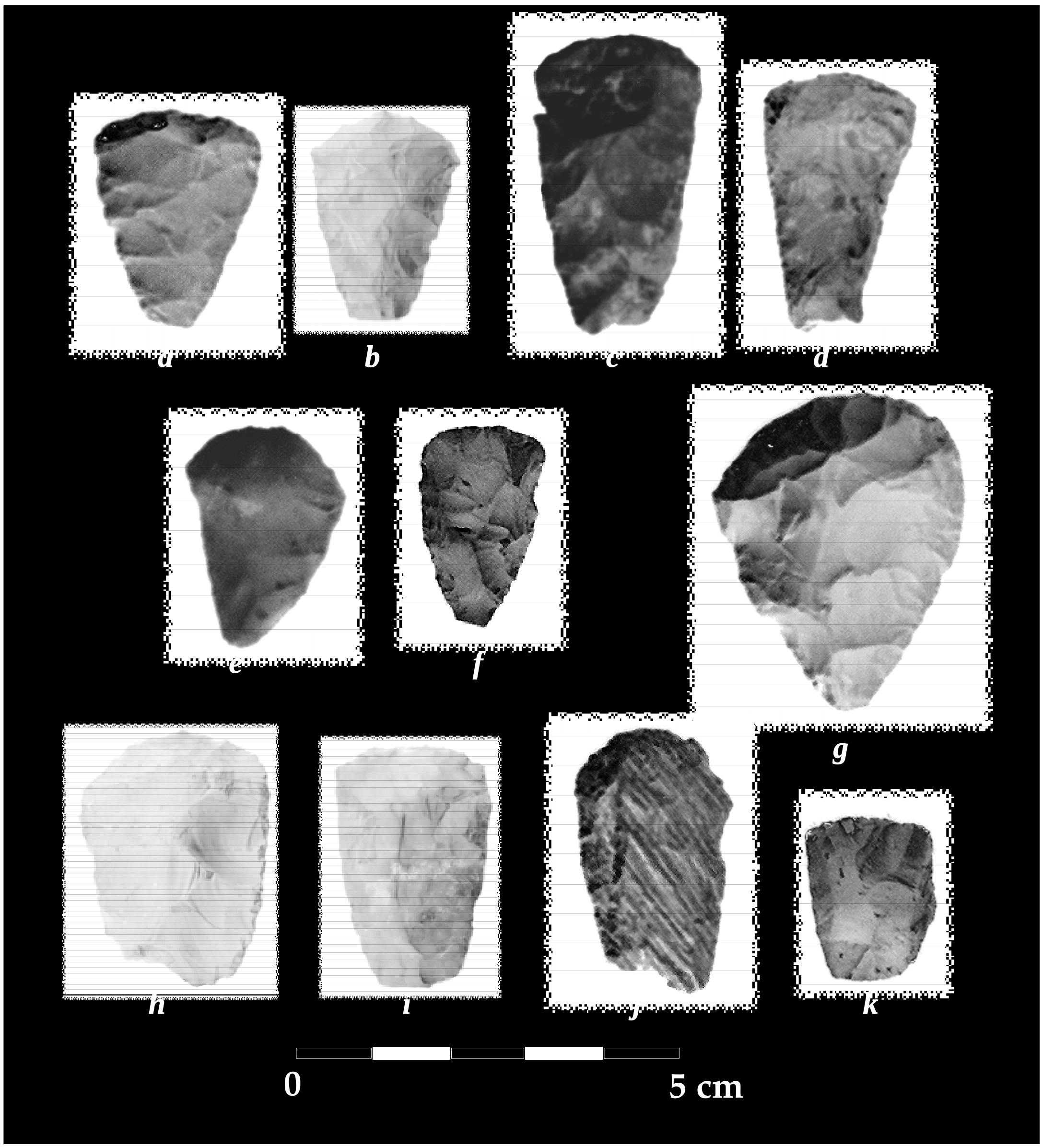
points, bifacial scrapers, drills, and unstemmed bifacial blanks as late products of a reduction sequence aimed at the production of very thin, uniform, bifacial quaternary blanks, or "cache blades" (Granger 1978: 17-18). Based on Granger's sequence, such a system results in small, thin bifacial scrapers with lenticular cross-sections and close to complete bifacial thinning. The functional attributes of particular tools (either scrapers, points, drills, etc…) is established outside of the biface manufacturing process, and does not intrude into the plans and processes of the biface manufacturer. Granger predicts that ideally, considerations of function enter into the process only after the completion of the blank. Indeed, the functional elements (such as steep end retouch and haft elements) may be applied to the blank significantly after it is manufactured, and by a secondary toolmaker. Granger also suggests a widespread preference (at least in the Great Lakes basin) for the use of Onondaga chert.

A few of the bifacial scrapers from Jemseg Crossing conform to this ideal (Plate 18.2). However, most of them are significantly different from the pattern described by Granger. Most have varying degrees of ventral modification, ranging from thinning over 90% of the ventral to the application of five or less ventral thinning flakes (I did not count specimens with three or less ventral removals as bifacial scrapers, as these removals may be accidental or post-depositional). Many of the Jemseg bifacial scrapers have asymmetric cross-sections, and few are thinned near the proximal end. They are made on a variety of raw materials ranging from the semi-translucent local chert (Washademoak chert), to quartz, volcanics, and various opaque to translucent, dark-coloured to bright-coloured variegated cherts.

These differences led me to consider several testable hypothesis about the relationship between bifacial scrapers and Early Maritime Woodland assemblages. I investigated the possibility that my criteria for distinguishing between unifacial and bifacial scrapers were too strict. If scrapers defined elsewhere and from other time periods as "unifacial scrapers" or "formed unifaces" exhibit even minor ventral modification, then the Jemseg Crossing bifacial scrapers might be considered as distinctive only in degree, and not in kind. To test this notion, I compared the Jemseg Crossing scrapers with ventral modification with other unifacial scraper assemblages, including a single component Late Maritime Woodland site, the Northeast Point site (Blair and Black1991), and the Debert Paleoindian site (Dickinson 2001, MacDonald 1968). Ventral modification was very rare on scrapers from Debert (and, when it occurred, was limited to a few ventral removals), and was nonexistent on the thirty-two scrapers from Northeast Point.

These patterns suggested to me that bifacial scrapers did indeed constitute a coherent group that might have been used for a restricted time period (the Early Maritime Woodland). I then considered the possibility that Granger's scheme for Meadowood reduction was an oversimplification, and that bifacial scrapers were not produced primarily as end products of a bifacial reduction sequence. If this were the case then perhaps the Jemseg Crossing bifacial scrapers could fit into the criteria for Meadowood bifacial scrapers. To test this notion, I examined an assemblage of artifacts that has been described as "Meadowood" from Pointe-du-Buisson, Québec (Clermont and Chapdelaine 1982; see also Chretien 1995). However, these artifacts were remarkably similar to those described by Granger.

Plate 18.2: Bifacial scrapers; (a to d) "Meadowood"-style bifacial scrapers, (e to k), various atypical bifacial scrapers, some with moderate ventral modification (f, h, i, j, k).

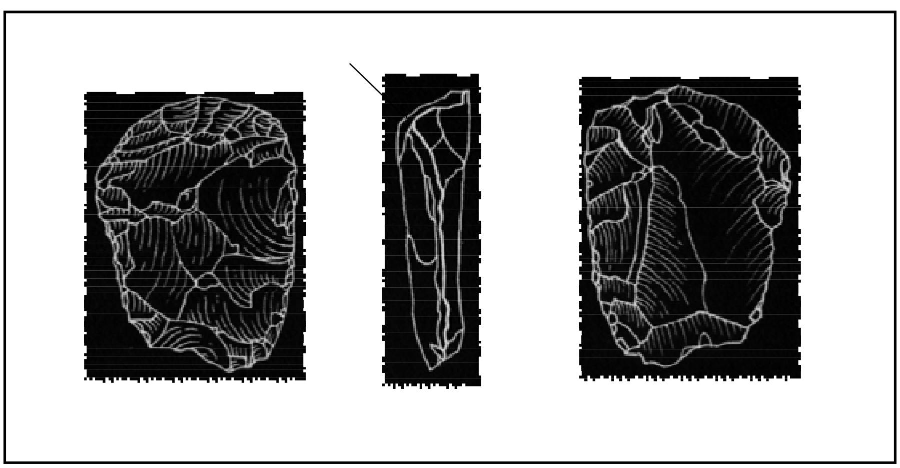


Almost all of the bifacial scrapers from Pointe-du-Buisson were indeed made on late stage bifaces. Furthermore, they were largely manufactured from Onondaga chert. This led me to conclude that the Jemseg Crossing bifacial scrapers are significantly different from Meadowood bifacial scrapers. Although they may be similar as end products, the two types of assemblages were produced by different reduction sequences, technological approaches and procurement systems.

The bifacial scrapers with partial ventral modification are different from Meadowood-style bifacial scrapers in a number of ways, beyond their divergence from the Meadowood biface production sequence. Of the 68 scrapers classed as bifacial, 10 were Meadowood-style scrapers. Non-Meadowood-style scrapers were morphologically and technologically diverse. Some (five) had only minor ventral modification (between five and eight ventral thinning flakes. A significant number (13) of non-Meadowood bifacial scrapers had sharp angles, small projections, or spurs on one or both edges of the working margin. This was frequently constructed by a controlled ventral removal from the corner of the bit, to create a ridge in the working edge near the margin (Figure 18.1). This particular modification appears to be functional, and may partially explain the preference for bifacial scrapers over unifacial scrapers.

My reservations about Meadowood and the nature of the Early Maritime Woodland were reinforced during the analysis of other classes of material. Because of our initial assumptions, we anticipated that at least some of the results of radiometric assays would support our notions of site chronology. Indeed, our first result, 2520±70 BP (Beta-101508), obtained from charcoal

Figure 18.1: Non-Meadowood bifacial scraper, in three views; note the side view clearly shows a modification near the edge of the bit, creating a raised "ridge", indicated by an arrow (actual size; illustration by A. Sumner).



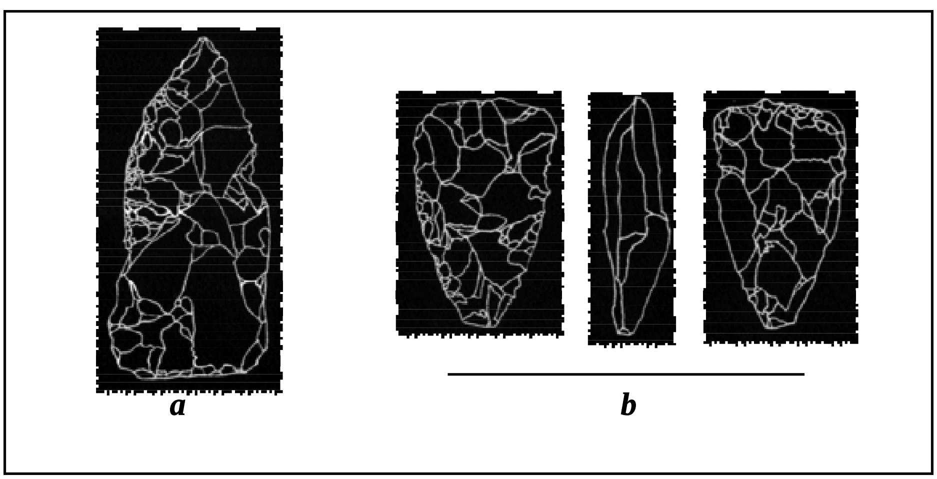
from a small hearth filled with fire-cracked rock (Feature 14, below) was comfortably "Meadowood", which elsewhere in the Northeast has been assigned to the period between 2800 and 2400 years ago (Fiedel 2001, Granger 1978, McEachan 1996). However, subsequent radiometric assays of 11 samples from 10 features revealed a sequence of dates for the Jemseg Crossing site ranging from the Terminal Archaic to the Middle Maritime Woodland. Only one further date (2460±60 BP from Feature 56), fits comfortably into this range.

Component 5 Features

Although only two features date to the period between 2800 and 2400 years ago (F14 and F56), I identified several others that may also relate to Component 5, including F8, F9, F16 and F47. However, due to a degree of uncertainty about their affiliation with Component 5, I restricted my detailed analysis of flakes and raw materials to artifacts found within and adjacent to Features 14 and 56.

Feature 14 was a basin-shaped hearth containing abundant cobbles and fire-cracked rock. It measured 118 cm by 80 cm by 26 cm deep. Feature 14 produced a very small suite of flakes. Only one of these artifacts, a portion of a large utilized flake, could be considered a tool. The remainder of the assemblage consisted of a fragment of a bifacial core, and 11 unmodified flakes. Feature 56 was a small oval pit containing dark brown loamy sand flecked with charcoal. As it continued in the unexcavated western edge of Area A, it was only partially excavated. The observed portions of the feature were ca. 100 cm wide, and ca. 25 cm deep. Given its form and content, Feature 56 may be a pit hearth or a refuse pit. It contained a large subassemblage of CP1 fabric-impressed ceramics, consisting 80 sherds representing portions of at least 2 vessels (designated vessel 1 and vessel 10;

Figure 18.2: Artifacts from Feature 56; (a) a bifacial knife with polish and retouch along the upper margin of one lateral edge, (b) three views of a bifacial scraper; both of Washademoak chert (actual size; illustration by A. Sumner).



