

**STRUCTURE AND REGIONAL DIVERSITY OF THE
MEADOWOOD INTERACTION SPHERE**

by

Karine Taché

B.Sc., Anthropology, Université de Montréal, 1998

M.Sc., Anthropology, Université de Montréal, 2001

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

In the
Department
of
Archaeology

© Karine Taché 2008
SIMON FRASER UNIVERSITY
Spring 2008

All rights reserved. This work may not be
reproduced in whole or in part, by photocopy
or other means, without permission of the author.

APPROVAL

Name: Karine Tache
Degree: Ph.D
Title of Thesis: Structure and regional Diversity of the Meadowood Interaction Sphere

Examining Committee:

Chair:

Eldon Yellowhorn
Assistant Professor, Archaeology

Brian Hayden
Senior Supervisor
Professor, Archaeology

George Nicholas
Supervisor
Associate Professor, Archaeology

Mary Ellen Kelm
Internal Examiner
Professor, History

Michael Deal
External Examiner
Professor, Archaeology, Memorial University of
Newfoundland

Date Defended/Approved: April 22, 2008



SIMON FRASER UNIVERSITY
LIBRARY

Declaration of Partial Copyright Licence

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection (currently available to the public at the "Institutional Repository" link of the SFU Library website <www.lib.sfu.ca> at: <<http://ir.lib.sfu.ca/handle/1892/112>>) and, without changing the content, to translate the thesis/project or extended essays, if technically possible, to any medium or format for the purpose of preservation of the digital work.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

While licensing SFU to permit the above uses, the author retains copyright in the thesis, project or extended essays, including the right to change the work for subsequent purposes, including editing and publishing the work in whole or in part, and licensing other parties, as the author may desire.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

Simon Fraser University Library
Burnaby, BC, Canada

ABSTRACT

In northeastern North America, elaboration of mortuary ceremonialism and the widespread distribution of Onondaga chert bifaces during the Early Woodland period (3,000-2,400 BP) have been attributed to the development of the Meadowood Interaction Sphere. The mechanisms underlying the flow of goods and ideas, the structure of the network, and the incentives of the participating groups, however, remain poorly understood. This study aims at discriminating between ritual, economic, and socio-political interpretations of the Meadowood Interaction Sphere through a pan-regional survey of its manifestations.

The ritual model defines Meadowood as a “Burial Cult” and ascribes the sharing of traits to the diffusion of religious ideas and cult items. According to the economic model, alliances between groups are based on economic reciprocity and serve to increase the stability of local subsistence systems. The socio-political model involves successful traders increasing their status through their ability to obtain prestige items. To evaluate these scenarios, this research examines Meadowood material manifestations, their contexts of use, the spatial distribution of sites and artefacts, as well as subsistence strategies and social organization.

The role of Meadowood trade goods as prestige items is supported by their fine craftsmanship and their occurrence in both residential and mortuary/gathering contexts. Meadowood manifestations concentrate in resource-rich areas, where communities have the greatest potential to produce surpluses and develop socioeconomic inequalities. Moreover, this study demonstrates an increasing dependence on abundant and predictable resources. Also significant is the recognition of distinct regional networks, where Meadowood groups are strategically located to act as “middlemen” between Atlantic and Midwestern communities. Finally, the presence of burial precincts distinct from habitation sites, variability in mortuary treatments and grave good distributions, and evidence of funerary feasts reflect social inequalities, ownership, and competitive displays of success.

The data presented in this study converge on socio-political forces being the major underlying factors for the establishment of Early Woodland interregional networks in northeastern North America. The development of socioeconomic inequalities and an attempt by individuals or corporate groups to enhance their status through privileged access to rare goods were central in maintaining the contacts that constitute the essence of the Meadowood Interaction Sphere.

Keywords: Northeastern Archaeology; Prehistoric Trade; Meadowood Interaction Sphere; Early Woodland; Regional Variability; Prestige Technology.

Subject words: Indians of North America--Antiquities; Indians of North America--Commerce; Indians of North America--Funeral Customs and Rites; Woodland Culture; Social Archaeology; Political Anthropology.

ACKNOWLEDGEMENTS

First and foremost, I want to thank my supervisor, Dr. Brian Hayden, for his helpful guidance. I greatly benefited from his ideals and this dissertation could not have been completed without his numerous and insightful advices. I also wish to transmit my gratitude to my committee member, Dr. George Nicholas, for his constructive comments of great value in shaping my dissertation, as well as my examiners, Dr. Michael Deal and Dr. Mary Ellen Kelm, for their valuable suggestions. Thanks also go to the other faculty and staff members of this department who, from time to time, discussed various aspects of my research and provided assistance with logistic and administrative issues.

The investigation of Meadowood artefact collections was made possible by the collaboration of several people and institutions: Pierre Desrosiers, Claudine Giroux, and Marc Gadreau from the Ministère de la culture, des communications et de la condition féminine du Québec; Stacey Girling, Colleen Bruchet, and Jean-Luc Pilon from the Canadian Museum of Civilization; Guy Coutu from the Musée québécois de culture populaire; Dr. Penelope Drooker, Andrea Lain, Ralph Ratau, and Molly A Scofield from the New York State Museum in Albany; Kathryn Murano from the Rochester Museum and Science Center; and Dr. Christopher Ellis and Dr. Michael Spence from the University of Western Ontario. Thanks to all these people for their assistance and generous hospitality, and for allowing me to reproduce photographs of artefacts taken in the course of my investigations. I am also indebted to M. René Lévesque for his encouragements to revisit the Batiscan collection, his detailed accounts of the digs, and for lending me his original field notes and photographs.

I could not have done this without friends: Véro, Marie, Laurence, Jean-Luc, Leïla, Jean-Jacques, Pascal, Claudine, Mimi, Jérôme, Roland, Vicky, Michael, Doug, Dennis, Robyn, Camilla, Jay, Ursula, Audrey, Sean, Jessi, Jonny, Cinnamon, and all the others. Thank you for the good time! I owe sincere gratitude to my parents, Gilles and Françoise Taché, for their unconditional support and encouragements. Merci mille fois à vous deux! Finally, a very special thanks to David Chicoine for his invaluable help and cheerful presence.

This study was funded through a doctoral scholarship from the Social Sciences and Humanities Council of Canada.

TABLE OF CONTENTS

| | |
|--|------------|
| Approval | ii |
| Abstract | iii |
| Acknowledgements | v |
| Table of Contents | vi |
| List of Figures | ix |
| List of Tables | xii |
| Chapter 1 – Introduction | 1 |
| Theoretical Background: The Study of Interaction in Anthropology and Archaeology | 3 |
| Diffusionist Beginnings | 5 |
| Adaptationist Framework | 7 |
| Political Framework | 14 |
| History of The Early Woodland and Meadowood Concepts | 16 |
| Contrasting Interpretations of the Meadowood Interaction Sphere | 19 |
| Ritual Factors and the “Burial Cult” Exchange Model | 21 |
| Economic Factors and the “Risk-Buffering” Exchange Model | 22 |
| Sociopolitical Factors and the “Trade Fair” Exchange Model | 22 |
| Methodology: Evaluating Interaction Models in Archaeology | 23 |
| Meadowood Material Manifestations | 24 |
| Contexts | 26 |
| Site and Artefact Distribution | 27 |
| Meadowood Communities | 30 |
| Description of Sites Analyzed | 31 |
| Mortuary Components | 32 |
| Habitation Components | 34 |
| Structure of Thesis | 39 |
| Chapter 2 – The Material Manifestations of the Meadowood Interaction Sphere | 40 |
| Stone | 41 |
| Flaked Stone Artefacts | 41 |
| Polished Stone Artefacts | 79 |
| Ground Stone Artefacts | 96 |
| Unmodified Stones and Minerals | 103 |
| Bone and Antler | 107 |
| Worked and Unworked Antlers | 107 |
| Awls and Needles | 109 |
| Worked and Unworked Teeth | 111 |
| Fishing Gear | 113 |

| | |
|--|------------|
| Dagger-like implements | 114 |
| Flute | 115 |
| Turtle Shell Cup | 116 |
| Shell and Native Copper | 116 |
| Shell Beads | 117 |
| Shell Pendants | 119 |
| Native Copper Beads and Ornaments | 119 |
| Native Copper Adzes | 121 |
| Native Copper Awls | 122 |
| Native Copper Chisels | 123 |
| Native Copper Flaking Tool | 123 |
| Native Copper Fishhook | 124 |
| Native Copper Waste | 124 |
| Ceramic | 124 |
| Vinette I Pottery..... | 124 |
| Tubular Pipes..... | 126 |
| Discussion | 129 |
| Meadowood Trade Items: Practical or Prestige?..... | 130 |
| Chapter 3 – Distribution of Meadowood Sites and Diagnostics in the Northeast..... | 135 |
| Lakes Ontario/Erie Lowlands and Northern Glaciated Allegheny Plateau..... | 139 |
| Resources | 139 |
| Cultural Inventory..... | 142 |
| St. Lawrence/Champlain Lowlands and Eastern Townships | 144 |
| Resources | 146 |
| Cultural Inventory..... | 149 |
| Hudson/Mohawk/Susquehanna Lowlands | 152 |
| Resources | 152 |
| Cultural Inventory..... | 152 |
| Atlantic Coastal Plain..... | 155 |
| Resources | 155 |
| Cultural Inventory..... | 156 |
| Maine–Maritime Provinces..... | 161 |
| Resources | 161 |
| Cultural Inventory..... | 164 |
| Western Great Lakes | 167 |
| Resources | 167 |
| Cultural Inventory..... | 169 |
| Canadian Shield | 170 |
| Resources | 171 |
| Cultural Inventory..... | 171 |
| Discussion | 173 |
| Multi-Scalar Interaction Networks | 178 |
| A Hierarchical System of Social Interaction | 180 |

| | |
|--|------------|
| Chapter 4 – Environmental and Cultural Contexts of Meadowood Material | |
| Manifestations..... | 188 |
| Finished Products..... | 190 |
| Meadowood Cache Bifaces | 190 |
| Meadowood Projectile Points..... | 195 |
| Meadowood Bifacial Scrapers..... | 200 |
| Birdstones | 202 |
| Raw Materials..... | 206 |
| Onondaga Chert..... | 206 |
| Mistassinni and Ramah Quartzites..... | 216 |
| Native Copper..... | 218 |
| Banded Slate | 223 |
| Marine Shells | 224 |
| Discussion | 226 |
| Chapter 5 : Environmental Productivity and Meadowood Communities..... | 230 |
| Subsistence Strategies | 231 |
| Floral Remains..... | 231 |
| Fish | 242 |
| Mammals | 250 |
| Birds, Reptiles, and Amphibians..... | 256 |
| Productivity of the Environment | 259 |
| Storage | 268 |
| Caches and the Question of Specialization | 272 |
| Meadowood Settlement Patterns and Population Density | 275 |
| Meadowood Settlements..... | 275 |
| Meadowood Settlement Pattern | 278 |
| Burial Practices and Funerary Rituals..... | 283 |
| Meadowood Cemeteries | 284 |
| Burial Modes..... | 290 |
| Meadowood Grave Offerings..... | 298 |
| Funerary Feasts | 303 |
| Discussion | 311 |
| Chapter 6 – Discussion and Conclusions | 317 |
| Material Manifestations | 319 |
| Predictions of Material Patterning..... | 320 |
| Results | 320 |
| Spatial Distribution of Sites and Exotic Items | 324 |
| Predictions of Regional Patterning..... | 324 |
| Results | 325 |
| Meadowood Subsistence and Social organization..... | 327 |
| Predictions of Subsistence and Social Organization..... | 328 |
| Results | 328 |
| Conclusion | 331 |
| Appendix A: Inventory of Meadowood Components/Diagnostics | 333 |
| References Cited | 350 |

LIST OF FIGURES

| | |
|--|----|
| Figure 1.1 Distribution of Meadowood sites | 20 |
| Figure 2.1 Preforms from the Batiscan site..... | 43 |
| Figure 2.2 Preforms from the Scaccia site (primary blank in square)..... | 45 |
| Figure 2.3 Bifaces from the Batiscan site..... | 47 |
| Figure 2.4 Bifaces from the Scaccia site..... | 48 |
| Figure 2.5 Funerary bifaces from the Batiscan site..... | 49 |
| Figure 2.6 Ceremonial knife from the Muskalonge Lake site..... | 50 |
| Figure 2.7 Location of quarries and Meadowood sites mentioned in the text..... | 51 |
| Figure 2.8 Cache bifaces from the Scaccia site (note the basal spurs on bifaces in square)..... | 52 |
| Figure 2.9 Meadowood cache bifaces from the Hunter and Muskalonge Lake sites..... | 53 |
| Figure 2.10 Typical side-notched Meadowood projectile points..... | 55 |
| Figure 2.11 Corner-notched and box-base Meadowood projectile points..... | 55 |
| Figure 2.12 Small and narrow-stemmed projectile points from Meadowood components..... | 57 |
| Figure 2.13 Indiana hornstone stemmed bifaces from the Scaccia site..... | 58 |
| Figure 2.14 Adena projectile points from the Batiscan site..... | 59 |
| Figure 2.15 Comparison between Meadowood and non-Meadowood points weight, including t-test result | 62 |
| Figure 2.16 Comparison between Meadowood and non-Meadowood points length, including t-test result | 62 |
| Figure 2.17 Comparison between Meadowood and non-Meadowood points width, including t-test result | 63 |
| Figure 2.18 Comparison between Meadowood and non-Meadowood points neck width, including t-test result | 63 |
| Figure 2.19 Comparison between Meadowood and non-Meadowood points thickness, including t-test result | 65 |
| Figure 2.20 Unifacial scrapers from the Batiscan site..... | 72 |
| Figure 2.21 Bifacial scrapers from the Batiscan site..... | 73 |
| Figure 2.22 Raw materials employed in the manufacture of gorgets..... | 82 |
| Figure 2.23 Gorgets and pendants from the Scaccia site..... | 83 |
| Figure 2.24 Highly fragmented gorgets..... | 84 |
| Figure 2.25 Reworked gorgets..... | 85 |
| Figure 2.26 Recycled gorgets..... | 86 |

| | |
|---|-----|
| Figure 2.27 Birdstones: <i>a</i> , popeyed birdstone from Petite Nation River (Qc); <i>b</i> , truncated birdstone from Scaccia; <i>c</i> , broken birdstone from southern Ontario..... | 87 |
| Figure 2.28 Fragmented polished adze from the Muskalonge Lake site..... | 91 |
| Figure 2.29 Steatite sherds: <i>a</i> , Scaccia; <i>b</i> , Oberlander 2..... | 93 |
| Figure 2.30 Other polished stone artefacts: <i>a</i> , elongated objects from Batiscan; <i>b-c</i> , notched pebbles from Scaccia; <i>d</i> , decorated and partially drilled pebble from Scaccia..... | 95 |
| Figure 2.31 Abrading stones: <i>a-n</i> , Batiscan; <i>o-p</i> , Scaccia; <i>q-s</i> , Oberlander 2; <i>t-u</i> , Muskalonge Lake..... | 98 |
| Figure 2.32 Grinding stones from the Batiscan site..... | 100 |
| Figure 2.33 Pebble hammerstones from the Muskalonge Lake site..... | 101 |
| Figure 2.34 Galena nodules from the Muskalonge Lake site..... | 104 |
| Figure 2.35 <i>a</i> , Solitary rugose coral fossils from Scaccia; <i>b</i> , quartz crystals from Hunter..... | 106 |
| Figure 2.36 Antler flakers from Scaccia..... | 109 |
| Figure 2.37 Bone awls, antler tines, and needle from the Scaccia and Oberlander 2 sites..... | 110 |
| Figure 2.38 Worked and unworked rodent and bear teeth from the Scaccia and Hunter sites..... | 112 |
| Figure 2.39 Bone harpoon and bone gorge from the Scaccia site..... | 113 |
| Figure 2.40 Bone daggers: <i>a</i> , Oberlander 2; <i>b</i> , Scaccia..... | 115 |
| Figure 2.41 Bone flute from Scaccia..... | 115 |
| Figure 2.42 Turtle carapace from Scaccia..... | 116 |
| Figure 2.43 <i>a</i> , marine shell beads from Muskalonge Lake; <i>b</i> , marine shell bead (<i>Busycon perversum</i> / <i>Strombus</i> ssp.) from Scaccia..... | 118 |
| Figure 2.44 Native copper beads from Bruce Boyd..... | 120 |
| Figure 2.45 Native copper beads and cordage from Muskalonge Lake..... | 120 |
| Figure 2.46 <i>a-b</i> , native copper awls; <i>c</i> , native copper waste product..... | 122 |
| Figure 2.47 Native copper flaking tool from Muskalonge Lake..... | 123 |
| Figure 2.48 Tubular pipes: <i>a</i> , cigar-shaped ceramic tube from Oberlander 2; <i>b</i> , stone pipe from Scaccia; <i>c</i> , blocked-end tubular pipe from Scaccia..... | 127 |
| Figure 3.1 Distribution of Meadowood sites in the Lakes Ontario/Erie Lowlands and northern Glaciated Allegheny Plateau..... | 140 |
| Figure 3.2 Distribution of Meadowood sites in the St. Lawrence/Champlain Lowlands and Eastern Townships..... | 145 |
| Figure 3.3 Distribution of Meadowood sites in the Hudson/Mohawk/Susquehanna Lowlands and the Atlantic Coastal Plain..... | 153 |
| Figure 3.4 Distribution of Meadowood sites in Coastal Maine-Maritime provinces..... | 162 |
| Figure 4.1 Distribution of Meadowood cache bifaces among different geographic areas..... | 192 |

| | |
|--|-----|
| Figure 4.2 Distribution of Meadowood projectile points among different geographic areas..... | 197 |
| Figure 4.3 Distribution of Meadowood bifacial scrapers among different geographic areas..... | 200 |
| Figure 4.4 Distribution map of finished and unfinished Meadowood birdstones..... | 203 |
| Figure 4.5 Distribution of Meadowood birdstones among geographic areas..... | 203 |
| Figure 4.6 Distribution map of Meadowood Onondaga chert items | 208 |
| Figure 4.7 Distribution of Meadowood Onondaga chert items among different geographic area | 210 |
| Figure 4.8 Distribution of Meadowood Onondaga chert items among sites in the Upper St. Lawrence valley..... | 212 |
| Figure 4.9 Distribution of Meadowood Onondaga chert items among sites in the Upper Connecticut valley..... | 213 |
| Figure 4.10 Distribution of Meadowood Onondaga chert items among sites in the Delaware valley..... | 213 |
| Figure 4.11 Distribution of Meadowood Onondaga chert items in habitation contexts among different geographic areas..... | 215 |
| Figure 4.12 Distribution of Meadowood Onondaga chert items in mortuary contexts among different geographic areas..... | 215 |
| Figure 5.1 Distribution of storage pit diameters at the Scaccia and Riverhaven 2 sites..... | 270 |
| Figure 5.2 Distribution of storage pit depths at the Scaccia and Riverhaven 2 sites..... | 270 |
| Figure 5.3 Rank order graph showing the distribution of offerings in burials at the Hunter site..... | 301 |
| Figure 5.4 Rank order graph showing the distribution of offerings in burials at the Muskalonge Lake site..... | 301 |
| Figure 5.5 Rank order graph showing the distribution of offerings in burials at the Oberlander 2 site..... | 301 |
| Figure 5.6 Rank order graph showing the distribution of offerings in burials at the Bruce Boyd site..... | 302 |

LIST OF TABLES

| | |
|---|-----|
| Table 1.1 Theoretical models explaining the Meadowood interaction sphere | 25 |
| Table 2.1 Distribution of flaked stone artefacts at seven Meadowood sites | 41 |
| Table 2.2 Attributes of secondary and tertiary preforms at the Batiscan site | 43 |
| Table 2.3 Raw materials involved in the manufacture of Batiscan's various bifaces | 44 |
| Table 2.4 Thermal alterations on flaked stone tools from seven Meadowood components | 48 |
| Table 2.5 Various researchers' criteria to distinguish between dart and arrow points | 64 |
| Table 2.6 Meadowood projectile point raw materials at seven sites | 67 |
| Table 2.7 Non-Meadowood projectile point raw materials at seven sites | 69 |
| Table 2.8 Attributes of bifacial and unifacial scrapers at six Meadowood sites | 74 |
| Table 2.9 Scraper raw materials at six Meadowood sites | 75 |
| Table 2.10 Distribution of polished and ground stone artefacts at seven Meadowood sites | 80 |
| Table 2.11 Distribution of gorget styles at seven Meadowood sites | 81 |
| Table 2.12 Distribution of bone, antler, and shell artefacts at seven Meadowood sites | 108 |
| Table 2.13 Distribution of shell and native copper artefacts at seven Meadowood sites | 117 |
| Table 2.14 Distribution of Vinette 1 pottery sherds at seven Meadowood sites | 126 |
| Table 2.15 Proportions of traded items within the seven study Meadowood assemblages | 133 |
| Table 3.1 Repartition of known Meadowood habitation and mortuary sites between the different physiographic provinces comprised within the Meadowood interaction sphere | 138 |
| Table 3.2 Classification of geographical areas according to their relative proximity to Onondaga chert sources/Meadowood Interaction Sphere's "core area" | 173 |
| Table 4.1 Distribution of Meadowood diagnostic artefacts among different northeastern provinces and subregions | 191 |
| Table 4.2 Relative proportions of Meadowood diagnostics within habitation (H) and mortary (M) sites | 194 |
| Table 4.3 Distribution of Meadowood cache bifaces within features | 195 |
| Table 4.4 Assemblages containing ≥ 20 Meadowood projectile points | 197 |
| Table 4.5 Distribution of Meadowood points within features | 198 |
| Table 4.6 Distribution of Meadowood bifacial scrapers within features | 202 |

| | |
|---|-----|
| Table 4.7 Distribution of unfinished and finished birdstones in Meadowood mortuary and habitation sites | 204 |
| Table 4.8 Number of Meadowood Onondaga chert items in habitation vs mortuary sites | 211 |
| Table 4.9 Distribution of Meadowood-associated marine shell, native copper, and banded slate items in different subregions | 222 |
| Table 5.1 Floral remains recovered in Meadowood habitation (H) and mortuary (M) sites | 233 |
| Table 5.2 Fish remains recovered in Meadowood habitation (H) and mortuary (M) sites | 245 |
| Table 5.3 Mammal remains recovered in Meadowood habitation (H) and mortuary (M) sites | 253 |
| Table 5.4 Bird, reptile, and amphibian remains recovered in Meadowood habitation (H) and mortuary (M) sites | 258 |
| Table 5.5 Ethnohistorical and modern references regarding fish, mammal, and bird productivity | 261 |
| Table 5.6 Return rates for harvesting of meat and fur value for one band (50 people)/year, modified from Webster's (1983) data | 265 |
| Table 5.7 Characteristics of habitation structures associated with Meadowood or Meadowood-related settlements | 277 |
| Table 5.8 Sizes, number of burials/individuals, and burial treatments characterizing a sample of Meadowood burial sites | 291 |
| Table 5.9 Type and quantity of grave offerings at the Hunter, Muskalonge, Oberlander, and Bruce Boyd sites | 300 |
| Table 6.1 Theoretical models accounting for the structure of the Meadowood interaction sphere | 318 |

CHAPTER 1 – INTRODUCTION

Human communities rarely develop in complete isolation and interactions between different groups, as social practices, impact cultural trajectories and stimulate social developments (Cusick 1988; Earle 1982; Sanders 1956). Inter-societal interactions can take various forms, from the basic exchange of goods to the sharing of religious beliefs, stylistic interchange, and warfare. In prehistoric North America, inter-societal interactions have been central to the study of various pan-regional phenomena (Caldwell 1964; Dragoo 1963; Fowler 1974; Peregrine 1996b; Ritchie 1955).

The Meadowood phenomenon, a pan-regional interaction network that developed in northeastern North America during the Early Woodland Period (3,000-2,400 BP), is a particularly fertile ground for the application of models of intersocietal interactions. While evidence of interregional interactions and long-distance exchanges date back to at least the Late Archaic period (6,000 to 3,000 BP) (Robinson 1996; Spence and Fox 1986; Steward 1989), the Early Woodland Period marked a significant increase in the intensity and scale of inter-societal interactions. Archaeologically, this is recognized by common burial practices and the widespread distribution of such items as high-quality chert bifaces, finely crafted slate objects, as well as native copper and marine shell artefacts. These traits were attributed to the Meadowood phenomenon (Ritchie 1955), believed to have brought in close contact several hunter-gatherer populations.

Previous Meadowood studies have been mainly descriptive and resulted in the identification of numerous components across northeastern North America (Clermont 1978; Lévesque et al. 1964; McEachen 1996; Spence and Fox 1986). Meanwhile, few attempts have been made at identifying the factors responsible for the establishment and maintenance of the Meadowood network as a regional phenomenon (Abel 1993; Chrétien 1995; Granger 1979; Ritchie 1955). Moreover, most archaeologists have taken a site-based approach to suggest the participation of specific communities in the Meadowood interaction sphere. Meanwhile, broader, more inclusive regional studies have remained a low priority of research. A number of authors studied the Meadowood phenomenon from the perspective

of specific regions, such as the Niagara Escarpment (Granger 1978), the Maritimes (McEachen 1996), and the vicinity of present-day Québec city (Chrétien 1995). Never, however, were all the regions involved in this interaction sphere integrated in a comprehensive study of Meadowood.

In this dissertation, I have conducted a regional survey of the Meadowood phenomenon to explore the dynamics of past human interactions. While the existence of an interregional network during the Early Woodland Period has long been recognized (Ritchie 1955), the *structure* of the network, the *mechanisms* underlying the flow of goods and ideas, and the *incentives* of the various groups participating in these exchanges are still poorly understood. Thus, the main objective of the research is to identify the factors involved in the emergence of the Meadowood Interaction Sphere, define its structure, and understand the social dynamics behind its maintenance and transformation during the Early Woodland Period.

Recent advances in archaeometric and geophysical techniques, such as material sourcing and compositional analyses, have fostered interest in the study of prehistoric interactions (e.g., Baugh and Ericson 1994; Druc 2004). The identification and sourcing of trade items have become common practice in archaeology, yet little emphasis has been placed on developing overarching theoretical schemes (Cusick 1998: 1; Earle 1982: 3; Schortman and Urban 1992: 12). As observed by Schortman and Urban (1987: 50), the ability to source exotic raw materials does not necessarily lead to the elaboration of models of inter-societal interaction. With that in mind, this study aims at developing the theoretical and practical grounds on which the different anthropological aspects of inter-societal interactions can be assessed. I apply the outcomes of these theoretical and practical considerations to the particular Meadowood case during the Early Woodland Period.

The Early Woodland Period marked an increase in long-distance contacts and inter-societal interactions. These elements are related to broader transformations in the social structures and cultural makeup of northeastern populations, including the intensified use of certain subsistence resources, the emergence of distinct burial precincts, the elaboration of mortuary ceremonialism, and the development of socio-economic inequalities (Custer 1989: 188; Stothers and Abel 1993: 85). From a comparative standpoint, northeastern North America is one of several cases in which the concurrent elaboration of ritual life, changes in subsistence strategies, and the emergence of social inequalities occur in contexts of increased

interactions (Burger and Matos Mendieta 2002: 169). As it is often the case, changes that occur concomitantly are linked to several different processes. The problem, however, resides in the evaluating the primacy of certain processes; in other words, what comes first and/or impacts the most on the social dynamics of a given community or group of communities. In this research, I build upon the assumption that fundamentally different motivations for participating in large-scale network of interactions result in distinct archaeological patterns and assemblages (Martin 1999: 198). More specifically, I consider the material correlates associated with ritual, economical, and socio-political motivations for participating in the Meadowood network. Recognizing the possibility of equifinality in archaeology, I build my interpretations on the coherent association of several different aspects of Meadowood communities rather than a single set of archaeological correlates.

In this introductory chapter, I situate my research topic into a broader cultural and theoretical context. In the first place, I present my theoretical grounding and summarize previous studies of interaction and trade. I then provide a brief history of the Early Woodland and Meadowood concepts, and discuss the various explanations that have been proposed for the Meadowood Interaction Sphere. This is followed by a description of the methodology I adopt to evaluate alternative interaction models. I conclude with a brief description of the physical and cultural contexts, as well as history of research, associated with the seven components selected for study. By doing so, I want to emphasize the potential contributions of revisiting these collections.

THEORETICAL BACKGROUND: THE STUDY OF INTERACTION IN ANTHROPOLOGY AND ARCHAEOLOGY

I begin this theoretical discussion with a brief definition of the concepts of *trade*, *exchange*, and *interaction*. While “trade” refers to the exchange of material goods, the concept of “exchange” encompasses a much wider range of phenomena, including the flow of ideas, information, and individuals. Trade and all other forms of exchange are usually closely linked—the exchange of material goods depends on, at the same time that it structures the flow of information and people in a network. The term “interaction,” meanwhile, has a very broad meaning, referring to any contact between two or more individuals or groups. In contrast, the concept of “interaction sphere,” originally coined by the late Joseph Caldwell

(1964), is usually reserved to describe interactions between several otherwise independent cultures. The latter distinction embodies another one, between internal exchange (i.e., within a culture) and external exchange (i.e., between distinct cultural units) (Renfrew and Bahn 1996: 335-336, 364). This dissertation focuses on external exchange.