Bourgeois 1999, and this volume). The lithic assemblage consists of 46 pieces of flaked stone, including seven tools. These include an unstemmed bifacial knife with retouch and polish on one margin near the tip (Figure 18.2), a medial biface fragment, a bifacial scraper, two medium-sized unifacial scrapers, one utilized or retouched core, and one utilized flake. It also produced one very large, thick, bifacial core, and 38 unmodified flakes.

Only 18 flakes from Features 14 and 56 retained striking platforms, allowing technological analysis (see Chapter 16). Despite the small size of the sample, it is dominated by flakes characteristic of biface production and use, including biface production and shaping flakes (4), biface thinning flakes (8) and biface sharpening flakes (1). One flake had a flat, unfacetted platform characteristic of initial phase core reduction, and four flakes had crushed or damaged platforms and were classed as 'indeterminate'. Generally, the flakes from Features 14 and 56 are small, with whole flakes averaging 13.9 mm in length, and striking platforms being on average 7.6 mm wide and 2.3 mm thick. These general characteristics suggest debris from a late stage in the biface production sequence, and may indicate a focus on final production and use. The presence of only one utilized or retouched flake implies a preference for formally styled tools, an inference supported by the presence of bifacial and unifacial knives and scrapers. We identified a range of raw materials in these features, especially varieties of felsic and mafic volcanics and chert (Table 18.2). The Washademoak chert was largely represented by red and translucent to yellow variants (87% by weight, and 74%

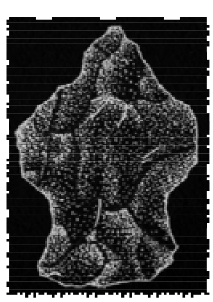
Table 18.2: Raw materials from Feature 14 and 56.

RM	# pieces	weight	description
Light coloured (felsic) volcanics			
6	6	10.1	Homogeneous felsite
42	14	12.5	Bleached reddish volcanic
Dark coloured (mafic) volcanics			
13	2	1.0	Sugary dark green volcanic
19	5	10.2	Dark brown –green volcanic
43	5	2.0	Bleached green volcanic
Porphyritic volcanics			
29	1	0.1	Mount Kineo/Traveller porphyry
Chert			
11	19	130.2	Washademoak chert
30	2	0.9	Minas Basin chert
45	2	9.0	Burnt or bleached chert
53.1	1	0.1	Mottled opaque grey chert
53.4	1	0.9	White to pink opaque to translucent chert
Quartz			
12	1	0.7	Quartz

by piece count). Several of the other chert types (JC 45, JC 53.1, JC 53.4) may present variants of Minas Basin or Washademoak chert. Quartz and quartzite were virtually absent.

The undated features that may relate to Component 5 share some of these characteristics. Feature 8 was a medium-sized pit-shaped hearth, 178 cm by 120 cm by 24 cm deep. It contained an array of artifacts, including an abrader, one wide side-notched projectile point, one bifacial scraper, four biface tips and medial sections, one unifacial scraper, six retouched flakes and two utilized flakes. Like the dated sample, this feature was dominated by Washademoak chert and mafic and felsic volcanics. It also produced low quantities of Mount Kineo-Traveler porphyry (six pieces) and Minas Basin chert (one piece). The wide side-notched point (Figure 18.3) is similar to Early Maritime Woodland drills reported from Québec (Clermont and Chapdelaine 1982: 64), and New York state (Granger 1978, Ritchie 1980), but is also similar to regional examples of Orient Fishtail points (Black 2000). However, the association of a Washademoak chert bifacial scraper provides secondary support for affiliation with Component 5.

Figure 18.3: Wide side-notched point from Feature 8 (actual size: illustration by A. Sumner).



Feature 9 was indirectly related to Feature 8 by a cross-mending biface. It was a small hearth (75 cm by 68 by 21 cm in size) that contained 132 flakes larger than five mm in diameter, and 1190 pieces smaller than five mm in diameter (microdebitage). The only tools were a heavily pitted "nutting" stone, and one possibly utilized flake.

Feature 16 was a circular soil feature 90 cm in diameter, forming a 21 cm deep basin. It contained a small selection of unmodified flakes (30), and a medium-sized oval unifacial endscraper made of green bleached volcanic. The plough zone above the feature produced a number of artifacts including some with "Meadowood" characteristics, including two projectile points with small side-notches, three bifacial scrapers, two unifacial scrapers, three unstemmed bifaces, one bifacial core fragment, one biface medial fragment, and 167 unmodified flakes. Feature 47 was an irregularly shaped series of charcoal lenses and fire-cracked rock that contained the base of a side-notched point made of opaque red volcanic or mudstone (JC15), and 15 unmodified flakes. Adjacent to the feature we found three similar flakes, and a thick bifacial core of bleached green volcanic.

Discussion of Component 5

In general, Component 5 features are all very similar, consisting of small to medium-sized hearths, with associated debris, largely related to both the production and use of bifaces. This pattern suggests a succession of small residential camps, and low intensity use, possibly distributed over a period of several centuries. The presence of low levels of regional "exotics" suggests integration into regional interaction networks, of a kind that closely resembles Terminal Archaic networks discussed in Chapter 16.

Our initial impression that the Jemseg Crossing site might represent a base camp, based on the distribution of artifacts in the plough zone, and our assumption that larger, semi-subterranean houses might be related to Component 5, appears to be unfounded. There are significant continuities between Component 4 and Component 5, in raw material procurement and reduction, settlement, and patterns of regional interaction. However, there are subtle differences as well. In Component 5, the residents of Jemseg added a distinctive bifacial scraper technology to the repetoire of tools, and shifted the focus of the reduction sequence away from the production of large biface production and thinning flakes as tools, towards more formalized morphologies. This may reflect other strategic shifts in mobility and the desire for smaller, more portable tools. It may be that the attention given to modification of the bit edge of bifacial scrapers is an integration of functional tasks previously conducted with utilized flakes. It also possible that the technological variation in bifacial scraper technology represents a chronological pattern. The Meadowood-style scrapers may be older forms, with non-Meadowood styles developing as technological processes shifted away from bifacial blank production, or were adapted to high-silica raw materials like Washademoak chert. From this perspective, non-Meadowood forms may be transitional to the predominantly unifacial scraper forms of Component 6.

Finally, it is clear that there is a significant Meadowood element to the Component 5 assemblage, both in terms of the style of particular types of formal tools (especially side-notched point and bifacial scrapers), and in terms of the association of particular artifact forms with other Meadowood characteristics, such early fabric-impressed pottery. However, the Component 5 assemblage also suggests that there is significant local patterning. It appears that the Component 5 assemblage developed out of the local Terminal Archaic, but it exhibits synchronic patterning similar to many parts of the greater Northeast. I suggest that the source of this patterning remains poorly understood.

We see a continuation in the earlier Early Maritime Woodland of regional interaction networks, suggesting a well-established population occupying the region fully. From these perspectives, there is little evidence in the Component 5 assemblage of the population replacement suggested by some for this period (Fiedel

Table 18.3: Radiocarbon dates from Component 6 features and feature complexes.

Uncal. date	Lab #	Source
2230±50 BP	Beta-105889	Feature Complex 4 (Feat 25
2140±60 BP	Beta-105892	Feature Complex 2 (Feat 11)
2060±40 BP	Beta-105999	Feature Complex 6 (Feat 44)
1940±90 BP	T0-9619	Feature Complex 1 (Feat 5)

2001). Furthermore, the technology evident in Component 5 is different from macroregional Meadowood systems, and suggests that our attribution of the component to a "Meadowood culture" may be meaningless. Models that explore the engagement of local groups into widespread networks exchanging knowledge and goods during the Early Maritime Woodland (such as proposed by Loring 1985, Heckenberger et al. 1990a, 1990b) may in the long term hold more explanatory value for the Jemseg "Meadowood-style" assemblage.

COMPONENT 6: LATER EARLY MARITIME WOODLAND (EMW2)

Following Component 5 there is evidence of both continuity and intensification and elaboration of settlement at the Jemseg Crossing site. This evidence rests primarily with a series of medium- to large-sized, dated feature complexes.

During the excavation we recorded closely related feature areas, often containing internal differentiation, such as multiple, distinct hearth areas. Some excavation teams designated these by a single feature number, and others assigned separate numbers to separate feature subcomponents. To create consistent chronological and functional units, I have identified these as feature complexes, and assigned them a separate series of number designations. As a consequence, these have a "feature complex" (FC) designation, as well one or more internal "feature" (F) designations. The occurrence of feature complexes in Component 6 hints at an increase in the internal complexity of structures, and a concomitant increase in domestic structure size.

Component 6 Feature Complexes

In all, we were able to use radiocarbon dating to identify four Component 6 feature complexes. These are, in order of the mean of the radiocarbon age (oldest to youngest), Feature Complex 4, Feature Complex 2, Feature Complex 6 and Feature Complex 1 (Table 18.3).

Feature Complex 4 was a medium-sized bi-lobate, basin-shaped complex initially designated by the feature number 25. With a radiocarbon date of 2230±50 BP, it was the oldest as well as the smallest of the Component 6 complexes. It was composed of two discrete hearth areas, and was located on the upper terrace (Area A). FC4 was 216 cm by 104 cm in size, and was 46 cm deep. It differed from the other complexes in its low volume of artifacts. Within and adjacent to the feature complex, we recovered one non-Meadowood bifacial scraper, two utilized flakes, and six unmodified flakes. These were primarily made of volcanics, but the scraper was made of a glassy black chert. No pottery was found in FC4.

Feature Complex 2, a deep semi-subterranean house floor, was also located in Area A. Despite internal differentiation, including multiple hearth areas, we assigned it one feature number (F11) in the field. FC2 was 332 cm by 207 cm in size, and was 51 cm deep. The presence of multiple layers of dark, organic soil and charcoal-rich lenses, suggests that this feature complex was successively occupied and periodically abandoned. Three discrete hearth areas were encountered, consisting of dense deposits of charcoal and ash with the fire-cracked rock. The date of 2140±60 BP was obtained on charcoal from one of the upper lenses, suggesting that much of the use of the feature occurred before this date.

FC2 produced a large number of lithic artifacts, including 15 tools and 85 unmodified flakes and cores. It also produced 80 sherds of fabric-impressed representing at least two pottery vessels. This pottery has been assigned to CP 1 (Petersen and Sanger 1991, Bourgeois 1999, this volume). These sherds indicate the stylistic durability of fabric-impressed wares.

Feature Complex 6, located on the levee next to the river, was the only Component 6 feature not located on the upper terrace. This large complex was only partially excavated through a scattering of 1 m by 2 m units. It was initially identified as interrelated features, numbered 43, 44, 45, and 46. It was minimally 3 m by 4.8 m in size. It contained hearth areas and living floors similar to those recorded at the Fulton Island site, a Maritime Woodland habitation site on the opposite side of the Grand Lake system (Foulkes 1981). These features may represent repeated, small scale occupation, a single campsite of several small wigwams, or a single integrated large house feature. FC6 produced 50 sherds of low-fired pottery, which Bourgeois attributed to two vessels (Vessel 6 and Vessel 11). Many of these sherds are highly fragmentary, but some have been burnished on both the interior and exterior, and are attributed to CP2a. FC6 also produced a large volume of lithic artifacts, including nine tools and 166 unmodified flakes and cores.

Feature Complex 1 was initially designated by feature numbers 1 to 5. It was located on the upper terraces, and continued into unexcavated portions of the site. Even though we were not able to determine its total extent, the visible portions of the feature complex were minimally 350 cm by 200 cm in size. FC1 contained considerable internal differentiation, including a thick, broad house floor, a flake concentration, a pit feature, a small hearth area, and an unusual area paved in flat cobbles. Although FC1

Table 18.4: Tool classes from Component 6.

Stemmed Biface	0
Edged Biface	9
Unstemmed Biface	3
Biface Fragments	3
Bifacial scraper	1
Unifacial scraper	5
Retouched flake	16
Retouched core	1
Utilized flake	31
Utilized core	6
Unmodified flake	616
Unmodified core	10

Table 18.5: Flake types from Component 6.

Flake type	Total pieces	No. tools*
Decortication	24	1
Core reduction	67	12
Bipolar	3	1
Biface production	23	2
Biface thinning	133	7
Biface sharpening	4	-
Pressure	20	-
Indeterminate	67	5
Total	341	28

* *scrapers, retouched and utilized flakes*

did not contain any pottery, it produced a large volume of lithic artifacts and debris, including 48 tools and 369 unmodified flakes and cores.

Lithic technology

The four complexes that I have attributed to Component 6 produced 75 tools and 626 unmodified flakes and cores. These tools are dominated by informal classes, such as retouched or utilized flakes, and bifacially retouched, unthinned, large flakes ("edged bifaces", Table 18.4). With the exception of a single bifacial scraper from FC4, formal tools types, such as stemmed projectile points, were rare. Formally styled unifacial scrapers are uncommon compared to retouched and utilized flakes. The few associated scrapers are medium-sized and broad (Figure 18.4). Informal tools exhibit a range of forms and size, and include large modified flakes and cores (Figures 18.4, 18.5).

Of the flakes from Component 6, a total of 342 retained a portion of the striking platform. This sample represents a range of lithic reduction activity. Despite the rarity of well-thinned bifaces within the feature complexes, biface production, thinning and pressure flakes are well represented (Table 18.5). This may suggest that bifaces were being produced at the site but were not used in the domestic settings recorded during JCAP.