As mentioned earlier, this project aims at developing overarching schemes to study past interaction spheres. It is not framed, however, by a single theoretical position. Intersocietal interactions are believed to be linked to broader socio-cultural phenomena, and therefore parallel particular environmental, economical, socio-political, and ideological conditions. These conditions are part of the world within which individuals maneuver (Earle 1982: 11) at the same time as they are affected by individual actions. Hence, this study admits the variable nature of exchange and the necessity to adapt and combine various theoretical frameworks according to the context and scale of analysis. In this particular case, the context is the *Meadowood Interaction Sphere* and the scale is *macroregional*.

Scholars have considered various factors to account for the creation of Meadowood network, including shared funerary practices and religious beliefs (Ritchie 1955), and trading partnerships to ensure more stability to local subsistence systems (Granger 1978; Haviland and Power 1994). However, with no systematic attempt at identifying the material correlates for each model, the reasons for favouring one explanation over the others have so far remained implicit. In this study, I propose explicit material correlates to assess the relative importance of ritual, economic, and socio-political factors in the development of the Meadowood Interaction Sphere. The relative importance of each of these factors is used to define three models: (1) the ritual or “Burial Cult” model; (2) the economic or “Risk-Buffering” model; and (3) the socio-political or “Trade Fair” model. These constructs are believed to represent three distinct, yet not exclusive, sets of strategies and rationales. For each model, I develop material expectations using data from the material features of the Meadowood network, the distribution of sites across the landscape, the environmental and cultural contexts of trade artefacts and raw materials, and Meadowood subsistence strategies and social organization.

These material correlates and a description of the specific variables analyzed are presented in the methodology section of this chapter. First, however, it is necessary to review the numerous theories, methodologies, and archaeological and ethnographical case studies that influenced the study of interaction spheres in archaeology.

Diffusionist Beginnings

The first efforts to study interaction in the discipline of anthropology were undertaken within a descriptive and culture historical diffusionist framework. This theoretical agenda developed in reaction to late nineteenth-century evolutionary theories, which perceived human development as internally driven and involving progressive change toward modern institutions. The evolutionist paradigm relied on a principle of “psychic unity,” which predicts that universal institutions and behaviours will be constantly invented and reinvented, in the same sequence, by all human societies (Morgan 1967 [1877]: 262, cited in Schortman and Schortman 1987: 41).

Diffusionists shifted the focus of study from the universal to the particular. Lists of traits were used to define spatially restricted cultures and culture areas. Culture change was seen as the result of trait borrowing rather than invention, and histories of particular cultures were thought to be directly reflected in patterns of trait distribution. In the late 1940s and 1950s, a series of questions arose about the application of the diffusion framework. The new challenges faced by culture historians were: (1) demonstrating rather than just assuming culture contact; (2) specifying the mechanisms through which diffusion took place; and (3) considering the role played by internal cultural processes in the adoption of traits by a society. A few attempts were made at reconciling generalist and particularist points of view by identifying regularities in culture contact situation (Caldwell 1964; Rouse 1958). For example, Joseph Caldwell suggested that by speeding up the process of innovation generation and spread, interaction spheres could have fostered the development of more complex social systems in the Eastern Woodlands (Schortman and Urban 1987: 41-46).

Joseph Caldwell was the first to propose the concept of *interaction sphere* to explain the far-flung influence of Hopewell burial ceremonialism in the Eastern Woodlands between approximately 2100 and 1500 years B.P. (Caldwell 1964). A decade later, Don Dragoo extended the concept back in time to include Adena-related burials (Dragoo 1976: 5). Caldwell defined an interaction sphere as a network involving several distinctive cultures that could retain their distinctiveness at the level of subsistence technology and local crafts, but which shared a common set of supralocal values, rituals, behaviors, styles, and materials. The widespread distribution of Hopewell and Adena traits was originally interpreted as resulting

from the diffusion of a set of beliefs, or cult (Caldwell 1964; Griffin 1961, 1974; Prufer 1964; Struever 1964; Turnbull 1976: 61; Wright 1982: 107)¹.

Based on craniometric data suggesting an affiliation between Illinois and Ohio populations, Olaf Prufer suggested that the Hopewell cult was diffused by ceremonial and craft specialists who traveled interregionally (Prufer 1961; cited in Carr 2005: 586). In a recent review of interpretations, Christopher Carr suggested instead that the dispersion of some Hopewell styles could be attributed to people traveling long distances in order to buy or exchange the rights to perform particular ceremonies and produce the ritual equipment required for those ceremonies. Ethnographic analogies exist for such buying, selling, and/or learning of ceremonial rites. Carr identifies such possible analogs as the medicine pipes among historic Crow, Hidatsa, Blackfeet, Sarsi, and Gros Ventura trading partners; the diffusion of the Dream Drum and Dream Drum cult among members of Eastern Siouan and Great Lakes Algonquian-speaking communities; the spread of the Ghost Dance across the Plain tribes; and the *Sangai* bachelors' rites of the Enga in New Guinea (Carr 2005: 586).

Similarly, Polly Wiessner (2001) documented additional cases in New Guinea when new cults and their accompanying feasts were imported by Big Men from other groups who appeared to be thriving, in order to modify the existing value and meaning of material goods. Wiessner discussed the importing of the Kepele cult from western to central Enga (where it became locally known as the Aeatee cult), the importing of Ain's cult (or Mata Katenge) from the northwestern corner of Enga into western Enga, and finally the importing of the Female Spirit Cult from non-Enga groups to the south into eastern Enga. The Female Spirit Cult was introduced to devalue the pig as the main form of wealth and shift values to pearl shells:

Historical traditions tell of voyages taken by big-men from eastern Enga, laden with goods and valuables contributed by themselves and fellow clanspeople, to purchase the sacred objects, spells, and rites of the cult as well as the service of a ritual expert to institute the cult in their clans (Wiessner 2001: 138).

In line with Caldwell's idea that shared supralocal values and rituals act as a vehicle of exchange throughout interaction spheres (Caldwell 1964; Simms 1979: 39), other

¹ Originally, William Ritchie and Don Dragoo suggested that Adena manifestations across the Northeast resulted from an eastern migration of people originating from the Ohio Valley (Ritchie and Dragoo 1960), but this scenario was quickly abandoned in favour of the religious cult diffusion hypothesis.

researchers have evoked the diffusion of a burial cult to account for similarities over vast areas. This kind of reconstruction is well exemplified by the Early Horizon period of Peru (2800-2200 BP), which has traditionally been associated with the spread of the Chavín religious cult from Chavín de Huántar, a centre of the north-central highlands:

[i]t is believed that Chavín de Huántar functioned as the principal source of religious doctrine and that the existing network was exploited as a means of diffusing its ideology to other Andean centers (Massey 1986: 288; cited in Chicoine 2006: 24).

The participants in the Chavín Interaction Sphere shared a number of traits, all thought to be related to the rituals of the Chavín cult. Among them are iconographic elements first identified at Chavín de Huántar and represented on pottery, sculptures or textiles (Browman 1975: 325; Patterson 1971: 33). For example, images of felines, raptorial birds, caymans and San Pedro cactus are said to reflect shamanistic beliefs. Besides these motifs, other ritual elements shared by the cult participants include ritual paraphernalia and ceremonial architecture (Chicoine 2006: 22). Richard Burger compared the Chavín burial cult to the pan-regional Pachacamac cult documented historically (Burger 1988: 114-115).

Adaptationist Framework

In spite of creative efforts, diffusion models of culture history decreased in popularity in the 1950s and 1960s with the advent of functionalist/adaptationist perspectives in archaeology. First promoted by Taylor (1948), this approach was soon adopted by many archaeologists (e.g., Binford 1968). The identification of general laws of cultural evolution once again became the focus of attention. Constants in the way humans adapt to the environment were thought to account for cultural similarities; diffusion was not only seen as a non-explanation but as a variable obscuring developmental regularities. The study of prehistoric trade systems regained popularity in the late 1960s but this interest did not change the main concern of archaeologists, still geared toward building functionalist models of culture change based on practical (mainly subsistence) needs. From that standpoint, trade was seen as “simply one more component of the local system that serves immediate needs” (Schortman and Urban 1987: 51).

Adaptationist models of interaction share the premise that trade is a strategy for enhancing the stability of the subsistence economy. Within this framework, exchange has

been perceived as a redistribution mechanism in contexts of high resource diversity (Sanders 1956: 6, 1984; Sanders and Price 1968: 188-193; Service 1962, 1975; Tourtellot and Sabloff 1972: 132); a means of managing resource deficiencies (Rathje 1971: 278, 1972) and resource variability over time and space (Halstead and O'Shea 1982; Isbell 1978; Muller 1987: 21; Plog 1980: 141; Toll et al. 1980: 95-97); or a strategy used by increasingly sedentary societies to obtain resources located outside their restricted home range (Browman 1975: 322, 325). According to these models, elites managed exchanges and gained power through their ability to enlarge the local subsistence resources and increase their reliability (e.g. Rathje [1972] on the Maya).

World System Theory

Another characteristic of social evolutionists and the adaptationist perspective is the focus on processes operating within the limits of single societies. This formed the basis of Alexander Lesser's (1961, cited in Feinman 1996: 115) critique, who decried the lack of attention given by social evolutionists to larger scale processes such as trade and marriage alliances. Unfortunately, Lesser's appraisal had little effect on the theoretical paradigm of his time. In 1974, the publication of *Modern World System* by the historical sociologist Emmanuel Wallerstein had profound impacts in many social sciences. Indeed, Wallerstein advocated a shift in basic units of analysis, from individual societies defined in terms of geographical, political, and/or cultural traits, to world-systems defined in terms of economic processes and links (Peregrine 1996a: 2).

Increasing discomfort with the local focus of most processualists began to be expressed in several works focusing on archaeological frontiers and boundaries published in the mid 1980s (DeAtley and Findlow 1984; Feinman 1996: 116; Green and Perlman 1985; Kowalewski et al. 1984). It was also around this time that Wallerstein's World System theory gained popularity among archaeologists attempting to interpret large-scale interaction processes (Schortman and Urban 1987: 55). Indeed, Wallerstein's framework addressed the question of scale by focusing on what he considered to be effective functioning economic units (i.e., World Systems). For him, World Systems were articulated by trade networks extending far beyond the boundaries of individual populations (Renfrew and Bahn 1996: 336-337).

The World System approach is based on the premise that within a given network, a core and a periphery can be identified, each with distinct interests and organizations. Interactions taking place between cores and the peripheries affect and structure the internal units of the World System. Cores are generally where elites and dominant communities are found, and interactions are based on the need of elites to obtain valuable resources from the peripheries to gain political advantages.

This model has been applied to the Chavín Interaction Sphere of Peru (Burger and Matos 2002). Indeed, new data shed lights on sites and regions that did not share, or shared only minimally, traits of the Chavín Interaction Sphere (Browman 1975; Burger and Matos Mendieta 2002). Moreover, in other areas, traits originally associated with the spread of the Chavín burial cult were found to predate the Early Horizon period, indicating that “clearly the importance of Chavín de Huántar as *the* fount from which the Chavín phenomenon spread has been emphasized far beyond what the data can support” (Keatinge 1981: 177).

In the Northeast, Dina Dincauze and Robert Hasenstab (1989) adopted the World-System theory to explain changes in the social, economic, and political orientations of Iroquoia about 1,000 years ago. They suggested that the characteristics of the northern Iroquois, which contrast with their Algonquian neighbours (i.e., Macro-Siouan vs Algonquian language; sedentary horticulturalists vs mobile hunter-gatherers; matrilineal vs patrilineal descent groups; ranked versus more egalitarian form of political organization), resulted from interaction with a Cahokia-centered World System. The Iroquois region was seen as a periphery, and Proto-Iroquois populations were thought to provide commodities such as maize, meat, hides, minerals and captives to Cahokia in return for prestige goods, calendrical ceremonies, and esoteric knowledge (Peregrine 1996b: 42).

Wallerstein’s World System theory has been criticized for its strong economic bias: “[r]eliance on Wallerstein’s model and concepts may serve to exacerbate this tendency to overstress economics. For example, trade is often equated with interaction in simple materialistic strategies, but trade is just one possible sort of interaction, and there are noneconomic aspects to trade as well” (Schortman and Urban 1987: 61). Another concern is the applicability of the World System theory to pre-industrial contexts. Wallerstein’s original theory conceived the early capitalist World System as having a single core, linked to peripheral regions through the exchange of bulk goods. Pre-industrial’s transportation constraints, however, made the movement of bulk goods difficult and long distance

circulation of light-weight, prestige items often characterized these earlier contexts. Many researchers have thus reformulated World Systems theory by ascribing significant implications to prestige goods (Peregrine 1996b; Schortman and Urban 1996: 98; but see Kowalewski [1996] for a different perspective). Similarly, it is now recognized that ancient networks often had multiple cores and sometimes lacked a truly dominant polity (Feinman 1996: 117).

In spite of criticisms, Wallerstein's World System theory has made significant contributions to the study of trade and interaction in archaeology. As mentioned earlier, the primary contribution of this approach may well lie in its focus on *macroregional* phenomena rather than single sites or regions. Looking at various scales of interaction is certainly necessary to enhance our knowledge of past social dynamics (Feinman 1996: 118; Jackson 1991: 265), but, aside from a few examples (Caldwell 1964; Willey 1945), the study of intersocietal networks was underrepresented in archaeology until the mid 1980s.

Another important contribution of Wallerstein's framework has been the demonstration that interactions are not always adaptive and do not always promote stability. Instead, the tenets of the World System theory generally admit that competition and a desire of elites to advance their own interests are what foster the establishment of intersocietal networks. In contrast, the functionalist framework described in the preceding section interpreted social changes, including changes in interactions, as adaptive responses to environmental changes.

Peer Politics, Salient Identities, and Interaction Spheres

Colin Renfrew (1986) proposed the concept of peer-polity interaction to avoid casting discussions about trade and exchange in terms of dominance and dependency. Peer-polity interaction refers to the full range of interchanges taking place between autonomous (self-governing and politically independent) socio-political units (Renfrew 1986: 1). While these exchanges generally occurred within the same geographic region, the concept has also been applied to interregional network, such as the Hopewell Interaction Sphere (as defined by Caldwell [1964]):

The American archaeologist David Braun has spoken of peer-polity interaction within the Hopewell sphere (while emphasizing that these were relatively simple societies, not states), and has pointed out that competitive emulation and symbolic

entrainment may be observed in Hopewell as in the case of other comparable interaction spheres (Renfrew and Bahn 1996: 364).

Edward Schortman (1989) proposed to replace the notion of cultures interacting with each other by the concept of *salient identities* founded on ethnicity and/or social class. Within this framework, specific individuals or groups participate in long-distance networks (referred to as *salient identity networks*) serving their interests over those of their neighbours (Schortman 1989: 55). Interestingly, Schortman observes that salient identities tend to develop in situations where affiliations based on ethnicity and/or class allow the manipulation and control of critical, scarce resources (including trade items) (Schortman 1989: 54-56).

Ethnographically, the concept of salient identity (and peer-polity interaction) could be applied to the Hausa network of Nigeria, to the Soninke, Malinke Mori, and Jahaanke ethnic networks in West Africa, and to the development of a Swahili identity in nineteenth-century East Africa. In all these contexts, salient affiliations serve to restrict the control of trade in certain goods. Archaeologically, these models have been used to explain similarities across the Maya Lowlands of northern Central America between 1750 and 1050 BP, the Bell Beaker network of the fifth millennium BP of western and central Europe, and the Hopewell Interaction Sphere of the first centuries AD in northeastern North America. Once again, shared material patterns are thought to reflect the linkage of elites into salient identities, which developed as a means of promoting and controlling the flow of goods between their dispersed localities (Schortman 1989: 58-59; see also Braun 1986).

The Significance of Prestige Goods

In the 1920s, the French sociologist Marcel Mauss highlighted, in his *Essai sur le Don*, the importance of reciprocal gift exchange in social relations. The role of imported and/or highly valued products in the development of inequalities and increasing competition for power have subsequently been addressed by several archaeologists who came to classify such items under the labels “prestige goods” (Feinman 1996: 119; Schortman and Urban 1996: 98), “prestige technologies” (Hayden 1998), “primitive valuables” (Dalton 1977), or “wealth” (Brumfield and Earle 1987: 4). Indeed, in many trade networks, the exchange of valuables seems far more important than the exchange of ordinary commodities (Dalton 1977; Renfrew and Bahn 1996: 367).

The monopolization of valuables is often seen as an elite strategy to ensure effective control over the labour of their followers, and hence to create and maintain socio-political hierarchies. Prestige items can be redistributed within a community in “exchange” for services and objects destined for subsequent export (Schortman and Urban 1996: 98). According to Dalton (1975: 97), however, valuables are not involved in the transaction of subsistence products. The continued effectiveness of such a prestige good system depends on the elite’s ability to acquire these items through inter-elite exchanges, and to monopolize their production by skilled artisans, as well as their subsequent distribution (Schortman and Urban 1996: 99).

Brian Hayden (1998) made a significant contribution to the study of prestige items by presenting concrete and useful means of analyzing prestige technologies, taking into account their specific goals and constraints, which differ drastically from that of practical technologies. In traditional societies, prestige items can be used to display control over wealth and labor; convert, store and concentrate surplus food production into other desirable forms; generate hierarchical indebted relationships; sanction important sociopolitical transactions; or as substitutes for human life (Hayden 1998: 25). Hayden outlined five strategies used by “aggrandizers” to promote their self interests, in which prestige items usually play a critical role: (1) hosting and promoting reciprocal and investment feasting; (2) instigating warfare and establishing peace; (3) obtaining allies in warfare; (4) acquiring desirable spouses and more spouses; and (5) increasing the value of one’s own children through maturation payments (Hayden 1998: 18).

This emphasis on prestige technologies, raw materials, and finished products derives in part from ethnographic studies of Big Man societies in the Pacific (Schortman and Urban 1996: 98). The moka ceremonial exchange system in the Mt. Hagen Highlands of New Guinea (Strathern 1971), for example, is characterized by public and ostentatious exchange of valuables. In this system, Big Men give away gifts (mostly pigs) and accumulate credit to assure their prestigious position. Similarly, the Melanesian Kula Ring, an exchange network linking a number of islands inhabited by small-scale sedentary societies, is characterized by the ritual exchange of highly valued shell necklaces and armbands, paralleled by the exchange of foodstuff and other subsistence-related commodities (Malinowski 1922, cited in Greenfield 1991; Renfrew and Bahn 1996: 337).

These ethnographic cases have inspired archaeologists, who suggested that similar processes occurred in prehistoric times. For example, Susan Frankenstein and Michael Rowlands (1978, cited in Renfrew and Bahn 1996: 364) argue that the emergence of ranked societies in Early Iron Age France was founded on a prestige-good system in which local elites controlled the supply of prestige items originating from the Mediterranean. Peter Peregrine (1996b) applied this model to the Mississippian World System flourishing in North America between approximately AD 900 and AD 1200. According to him, Mississippian political power derived from the control and manipulation of exotic items and esoteric knowledge. Moreover, Peregrine (1996b) argued that the development of distribution centers at nodal locations where the flow of valuables could be readily controlled was a logical consequence of a prestige-good system (Peregrine 1996b: 41). These centers could be compared to Polyani's (1963) *Ports of Trade* or Jackson's (1991) *trade fair* sites, two concepts referring to places where large, spatially and temporarily predictable gathering of autonomous societies occurred.

All do not agree, however, on the importance of prestige items in interaction networks (e.g., Kowalewski 1996: 30-32). Moreover, a number of archaeologists recognize the importance of valuables in the establishment of intersocietal contacts, but continue to defend the idea that the ultimate function of interaction is to increase the stability of the local subsistence system. These views are intermediate between economic/adaptationist perspectives and sociopolitical ones (Brumfield 1987: 2).

Kent Flannery (1968), for example, was concerned with explaining architectural, iconographic, and artefactual similarities—expressed in such non-portable material culture as ceremonial architecture and iconography, as well as portable prestige raw materials and finished items—between Formative Period communities in the valley of Oaxaca, Mexico, and the Olmec communities in coastal Veracruz and Tabasco. While he believed that the primary function of exchange might have been to enhance the security of local populations by creating reciprocal obligations between groups, he also observed that this was attained through elite-orchestrated long-distance trade for the purpose of obtaining prestige goods (Flannery 1968: 107). Flannery (1968: 102-105) suggested the fur trade between coastal Tlingit and inland Athabascan groups in the Pacific Northwest, and the jade and food trade between the Shan and Kachin peoples in Burma as ethnographic analogies.

Studying exchange in the Owens valley, California, Robert Bettinger and Thomas King (1973) proposed a similar interpretation for the fiesta-redistributive system documented in this region. The efficiency of this system, where several villages occasionally gathered to dance, gamble, and trade goods, relied on the development of “hard” currency (i.e., nonedible resources [in this case obsidian and shell beads and pendants]) incorporated in the system as a storable equivalent of edible resources. However, the main function of this trade system was thought to be the movement of the edibles needed to support larger populations in a circumscribed environment (Bettinger and King 1973: 144).

Political Framework

Political factors and the development of socioeconomic inequalities could also explain the emergence of interaction spheres (Dalton 1975, Hayden and Schulting 1997). According to this scenario, interaction is promoted and maintained by high-ranking individuals or communities seeking to maximize their power and wealth by establishing ties to elites in other communities and regions (Clark and Blake 1994: 29; Hayden and Schulting 1997: 76; Lewis-Williams and Dowson 1993; Sherratt 1990;). Emerging elites maintain or strengthen their positions within a society by virtue of their differential access to highly prized, but rare goods (Hayden 1995; Plegler 1998: 20). They are the main, and often the sole beneficiaries of trade, “the purposes of elites being entirely sufficient to account for their participation in exchange” (Brumfield and Earle 1987: 2).

Brian Hayden and Richard Schulting (1997) applied a socio-political framework in their study of the Plateau Interaction Sphere in northwestern North America. They argue that the elite of widely spread communities gained and maintained their power in part by sharing esoteric knowledge and paraphernalia as one means of excluding other members of the communities (Hayden and Schulting 1997: 75). Similarly, it has been suggested that the esoteric knowledge associated with the Chavín religious cult was a “valuable elite resource” (Massey 1986: 288, cited in Chicoine 2006: 24). The concentration of prestigious traded items in the richest fishing and trading localities is one of the main arguments supporting the economic power base for supernatural or other elite claims in Hayden and Schulting’s scenario. These authors suggest the presence of centers similar to Jackson’s (1991) idea of trade fair sites (Hayden and Schulting 1997: 77).

Edwin Jackson (1991) interpreted trade fairs as a means of maintaining networks among widely spaced hunter-gatherer communities. Fair are also believed to facilitate the movement of raw materials in contexts of increasingly restricted territories. Besides trade, a range of events reinforcing intergroup integration—feasting, dancing, games, ceremonial activities—took place at these sites (Hayden and Schulting 1997: 77; Jackson 1991: 266; Renfrew and Bahn 1996: 338).

Ethnographic analogies of trade fairs are recorded in Alaska, Australia, and the northwestern United States plateau region (Jackson 1991: 272). These centers, which had to be easily accessible, coincided with areas of high-resource productivity where gatherings occurred when concentrations of resources peaked and where surpluses could be produced for exchanges (e.g., The Dalles and Lillooet regions in the Plateau). Moreover, investments were sometimes made to increase the productivity of these areas even more. This was observed in the Plateau where fishing platforms were constructed at the best fishing stations, in New South Wales in Australia where inhabitants built an extensive system of fish traps on the Darling River, and in southwest Victoria (Australia) where artificial drainage systems were constructed to intensify the exploitation of eels (Jackson 1991: 275).

Based on these ethnographic analogies, direct and indirect archaeological markers of trade fairs can be defined. In terms of subsistence strategies, trade fairs should be primarily associated with hunter/gatherers. They are multiethnic gatherings that take place at the same locale year after year. Archaeologically, these characteristics translate into large sites with relatively deep deposits and evidence of multiple reoccupations. In terms of site location, trade fairs have to be easily accessible. Typically, they are at the junction of major waterways, at the crossroad of several regional territories or in neutral locations (Jackson 1991: 278). Moreover, gatherings occur where predictable, although temporary, resource surplus is available to accommodate large number of participants, and capital investments are sometimes made to increase the productivity of a location (Jackson 1991: 275). Therefore, the presence of large archaeological sites near resource-rich areas (e.g., productive fishing grounds), and their association with special constructions (e.g. fish traps) constitute two additional indirect indicators of trade fairs. Besides the major interregional gatherings, it is not unusual to observe a series of smaller fairs that allow for a secondary redistribution of trade goods (Jackson 1991: 276). In the archaeological record, regional and local centres of

distribution can be detected through a differential distribution of trade goods between sites in a region.

In terms of material manifestations, the primary markers of trade fairs are exotic goods and raw materials originating from a variety of sources, some of which may be located several hundreds of kilometers away from the site. Evidence of feasting and ritual activities is also consistent with trade fairs. The association of artifact styles that are usually attributed to distinct cultures may further support the identification of archaeological sites as trade fairs. Finally, Jackson (1991: 278) observed that these extensive trading networks promote and perpetuated differential social prestige. Archaeological evidence of social inequalities therefore represents yet another indirect marker of trade fairs. Interestingly, however, this flexible system of trading partnerships also appears to inhibit the establishment of hereditary, hierarchical ranking (Jackson 1991: 278).

The accumulation of data on prehistoric and historic trade networks reviewed above highlights the contextual and variable nature of interregional exchange. The motivations and mechanisms behind the movement of goods and ideas appear to have been strongly related to the scale of interaction networks. Moreover, each of the major theoretical perspectives discussed (i.e., diffusionist, adaptationist, and political) encompasses a variety of possible reconstructions and specific mechanisms underlying trade. For example, to highlight the primacy of, say, political factors leaves many questions open, such as whether or not there was an unequal, or core-periphery, relationship between the exchanging parties (Flannery 1968; Renfrew 1986), or if status was gained by buying ritual prerogatives and controlling esoteric knowledge (Helm 1979, 1988, 1993). This dissertation addresses some of these fundamental questions, focusing on the Meadowood Interaction Sphere.

HISTORY OF THE EARLY WOODLAND AND MEADOWOOD CONCEPTS

For more than two centuries, archaeologists interested in the prehistory of northeastern North America have located and excavated thousands of sites, each of them containing information about past cultural practices and adaptive strategies. The accumulation of sites fostered the need to order data in time and space. In this attempt, the diagnostic hallmark of the Early Woodland period has traditionally been viewed as the first

evidence of ceramics². The use of pottery types as temporal indicators was introduced into the Northeast by Richard MacNeish, and led to the publication of a ceramic typology for New York State (Ritchie and MacNeish 1949).

In archaeology, as in other disciplines, the first concepts proposed for classification had a strong influence on the way subsequent discoveries were discussed and interpreted. Across northeastern North America, for example, most of William A. Ritchie's (1944, 1961) now-decades-old types and classifications are still used today to assess the position of archaeological assemblages within the cultural sequence of the area.

In 1938 and 1940, Ritchie investigated several sites near Brewerton, on Oneida Lake, New York State. At one site, known as Oberlander 2, evidence for a distinct mortuary complex was found with high frequencies of grave goods associated with a crude interior-exterior cordmarked pottery, which came to be called Vinette 1. Adopting the Midwestern Taxonomic System (McKern 1939), Ritchie (1944) characterized these early ceramics as occurring in the Early Woodland period, specifically in the Vine Valley aspect and the Point Peninsula 1 focus. Point Peninsula mortuary ceremonialism was considered to have direct affinities with Adena manifestations to the west (Granger 1978: 22). The discovery of very similar burial practices and offerings at other New York State sites (e.g., Wary, Pickens, Muskalonge Lake, Hunter) led Ritchie to propose the concept of an "Early Woodland Burial Cult." Although contemporaneous habitation sites were known, this concept referred exclusively to burial components and was thought to reflect some social differentiation within communities (Ritchie 1955: 76).

The definition of the "Early Woodland Burial Cult" was based on a constellation of diagnostic mortuary traits: cremation of bone bundles; redeposition of incinerated remains; occasional multiple cremations or cremation associated with unburned skeletons; inclusion of fine artefacts with the dead; intentional destruction of grave goods; burning of artefacts at cremations; association of red ochre with burials; and caches of leaf-shaped "blades" (Ritchie 1955: 75-76). Using these traits, Ritchie argued for a relationship of this cult with Middlesex (Adena), Hopewell and Orient phases. Common elements were due to the sharing of a "core of religiosity" by people with common technology in a common adaptive milieu.

² It is worth noting, however, that such a division has been questioned by archaeologists who believed that this criterion masks the cultural continuity between the Late Archaic and Early Woodland periods (see Brown 1986; Fitting and Brose 1971; Stother and Abel 1993).

Differences, on the other hand, were created by localized cult development, or innovation (Ritchie 1955: 75).

In his classic synthesis *The Archaeology of New York State*, first published in 1965, Ritchie adopted Phillips and Willey's (1953) theoretical positions. The sequential ordering of the archaeological record was thus broken down into *stages, cultures, phases, and components*. Point Peninsula 1 was divided into two phases: the Meadowood and Middlesex phases³.