A second trend is evident through an examination of the kind of flakes that were used as tools. In Component 4, there was a technological focus on the use of biface reduction flakes. However, the emphasis on use of initial stage core reduction flakes in Component 6 may suggest focus on non-bifacial cores for flake production (Table 18.5). Component 6 produced 10 cores and core fragments. These exhibit considerable variation, and include bipolar cores (2), multidirectional cores (2), tabular cores (3), and bifacial cores (1). This variability may, in part, reflect raw material characteristics.

Raw material procurement

The flaked lithic assemblage from Component 6 was diverse. It contained an array of felsic and mafic volcanics, and mudstones, as well as assorted quartzite, quartz and brightly coloured cherts. These latter classes of raw material were underrepresented in previous components. Some of these classes (especially the brightly coloured quartzites) are strongly clustered in particular feature complexes (such as Feature Complex 6), suggesting a pattern of continuous, *in situ* reduction; this may also reflect a lack of contemporaneity among the feature complexes.

There is also evidence of a shift towards brightly coloured variants of Washademoak

Figure 18.4: Unifacial scraper (left) and retouched flaked (right), both of bleached volcanic; from Component 6 (actual size; illustration by A. Sumner).

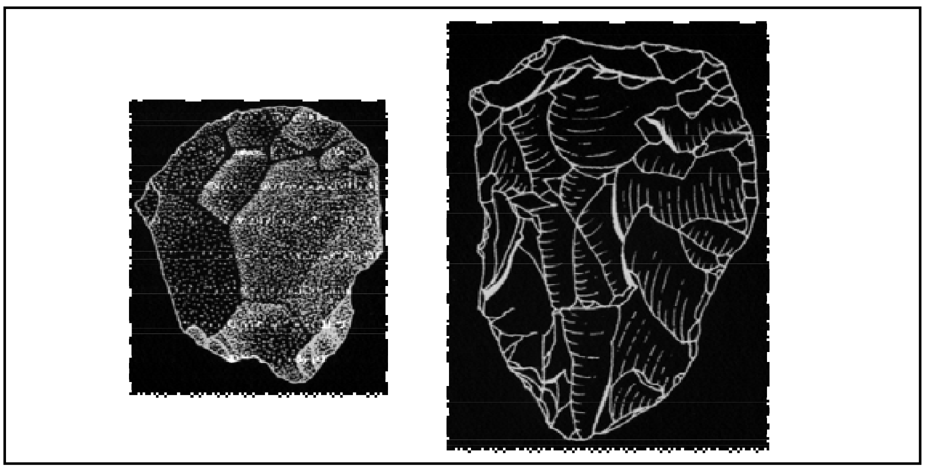


Figure 18.5: A utilized core made of Washademoak chert, from Feature Complex 2, Component 6 (actual size, illustration by A. Sumner)

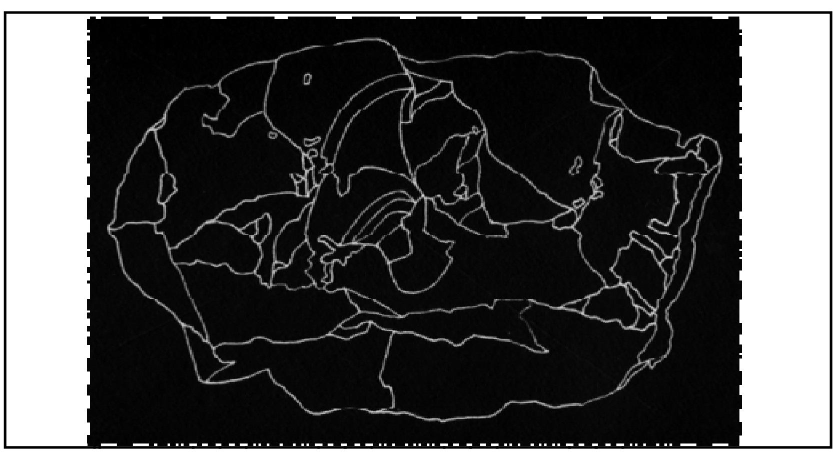


Table 18.6: The petrographic composition of the flaked stone from Component 6.

RM	# pieces	weight	description
Light coloured (felsic) volcanics			
6	53	114.9	Homogeneous felsite
7	22	21.7	Grey-green veined volcanic
26	8	6.8	Light brown and white spotted volcanic
39	12	11.8	Grey patchy volcanic
42	99	78.9	Bleached reddish volcanic
Dark coloured (mafic) volcanics			
9	20	19.3	Homogeneous blue-black volcanic
13	40	21.5	Sugary dark green volcanic
19	106	147.1	Dark brown green volcanic
34	7	28.1	Purple red patchy volcanic
43	57	68.9	Bleached green volcanic
44	2	10.4	Pitted bleached green volcanic
50	21	49.5	Coarse dark volcanic
Porphyritic volcanics			
2	1	0.3	Brown heterogeneous andesite or porphyry
29	6	3.6	Mount Kineo/Traveler Mountain porphyry
40	1	1.2	Grey-pink porphyry
Quartzite			
1	2	13.2	Grey to brown medium grained quartzite
3	2	0.2	Grey translucent quartzite
23	2	0.8	Smoky grey semi-translucent quartzite (Ramah)
58	31	30.8	Yellow medium-grained quartzite
59	9	2.5	White to translucent medium-grained quartzite
60	5	3.1	Coarse translucent-brown quartzite
Chert			
11	88	591.4	Washademoak chert
30	13	11.6	Minas Basin chert
31	1	0.9	Red and black glassy chert (Tobique chert)
32.3	1	2.0	Glassy black chert
32.4	2	7.5	Black and brown waxy chert
45	9	27.2	Bleached or burnt white chert
53.1	10	10.0	Mottled opaque grey chert
53.2	3	1.0	Brown mottled chalcedony
53.3	3	2.7	Brown semi-translucent chert
53.4	3	10.5	White to pink semi-translucent chert
53.5	3	3.9	Amber coloured semi-translucent chert
Quartz			
12,23	47	78.7	Quartz
Mudstone			
15	3	3.7	Red mudstone
24	1	30.1	Opaque dark green mudstone
Other/untyped			
misc	7	4.3	

chert. Red and yellow variants made up 86% of the assemblage by piece count, and 91% of the assemblage by weight, far outnumbering blue-grey and black-brown variants. Most (9 out of 10) cores from the component are made of Washademoak chert.

Pottery Technology

Although there is evidence for the use of low-fired pottery in Component 6, ceramic sherds are irregularly distributed among feature complexes. While FC2 and FC6 produced pottery assemblages, FC1 and FC4 did not. This is unlikely a chronological pattern, since feature complex 1 and 4 represent two extremes in the dating of the component. This may suggest that pottery served a limited or specialized function at this time. It also reinforces the notion that pottery manufacture and use remained a peripheral activity in the technological organization of the people of the Jemseg area. Despite its small size, the Component 6 pottery assemblage captures an element of the transition from a long-standing tradition of making pottery with fabric impressed surfaces, towards elaboration in pottery decoration, with the appearance in Feature Complex 6 of burnished wares.

Discussion

Component 6 represents a significant shift in the settlement and technology of the people of the Jemseg area. During this period, we see a transition from small, ephemeral hearths and campsites, to larger, more structurally complex dwellings. These were occupied or reused over longer periods of time, as indicated by internal stratigraphy and the greater density of lithic materials. These trends may also suggest a change in mobility. This change may relate to a decrease in residential mobility, or a shift from residential mobility (the movement through the site by groups continually shifting their houses) towards logistical mobility (the use of the site as a base camp from which groups staged logistical forays, *sensu* Binford 1980). This pattern is also reflected in the Component 6 lithic technology. There is a trend away from highly portable technological toolkits that are oriented towards biface production (as evident in Component 4), towards the use of less portable technological systems that incorporate the use of pottery, and balance biface production with the production of flake tools from cores. This view of the relationship between mobility and lithic technology draws on a burgeoning North American literature on technological organization (Andrefsky 1991, 2000, Bamforth 1986, Bleed 1986, Boyston 1991, Carr 1994, Cowan 1999, Johnson and Morrow 1987, Kelly 1988, Kuhn 1994, Nelson 1991, Odell 1998, Shott 1986, 1994).

Feature Complex 4 represents a transitional assemblage, between the more ephemeral features of Component 5, with their evidence a bifacial technological system, and the patterns exhibited in the later feature complexes. The high diversity of raw materials in Component 6 may reflect a longer period of occupation, or may relate to the larger sample size. As with previous components, there is little direct evidence of subsistence and seasonality. Based on the contents of features, butternut continues to be exploited (Chapter 14), along with a variety of other plants. The calcined bone assemblage and plant materials remain underanalyzed, and affords future research potential for understanding the economic basis for these patterns.

COMPONENT 7: MIDDLE MARITIME WOODLAND (MMW)

The final pre-contact component that can be identified in the Jemseg Crossing assemblage dates to the Middle Maritime Woodland. Based on material recovered from the areas of excavation, only a brief part of the MMW could be defined, from ca. 1750 to ca. 1500 years ago. This is largely due to the small size of the component, and the lack of diagnostic artifacts and radiometrically dateable features. It is clear, however, that there were many flourishing Aboriginal communities in the lower and central St. John River Valley during this time (Foulkes 1981, Varley 1998, WGA 2000). It seems likely that the Jemseg area continued to be used after this period, but we simply did not recover evidence of later activity within the proposed footprint of the highway. After discussions with local people, and through the examination of private collections, we identified Middle and Late Maritime Woodland activity in the area, but not in the excavated portion of the site.

Several features, including Feature Complex 3 (Feature 21), Features 20, 22, 23, 24, and 48 have been attributed to Component 7. Most of these cluster around the central and northern portion of Area A, and may be functionally related to one another.

Component 7 features

Feature Complex 3 was one of the last features completed before the field project was halted. It is a large feature, consisting of an long, lozenge-shaped basin that was 259 cm by 155 cm in size. It was 57 cm deep and contained layers of compact purple-grey sandy clay and reddish-brown sandy silt. These are capped by layers of apparently undisturbed alluvium and a grey loamy clay lens. These may represent post-abandonment pedogenic processes, such as flooding and in-filling with silt and clay (Varley and Howlett 1997). The sandy-clay and sandy-silt in the bottom of the feature, which ranged from 20 to 40 cm thick, contained all of the cultural material.

This feature complex is likely a semi-subterranean house and may represent a considerable period of use. The basin-shaped profile is similar to Component 6 features (above), and suggests significant energy expenditure in its construction. Although they have not been linked by radiometric dates or cross-mended or refitted artifacts, we have inferred from their proximity and their complementary nature that features 20, 22, and 23 may be functionally related to FC3, and represent a similar period of use.

Two radiometric dates were obtained from FC3, one from a lens of wood charcoal in the purple-grey sandy clay (approximately 45 cm below surface), and the other from carbonaceous encrustation on the exterior of a pre-contact ceramic sherd (Vessel 3). The first returned a date of 1600±60 BP, while the second returned a date of 1650±40 BP .

FC3 produced 14 sherds of a thin-walled (ca. 6 mm) fine grit-tempered ceramic vessel, designated Vessel 3 (Bourgeois 1999, this volume). This vessel has a smoothed interior and exterior, and has been decorated with a dentate tool, using a rocker dentate technique. The resulting motif consists of bands of vertical rocker stamps, and is quite distinctive from other (primarily undecorated, surfaced-treated) ceramics in the Jemseg Crossing assemblage. Other materials recovered from the feature include two small biface medial sections, two retouched flakes, five utilized flakes, and one utilized core. A single fragment of ground slate was also recovered from the feature. We have not associated this material with Middle and Late Maritime Woodland lithic industries. However, given the fact that these people constructed a house using an excavation technique on a site which contains abundant evidence of earlier activity, it seems possible that the ground slate was collected by the occupants of FC3, either from the surface or from disturbed areas of the site.

A considerably quantity of material was recovered from the disturbed alluvium (plough zone) above the feature. These include a bipoint or a pentagonal point with a broken base, made of bleached green volcanic (JC43), a bleached green volcanic (JC43) biface midsection, a second ground slate fragment, an unidentifiable fragment of groundstone, four utilized flakes and 85 unmodified flakes. Some of these items, and in particular, the bipoint fragment, are likely related to FC3. Similar bipoints have been recovered from Middle Maritime Woodland contexts in the Grand Lakes area (Foulkes 1981: 88-89), and elsewhere in the Maritime provinces (Allen 1980: 136). Pentagonal points exhibit a similar pattern of use in the broader Northeast (Ritchie 1971: 28). Although contracting-stemmed projectile point variants first appear on regional sites somewhat earlier than Component 7, they may persist through the Middle Maritime Woodland (Foulkes 1981: 94-95).

Several other features also were identified that may relate to the Middle Maritime Woodland, and in particular, to FC3. These include features 20, 22, and 23, and Feature 48. Features 20, 22, and 23 are a cluster of small pits adjacent to (south and east of) Feature Complex 3. All three are pit features that contain a range of food-related and tool debris. Although it is tempting to interpret them as storage facilities related to Feature Complex 3, clearer evidence of their contemporaneity and function is needed before we draw too many inferences from their presence. This evidence may result from raw material analysis, lithic refit analysis, or multiple chronometric dates. Indeed, some preliminary raw material analysis has failed to identify any Washademoak chert in these features (Black, this volume), a pattern that is characteristic of FC3 (see below). Similar features adjacent to Component 6 feature complexes may also be related storage facilities. All of these are described in Chapter 14, this volume.