The Meadowood phase was named after the name of the estate of Mr. Wray in Monroe County, New York, where the first site of this archaeological complex was found and excavated in 1930. In 1965, it represented a local culture located in the western and central parts of New York State and comprised little more than a dozen sites. In the last 25 years, several Meadowood phase sites have been reported and excavated outside the boundaries of New York State (Clermont 1978; Clermont and Chapdelaine 1982; Chrétien 1995a; Granger 1978; Lévesque et al. 1964; Spence and Fox 1986). As a result, the Meadowood concept now generally refers to a network of interrelated groups distributed throughout the Lake Forest region between 3000 and 2400 BP (Papworth 1967).

One of the most consistent elements of the Meadowood culture is the presence of what has been traditionally called Meadowood cache "blades." These are thin, highly standardized, subtriangular bifaces, generally varying in length from 40 to 50 mm (see next chapter for a more detailed analysis of Meadowood point dimensions), that are often found in varying quantities in burials and caches. Since the technological characteristics of these objects do not fit the conventional definition of blades⁴, I will refer to them as Meadowood cache bifaces in this dissertation. Other authors have chosen to call these objects *quaternary blanks*, but it is my contention that the term blank can also be ambiguous. Meadowood cache bifaces are almost exclusively manufactured from Onondaga chert. This high-quality chert is easily recognizable by its mottled and streaked structure, its gray, blue-gray, or tan colours, and its shiny luster. Geological sources of Onondaga chert are located in western New York State and on the north shore of Erie Lake in Ontario. Meadowood cache bifaces could be

³ Since the definition of the Middlesex concept is based solely on mortuary data, its nature and its association with a particular time period are still a matter of debate among archaeologists today. It is generally recognized that Middlesex followed the Meadowood phase in the Northeast. The similarities observed between these two groups of sites strengthen the hypothesis of continuity in mortuary practices from Early to Middle Woodland periods.

⁴ Blades are flakes that are at least twice as long as they are wide and that have parallel or subparallel sides and at least two ridges on the dorsal (outer) side.

transformed into side-notched projectile points or bifacial triangular scrapers, two other Meadowood diagnostic traits. Because of the high standardization in the production of cache bifaces, Meadowood projectile points and scrapers are also very homogenous objects across the study area. Meadowood manifestations can also be recognized by the presence of “birdstones,” gorgets, stone and ceramic tubular pipes, and copper and shell ornaments. These finely crafted items, often manufactured out of exotic raw materials, represent minority types at Meadowood sites. The presence of Vinette 1 pottery, representing the first evidence of ceramics in northeastern North America, is another Meadowood diagnostic trait. The presence of such pottery (often but not always cordmarked on both interior and exterior surfaces [Taché 2005]), is common but only in small concentrations, indicating a limited use of the new ceramic technology. Pottery is very rarely found in burials, although it has been found near graves in some mortuary sites.

CONTRASTING INTERPRETATIONS OF THE MEADOWOOD INTERACTION SPHERE

In this dissertation, the Meadowood complex will be referred to as the *Meadowood Interaction Sphere*. Indeed, Caldwell’s (1964) definition of an interaction sphere as a network involving several regional cultures that may retain their distinctiveness at the level of subsistence technology and local crafts, but which share supralocal values, rituals, behavior, styles, and materials seems appropriate to apply to Meadowood manifestations. Indeed, their vast spatial distribution, from the western Great Lakes to the Atlantic Coast, and from the Canadian Shield to the lower Delaware valley (Figure 1.1), necessarily implies several regional cultures. One objective of my study is to better identify the various groups involved, and this will be partly achieved by dividing this vast territory into several distinct subregions, within which the quantity and nature of Meadowood manifestations will be assessed.

My use of the interaction sphere concept does not assume the presence of centers (where ideas and ritual goods originated) or peripheries (where the occurrence of these ideas and goods fell to zero—Bourque 2004: 39). Instead, this construct will be treated as a hypothesis to be tested within a theoretical framework.

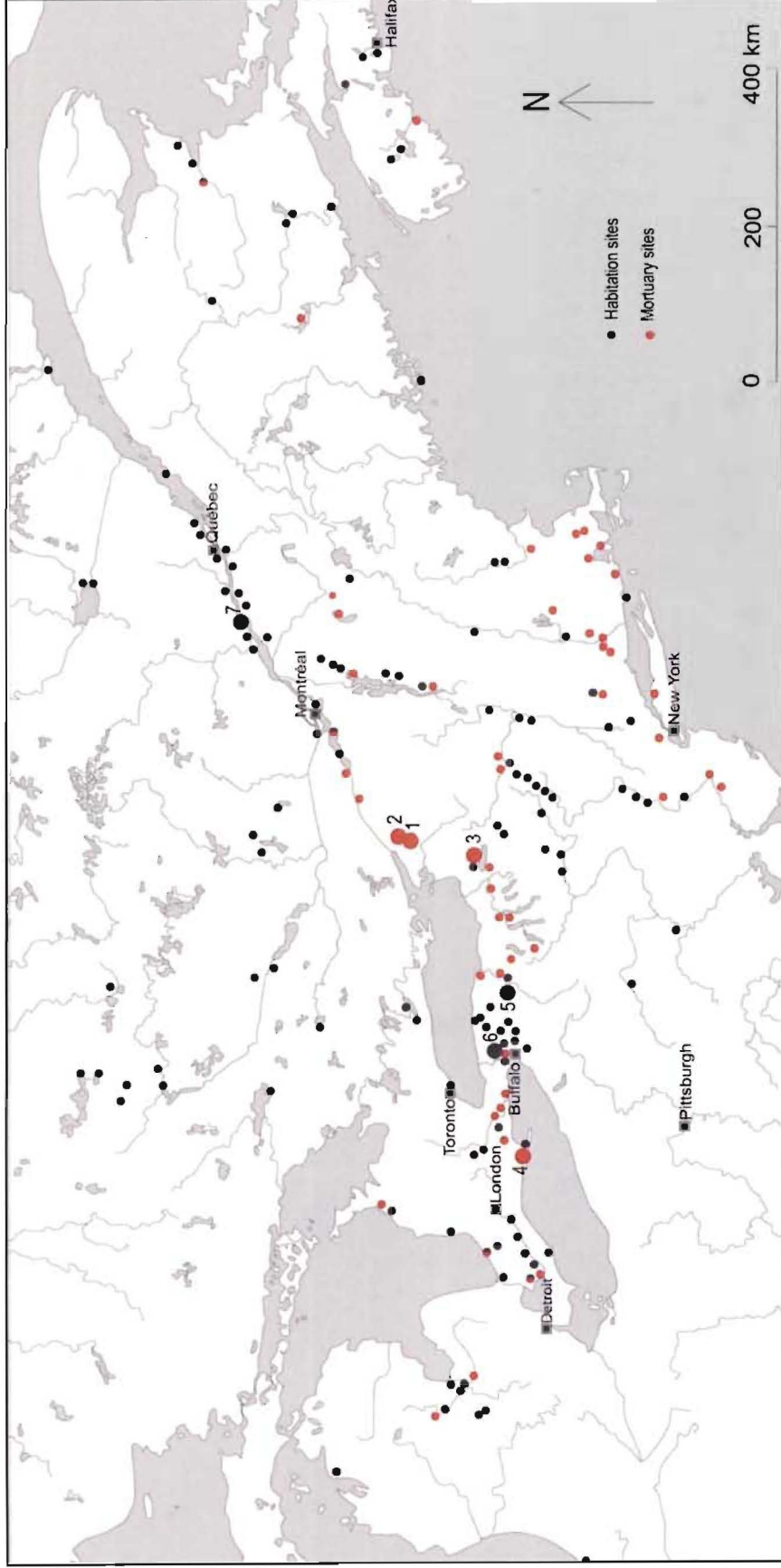


Figure 1.1 Distribution of Meadowwood sites
 1, Hunter; 2, Muskalonge Lake; 3, Oberlander 2; 4, Bruce Boyd; 5, Scaccia; 6, Riverhaven 2; 7, Batican

Hayden and Schulting (1997) believe that social inequalities are implied by the very existence of interaction spheres as defined by Caldwell. Again, this will not be used as an assumption but rather as a hypothesis to be verified. Similarly, although Caldwell suggested the interacting agents could be, or often were, elites, he did not emphasize that this was always the case. Thus, the agents involved in the Meadowood Interaction Sphere need to be identified. Finally, the mechanisms allowing for a mutual influence between distinct groups will have to be defined.

In the following section, I outline three sets of factors — ritual, economical, socio-political — that may account for the establishment and maintenance of interaction spheres in prehistory. The exchange models deriving from these factors will be compared with data about the objects circulating in the Meadowood Interaction Sphere, their contexts, the distribution of sites across the landscape, and other characteristics of Meadowood communities in order to determine which model best fits the available data. Specific expectations derived from each scenario are presented next.

Ritual Factors and the “Burial Cult” Exchange Model

The Meadowood concept was first defined by Ritchie (1955) as a cult shared by several cultural groups. In this view, the sharing of traits between various communities resulted from the diffusion of religious ideas and cult-related items. Ritchie’s scenario involves peaceful trading relationships between groups as a means by which ideas and ceremonial objects related to the “Cult of the Dead” were exchanged. Trade would have been facilitated by the extensive system of waterways characterizing the Lake Forest region and its surroundings, where a majority of sites have been found. That goods and raw materials were primarily transported by water is further supported by the riverine or lacustrine location of most Meadowood sites (Ritchie 1965: 195).

Ritchie’s interpretation of the Meadowood complex as a burial cult adheres to the prevailing normative/culture history approach of pre-1960 archaeology, which defined cultures as sets of traits, originating in one area and diffusing to others (Pleger 1998: 25). This type of reconstruction neglects potential economic and/or social reasons for the establishment and maintenance of interaction spheres and the circulation of goods across the landscape (Heckenberger et al. 1990: 112). In this context, it is unclear what were the

benefits for participating in such ritual networks, unless ideology justifies other economic or political goals.

Economic Factors and the “Risk-Buffering” Exchange Model

Joseph Granger (1979) challenged the idea of an Eastern Burial Cult being responsible for the distribution of Meadowood manifestations in the Northeast. According to him, economic factors were responsible for the movement of Meadowood traits across the landscape. He argued that a form of “peace fare” facilitated interregional exchange (Granger 1979: 114). He also maintained that the acquisition of cache bifaces manufactured from high grade, Western Onondaga chert would have been one of the main incentives for participating in the Meadowood network.

Similarly, William Haviland and Marjory Power believed that Meadowood communities were composed of “small, autonomous, dispersed social groups and that alliances may have been formed between groups based on economic reciprocity by which access to resources was ensured” (Haviland and Power 1994: 110). The assumption underlying this economic framework is that the function of interaction and exchange is to increase the stability of the local subsistence system. According to Steven Simms (1979), the instability accompanying the transition toward food production at the beginning of the Early Woodland period resulted in pressures to exchange food products, thus fostering the maintenance and elaboration of existing exchange systems.

Sociopolitical Factors and the “Trade Fair” Exchange Model

A number of authors have favoured a socio-political framework to account for manifestations that are partly contemporaneous and very similar in kind to the Meadowood Interaction Sphere. Stothers and Abel (1993: 66) note that:

It has long been argued that the maintenance of regionally based ritual centers and their attendant trade and exchange networks, such as those responsible for Late Archaic to Early Woodland regional centers, the Hopewellian Interaction Sphere, and the Mississippian florescence, was possible only under the direction of an authority structure; or with the facilitation of a resource/information-controlling corporate body, who directed access to restricted resources, ritual centers, and to cemeteries (Brose 1979; Green and Sassaman 1983: 278; Hayden 1990; Rothschild 1983; Spence 1982: 187; Spence et al. 1984).

Thomas Pleger (2000) evoked socio-political factors to explain the transition from Old Copper to Red Ocher exchange systems in the western Great Lakes. Red Ocher shares many characteristics with the Meadowood Interaction Sphere, including greater frequency of exotics in sites, increasing burial ceremonialism, and participation to large-scale trade networks (Pleger 2000: 172). Incidentally, Pleger (2000: 180) perceives the Red Ocher trade system as a regional variant of a larger interaction sphere that includes Meadowood manifestations. To explain these developments, Pleger (1998: 56; 2000: 180) insists on the role of successful traders, emerging in the context of new ecological conditions and taking advantage of the exchange system to increase individual and kin status through their ability to obtain rare valuables.

In a similar fashion, Bruce Bourque (1994: 34) observed that the diffusionist and adaptationist models fail to account for the non-utilitarian nature of the objects circulating in the Adena network, their concentration in mortuary or ritual sites, and the widely separated nodes in which they are found. Moreover, if these interaction spheres were solely adaptive, Bourque wonders why some of them declined drastically at the end of the Early Woodland period, without significant environmental changes in northeastern North America (Bourque 1994: 39). Alternatively, Bourque believes in the existence of a political network unequally distributed in space and applies Schortman's (1989) notion of salient identity to account for it.

In a paper presented at the 1997 Annual Meeting of the New York State Archaeological Association, Timothy Abel drew from Jackson's (1991) trade fair model to interpret Meadowood burial practices and community dynamics. More recently, this idea of regional trade fair has been adopted to interpret the Transitional Archaic Williams Mortuary Complex in Northwestern Ohio (Abel et al. 2001). Following their lead, the framework offered by the trade fair model will be evaluated as an alternative explanation of the Meadowood Interaction Sphere.

METHODOLOGY: EVALUATING INTERACTION MODELS IN ARCHAEOLOGY

As mentioned at the beginning of this chapter, the underlying assumption of my research project is that different motivations for participating in interaction spheres will

result in distinct archaeological patterns and assemblages (Martin 1999: 198). The four data sets used in this study to discriminate between ritual, economical, and sociopolitical explanations of the Meadowood Interaction Sphere are discussed in the next section. These include material manifestations, spatial distributions, contexts, and data on Meadowood communities (Table 1.1).

Meadowood Material Manifestations

In terms of material manifestations, the “Burial Cult” exchange model discussed above involves the circulation of non-utilitarian, ritual objects. Ritual paraphernalia and cult-related items may include objects suggesting trance induction (e.g., turtle-shell rattles, deer antler tine tinklers, smoking pipes), objects of divination (e.g., quartz crystals), and healing tools (e.g., turtle-shell, bird bone sucking tubes) (Carr 2005: 581-582).

On the other hand, one would expect raw materials or food resources necessary for subsistence to circulate in a network established primarily for economic and practical reasons. Admittedly, evidence for the exchange of subsistence goods may be hard to detect archaeologically, since many would mainly consist of perishable commodities. To help overcome this preservation bias, the economic model can be indirectly supported by documenting relative abundances and unequal distributions of resources. The use of ethnographic analogies can also point to the relative importance of perishables in trade. Wealth items can be exchanged for food to even out environmental variability over time and space. As such, they can be associated with the “risk-buffering” exchange model (Halstead and O’Shea 1982; Rappaport 1967: 106-107; Strathern 1971: 112-113; Suttles 1960). However, since environmental instability and restricted surplus are seen as the prime movers of prestige technologies in adaptationist explanations, the economical scenario predicts a limited production of prestige items (Hayden 2001a: 249).

Within a socio-political model, a widespread and expanding occurrence of a variety of prestige items is expected (Hayden 2001a: 249). In this scenario, prestige items reflect increasing social inequalities and constitute evidence of ownership and competitive displays of success. Emerging elites use prestige objects to transform surplus food into more durable material items, create social bonds through gift and debt relationships, validate and materialize important events as well as to display economic success and political power (Hayden 1998).

Table 1.1 Theoretical models explaining the Meadowood interaction sphere

| Archaeological correlates | | Factors underlying interaction sphere | | |
|------------------------------------|---|---------------------------------------|-----------------------------------|---|
| | | Ritual | Economical | Socio-political |
| 1. CIRCULATING OBJECTS / MATERIALS | Utilitarian/subsistence related items | | ✓ | |
| | Non-utilitarian prestige items | Cult items | Wealth items (exchanged for food) | Status items |
| 2. CONTEXTS | Type of sites | Mortuary | Domestic | Gathering, mortuary, habitation |
| | Associated features | Burials, caches | Middens, houses | Burials, caches, special features |
| | Differential distribution in features and sites | | | ✓ |
| 3. DISTRIBUTION OF SITES | Homogenous distribution | ✓ | | |
| | Function of distance from material sources | | ✓ | |
| | Concentration in certain areas | Core | | Rich areas |
| 4. COMMUNITIES | Subsistence strategies | ? | Resource uncertainties | Corporate labour |
| | Social inequalities | Possible | Limited | Reflected in burial practices, feasting, etc. |
| | Storage | Possible | Possible | ✓ |
| | Specialization | Possible | | ✓ |

Prestige items are usually artefacts that require considerable time and effort investment in their procurement and/or manufacture. They are often exotic, rare, or unusual raw materials, finished products, or foods. Exotic products can be defined as objects or materials with sources located beyond 100 km from the site where they were found (Pleger 2000: 181). Finely crafted, non-utilitarian bifaces of exotic raw material, and personal adornment items, metal and shell objects, and animal skins are just a few examples of objects commonly used to convey status (Pleger 1998: 27).

In my analysis of Meadowood assemblages, I will attempt to identify the primary function of artefacts (i.e., subsistence goods, prestige items, or ritual paraphernalia) based on a number of technological, stylistic, and use wear attributes. My functional interpretations will be based on such variables as the source, craftsmanship, standardization, and visual qualities of Meadowood diagnostics. The presence or absence of use wear will also help

discriminate between utilitarian and non-utilitarian artefacts. Cult items, however, are often made of exotic materials or in labour-intensive fashions, and it may be impossible to favour ritual over socio-political factors based solely on the material manifestations of the Meadowood Interactions Sphere. Moreover, all three exchange models (i.e., “burial cult,” “risk-buffering,” and “trade fair” models) potentially involve the movement of non-utilitarian/wealth items. To determine the role that such valuables played in Meadowood communities, and therefore discriminate between the three alternative scenarios, contexts of use will have to be considered:

Contexts

As a way to infer artefact functions, examining contexts will contribute to testing predictions about the nature of the objects/raw materials circulating in the Meadowood network. In this study, contexts will also be assessed by contrasting the nature and quantity of Meadowood trade items in habitation vs mortuary sites and by looking at their association with specific features within individual sites. It is important to keep in mind, however, that contexts reflect at best the last usage of an artefact, when they do not simply represent a refuse, or abandonment context. When coupled with other data, contextual analysis can nevertheless help answer some important anthropological questions:

Very generally, the archaeologist can differentiate ritual contexts — burials, caches, special architectural features — from domestic contexts — houses, fill, midden — and the restriction of a good to one or another should indicate the commodity's dominant use (Earle 1982: 9).

If the Meadowood Interaction Sphere was mainly ritual in nature, then trade items would more likely be found in mortuary or ritual sites, associated with graves or caches. Conversely, the recovery of significant numbers of exotic/finely crafted items in habitation sites would contradict the ritual model.

According to the “risk-buffering” exchange model, a majority of trade items should be found in domestic sites, in contexts such as middens or houses. This is also true of the wealth items potentially circulating within the network. Indeed, the economic scenario is theoretically inconsistent with the removal of wealth from circulation through burial or destruction. There is thus no reason for prestige items to be intentionally destroyed or to occur in ritual or mortuary contexts, except perhaps as personal possessions of the deceased.

A predominance of prestige items in mortuary sites would thus contradict an economical model.

Hayden proposed that the dominant context of use of prestige items is in feasts, where they are publicly displayed and where gifting is often recorded and advertised (Hayden 2001a: 254). Consequently, the observed association of significant numbers of prestige items with gathering and mortuary sites, but also occasionally with habitation sites⁵, would fit a sociopolitical model in which feasts at gathering locales, funerals, and residences represent prestige items' main context of use. As their availability increases, prestige goods can be obtained by more and more members of a society. The elite can slow down this emulation process by diminishing the availability of status items or by adopting new classes or rarer items to indicate social status. Removing wealth from circulation through burial or destruction also results in a continual demand for new prestige goods, which in turn stimulates the production of surplus and the development of trade networks (Chapman 1995; Schulting 1995, 1998). Therefore, intentional destruction and/or the association of valuables with special structures, graves, or caches support their use as prestige items.

Site and Artefact Distribution

The ritual scenario for the establishment and maintenance of the Meadwood Interaction Sphere implies the existence of a core and peripheral areas, where the developments in the periphery are dependent upon what happens in the ritual core. Diffusion of ideas would logically result in a relatively homogenous distribution of sites on landscape, although the most typical and elaborate expressions are expected to occur in the core area.

Among the corollary assumptions of the “risk-buffering” exchange model is that inequalities in resources are randomly distributed and that all communities are equally affected by resource fluctuations in a region. In such environments, no specific locality can be identified as most reliable or abundant (i.e., as the ideal place to go to get food or cash in prestige items for food). Therefore, the degree and frequency of contacts between communities, typically identified archaeologically through similarities and differences in artefactual types and proportions, should be a function of the distance separating them. We

⁵ Rituals, political gatherings, and feasts have been documented archaeologically and ethnographically in many domestic contexts (Adams 2001; Clarke 2001; Hayden 2001a).

should also observe declining frequencies of exotic materials as distance from their source areas increases.

On the other hand, since the socio-political model assumes that exchange was preferentially directed toward wealthy communities, greater quantities of traded items and exotic materials at a few loci are expected (Hayden and Schulting 1997: 76). Concentrations will likely occur where resources are relatively abundant, spatially restricted, and not susceptible to overexploitation. These conditions would be met, for example, at locations characterized by high fishing productivity, in intensive nut collecting areas or at sites especially suitable for plant growth. Underlying this assumption is the prediction that there will likely be, in northeastern North America, Early Woodland groups that did not participate in the Meadowood Interaction Sphere, due to the low productivity (lack of surpluses) of their living environment.

If this prediction is true, few or no Meadowood trade goods will be recorded in regions characterized by scarce and/or unpredictable resources. The identification of non-diagnostic Early Woodland sites containing locally-produced mundane items, but no exotics, would further support this idea. In the Eastern Woodland, archaeologists typically rely on diagnostic artefacts to assign a site to a particular period/culture. Confidently confirming or refuting the hypothesis that non-Meadowood sites characterize certain regions in northeastern North America is therefore a challenging enterprise and will require the systematic dating of stratified archaeological components. This cannot be accomplished in the context of a single dissertation and my research relies on available and published data, for lack of a better alternative.

Besides the incapacity of transforming surplus food into durable items, warfare or inter-group conflicts may also prevent certain communities from participating in the Meadowood Interaction Sphere. In this study, a lack of evidence for conflicts, coupled with a concentration of Meadowood components in resource-rich areas, will tentatively be interpreted as an indicator that exchange was preferentially directed toward wealthy communities. Other historical or ideological reasons may admittedly explain the variability of choices exerted by different groups, but these are more difficult to identify in the archaeological record and their acceptance generally requires ruling out other, more controllable, hypotheses. In the case at hand, for example, unidentified historical/ideological factors may be evoked for “opting out” of the Meadowood Interaction Sphere if trade goods

are absent from regions where resources are plentiful and predictable while evidence of inter-group conflicts are lacking. Identifying these possible other motives, however, goes beyond the scope of my dissertation.

To evaluate predictions regarding spatial distribution patterns, an inventory of Meadowood archaeological sites in northeastern North America will be generated and mapped based on a comprehensive literature review. Northeastern North America will also be divided into physiographic provinces and sub-regions. Comparing the physical characteristics of each physiographic province with the distribution and nature of Meadowood manifestations across the landscape will provide an important basis for understanding the ecological foundations of the Meadowood Interaction Sphere. Such variables as the total number of Meadowood sites relative to contemporaneous other sites, the number of habitation versus mortuary components, and the density of sites will be discussed in relation to resource availability and predictability, transportation routes, and access to raw materials.

My analysis also includes a study of the distribution and relative frequency of exotic raw materials and traded items in Meadowood residential and burial sites. I will determine whether their occurrence is governed by distance to source areas or by a monopolized access to these materials by privileged individuals or communities. Sources or source area(s) have already been identified for some of these raw materials. Beside Onondaga chert originating from the Niagara Peninsula in both Ontario and New York, raw materials circulating in the Meadowood interaction network included marine shells from the Atlantic Coast, Mistassini and Ramah cherts from northern Québec and Labrador, and native copper and slate from the Upper Great Lakes. The shortcomings inherent in the domain of raw material sourcing and the potential existence of secondary or as yet unidentified sources are problems that may be overcome by examining the distribution of several materials, as well as the finely crafted items that were made out of them. Because lithic products are by far the most numerous and varied in Meadowood assemblages, I will pay considerable attention to the identification and sourcing of stone. Identification relied primarily on macroscopic analysis, as well as consultation with geologists and comparisons with reference collections housed in universities and museums, such as the New York State Museum in Albany.

Meadowood Communities

This study also includes a discussion of the seasonality, abundance, and predictability of the floral and faunal resources available in the Meadowood landscape and recovered from archaeological sites. The main purpose behind this discussion is to highlight the possible consequences of subsistence constraints/possibilities and choices on Meadowood's technology, settlement patterns, social organization, and trading strategies. This will be the focus of Chapter 5.

Unless they require very little labour investment, the production of cult-related items expected in the ritual model implies a certain stability of the resource base. This in turn is not inconsistent with the existence of storage, social inequalities, and craft specialization. However, it should be noted here that there is no compelling reason for cult related artefacts to be manufactured in exotic materials or in labour-intensive fashion if their primary role was symbolic.

Predictions associated with an economic scenario, on the other hand, include the presence of complementary ecological niches and/or some form of resource uncertainties. Under such conditions, storage, like inter-group exchanges, may have represented one of many risk-buffering strategies. Social organization, in this case, is generally assumed to be egalitarian.

Alternatively, the social inequalities implied by the socio-political framework depend upon subsistence intensification and the relative amount of surplus that could be produced on a consistent basis by families or larger economic groups (Price and Brown 1985; Plegler 1998: 20). The recognition of corporate labour subsistence practices (Hayden 1995: 17-20), storage facilities, or concentrations of Meadowood prestige items in localities with unusually productive resources are thus indicators that would tend to favour the socio-political model. Archaeological indicators of social differentiation and inequalities, such as the presence of skilled specialists or the differential distribution of Meadowood items in graves, should also be observed if the "trade fair" exchange model is favoured.

Together, this set of four material correlates (i.e., material manifestations, contexts of use, site and artefactual distributions, subsistence and social organization) will allow me to assess the relative importance of ritual, economic, and socio-political factors in the development of the Meadowood Interaction Sphere.

DESCRIPTION OF SITES ANALYZED

The data used in this study come from a comparative analysis of Meadowood assemblages from large habitation and mortuary sites located in the Ontario/Erie and St. Lawrence Lowlands. To date, over 225 Meadowood sites have been documented in northeastern North America over an area extending from Virginia and North Carolina in the south to the boreal forest of Ontario and Québec in the north and from the prairie grasslands in the west to the Atlantic Ocean in the East (Trigger 1978: 1) (Figure 1.1; Appendix A). However, the quality of the archaeological data that can be used to study patterning of Meadowood materials is highly variable. The sites I used in my analysis were selected according to the following criteria:

- 1- They had to be located in areas of northeastern North America typically included in the Meadowood Interaction Sphere;
- 2- They had to contain clearly demarcated or isolated Meadowood components, allowing me to consider the totality of the assemblages rather than only diagnostic artefacts;
- 3- A significant proportion of each site (at least 5%) had to have been carefully excavated so that contextual or temporal associations could be reconstructed;
- 4- There had to be an adequate sample of domestic assemblages and associated features to provide a definition of Meadowood's material manifestations. Large habitation sites (1 to 4 hectares), characterized by great length of occupation and imposing artefactual assemblages (at least 600, and up to more than 1,600 objects), were thus selected for this study; and
- 5- They had to be available for analysis. Collections stored and inventoried in public institutions and universities in the Northeast were targeted.

Three habitation and four mortuary sites met the above criteria and were included in my comparative analysis. In the next section, I describe the physical settings and summarize the history of research associated with these seven components.

Mortuary Components

Muskalonge Lake and Hunter sites (Figure 1.1: 1-2)

Excavations at the Muskalonge Lake and Hunter sites by the New York State Museum and Science Service led to the publication of *Recent Discoveries Suggesting an Early Woodland Burial Cult in the Northeast* (Ritchie 1955). In this report, the hypothesis of a new cultural group migrating into the Northeast and bringing with them a complex mortuary cult followed the description of the two assemblages. These two burial components, central to the definition of the Meadowood concept, are located in Jefferson County, northern New York, five km apart as the crow flies but approximately 20 km apart when following the watercourse of the Indian River (Ritchie 1955: 9). The Hunter and Muskalonge collections, stored at the New York State Museum in Albany, were reanalyzed.