There are several other features distributed about the site that may also relate to activity during the Middle Maritime Woodland. Although it was not radiometrically dated, Feature 24 is stratigraphically above Feature 25, which produced a radiocarbon date of 2230±50 BP (see above). Feature 24 is a small, oval area of charcoal flecked grey loamy-clay with a basin-shaped profile. It produced 8 flakes, all of bleached mafic and felsic volcanic. Feature 48 may also be related to FC3 and Component 7. It was a oval area of dense lithic debris at the base of the break in slope below the upper terrace (in Area B). It was associated with a single identifiable sherd of pre-contact ceramic. In all, this feature produced 437 pieces of flaked lithic, mostly of one particular type of mottled grey-green mudstone (JC 62). Other than Feature 48, this material was only found in and around FC3, so this may represent a related knapping area.

Component 7 Lithic Technology and Procurement

I focused the lithic analysis on the only well-dated Component 7 feature, FC3. The lithics from within FC3 exhibit both continuities and discontinuities with previous periods. Biface technology, manifested both in terms of tools present (see above), and flake types (Table 18.7) continues to be a focus of technological activities. The use of cores for flake tool production is less evident, but this may be a reflection of smaller sample size. Scraper technology (either unifacial or bifacial) appears to be more limited than in previous periods.

However, we can observe a significant shift in patterns of raw material procurement (Table 18.8). There is no

Table 18.7: Flake types from Feature Complex 3.

Flake type	Total pieces
Decortication	4
Core reduction	5
Bipolar	1
Biface production	3
Biface thinning	26
Biface sharpening	-
Pressure	-
Indeterminate	8
Total	47

evidence in Component 7 of use of Washademoak chert, a characteristic that had united previous components. Indeed, brightly coloured cherts of any kind are absent. The focus appears to be almost entirely on local volcanics, with the exception of one small, highly bleached porphyritic volcanic that may be from the Mount Kineo/Traveler area of Maine. The red mudstone is a stony variant that is not macroscopically similar to waxy variants of red cherts or mudstone from northern Maine.

These patterns are also present in the undated features that I have related to Component 7. In an analysis of the 455 lithic artifacts in Feature 24 and 48, I did not find any Washademoak chert or Minas Basin chert. Unifacial technology is also absent from these features, but there is a continued use of flakes as tools. Although none of the flakes from Feature 24 were modified by or for use, Feature 48 produced 20 retouched flakes, and 41 utilized flakes. These flake tools were made on an array of different flake types, including both biface production and thinning flakes (16) and initial stage core reduction and decortication flakes (10).

These patterns represent a significant and baffling shift from those evident in other Jemseg Crossing components. Why did the Washademoak chert source fall out of use? Does this correspond to a general shift away from cherts, or is it a function of Washademoak chert or its availability that changes?

Table 18.8: Raw materials identified in Feature Complex 3.

RM	# pieces	weight	description
Light coloured (felsic) volcanics			
6	9	107.9	Homogeneous felsite
28	2	7.5	Grey veined volcanic
42	36	36.7	Bleached reddish volcanic
Dark coloured (mafic) volcanics			
13	1	0.2	Sugary dark green volcanic
19	12	19.6	Dark brown –green volcanic
43	2	1.0	Bleached green volcanic
44	1	0.8	Pitted bleached green volcanic
50	1	1.6	Coarse dark volcanic
Porphyritic volcanics			
29.3	1	1.5	Bleached porphyry
Chert			
45	1	0.3	Bleached or burnt white chert
53.1	1	0.1	Mottled opaque grey chert
Quartz			
12	2	3.5	Quartz
Mudstone			
15	13	10.8	Red mudstone
62	9	20.5	Mottled grey-green mudstone

Discussion

The patterns evident in the material from Component 7 show some continuity from the Early Maritime Woodland components at Jemseg, but in many ways are strikingly different. The style of house construction, involving the fairly labour- and time-intensive excavation of a shallow basin-shaped pits is similar to that evident in Component 6.

However, unlike preceding periods, there seems to have been a shift away from brightly coloured, translucent lithic materials, with a focus on opaque, local materials. The only potential exotics (non-local) identified in the Middle Maritime Woodland component were some red mudstones or cherts, materials that may be available from northern Maine, or from closer to hand (Black, this volume). Completely absent from any categorically Middle Maritime Woodland context are any possible variants of Washademoak chert, Minas Basin chert, or other translucent cherts. Other recognizable exotic lithic types, such as Ramah Bay quartzite, and Kineo-Traveler Mountain porphyry are also rare or absent. These suggest that the levels of interaction evident in the Early Maritime Woodland periods had disappeared by the Middle Maritime Woodland.

This pattern has been observed on other sites in the Northeast where the transition from Early to Middle Woodland has been documented (Heckenberger et al. 1990a, Loring 1985). In part, this may be because there were widespread, deep economic and social shifts occurring in many parts of the wider Northeast, including the development of agriculture in its southern portions. "This process [of localization] appears to mark the transition from an egalitarian social system of dispersed hunters and foragers to one of incipient ranked society, as territorial flexibility was replaced by nucleated villages and tribal boundaries" (Loring 1985: 106).

Indeed, the trend towards flake tool production that began in Component 6 appears to continue into Component 7. Furthermore, compared to Component 6, there are fewer formal tool types. It is clear that these are being supplemented by flake tools such as utilized and retouched flakes. In my discussion of Component 6, I suggested that this pattern may reflect a change in mobility strategies. However, these patterns could also indicate a shift in focus away from lithic production in a general sense, with these materials being replaced by the use of other materials such as bone and antler. In addition, although pottery continues to be made in the Middle Maritime Woodland, it is not as abundant as in Component 6, which suggests that the use of pottery is being supplemented with other food-processing and cooking techniques such as organic container cooking (a method which employs bark, hide or textile containers and heated rocks ("boiling stones" to cook foods, see above).

After Component 7

Although there is little evidence of succeeding time periods within the excavated material recovered from the Jemseg Crossing site, these materials are likely present in the local area. It is possible, however, that the subtle trends that may be evident in the Middle Maritime Woodland away from non-portable technologies such as pottery, and towards a focus on local materials may reflect increasing mobility. People may have been getting all of the raw materials they needed through seasonal rounds, and so were withdrawing from regional networks. If this trend continued, there would be substantial changes in settlement patterns after the time of Component 7. These might result in shorter stays in the Jemseg area than occurred during the Middle Maritime Woodland and earlier. Other locales in the area might have been more amenable to these shorter term resource-specific camps. Indeed, the use of basin-shaped *wikuwamul* floors (or "semi-subterranean" houses) do not appear to have persisted into the Late Maritime Woodland in the broader region. Research elsewhere in the Maritime Peninsula (e.g. Black 1992, Blair 1997, Bourque 1992, Bourque and Cox 1981, Cox 1987, Leonard 1996) suggests that this trend towards a localization of lithic procurement is also evident in other Middle Maritime Woodland period assemblages. This may also correspond to an emphasis on regional identity and sociopolitical organization, as suggested by Burke (2000). After about 1300 years ago, there is significant evidence of the rekindling of interregional relationships between groups in the Maritime Peninsula, leading to renewed patterns of regional interaction and trade that continued into the post-contact period (Bourque and Whitehead 1987).

Cimaciw Wenuhcok Petapahsultitit
19. Post-Contact Artifacts and Features

Susan Blair, Pam Dickinson, and Christopher Blair

The post-contact period in North America is the period of time after the early contact between the Aboriginal peoples of North American and European explorers, missionaries and colonisers. In Canada, these events took place earliest in the region known today as Atlantic Canada. Although there were a series of early expeditions and temporary settlements in the 16th century, permanent settlement began in New Brunswick in the early 17th century. There is documentary information available for almost all of the European peoples who settled in this region since that time. As a result, the period after European contact is also known as the historic period. In this sense, *historic* refers to the existence of written records (see Chapter 13). The Jemseg area has been an important focus of regional activity throughout the post-contact period, and we anticipated finding evidence of history of use in the archaeological record.

However, most post-contact period archaeology has focused on the European settlement by the French and English during the subsequent four hundred years since the earliest settlements. Comparatively little archaeological research has been conducted into the lives of New Brunswick's Aboriginal peoples during these centuries.

It was hoped that the Jemseg site would open a window on Wolastoqiyik activities in the Jemseg area during the post-contact period. Through the spoken histories and informal discussions we learned of the rich relationship of recent Wolastoqiyik with the Jemseg area, the Grand Lake system, and the lower Saint John River valley. This information demonstrates that these components existed in the Jemseg area, independent of archaeological research.

Unfortunately, much of the area utilized during the post-contact period was heavily disturbed, mainly by ploughing and related activities. This kind of disturbance seriously impedes our abilities as archaeologists to interpret the past. We did, however, identify an array of historic period artifacts from the site. These artifacts provide both a chronological framework for Wolastoqiyik and non-Aboriginal activities at Jemseg, and guide us in some general interpretations. In the following chapter, we will discuss the documentary record pertaining to this area, and explore some additional sources of information, especially local knowledge and Aboriginal spoken histories. Due to the rich history of Wolastoqiyik and non-Aboriginal activity in the Jemseg area, this treatment is not comprehensive, but is intended to provide a general historical framework. Readers are invited to contemplate many of the excellent examples of local scholarship focused on the historic period of New Brunswick and the lower Saint John river for a more complete analysis of these time periods. Following this synopsis, we will explore some specific classes of artifacts and their distribution in the site, as a means of highlighting some of the potential of the historic artifact assemblage Jemseg Crossing site. However, this assemblage remains only partially studied, and further research will undoubtedly provide greater insight into the recent history of the Jemseg Crossing site.

Background

In many ways, the post-contact utilization of the Jemseg area developed out of pre-contact patterns. The Jemseg region has been woven into the lifeways of the Northeast by extensive networks of travel. These networks flowed along the rivers that deeply penetrate the interior of the Northeast, and are often separated at their heads by short portages (Ganong 1899). The Wolastoqiyik are closely linked to the development and use of the birch-bark canoe, the perfect vehicle for this widespread, interconnected highway.

Although it is underwritten by a continual Wolastoqiyik presence, the post-contact period itself can be subdivided into a series of incursions, settlements and territorial claims, based on the geopolitics of the region and its connection to the larger battles between colonial forces in the Americas. The lower Saint John river and the Jemseg area figured significantly in these conflicts in the Acadian or French period (1604 to 1760). This region later became a centre of non-Aboriginal settlement during the Planter period (1760 to 1784), and, following the arrival of Loyalists in the late 18th century, entered into a phase of general economic expansion and development.

During the early 17th century, the French began to establish a series of trading posts in the lower Saint John, solidifying relationships with the Wolastoqiyik. However, while the 17th century has been referred to as part of the Acadian Period (1604-1760), the lower Saint John was repeatedly seized by various competing colonial powers. In 1659, during a period of British control, Thomas Temple constructed Fort Jemseg and a trading post at the mouth of the Jemseg River, approximately 10 km down river from the Jemseg Crossing site (Lockerby 2000: 6; Raymond 1943: 44).

In 1667 the region was restored to the French under the Treaty of Breda, and the French, under Pierre de Joybert, Sieur de Soulanges et Marson took control of Fort Jemseg in 1670 (Lockerby 2000). In 1674, a Dutch privateer, Jurriaen Aernoutsz seized the Fort from the French (Ganong 1899: 312; Lockerby 2000; Raymond 1943: 45-46; Soucoup 1997: 31-32). A year after the Dutch pillaged the Fort, the French re-established it as part of the French defence system and as the headquarters for Acadia until 1692 (Raymond 1943: 46-47). During this time, some French settled the land in the area, establishing farms.

> In 1686 a Canadian, Louis Damours de Chauffours, was granted the seigneury at Jemseg previously held by Pierre de Joybert. Damours moved there with his new wife and farmed his land, pursued the fur trade with the Maliseet [Wolastoqiyik] and opened a store. He was one of the first farmers on the St. John River (Lockerby 2000: 7).

The 1695 census indicates that Damours had 65 acres under cultivation, a barn, a stable, 22 horned cattle, 50 hogs, and 150 fowl. The Damours holding at Jemseg was described by John Gyles, a Puritan boy who had lived with Damours as a purchased slave after a period of captivity with the Wolastoqiyik (Gyles 1851).

Ganong (1899:271) also makes note of a French village of thirty or forty houses just below the mouth of the Jemseg River. By 1733 at least twenty Acadians had established farms around the old French estates at Jemseg (Soucoup 1997: 38). During this period, seigniorial land grants of the area along the Jemseg River passed hands a number of times (Ganong 1899, Soucoup 1997: 23-36).

The focus of French colonial administration shifted to Nova Scotia after the early 17th century (Lockerby 2000).

In the fall of 1758, the English seized the lower Saint John, and burned out extant Acadian settlements in the area, including some at Jemseg (Lockerby 2000, Raymond 1943). Following the expulsion of Acadians from parts of the Maritimes, the British established colonies at Maugerville, north of the outlet of the Jemseg River (Raymond 1943). In time, these colonies shifted and grew, and were supplemented by increasing immigration into the area of Loyalists, Irish, Scottish and English.

Local Activities

The post-contact settlement and exploitation of the Wolastoq (Saint John river) reflects its continued importance for travel and transportation. This included industrial applications such as lumbering and coal mining.

Accounts by Clark Wright (1966: 115) and Soucoup (1997:27) suggest that the Grand Lake area contains the earliest recorded coal mining on the North American continent, in written records dating as early as 1643. Turnbull *et al.* (1995) translated an account of the possession of Fort Jemseg in the name of the King of France by Sieur Joibert de Soulanges on August 27, 1670. This account mentions the economic potential of local coal deposits:

> There is found about a ton of the coal of the region; at about six paces distant at the same side, there is a pit which can hold two tons.
>
> (Translated from French by FidŹle Thériault, Fredericton, 3/06/1996).

Since this time, the Jemseg River has continued to be used for a variety of economic activities. Clark Wright (1966: 116) records the use of the river to transport logs to the city of Saint John. Commercial fisheries continued on Grand Lake into the 20th century (Meth 1971).

Some of these activities have been specifically focused in the area of the Jemseg site. Dignam (1997) gathered site specific land use information while completing personal interviews with a number of Jemseg residents. He recorded information about many industrial activities along the banks of the Jemseg River, including a boat yard (1820-1890), a wood mill (1920-1929), a box factory (1930-1947), and a marina (1980-1997). He also determined that the site itself had been used in the early 20th century for a mixed farming operation that included ploughing, burning, and pasturing of the land. In 1961, the eastern (landward) end of the site area was bulldozed during the construction of a highway.

The spoken histories reveal that while all of this economic and political activity was ongoing, there was a steady stream of Wolastoqiyik moving along the Jemseg River and through the Grand Lakes area. Although these patterns were unnoticed by the historians writing down "momentous events", they are recorded in the memories of elders. As summarized by Perley (from Chapter 7, this volume):

> Many elders have shared their stories of Jemseg and its place in the cultural landscape of the Wolastoqiyik, the People of the beautiful river. Charles Paul from Neqotkuk/ Tobique said that Jemseg was a place where people went to gather driftwood (pers. comm. 1997). It was also known as a place where people gathered. Ruth Saulis, originally from Welmooltuk/ Oromocto (later of Neqotkuk/ Tobique) remembered visiting the site when she was a little girl. She called the place a "stop over place", where people travelling on the river to Saint John would camp for a day or two, sometimes longer. Here they made baskets, fished, hunted ducks, gathered cranberries, traded and socialized. She recalled a steady stream of people arriving and leaving at different times (pers. comm. 1997).
>
> Christina Nash from Welmooktuk/Oromocto remembered visits when people were "fiddleheading" and trapping muskrats. During this time, there were two births that took place at Jemseg, her sister's son, and that of John Atwin (pers. comm. 1996).
>
> Some of these traditional patterns have continued to the present. Charles Paul from Welmooktuk/Oromocto told us that John Sacobie (Welmooktuk/ Oromocto) continued to visit Jemseg until recently to collect medicinal plants, groundnuts (*Apios americana*) and trap muskrats. Only his health has prevented him from continuing this tradition (pers comm. 1997).

Archaeological evidence

Archaeologically few early sites have been identified that suggest contact between the Aboriginal and early non-Aboriginal people in the region. However, the Fulton Island site contained two clay pipe bowls as well as a copper bell (Turnbull 1975). Turnbull *et al*. (1995-96) suggests that stylistically these clay pipe fragments "should date the occupation to the mid-seventeenth century, contemporaneous with Fort Jemseg's occupation…. and it is quite conceivable that they could have been traded at Fort Jemseg". Recent efforts to find Fort Jemseg itself may hold further potential for our understanding of the post-contact era of the Jemseg area. The current paucity of archaeological material from the area highlights the importance of the Jemseg Crossing site assemblage.

The Jemseg Crossing site produced 19626 artifacts that could be attributed to the post-contact era. These are dominated by varieties of European-made pottery, bottle and container glass, and iron objects, especially nails and spikes. They span the entire post-contact period, from the early 17th century to the late 20th century. Although we did not identify any unequivocal post-contact era structures during our excavations, we did observe patterning in the distribution of particular materials and material classes that may provide further information.

This assemblage remains largely unanalyzed, although we have conducted preliminary analysis of several artifact classes. Dickinson conducted graduate research on the clay tobacco pipes, and this research will be presented herein, C. Blair integrated the post-contact material into an interpretive framework (and, assisted by Darcy Dignam and Cynthia Adams, conducted preliminary artifact identifications), and S. Blair integrated the material into a spatial and chronological

Table 19.1: The post-contact artifacts from the Jemseg Crossing site, by general artifact and material class.

Artifact class	# pieces
White refined earthenware (creamware, pearlware, vitrified wares....)	980
Coarse red earthenware (bricks and vessels)	122
Stoneware (various vessels and containers)	242
Porcelain (doll parts, toy tea sets, figurines, table ware...)	124
Other (unanalyzed) ceramics	5161
Clay tobacco pipe (bowls and stems)	303
Flat glass	497
Container glass	5062
Glass beads	288
Bone, modified (primarily beads and buttons)	20
Iron nails and spikes	2719
Other iron objects	2199
Other metals	315
Slate pencils	5
Slag	40
Coal	262
other materials and artifacts	106
Plastic, rubber, styrofoam, etc...	1181
Total	19626

framework. This analysis has provided some insights into particular aspects of this component, especially a possible Wolastoqiyik habitation, also described below. This latter research was facilitated by detailed, annotated, conservation records of the glass beads by Val Monahan, who carefully noted manufacturing techniques and morphology during her work (see Monahan 1997).

The following section describes the only post-contact period feature or activity area identified to date, followed by a brief discussion of two diagnostic artifact classes -- clay tobacco pipes and ceramics -- from which we can glean a rudimentary chronological framework for the post-contact era.

FEATURES AND ACTIVITY AREAS

As discussed in Chapter 14, we identified a concentration of post-contact period artifacts in the southern portion of Area B, including Units A54, A55, B55, C54, C55, and D55. These were associated with a series of highly disturbed soil lenses, and several decaying wooden planks.

In all we recovered 5150 historic period artifacts from this area, as well as 1097 calcined animal bones (generally assigned to an "unknown" chronological class, instead of to either pre-contact or post-contact, see Chapter 8), totalling 6247 archaeological specimens. Many of the artifacts represent a span of several centuries (from the late 18th century to the late 20th century), but may also include older artifact classes. Their composition is described in Table 19. 2, below.

Several of these classes of artifacts exhibit even distribution between all units, and this pattern may indicate small-scale, regular dumping activities, creating a fairly random pattern. These classes include various kinds of ceramic table wares (earthenwares with white, refined or vitrified bodies, coarse bodied red earthenwares, grey, white, and buff-bodied stonewares, and porcelain), as well as container glass, and plastic and rubber.

However, some classes of artifacts were unevenly distributed. In some cases, these may represent the discard and subsequent shattering into many pieces of one large object. This may be the case with the class "other iron", as B55 produced a large quantity of cast iron fragments that may have been from a single, large piece of equipment, or a cast-iron stove. Other distributions may reflect activity areas, masked by a scattering of recent debris and dumping activities. This may be the case for the distribution of glass beads and clay tobacco pipe fragments in A54 and A55, and the distribution of calcined animal bones with buff-bodied stoneware vessel fragments in C55.

Based on these patterns and the rarity of some of these materials in other parts of the site (especially glass beads) we suspect that a subset of these may be related to a late 19th century habitation. This notion is partially confirmed by spoken histories (see Volume 1). We know from these spoken histories that Wolastoqiyik camped in the Jemseg area while hunting and trapping muskrat, and carrying out other subsistence activities. A cast iron leg trap from unit A54, and several small pieces of lead shot from A55 may reflect these activities. A large sample of 1097 charred and calcined (i.e., cooked) animal bones was recovered from Unit C55. Although detailed faunal analysis of this sample has not yet been conducted, preliminary analysis by Stewart (see Chapter 12, this volume) identified many calcined muskrat bones (139 pieces), as well as large mammal bones (21 pieces), possible bird bones (121 pieces), and fish bones (10 pieces). Some of these have cut-marks from butchering. The diversity and composition of the assemblage suggests primary subsistence activities, a focus on wild game, and in particular, on muskrat for food as well as fur. This combination of attributes is strongly suggestive of a Wolastoqiyik presence on the site.

The spoken histories also enabled us to identify artifact classes that may specifically relate to Wolastoqiyik cultural practices. These include large pieces of glass that were used to shave ash splints during the manufacturing of baskets and other tools (see Volume 1). We recovered a large piece of clear container glass with small fractures and flakes removed from one margin from Unit C55, and a smaller piece of white glass with a similar, localized pattern of use or modification from A54. These may both be examples of glass “scrapers”, as described to us by Wolastoq’kew elders.

Finally, the concentration of glass beads in A54 and A55 (mirrored by a smaller concentration of clay tobacco pipe fragments) may also reflect Wolastoqiyik activities. In all, we recovered 283 tiny glass

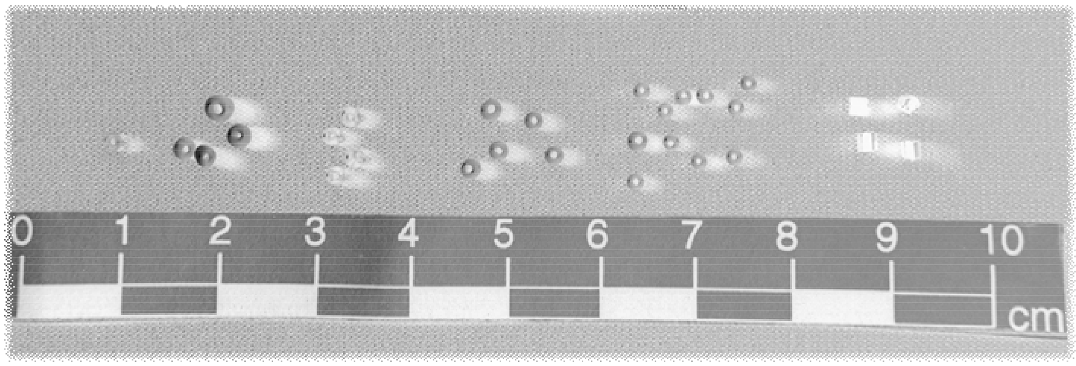
Table 19.2: Material classes from the southern portion of Area B, organized by unit.

Material	**A54**	**A55**	**B55**	**C54**	**C55**	**D55**	**Total**
White refined earthenware	60	57	28	47	50	69	311
Coarse red earthenware	1	0	2	5	5	8	21
Stoneware	1	2	35	40	79	18	175
Porcelain	11	22	23	3	1	9	69
Clay tobacco pipes	17	1	1	0	4	6	29
Flat glass	88	43	164	6	95	6	402
Container glass	291	91	232	144	125	63	946
Glass Beads	193	66	19	1	4	0	283
Iron nails and spikes	489	220	121	96	193	127	1246
Other Iron	110	199	808	0	93	89	1300
Other metals	22	34	34	2	17	19	128
Modified bone (buttons etc…)	7	1	9	0	0	0	17
Unmodified animal bone	27	26	5	0	684	355	1097
Plastic and rubber	18	10	59	1	6	11	105
Other materials	9	4	20	2	1	1	37
Total	1393	782	1586	347	1357	781	6247

Table 19.3: The types of glass beads from the site (after Monahan 1997).

Type	Description	Area B	other areas
type 1	medium-sized, opaque red bead, with pentagonal cross-section, either moulded or made by cutting and grinding	0	1
type 2	medium-sized, glossy white, round, drawn bead	0	1
type 3	medium-sized, glossy white, barrel-shaped, drawn bead	0	1
type 4	large, light blue, wound bead; many are damaged or burnt	27	0
type 5	medium-sized, glossy, clear, drawn tubes; come damaged	3	0
type 6	small, irregularly-shaped, black, hexagonal, drawn beads	6	0
type 7	small, red and white, compound drawn beads, pitted and cracked	8	0
type 8	small, glossy red, drawn bead	10	0
type 9	small, glossy colourless, drawn bead	3	0
type 10	small, glossy pink, drawn bead	134	0
type 11	small, glossy white, drawn bead	50	1
type 12	small, glossy light blue, drawn bead	25	0
type 13	small, fragmentary, cracked, yellow, drawn bead	1	0
type 14	medium, glossy blue, drawn bead	0	1
type 15	large, burned and fragmentary, blue bead	4	0
type 16	medium-sized, dark blue, wound bead	1	0
type 17	medium-sized, moulded and seamed, slightly iridescent, colourless bead	5	0

Plate 19.1: A sample of glass beads from the southern portion of Area B, after conservation by V. Monahan.



beads (most less than 2 mm in diameter) from the southern portions of Area B, 92% of which were from Units A54 and A55 (Plate 19.1). These were associated with remnants of wooden planks (possibly floor boards of a small structure or house). The beads were classified by the lab manager/ conservator, who assigned them type numbers based on size, shape, colour, and inferred manufacturing technique (Monahan 1997, Table 19.3). Further examination of these beads by a bead analyst is warranted, and may provide a more precise date for these activities.

The 19th century date for this assemblage is inferred from the intersection of the spoken histories, the age suggested by the clay tobacco pipe fragments, and the age suggested by the glass beads. However, the analysis of historic artifacts from the Jemseg Crossing site is preliminary, and further research may refine or refute our view of a 19th century Wolastoqiyik habitation in Area B.

CLAY TOBACCO PIPES

Just as changes the shape of a projectile point can help us to date pre-contact habitation at the site, so too can the evolution of the clay tobacco pipes facilitate the dating of the post-contact habitation. The general morphology or shape of clay tobacco pipes changed over time. As a result, the shape of the pipe bowl and any decorations or marks on the bowl and stem can often be used as temporal markers (Noel Hume 1970; Oswald 1975).