Shifting sand at Muskalonge Lake and Red Lake sites revealed archaeological remains that were surface collected by various individuals from at least 1915. In 1928, George and Charles Sheley, who owned a farm at the head of Red Lake, made the first major discovery at the Muskalonge Lake site. On the eastern slope of a sand knoll overlooking Muskalonge Lake, they noticed a pile of fire cracked rocks and excavated its periphery. This first feature discovered at the Muskalonge Lake site (later interpreted as a burial pit covered by a stone crematory) revealed, approximately 120 cm below the surface, a large mass of red ochre within which were embedded some 1,500 Meadowood cache bifaces (still to date the largest number recorded for a single Meadowood feature) and two side-notched projectile points. Excavations by William Ritchie, then head archaeologist at the New York State Museum and Science Service, were conducted in 1951 and 1952. The Muskalonge Lake site occupies an area of approximately 500 m² on a 320 m-wide sand ridge extending for about 1.6 km between the northern shore of Muskalonge Lake and the Indian River. The ridge's maximum elevation is approximately 45 m above the mean lake level, itself 92 m above sea level. Sand knolls created through erosion occur along the crest of the ridge. Three of these natural mounds were found to be the loci of Early Woodland burial features, between which stone crematories were also documented.

The Hunter site covers an area of about 18,500 m² on the southern part of the Indian River valley, between Red Lake outlet and the steep rocky highland constituting most of the lake's north shore. Four stone crematories, as well as five probable hearths, occur on a

long, wind-eroded ridge, designated Locus C (Ritchie 1955: 23). The ridge varies in elevation from 11 to 14 m above the neighbouring lake level, itself 93 m above sea level. Four burial pits and a feature probably later in date were found on a smaller, steep-sided sand knoll rising about 8 m above the lake level. This area, designated Locus B, is located about 150 m from the higher ground of Locus C and is separated from it by a broad hollow. The burials were discovered on a small rise near the ridge's southern end.

Separated loci of crematoria and burial pits at the Muskalonge Lake and Hunter sites suggest the periodic performance of mortuary ritualism at a sacred area by a group resident elsewhere in the region. Indeed, the habitation traces on both sites are too limited to account for more than a brief sojourning while cremation and inhumation of the dead were accomplished.

Oberlander 2 site (Figure 1.1: 3)

The Oberlander 2 site, named after the owner of the property where it was found, is a nearly level-topped knoll located on the shore of the Oneida River near the outlet of the Oneida Lake, in central New York (Ritchie 1944: 152). The groups who used this burial precinct likely occupied the nearby Vinette site. This area was historically renowned for its abundance of fish, especially Atlantic salmon and eels. A large seventeenth-century Iroquois fishery station, Techiroguen, was located at the Oneida outlet, which furnished the principal village with salmon the entire year (Jesuit Relations [JR] 42: 35). Spring and fall fishing expeditions were organized there and permanent fish weirs were employed (JR43: 123)⁶.

Excavations at the Oberlander 2 site were conducted by the Rochester Museum under the direction of William Ritchie in 1938 and revealed 22 burial pits. These important discoveries, later incorporated within the "Early Woodland Burial Cult" (Ritchie 1955: 67) were only briefly described in Ritchie's *Pre-Iroquoian Occupations of New York State* (Ritchie 1944: 152-160, pl. 71-73, trait table pp. 354-366). A visit to the Rochester Museum & Science Center, where the collections are still stored today, allowed consultation of field notes and a new examination of the assemblage. The results of this research are included in the comparative analysis presented in Chapter 2.

⁶ It is improbable, however, that salmon, which reaches its peak during the Little Ice Age (14-18th centuries), was as abundant in Early Woodland times (Carlson 1988).

Bruce Boyd site (Figure 1.1: 4)

The Bruce Boyd site is an Early Woodland burial area located on a sand knoll near Long Point, on the shore of Lake Erie in Ontario. Following William Fox's first recording of a large red ochre stain associated with a Vinette 1 sherd on top of the knoll, excavations at this prehistoric burial component were conducted in 1975 and 1976. An area of 225 m² was cleared, revealing 68 pit features. These features, together with their associated human skeletal, zooarchaeological and artefactual remains, reflect an extensive use of the area by a number of Late Archaic, Early Woodland and Late Woodland groups. My study focuses on the Early Woodland component, which comprises 170 artefacts recovered within 38 features assigned to this time period on typological grounds, on the basis of stratigraphic relationships, radiocarbon dates, or fluorine readings (Spence et al. 1981). Overlapping of the Meadowood features indicates repeated use of the cemetery (Spence et al. 1990: 133). Moreover, the presence of Meadowood remains at the multicomponent Boyd Lakefront site, located about 250 m southwest of the cemetery, indicates probable use of the latter by occupants of a nearby habitation site.

Relying mostly on feature contents, Spence (n.d.) tentatively identified 13 Early Woodland burials, three refuse pits, and three caches. The function of the remaining 19 Early Woodland features remains uncertain. Funerary offerings included cache bifaces, Meadowood points, trapezoidal gorgets, galena, copper beads, copper bracelets, iron pyrites and red ocher. The ceramics recovered at the Bruce Boyd site, cordmarked on both interior and exterior, are typical of the Early Woodland period in the Northeast. Data from the Bruce Boyd site presented in this dissertation come from first-hand observations of the collection at University of Western Ontario in London, as well as from published (Spence and Fox 1986: 23-28; Spence et al. 1978, 1981, 1990: 132-133) and unpublished (Spence n.d.) reports on this burial component.

Habitation Components

Scaccia site (Figure 1.1: 5)

The Scaccia site, located about one kilometre south of the Cuylerville town in western New York State, borders a swamp on the Genesee River flood plain. It is located on a prominent ridge of land extending along the south side of Little Beard's Creek on the

western side of the Genesee River. The remains of intensive habitation at the Scaccia site make it one of the largest known domestic components of the Meadowood phase. Excavations conducted in 1963 (by Charles F. Wray, member of the Morgan Chapter, New York State Archaeological Association) and 1965 (by the New York State Museum and Science Service under the direction of Robert E. Funk) revealed the presence of more than 125 features distributed over the site, which has an estimated size of more than 4,000 m². The features range from 30 to 245 cm in diameter and from 10 to 140 cm in depth: “This concentrated refuse area was so prominent that it was clearly visible from the air” (Wray 1965: 3).

Many of the basin-shaped features have been interpreted as storage pits, filled with varying quantities of refuse and artefacts. Other features were filled largely with fire-cracked stones sometimes interspersed with charcoal. Their dimensions vary from 30 to 230 cm in length (average: 89 cm), 30 to 120 cm wide (average: 72 cm), and 8 to 20 cm deep (average: 5.5 cm). These features are probable hearths and earth ovens, indicating food preparation activities. Variability in pit sizes may reflect concomitant variability, synchronically and/or diachronically, in kinds and quantities of food prepared. Post moulds were recorded within several features (Wray 1965: 3). Additional posts were thought to define an oblong structure (5.25 x 4 m), which was excavated in 1965. Three burials dated to the end of the Early Woodland period were also excavated, and one or two more tentatively identified from surface remains (Wray 1965: 5).

The data recovered by the New York State Museum were partially reported in *Aboriginal Settlement Patterns in the Northeast* (Ritchie and Funk 1973), where the Scaccia site was identified as a Meadowood component and used to exemplify Early Woodland settlement patterns. In the present study, the complete assemblage is considered for the first time. This was made possible by analysing both the 1963 assemblage, stored at the Rochester Museum & Science Center in Rochester (NY), and the 1965 assemblage, stored at the New York State Museum in Albany (NY), and compiling the resulting information.

Riverhaven 2 site (Figure 1.1: 6)

The Riverhaven 2 site revealed a long-term, recurrent Meadowood occupation. Most of the refuse from the Riverhaven 2 site is located on a narrow, 15-m-wide terrace bordering the Niagara River, on the easternmost promontory of Grand Island (Ritchie 1965: 189).

Such a location is less than 7 km from the Orchid B quarry site on the Onondaga Escarpment chert source (Granger 1979: 102). Eighteen features were associated with the Meadowood occupation at Riverhaven 2, half of which are large, deep pits probably used for storage. Among the activities documented at this component is the processing of herbivorous mammals and the manufacturing of Meadowood bifaces, but no mortuary or ceremonial activity.

Excavations at the Riverhaven 2 site were first conducted by Edward Kochan of the Ondiara Chapter of the Buffalo and Erie County Historical Society between 1960 and 1963. Fieldwork concentrated in two loci and uncovered a total of 78.5 m², although Kochan only reported on 58 m² (Kochan n.d.; cited in Granger 1978: 180). In his synthesis of *The Archaeology of New York State*, William A. Ritchie included this assemblage, which was then largely unpublished, in the newly defined Meadowood phase. An additional 3.7 m² was dug in 1967 by Granger and Taggart and in 1971, 201.4 m² of the site was removed during excavations hastened by an emergency threatening of the site. The data included in the present dissertation come from Kochan's and Granger and Taggart's 1967 excavations, and were taken from Joseph Granger's published Ph.D. dissertation (Granger 1978). To the best of my knowledge, the results of the 1971 field work remain unpublished and the collections are unavailable for study.

Batiscan site (Figure 1.1: 7)

Batiscan was the first well-established Meadowood site to be identified in southern Québec. At the time of its discovery, the site's clear affiliation with Hunter and Musalonge, the type components described by Ritchie in 1955 and located 400 km southwest of Batiscan in New York State, indicated that Meadowood groups had at least visited the St. Lawrence Lowlands east of Trois-Rivières. As mentioned above, the last 30 years witnessed an accumulation of data related to the presence of Meadowood communities in southern Québec, representing more than occasional visitors. Meadowood communities now occupy an important aspect of the region's cultural history between 3000 and 2400 years BP (Clermont et al. 1999: 67).

Batiscan was named after the town located just 1.6 km northeast of the site. It is located in a sandy terrain 1.6 km distant from the north shore of the St. Lawrence River in the province of Québec. In 1927, artefacts were collected from the surface of the Batiscan

site by the late W.J. Wintemberg, then working for the National Museum of Canada. The main excavation work was conducted in 1962 by late René Lévesque and a team from the Sherbrooke Archaeological Society. The major excavated portion of the site is situated on a 9 to 15 m high marine terrace bordering the St. Lawrence River floodplain. Wind erosion exposed various parts of the site. Excavation focused on two sandy knolls that were probably linked together and formed a ridge at the time of occupation (Taché 2005: fig. 2). While the total area of the site is unknown, it has been estimated that Batiscan extends a minimum of 2,500 m², which makes it a large habitation site for the Early Woodland period. About 295 m² were excavated, revealing three refuse pits and five hearths, as well as ceramic and lithic artefacts typical of the Meadowood culture. One of the refuse pits was about 2-m-long and contained a shell layer 60-cm-thick. Unfortunately, the depth of this feature was not mentioned in Lévesque's report (Lévesque et al. 1964: 4). Nevertheless, added to an abundance of turtle bones and the reconstructed location of the site in a swamp (discussed below), these data point to the exploitation of aquatic resources by the people living at Batiscan.

In a brief report published in 1964, M. Fitz Osborne discussed the paleoenvironmental conditions at the site before, during, and after human occupation (Lévesque, Osborne, and Wright 1964). Osborne argued that a part of the lower terrace was submerged during the Archaic period. During the Early Woodland period, people would have established their camp near a swamp bordering the St. Lawrence River floodplain. Isostatic rebound after occupation brought about the draining of the swamp and the retreat of the St. Lawrence River, which eventually acquired its current position 1.6 km away from the Batiscan site. Based on this reconstruction, and the relative homogeneity of the artefacts excavated at Batiscan, it was hypothesized that Batiscan reflects a relatively short occupation during the Early Woodland period. The subsequent position of the site away from the St. Lawrence River probably made it a less attractive location for permanent or semi-permanent habitation.

In the stratigraphic sequence observed at the Batiscan site, the Early Woodland occupation is buried by a layer of sterile fluvial sand. Based on this sequence, the presence of diagnostic items, and the homogeneity of the remains uncovered at Batiscan, it was hypothesized that this site reflects a relatively short occupation during the Early Woodland period (Lévesque et al. 1964: 27). This situation contrasts with most archaeological contexts

in the Northeast (characterized by long-term occupations and mixed components). To date, Batiscan represents the only site in the Upper St. Lawrence valley with a distinct, single Meadowood component. This being said, it should also be mentioned that a few Archaic remains and Middle Woodland diagnostics have been found on the surface of the site probably representing a few short duration occupations.

Sites with distinct isolated cultural components are essential to have in order to go beyond the study of diagnostic artefacts and to define the regional cultural complex (on the basis of complete assemblages) that characterized the Early Woodland period in the Northeast. For this reason, and because the results of excavations at Batiscan have only been subject to preliminary analysis and a very brief publication (Lévesque et al. 1964), I chose to focus much of my study of the Meadowood presence in the Upper St. Lawrence valley on data from the Batiscan site. Data included in my study derive from a reanalysis of the entire assemblage, stored in part at the Canadian Museum of Civilization in Gatineau (Qc), at the Ministère de la Culture et des Communications du Québec in Québec City (Qc), and at the Musée Québécois de Culture Populaire in Trois-Rivières (Qc).

In sum, three habitation and four burial Meadowood sites were selected for this study. These are the only sites that met all my criteria for a detailed comparative analysis. Many of these components (i.e., Hunter, Muskalonge Lake, Oberlander 2, Scaccia, Riverhaven 2) contributed to the definition of Meadowood (Ritchie 1965) and are commonly cited in the literature as typical sites of this complex. With the exception of Riverhaven 2 (Granger 1978), however, data analyses and interpretations remain preliminary or brief, and date back to 30 to 50 years ago. Moreover, although Riverhaven 2 and other important habitation sites have been considered in the context of a settlement pattern study (Granger 1978), nobody ever focused on a comparison of large habitation and mortuary sites in order to document the structure of the Meadowood network, the mechanisms underlying the circulation of goods, and the incentives of the various participating groups. Consequently, revisiting these archaeological collections will greatly enhance our knowledge of the Meadowood Interaction Sphere, an important episode in Northeastern prehistory.

This sample represents less than five percent of all the reported Meadowood sites in the Northeast. Therefore, a number of analyses and discussions presented in this dissertation also rely on published data on other sites (not suitable for detailed comparison). Both my detailed comparative analysis of seven Meadowood sites and my literature review were

directed toward gathering information on the nature, distribution, and contexts of Meadowood artefacts, features, and communities in order to make inferences about Meadowood economic and socio-political organization.