The 303 clay tobacco pipe fragments recovered from the Jemseg Crossing site can be used in this manner. All of these pipe fragments were produced in Europe and were brought over to North America as trade items, as personal effects, and for general consumption and sale. Complete pipes are very rare in most archaeological sites, and the Jemseg Crossing site was no exception. We did not recover any complete tobacco pipes. Therefore we must use particular techniques to estimate the age of some of these fragments. These include the application of statistical methods to study the bore diameter of the pipe stems, as well as studies of the decorations and markings on stems and bowls.

Bore diameter analysis

One of the most common and most accepted ways to date clay tobacco pipes was discovered by J. C. Harrington in 1954, when he noted that the bore diameters of clay tobacco pipe stems become more constricted over time (Harrington 1978: 63-65). In using measurements in 1/64th inch, he published a chart that showed the rough percentage distributions of pipe stem bore diameters in five successive time periods covering the years between 1620 and 1800 (Harrington 1978: 64). In 1961, L. Binford refined Harrington's method of dating pipe stems by producing a straight line regression formula that enabled a mean date to be generated for any assemblage of stem fragments (Binford 1978). The formula, known today as the Harrington/ Binford Formula, is

Y = 1931.85 – (38.26 X),

where "X" equals the mean bore diameter in 64th of an inch, and "Y" equals the mean age of the pipes recovered from the site.

The Harrington/Binford Formula is widely used to estimate periods of activity at a site. However, Binford (1978:66) cautioned that the formula is accurate only within a narrow period of time between 1620 and 1780. The probability of error increases for pipe stems that date to outside of this narrow range. Others (A. Faulkner pers. comm., 2000) suggest that the formula may actually be most reliable within the rage of 1640 to 1750. Harrington (1978: 64-65) further suggests that the resultant date may be biased by a range of technological factors. During manufacturing process, the bore of the finished end of the pipe can be enlarged when the wire is withdrawn before drying. Furthermore, there may also be local variation between pipe makers. Finally, enlargement of the bore diameter can also occur at the bowl end of the stem where the pipe maker is forced to make the stem hole meet the bowl (A. Faulkner, pers. comm. 2000).

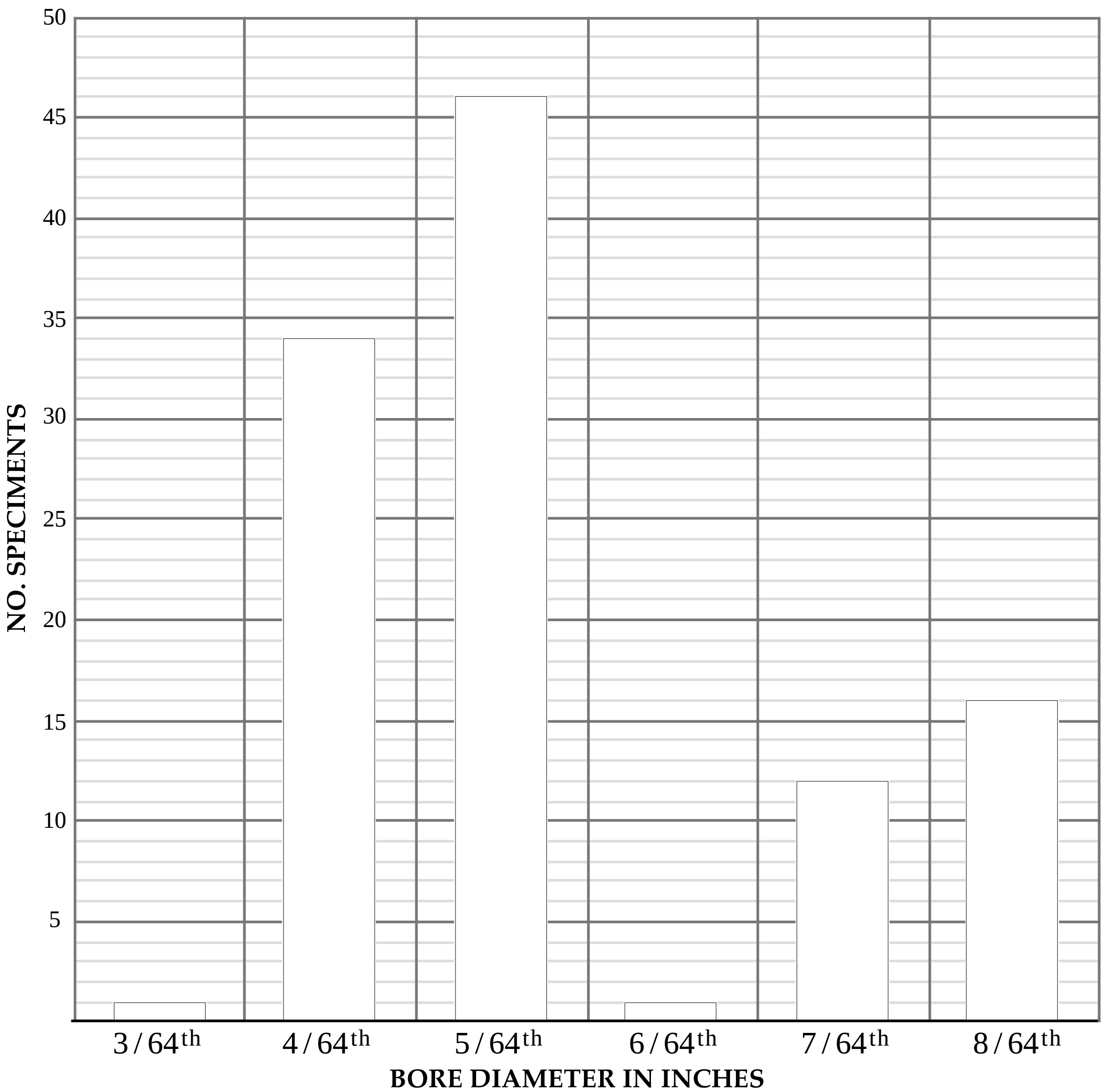
There were a total of 126 clay tobacco pipe stem fragments recovered from the Jemseg site. These were measured using 1/ 64th inch drill gauges. The pipe stem bore diameter distribution for the site shows a bimodal curve, which suggests two different periods of site activity (Figure 19.1). Binford (1978:66) cautions that increased rates of accumulation of stems for one period over another may skew the total sample from the site in favour of one period. The bimodal distribution indicated in Figure 19.1 suggests that we should consider this factor in our assessment of the Jemseg Crossing site. Since there were two distinct periods represented at the site, the Harrington/Binford Formula was not applied using the complete clay pipe stem collection. Also, Faulkner (1980:24) raises issues of sample size. As a result, a reliable mean date could not be obtained for the pipe stems represented by the earlier peak on the bimodal curve, as the number of pipes in this period is too small.

The stem bore diameter analysis suggests two separate periods of site activity. Two early peaks were noted at 8/ 64th inch and 7/64th inch. This suggests use of the site between 1620 and 1680. However, the shorter, more bulbous form of "belly bowl" shape pipe bowls does not seem to be present in the collection. This suggests that most of these pipes may actually date to between 1650 to 1680. Indeed, only one pipe fragment had a bore diameter measuring 3/64th and one had a bore diameter measuring 6/64th inch.

The bimodal distribution also suggests a hiatus in either the use of the site, or the use of clay tobacco pipes at the site between 1680 and 1710.

The largest number of pipe stems (representing the second peak) had bore diameters measuring 5/64th inch. This peak may reflect the general lack of heels

Figure 19.1: Bore diameters of the Jemseg Crossing pipe stem assemblage.



recovered from the Jemseg site, and corresponds with the heel-less export pipes of 1710 to 1750. The last concentration of bore diameter measurements comes from pipe stem fragments measuring 4/64th inch. This may suggest a 19th century use of pipe stems, and is supported by the presence of incuse markings on pipe stems, and a mouthpiece with a glazed tip.

Clay tobacco pipe makers marks and decoration

Makers' marks as well as stylistic designs can also be used to date clay tobacco pipes. Unfortunately, we recovered only 29 clay pipe fragments with decorations or markings. Within the clay pipe assemblage there was only one complete pipe bowl with partial stem. However, there were 12 bowl fragments with some form of potentially diagnostic marking on them. Of these 12 fragments, three of the markings were completely unidentifiable due to wear, and seven were unidentifiable due to only partial presence of the markings. However, several sets of marking may provide some insight into the age of the sample.

Llewellin Evans pipes

The only makers' mark with decoration was "LE", found on the complete clay tobacco pipe bowl with partial stem (Plate 19.2), as well as on four additional stem fragments. This particular makers' mark is discussed by Oswald (1975:152) and further described by Miller (1983: 76). The "LE" mark is that of Llewellin Evans, a Bristol pipe manufacturer who exported his pipes to North America from 1661 to until his death in 1688 (Oswald 1975: 128, 152). His wife continued to export "LE" pipes to North America for several years after his death, and as a result "LE" continued to appear in North American contexts into the 1690's (A. Faulkner, pers. comm., 2000). Pipes from the Evans family have been recovered in Maine at the seventeenth century village of Pemaquid, the Clarke and Lake Company site, as well as at Fort Pentagoet (Faulkner 1987: 175). His marks occur as impressed letters on the backs of bowls or heels and as rouletting on stems.

We found several examples of these decorations and markings on pipe fragments within the Jemseg assemblage. Four stem fragments that had a "LE" mark with rouletting, consistent with the Llewellin Evans pattern noted elsewhere, including "… a row of diamonds with dots in the centre demarcated above and below with double rows of dashed lines" (Miller 1983: 76). Although all the Llewellin Evans pipes from the Jemseg collection have the double row of dashed lines below the rouletting, these were absent from the top of the complete pipe bowl and stem. The row of diamonds on the stem was broken by the appearance of the letters "LE". There were two other stem fragments that had partial rouletting present, consistent with the Llewellin Evans pattern, although the "LE" mark itself was absent on these pieces due to patterns of breakage and loss. As noted by Miller (1983: 76), Llewellin Evans pipes generally have a stem bore diameter of 7/64th and 8/64th inch. The six stem

Plate 19.2: The Llewellin Evans pipe bowl and stem, recovered from Unit E61, Area B.

fragments recovered from the Jemseg site with the Llewellin Evans marks all had a stem bore diameter of 7/64th inch.

William White pipes

The other pipe stem fragment with some dateable features had "78" and "W.W—-" impressed on one side of a stem. On the reverse side of the stem "—GOW" was visible. As suggested by Alexander (1983: 221), the entire legend may read "78" (the firm's catalog number), "W. WHITE" (William White 1805-1955), with "GLASGOW" on the reverse. A second stem fragment with a "78" was recovered. Alexander (1983: 221) suggests that these pipe fragments may date to the twentieth century.

Duncan McDougall pipes

Another securely dated clay pipe fragment is a stem fragment that bears the mold-imparted letters "Mc—-" on one side of the stem with "—LAND" on the reverse. This is a mark of the Duncan McDougall firm from Glasgow, in business from 1846 to 1968. McDougall pipe makers advertised themselves as the "largest export manufacturers in the world" (Walker 1977: 340-344). However, we have inferred that this pipe likely dates to after 1890. The McKinley Tariff Act of 1891 required manufacturers to indicate the country of origin on all imported clay tobacco pipes. Therefore, McDougall pipes prior to 1890 had incuse lettering that read

Plate 19.3: Pipe fragments with portions of heels present.

"McDOUGALL / GLASGOW". After the McKinley Tariff Act, this lettering was changed to "SCOTLAND" instead of "GLASCOW".

Glasgow pipe makers had followed Bristol makers as the major suppliers of clay tobacco pipes to the New World by the middle of the eighteenth century, and continued to dominate the trade throughout the following century (Faulkner 1980: 33). The years of 1870 to 1885 were the time of greatest prosperity for the Glasgow pipe makers (Walker 1977: 340).

Other marked and decorated pipe stem fragments

We also identified a small stem fragment with "MI—-" in incuse lettering on the side of the stem. There were many Bristol pipe makers in the eighteenth and nineteenth century that may have used incuse lettering that started with "MI—-". Examples of such pipe makers' include: Ezkiel Millard, John Mills, William Mills, James Millson I, James Millson II, Joseph Millson, and Richard Millson (Walker 1977: 1212-1215). An additional fragment that had partial incuse lettering that was identifiable had "—TE—-" on the stem. There were three clay stem fragments that had unidentifiable, rectangular, incuse lettering on the stems.

Heel decorations

There were three identifiable clay pipe fragments that had intact heels (Plate 19.3). The heels are small in size and are probably from the late seventeenth century. One of the heels comes from a pipe that has the Llewellin Evans pattern on the bowl and stem. The position of this form in the chronological series of clay pipe bowls published by Oswald (1975: 39), together with the shape and length of the heel, suggest that this specimen dates to the late seventeenth century, making it a later Llewellin Evans pipe. The second clay pipe heel recovered from the site also resembles the Llewellin Evans pipe heel discussed above. Finally, there was one heel / spur found with a portion of the back of the bowl and stem still intact. However, the heel / spur itself was badly damaged on the front and lateral side, and could not be identified.

Bowl decorations and markings

The decorations or markings on the clay pipe bowl fragments include a number of raised motifs (Plate 19.4). There were three clay tobacco pipe bowl fragments with a wheat motif pattern up the spine of the bowl, which is suggestive of the nineteenth century. Four additional bowl fragments had some form of unidentifiable webbing motif. Two additional clay tobacco pipe fragments with raised motifs include one fragment with the bottom half of a person, which may be indicative of the

Plate 19.4: Various decorated pipe bowl fragments.

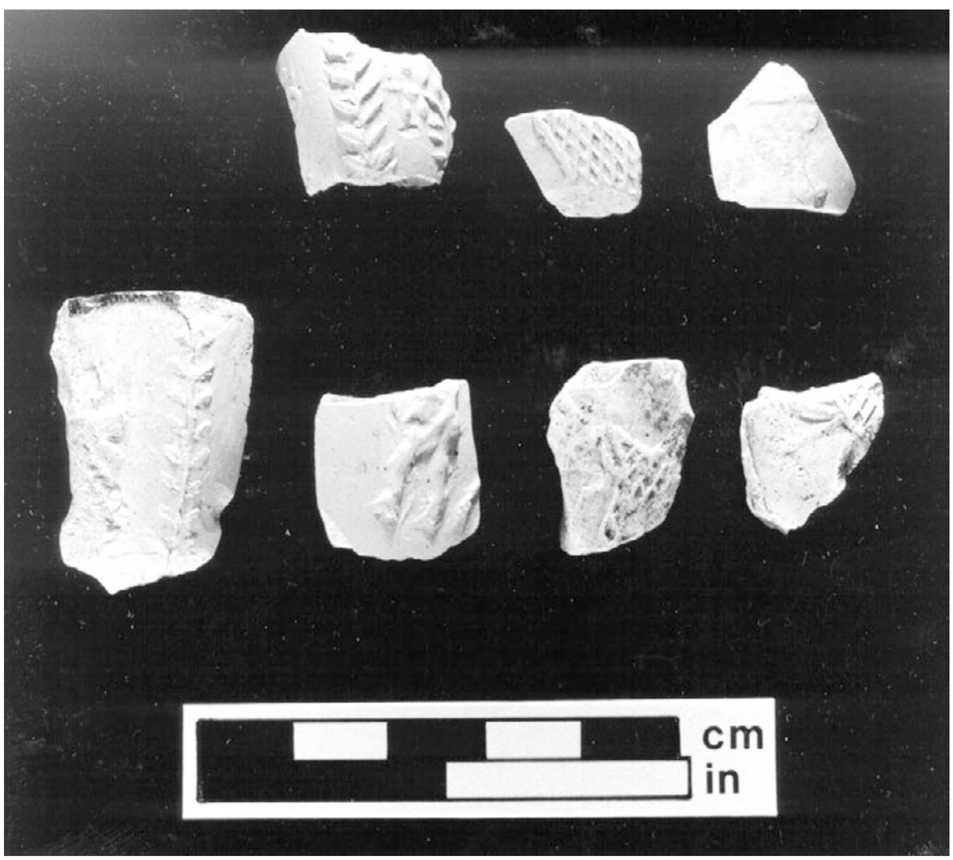


Plate 19.5: Clay tobacco pipe bowl fragments with impressed letters.

Dutch "Crusader and Huntress" seventeenth century pipes. One clay pipe bowl rim had an unidentified raised flat band just below the rim. Two clay tobacco pipes had impressed letters on the bowls (Plate 19.5). The first bowl had the letters "—EN" with a partial circle around the letters, and the second bowl had "DE—-" with a partial square around it. There is a partial third letter visible following the "DE", which may be either a "R", "F", or "P".

Due to the fragile nature of clay tobacco pipe bowls and the degree of post-use and post-depositional damage that we observed, there were few clay tobacco bowl fragments large enough to indicate with any certainty the shape of the bowl. Of the bowl fragments recovered, none resemble had a swelling or bulbous shape, suggesting that they date to after 1660 (Oswald 1975:37-39). Two clay pipe stem fragments that mend to a mouth piece tip were glazed, suggesting a late nineteenth or early twentieth century pipe.

Site distribution

Most of the clay tobacco pipe fragments were recovered from the upper terrace of the Jemseg Crossing site. This part of the site had been ploughed for agricultural purposes. Nonetheless, we observed patterning in the distribution of pipe fragments. Due to the ploughing, specific concentrations that might reflect localized patterns of use (such as doorways and paths) were undetectable. The patterning was only visible at a resolution of greater than 2 m, following the assignation of fragments to particular 2 m by 2 m excavation units. Pipe fragments were concentrated in the northern and southern portions of Area A of the upper terrace, while there were comparatively few fragments from the centre of Area A. The later 18th to 19th century clay pipe stem fragments were distributed across the centre of the site in a pattern perpendicular to the river. This may reflect the smoking of tobacco in pipes during agricultural activities, since this area corresponds to the ploughed field. The absence of 18th and 19th century pipes closer to the water (within the floodplain) may support this inference. The late 17th and early 18th century pipe stem fragments were distributed over the entire site with no obvious pattern visible. Further statistical analysis of these patterns may give further insight into these patterns.

Chronological patterning

This analysis suggests that there were two very separate post-contact periods of use of the Jemseg Crossing site. The pipe stem bore diameter distribution revealed a bimodal curve suggestive of an early post-contact period, between 1620 and 1680, and a separate and distinct later contact period, between 1710 and 1800. By comparing these dates to other elements within the pipe assemblage, we were able to narrow these dates to a peak of used between 1650 and 1680, and after 1710. This analysis suggests a hiatus of at least 30 years in between these two periods, although it is unclear whether this reflects a hiatus in site use, or a hiatus in pipe use at the site. The later distribution of clay tobacco pipes represented on the bimodal curve probably reflects a widespread use of the site in the late 19th century. Aspects such as bowl shape, the presence or absence of heels or spurs, bore diameters, as well as decoration and makers' marks reinforce our suggestion that clay tobacco pipes at the Jemseg Crossing site date from the late 17th to the 20th century.

The chronological patterning in the clay tobacco pipes may suggest changing relationships between Wolastoqiyik and the colonial forces at the confluence of the Jemseg and the Saint John Rivers. The early peak, between 1650 and 1680 is contemporaneous with a period of alliance-building between the French and the Wolastoqiyik (Raymond 1943). Although there was a continued French presence in the area during the period between 1680 and 1710, it was also a period of political uncertainty for the French, with repeated incursions, treaties and changes in the fortunes of Fort Jemseg (Ganong 1899, Lockerby 2000, Soucoup 1997: 23-36). This uncertainty may have disrupted local relationships, resulting in decreased trade or local patterns of interaction. From this perspective, all of the 17th century pipe fragments may reflect Wolastoqiyik use of the site area, as well as a local French presence. These patterns may have continued into the 18th century, although it is unclear precisely when increasing settlement of the area by Eurocanadians began to create patterns of Eurocanadian pipe smoking and pipe discard. These two patterns, one Wolastoqiyik and one Eurocanadian, likely continued to the 20th century.

CERAMIC ANALYSIS

The history of ceramic tableware is marked by intense competition between manufacturers, who sought new innovations in techniques, decoration and patterns. In part, this competition was a reflection of the desire of European potters to create competitive copies of popular, high priced Chinese wares (Noel Hume 1970, Collard 1963). The resulting changes in styles and techniques provide us with clues to the age of tablewares, and associated historic components.

The Jemseg Crossing site produced a wide array of post-contact ceramics, including stonewares with various bodies and glazes, coarse red earthenwares, soft, beige bodied, tin-glazed earthenwares, white-bodied, refined and vitrified earthenwares, and porcelains (see Table 19.1). Based on changes in glazes, decorating techniques and styles, and changes in the bodies or fabrics of the ceramics themselves, we were able to isolate particular types that suggest chronological patterning.

Through these analyses, we identified ceramics dating to the 1760s and onward, encompassing the Planter period, the Loyalist period, and the era of 19th and 20th century colonial expansion. However, we did not identify any ceramics dating to before 1760, despite the evidence of activity suggested by clay tobacco pipes, above. This presence of later 18th century ceramics may reflect an increasing Eurocanadian presence in the site area. Because we have excavated so few post-contact Aboriginal sites, we do not fully understand the range of Eurocanadian goods that appear on them at various times, but in general terms, it may be that ceramics, as a relatively non-portable technology, with stylistic content embedded in Eurocanadian cultural traditions, are not well represented in pre-20th century Aboriginal material culture. Given these assumptions, the appearance of ceramic tableware in greater frequencies after the mid-18th century may represent a growing incursion by Eurocanadian into the region. This pattern also reinforces our notion that clay tobacco pipes older than the mid-18th century are related to Wolastoqiyik activities, and not direct French habitation on the site.

It is also likely, given the volume of later ceramic tableware, combined with stratigraphic evidence, that some of the 19th and 20th century wares represent dumping episodes or fill.

The classes of ceramic tablewares will be briefly described below. However, this analysis remains incomplete, and to date many wares have only been given basic identifications.

The Planter period

This period is defined by British attempts to retain control of the Maritimes and prevent the return of expelled Acadians. This was partially accomplished by British encouragement of a modest immigration of people from the New England area following the 1755 Acadian Expulsion. These efforts continued until the American Revolution, and the beginning of the Loyalist period in 1784. The term "Planter" refers to the action of the settlers "planting" themselves on a new land.

We attributed three types of ceramics to the Planter period. These included white salt-glazed stoneware, a buff-bodied earthenware and tin-glazed earthenware. All three groups were represented by extremely low numbers (21 pieces total) in Area A, as well as a scattering of fragments in Area C. In Area A, these artifacts were concentrated in a band extending from the centre to the northeast corner of Area A. Domestic artifacts such as ceramics tend to be indicative of habitation, and despite the lack of documentation it is possible that a temporary or short-term lodging of some sort was established in this area during this period. The Planter community of Maugerville was established only a few kilometres up the Saint John River from the Jemseg area. It is also possible (although less likely), that these artifacts represent a secondary deposit, with the artifacts being brought to the site in "fill" or imported topsoil.

The Loyalist period

The Loyalist Period is defined by the arrival of thousands of people from the New England states following the end of the American Revolutionary War. The term "Loyalists" was used by those who supported the British efforts to maintain overall authority in America during the uprisings there in the 1760s and 1770s. Following the military victory by those who wished to create a republic in America, large numbers of people either chose or were forced to leave New England. Many of these people arrived in the Canadian Maritimes, and were granted lands. Due to their numbers and their political power, the Loyalists significantly influenced local settlement and society, and they began to recreate the lives and society they had abandoned in New England. Although we have identified Loyalist artifacts, dating them to the period between ca. 1784 and 1830, in terms of material culture, the Loyalist period grades imperceptibly into local Eurocanadian culture of the late 19th and early 20th century.

Relatively significant numbers of Loyalist period ceramics (those dating to between ca. 1784-1830) were recovered from the Jemseg Crossing site. These are characterized by varieties of white bodied refined earthenwares, especially varieties such as "pearlwares". Almost all of these were found in Area A. Within this area, these artifacts were concentrated in, but not limited to, the southwestern half of Area A. As with most of the post-contact period material, these artifacts were recovered from the ploughzone.

The presence of relatively significant numbers of domestic Loyalist period artifacts in a localized area tends to indicate some sort of habitation, despite the lack of documentary confirmation. It is possible that house structures are either located outside of the areas examined during the archaeological work or even under the large mound of fill at the eastern edge of the site. It is also possible that some of these were used by Wolastoqiyik in comparatively ephemeral seasonal camps. Finally, we must also consider the possibility that some or all of these items could also be the result of dumping activities.

The Later Colonial Period

The Later Colonial Period is defined by the decreasing domination of families of Loyalist extraction in the Maritimes with the increasing arrival of European colonists, particularly from the British Isles. The 1830s also mark the homogenization of the diagnostic creamwares and pearlwares indicative of the Loyalist period. By this time improved manufacturing techniques had eliminated the distinctive colouring of these two ware types making white refined earthenwares virtually indistinguishable from each other. Because of this homogenization, dating sites to this period is often a process of eliminating the presence of ceramics types from earlier or later time periods. Much the same thing can be said of the various container glasses and their manufacturing techniques. Most styles and types of glass produced during the last quarter of the 19th century continued into the 20th century.

Although many of the ceramics types recovered from the site could date to this time period, very few were collected that were *only* from this time period. Diagnostic wares such as ironstones decorated with "wheat" patterns, and refined earthenwares with "flow-blue" decoration all continued to be produced to the end of the 19th century and beyond. This continuity is also the case for the various types of glass recovered from the site. The very limited amount of ceramics suggests this was not the result of Eurocanadians (non-Aboriginal) activity and it may be that some of the later 19th century ceramics were brought to the site by Wolastoqiyik.

The Modern Era

For analytical purposes, we had considered the "modern" era to have begun in 1891. This is due to the fact that in that year the United States established the McKinley Tariff Act which stated that all good shipped into the U.S. had to display their country of origin. Many artifacts in the Jemseg Crossing assemblage, including some of the clay tobacco pipes, and many of the numerous tablewares, have a maker's mark indicating the country of origin. These artifacts facilitate the dating process, and makes 1891 a convenient chronological dividing line.

This is also likely the period when the ploughing and deforestation of the site began. These actions have had the unfortunate effect of obliterating most of the features that may have resulted from post-contact period Wolastoqiyik utilization of this area. We are very grateful that a number of Wolastoqiyik elders graciously shared their memories and their history with us, allowing us to learn about this time period in way not possible with archaeology.

In times closer to the present, documentary sources on an area's history are more abundant and reliable. Hence, the lack of evidence of any homesteads being established within or immediately adjacent the proposed highway footprint in the early part of this century tends to suggest that the large numbers of modern era artifacts collected from this area of the site were either dumped there or may have come to the site within soils deposited there.

Based on spoken histories and artifact analysis, we have defined a late 19th century Wolastoqiyik habitation at the site. Given the patterns of site activities during the last one hundred years or so it is not surprising that Area B would have been used preferentially as a camp site over Area A. Area B marks the edge of the ploughed field and appears to be at the minimal extent of the seasonal flooding of the area. Any seasonal encampment by Wolastoqiyik would not likely have been placed in the middle of an active farmers field, nor in the swampy floodplain below.

Glass scrapers

One of the most interesting artifact classes that we identified during the project was that of "glass scraper". Although somewhat difficult to identify with absolute certainty, a least five possible glass scrapers were identified in the collection. Within units C-54 and C-55 eleven glass lids were recovered. They were approximately 5 cm in diameter and in various stages of completeness. Most appeared to be pre-World War I. At least two of these pieces appeared to have worked edges, indicating they may have been used for working wood. In visits to the site and during the spoken histories Wolastoqiyik elders told us that glass was used for working ash (wood), particularly for smoothing axe handles and shaving ash strips for baskets. Some recalled these activities being carried out in the Jemseg area. Subsequent discussions with elders about glass scrapers has indicated several interesting patterns. Most recalled using window glass for these tasks, although some suggested that lead crystal produced a better edge, and could be modified to suit specific tasks (perhaps through knapping?). The archaeological evidence suggests that thick container glass, such as the glass lids of preserving jars, may also have been used. Only one lip fragment from a jar that could fit the glass lids from C-54/C-55 was recovered, suggesting that these lids were not matched with jars. This may reinforce the notion that glass lids served a function other than their intended use. We found small concentrations of window glass in some areas (such as within Area C). These glass concentrations, where they occur without other evidence of structures (such as features, or concentrations of other construction debris such as iron nails), may indicate a supply of tools for Wolastoqiyik wood workers.

Conclusions

The Jemseg Crossing site is located in an area of continued and sustain post-contact activity. It has been an important place for the Wolastoqiyik throughout the pre-contact and post-contact eras. However, it has also been located near several major episodes of early post-contact era Eurocanadian incursions and activities, and has subsequently seen ongoing settlement and development.

The archaeological evidence has complemented and benefited from the rich and detailed information in the spoken histories (see Volume 1). We have archaeological evidence of local activity in the 17th, 18th, 19th and 20th centuries. The 17th and early 18th century artifacts are characterized by trade goods (especially tobacco pipes), and the absence of European habitation materials (such as tablewares), and thus likely represent Wolastoqiyik activities.

Although the late 18th and 19th century artifacts suggest an increasing presence of Eurocanadian settlers in the Jemseg area, there is clear evidence in both the spoken histories and the archaeological material of an ongoing Wolastoqiyik relationship to the site.

Despite the substantial disturbance to most of the upper layers of the site, where most of the evidence of post-contact period use of the site would have been, we have linked artifacts with the teachings provided by the spoken histories to shed light on the post-contact period at the Jemseg Crossing site.

Section Five

CONCLUSIONS

Elikisimawipunomek Kehkitasuwakon
20. Summary and conclusions

Susan Blair

The Jemseg site is one with a rich and diverse history. At least eight cultural components, representing different periods of use, can be recognized in the excavated material from Jemseg. These periods are defined by material recovered during the Jemseg Crossing Archaeological Project (JCAP). It is clear from both the archaeological record and traditional knowledge of the Wolastoqiyik that these periods are only small windows into the much longer stretches of time during which Aboriginal people flourished in the area. Indeed, this impression is confirmed by the spoken histories in Volume 1, and by local collections examined during the JCAP, which reveal an even greater temporal range and diversity of Wolastoqiyik activity in the Jemseg area. Both spoken histories and archaeological materials indicate that these relationships have continued through to the present day.

These components provide evidence of long traditions of local development, but also periods of variability, when the people of Jemseg solved problems in ways that transformed the material culture traces they left behind.

The archaeological record at Jemseg reveals a great time depth. We have hints of a presence in the site area that may be older than 10,000 years old, as indicated by the analysis by Dickinson in Chapter 15. These tenuous traces continue through the period between 8500 and 5000 years ago (Blair, Chapter 16), becoming clearer over time. During this time the people of Jemseg were carrying out activities on the upper terrace that related to everyday activities such as food processing and tool manufacturing. It may be that even at this time, people were periodically gathering at the site and then dispersing over the landscape, to hunt, fish and gather plants along the rivers and lake shores. It is unclear the nature of the relationship between these people and the people of the Gulf of Maine, to the south. However, these early people of Jemseg shared some of their way of life and material culture with people in adjacent regions, such as the St. Croix river system and areas of the Atlantic coast. These shared patterns may suggest an regular, low intensity interaction and communication network within the region.

In the following period, the Late Archaic (5000 to 3500 years ago), people likely carried out similar activities, and many have steadily increased the degree to which they interacted with people in Maine and the Atlantic coast. The archaeological material from this time period has been significantly disturbed by more recent site activities (both during the pre-contact and post-contact period) making it difficult to determine patterns of activity or change, although it seems likely that these were the same people who developed and used the cemetery at Cow Point, 5 km away. Regional evidence suggests that during this time period, population was steadily increasing, with people gradually focusing on more specific resources, like coastal fisheries and marine mammal hunting, or on particular, locally abundant plants.

These trends may have culminated in the period between 3300 to 2800 years ago. During this time we have an increase in the quantity and quality of archaeological evidence, due primarily to factors of preservation and patterns of disturbance. We see some evidence of interaction in this period with Meadowood-related populations to the southwest. This interaction may have been focused northward, up the Wolastoq (St. John River) and through ancient portage routes, into the Saint Lawrence, as suggested by a string of Meadowood sites along the St. Lawrence and the northern shores of the Great Lakes (e.g. Chretien 1995, Clermont and Chapdelaine 1984, Ferris and Spence 1995, Jackson 1986, Williamson 1980, Wright 1999). These patterns became more pronounced after 2800 years ago. It appears that the people of the Jemseg site were also negotiating several important boundaries between the Miramichi and the Gulf of Maine. This is manifested in the Jemseg assemblage as artifacts linking the site to both the (previously unpublished) Quarryville material from the Miramichi River basin, and the Orient phase of the Gulf of Maine and southern New England.

Locally, however, we have evidence of nut harvesting and processing. There is a pattern of subtle settlement variability between on the upper terrace and levee which may suggest different seasonal uses, or widespread settlement with far-flung activity areas. The stone tool manufacturing systems of the Terminal Archaic inhabitants of the Jemseg site was oriented towards a comparatively diverse tool kit, including the production of large bifacial cores for flake tools, as well as the production of small, thin bifaces (exhausted cores?) and large unifacial scrapers on side-struck flakes. There is little evidence of the elaborate and often heavy ground stone tools that dominated the earlier Archaic assemblages, and this, coupled with the possible early presence of pottery, suggests a general Maritime Woodland character.

After 2800 years ago, these patterns become more pronounced. Pottery, appearing as small fabric-impressed or "paddled" low-fired vessels, is very similar to types used in many parts of the greater Northeast. Lithic technology also shows strong affinities with technological systems from the Great Lakes, especially the "Meadowood" complex. This system is strongly focused on the production of small, thin bifaces. However, we noted particular patterns in the manufacturing of bifaces in the Jemseg assemblage that suggested that although the end product of the process employed at Jemseg is similar to Meadowood artifacts, the process itself may have been different. This may suggest a change over time, or may suggest that the system employed at Jemseg is a local interpretation of "Meadowood".

During this period (between 2800 and 2400 years ago, and referred to in Chapter 17 as the earlier Early Maritime Woodland), settlement was largely restricted to the upper terrace. This settlement consisted of a series or group of small campsites, primarily involving small hearths, perhaps associated with an ephemeral structure. The pattern suggests high residential mobility, and is consistent with the highly portable character of the lithic tool-kit.

Although many patterns of tool production, raw material procurement, nut processing, and regional interaction continue into the period after 2400 years ago (the later Early Maritime Woodland), there are clear signs of changing settlement and mobility. The ephemeral camps of the earlier period are gradually replaced by larger, more complex structures, many of which are erected over comparatively deep, basin-shaped floors. Some of these structures appear to have a high degree of internal variability, and some may have had associated storage facilities. These patterns suggest a decrease in mobility, and may indicate a shift from residential mobility towards logistical mobility (*sensu* Binford 1980).

The toolkit of the later Early Maritime Woodland people at Jemseg reflects this change in settlement. Although bifaces continue to be an element in the broader technological system, there is evidence of a growing focus on cores for flake tool production. Our analysis of settlement and subsistence patterns has been impeded by generally poor organic preservation and a lack of detailed faunal analysis. Nonetheless, the sparse evidence from the Jemseg Crossing site suggests that the period between the late Terminal Archaic (after ca. 3300 years ago) and the late Early Maritime Woodland (before ca. 1900 years ago) is characterized by a focus on nut-harvesting, likely supplemented by an active fishery, the exploitation of rich aquatic environments of the Grand Lake Meadow, and caribou, bear, and moose hunting. Several trends are evident through the three components, including decreasing mobility (as indicated by the increasing use of storage facilities, and the more intensive investment of labour and time in domestic structures) and increasing interregional interaction.

During this period there is evidence for a low-intensity, regular pattern of interaction up the Saint John and into the interior via portage routes such as the Maliseet trail, or further up to the Saint Lawrence. This interaction peaked in the middle component of the Early Maritime Woodland period (2800 to 2400 years ago). I have suggested that this participation in interregional interaction is evident in the way that people made stone tools and pottery, as evidenced by the intense focus on making "Meadowood"-like bifaces. The appearance of raw materials from outside the lower Wolastoq (St. John River), such as Kineo/Traveller Mountain porphyry, reinforces the notion of westward and northward connection.

However, by the later Early Maritime Woodland the focus of the interaction seems to have expanded to include the active exchange of lithic raw materials (and perhaps other more perishable items) to partners to the south as well as the west and north. This may represent an attempt to develop local networks in light of a reduction or collapse of interaction networks with the Saint Lawrence/ Great Lakes. Some (e.g. Loring 1985) have speculated that a collapse of widespread Early Woodland exchange systems was triggered by the development of agriculture in the southern part of the Northeast. This basic subsistence shift profoundly altered way in which people procured goods and resulted in their withdrawal from exchange network. For people in the Maritime Peninsula, who were practising hunting and gathering and maintaining a degree of mobility, networks facilitated access to irregularly distributed or locally unavailable resources, and built up alliances as insurance against times of need.

However, by the final pre-contact component of the Jemseg site, the Middle Maritime Woodland (1750 to 1500 years ago), the Jemseg people had withdrawn from this regional interaction, and were focusing of locally available materials. Although they may have been continuing to stay on the site for relatively long periods of time (as indicated by the persistence of semi-subterranean house) regional evidence suggests a trend of growing mobility after this period (e.g.: Black 1992). However, Black has also suggested the possibility that lower visibility may reflect population aggregration on larger (and as yet unidentified) village sites. This pattern may also explain the lower density of Middle and Late Maritime Woodland materials in the Jemseg assemblage.

Although there was little archaeological evidence from within the excavated area for periods after the Middle Maritime Woodland, these periods are represented by artifact types in local private collections, which suggests that the activities carried on at these times were somewhere outside of the proposed highway footprint, but within, or adjacent to, the broader site area. Increasing patterns of mobility may have altered the location and nature of site use, which may account for the shift from using the area within the bridge footprint.

As evident in the spoken histories, and in the archaeological record, Aboriginal people continued to carry out regular activities in the Jemseg area, including fishing, trapping muskrat, and gathering plants for food and medicine throughout the post-contact period. As with earlier time periods, this activity may have been continuous in the larger area, but irregularly represented within the material from Jemseg.

The earliest post-contact period archaeological evidence dates to the 17th century. A small number of early European clay tobacco pipes and occasional glass beads suggest that the people of Jemseg interacted or traded with the French who had occupied the lower St. John River. However, we have little evidence of direct French activity at the site, and we have inferred that prior to the early 18th century, the site was used almost exclusively by Wolastoqiyik.

However, from 1750 to 1785 there in increasing evidence of Eurocanadian settlement in the Jemseg area. The volume of post-contact material increases dramatically during and after the Loyalist period (1785 to 1830) when there is abundant evidence in the form of fragments of pottery, glass and iron. Some of these materials may reflect early settlers in the area, such as Loyalists and later British traders and farmers, but they may also reflect later periods of dumping or refuse disposal. It is difficult to determine whether these material also represent Wolastoqiyik activity in the area, although there is abundant evidence that the Wolastoqiyik maintained their close relationship with the local landscape throughout these times.

The final occupation of the site, extending from the late 19th century (after 1891) to the present day may also reflect similar activities, but is complicated by more intensive agricultural activities in the area, as well as some local industrial activity, such as the milling of lumber, and the transport past the front of the site of coal on barges.

The Jemseg Crossing Archaeology Project was initially proposed and funded to salvage archaeological materials before the construction of a bridge for the new TransCanada Highway. However, what has resulted has been the collection of one of the most significant assemblages of archaeological material ever recovered in the Maritime Provinces. When enhanced by the perspectives of Wolastoqiyik and enriched by their living traditions through both spoken history and co-management, the ancient past of the *Wolastoqiyik* at Jemseg becomes visible through the mists of time. By building bridges in the present, we have help to strengthen the bridges to past.

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