STRUCTURE OF THESIS

This dissertation is organized in a way that each major category of material correlates is discussed in a distinct chapter. In Chapter 2, the material aspects of the Meadowood Interaction Sphere are presented by describing the local and exotic artefacts recovered from the seven Meadowood sites described above. Defining the types of objects circulating within the Meadowood network, and highlighting variability between Meadowood components are two important objectives of this chapter. Chapter 3 examines the spatial distribution of Meadowood components within a variety of physiographic provinces and regions. To understand the possible ecological foundations of the Meadowood Interaction Sphere, environmental attributes are contrasted with the quantity and the nature of the known archaeological manifestations. In Chapter 4, the distribution of exotic raw materials and of specific traded items in the landscape, in habitation versus mortuary sites, and within specific features at each, will be described. These contexts should contribute to our understanding of the motivations behind interactions. Chapter 5 focusses on more general aspects of Meadowood communities, such as their subsistence strategies, storage capacity, technological innovations, settlement patterns, and burial practices. The goal is to reconstruct Meadowood's social organization, and, more specifically, to assess the relative development of socio-economic inequalities in these communities. The latter issue is crucial for identifying the potential ritual, economical, and/or socio-political benefits that could have accrued from participating in the Meadowood Interaction Sphere. Finally, the various scenarios for the establishment and maintenance of the Meadowood Interaction Sphere will be evaluated in Chapter 6.

CHAPTER 2 – THE MATERIAL MANIFESTATIONS OF THE MEADOWOOD INTERACTION SPHERE

This chapter presents the results of a comparative analysis of seven major Meadowood sites. As discussed in the introductory chapter, Scaccia, Riverhaven 2 and Batiscan are mainly habitation components, while Muskalonge Lake, Hunter, Oberlander 2 and Bruce Boyd represent mortuary components. The results of this analysis will be used to identify the material correlates of the Meadowood Interaction Sphere, and to determine what objects and raw materials were circulating within this network. It will also be necessary to classify these traded items as prestige objects, cult paraphernalia, or subsistence goods. These issues are related to the first set of expectations that I propose to evaluate the interaction models within my theoretical framework (Table 1.1). While my main interests for the Meadowood Interaction Sphere involve the identification and analysis of traded items, the seven assemblages are here described in their entirety. This is justified, in the first place, by the need to distinguish traded items from objects that did not circulate in the network. Secondly, I believe that the role of these items can only be understood if compared to the remaining collection of locally produced artefacts. Locally produced artefacts may also help understand basic Meadowood subsistence strategies and adaptations. Finally, detailed descriptions of collections are relevant considering that, as mentioned in the introductory chapter, most of the components included in the present comparative analysis had only been briefly or partially reported upon.

For my analysis, artefacts were divided by raw materials: stone, bone and antler, shell, native copper, and ceramic. The stone category was further subdivided into flaked, polished, ground, and unmodified stone artefacts. Within each of these categories, the various objects recovered in the sites are described and compared. This chapter concludes with a discussion about the nature of the artefacts and raw materials that were circulating within the Meadowood Interaction Sphere.

STONE

Flaked Stone Artefacts

Within this broad category, fragmented and whole preforms are distinguished from fragmented and whole finished bifaces. The diagnostic Meadowood cache bifaces form still another sub-category of flaked stone artefacts. The other flaked stone items are divided between functionally-distinct classes such as projectile points, scrapers, and drills (Table 2.1). However, these classes can be misnomers if not supported by more precise tool-use patterns. Multifunctional or recycled tools are also difficult to classify in functional categories.

Table 2.1 Distribution of flaked stone artefacts at seven Meadowood sites

| | | Flaked stone tools | | | | | | | TOTALS |
|------------------|-------------------------|--------------------|------------|---------------|-------------------|------------|------------------------|-----------------|--------------|
| | | Preforms | Bifaces | Cache bifaces | Projectile Points | Scrapers | Drills / graving tools | Strike-a-rights | |
| Habitation sites | Batiscan | 28 | 77 | 6 | 66 | 149 | 17 | 1 | 344 |
| | Scaccia | 39 | 154 | 37 | 215 | 7 | 51 | 1 | 504 |
| | Riverhaven | 513 | 30 | 705 | 68 | 196 | 49 | 0 | 1,561 |
| Mortuary sites | Hunter | 0 | 3 | 243 | 10 | 16 | 1 | 2 | 275 |
| | Muskalonge | 0 | 1 | 1,712 | 12 | 3 | 2 | 6 | 1,736 |
| | Bruce Boyd ¹ | 0 | 3 | 70 | 33 | 12 | 4 | 1 | 123 |
| | Oberlander | 0 | 20 | 163 | 57 | 17 | 13 | 1 | 271 |
| TOTALS | | 580 | 288 | 2,936 | 461 | 400 | 137 | 12 | 4,814 |

1- Data for the Bruce Boyd site were taken from an unpublished manuscript by Michael Spence (Spence nd). When describing the content of the two cache features recorded at the site, this unpublished source mentioned slightly different number of bifaces, cache bifaces, and scrapers than mentioned in Spence et al. 1990: 132.

Preforms

In his study of the Meadowood settlement patterns in the Niagara Frontier, Joseph E. Granger (1978: 17) distinguished four technological stages involved in the manufacture of chert tools, with finished products as the fourth stage. The ordering of a continuous process such as tool production into stages is necessarily arbitrary. Nevertheless, it allows

archaeologists to identify and characterize manufacturing activities that were taking place at different sites.

Among the criteria used by Granger, the amount of edge retouch was decisive in classifying Batiscan's preforms. Put simply, primary blanks are crudely worked bifaces with deep detachment scars, secondary blanks have been slightly retouched on their edges to a more refined and symmetrical shape, and tertiary blanks are characterized by secondary pressure flaking along their edges (Granger 1978: 223). Generally speaking, bifaces become successively smaller during the manufacturing process. Quaternary blanks, or what I chose to call Meadowood cache bifaces in this study (see preceding chapter for a justification of this choice), are the finished products of this reduction sequence. As mentioned in the introductory chapter, they are thin, highly standardized, subtriangular bifaces typically varying in size from 40 to 50 mm. Meadowood cache bifaces rarely retain cortical surfaces, indicating they were made on flake blanks rather than nodules or cores (Ellis and Spence 1997: 122). Granger's primary, secondary, and tertiary bifaces are here subsumed under the term preforms. Finished bifaces will be discussed in the two next sections.

Nine secondary and 19 tertiary blanks were identified at the Batiscan site, indicating the manufacture of bifaces from relatively crude preforms (Table 2.2, Figure 2.1). The fact that no primary blank and only nine secondary blanks were recorded in the assemblage probably accounts for the relatively low proportion of residual striking platforms and cortex on Batiscan's preforms. Moreover, the high fragmentation rate of these preforms suggests that "the manufacture activity was apparently carried through to virtual completion, eliminating almost all whole blanks" (Granger 1978: 223). Appalachian chert is the raw material involved in the manufacture of 78% (n=7) of secondary preforms from Batiscan. A greater diversity of raw materials and a more common use of exotic stones characterize the 19 tertiary blanks found at Batiscan (Table 2.3).

Based on the relatively small number of blanks and the diversity of raw materials represented, biface production was probably conducted on an occasional and opportunistic basis at Batiscan. Unlike the preform discards from the Riverhaven 2 site, which never display edge wear, a high proportion of the fragmented preforms from Batiscan were recycled (i.e., used after their breakage). Such recycling further suggests that raw material was not readily available to the people of Batiscan.

Table 2.2 Attributes of secondary and tertiary preforms at the Batiscan site

| | Length (mm) | | | | Width (mm) | | | | Thickness (mm) | | | | Weight (g) | | | |
|------------------------|--------------------|------|-------------------|-----|---------------------|------|--------|-----|----------------|------|-----|-----|------------|------|-----|-----|
| | N | Mean | Min | Max | N | Mean | Min | Max | N | Mean | Min | Max | N | Mean | Min | Max |
| Secondary blanks (n=9) | 2 | 49 | 48 | 50 | 8 | 37 | 25 | 53 | 9 | 13 | 9 | 19 | 9 | 26 | 9 | 82 |
| Tertiary blanks (n=19) | 5 | 52 | 31 | 69 | 7 | 29 | 22 | 45 | 19 | 10 | 7 | 17 | 19 | 13 | 3 | 45 |
| | Fragmentation rate | | Striking platform | | Thermal alterations | | Cortex | | Use | | | | | | | |
| | N | % | N | % | N | % | N | % | N | % | | | | | | |
| Secondary blanks (n=9) | 8 | 89 | 2 | 22 | 3 | 33 | 3 | 33 | 6 | 67 | | | | | | |
| Tertiary blanks (n=19) | 16 | 84 | 7 | 37 | 3 | 16 | 3 | 16 | 12 | 63 | | | | | | |



Figure 2.1 Preforms from the Batiscan site
 (Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

Table 2.3 Raw materials involved in the manufacture of Batiscan's various bifaces

| | | | Preforms | | | | Bifaces | | Cache bifaces | |
|-------------------------|--------------------------|-----------------------|------------------|----|-----------------|----|---------|----|---------------|----|
| | | | Secondary blanks | | Tertiary blanks | | | | | |
| General lithic category | Lithic subdivisions | Sources | N | % | N | % | N | % | N | % |
| Chert | Carbonate | Onondaga | | | 1 | 5 | 19 | 25 | 2 | 33 |
| | | Ontario/Erie Lowlands | 1 | 11 | 3 | 16 | 18 | 23 | 2 | 33 |
| | | Munsungan | | | | | 2 | 3 | | |
| | Appalachian | Local | 7 | 78 | 7 | 37 | 14 | 18 | 1 | 17 |
| | Unidentified | Unidentified | | | 2 | 11 | 5 | 6 | | |
| Rhyolite | -- | Kineo | | | 1 | 5 | | | | |
| | Unidentified | Unidentified | | | | | 2 | 3 | | |
| Welded tuff | -- | Ottawa valley (?) | | | | | 2 | 3 | | |
| Quartzite | Fine-grained | Mistassinni | | | 1 | 5 | 6 | 8 | | |
| | | Ramah | | | | | 3 | 4 | 1 | 17 |
| | Medium to coarse-grained | Cheshire | 1 | 11 | | | | | | |
| | Unidentified | Unidentified | | | 1 | 5 | 3 | 4 | | |
| Quartz | -- | Local | | | 1 | 5 | 1 | 1 | | |
| Siltstone | -- | Local | | | | | 1 | 1 | | |
| Limestone | -- | Local | | | | | 1 | 1 | | |
| Sandstone | -- | Local | | | 1 | 5 | | | | |
| Schist | -- | Local | | | 1 | 5 | | | | |

A number of factors could explain the large proportion of thermal alterations observed on Batiscan's preforms compared to that of other Meadowood habitation sites (Table 2.4). The objects could have been discarded in a fire, or fire may have been involved in the manufacturing process. However, in the case of the three tertiary bifaces manufactured in non-local raw materials, the possibility that these objects were subject to ritual fire after being broken and reused should not be ruled out. Ritual burning at the Batiscan site is attested by the recovery, on the upper terrace, of disturbed crematory remains. These include a few copper-stained human teeth, a handful of calcined human bones, copper beads, and a number of exotic and highly fragmented funerary bifaces (described below).

Like those from the Batiscan site, the preforms from the Scaccia site are mostly of the second and third technological stages, although at least one primary blank was identified in the collection (Figure 2.2). Among the Meadowood habitation components selected for the present analysis, the Riverhaven 2 site has by far the most abundant bifacial assemblage. With its 46 primary, 114 secondary, and 354 tertiary blanks all stages involved in the manufacture of chert tools are represented in the assemblage (Granger 1978: 208). Besides “a possibly unfinished biface” (Spence et al. 1990: 132) found in a cache feature at the Bruce Boyd site, not a single preform was documented in the four funerary Meadowood sites selected for this study, indicating that the manufacture of the numerous flaked stone items found on these sites was carried out somewhere else.

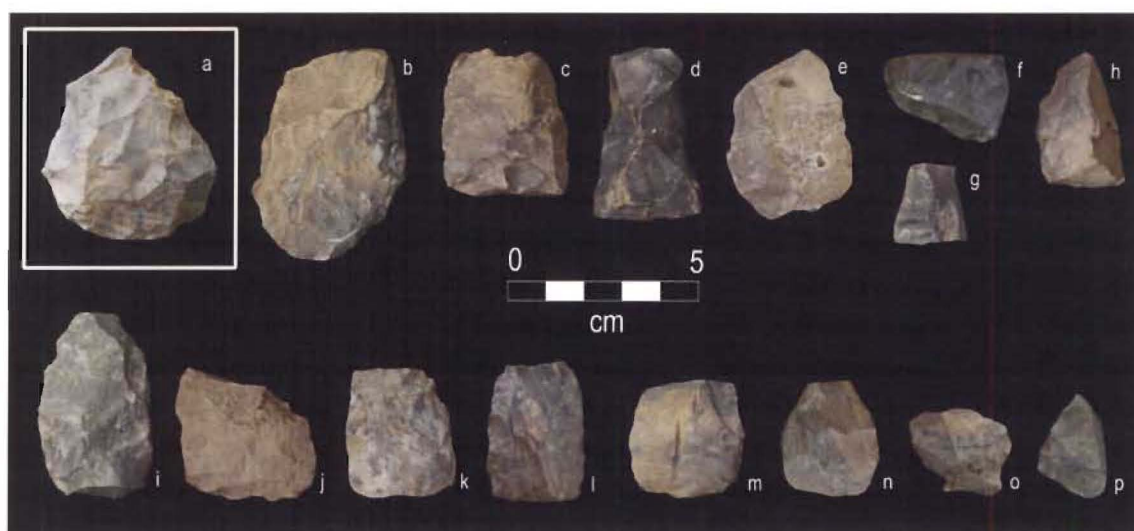


Figure 2.2 Preforms from the Scaccia site (primary blank in square).
(*a,e-f,l,n-p*: Courtesy of the New York State Museum, Albany, NY; *b-d,g-k,m*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Bifaces

The Meadowood Interaction Sphere is best known for its Onondaga chert bifacial productions, which include cache bifaces, side-notched projectile points, triangular scrapers, and, to a lesser extent, expanded base drills. While the latter artefacts do not account for the complete range of bifaces represented within Meadowood components, other bifaces are often overlooked in site reports, mainly because they cannot confidently be associated with the Meadowood occupation. The next section is devoted to such “atypical” Meadowood-associated bifaces. Keeping in mind the main objective of this chapter, which is to identify

the material correlates of the Meadowood Interaction Sphere, I will try to determine whether or not some of these objects could have represented traded items. Whatever the answer to that question is, it is argued that complete inventories of Meadowood groups' bifacial production, including both imported and local products, will allow a better understanding of the role occupied by the well documented, Onondaga chert bifaces (discussed in the next section).

At the Batiscan site, six complete and seven proximal fragments of finished bifaces were recorded, eight of which exhibit macroscopically visible traces of use. Five bifaces with use wear on one or both sides were probably used as knives. One of them was originally hafted, as indicated by a single notch located 18 mm from its base, and later recycled into a scraper. These tools are comparable to the 30 longitudinal knife-scrapers documented at the Riverhaven 2 site. Granger (1978: 214) observed use wear on 97% of the knife-scrapers, all characterized by at least one excurvate lateral edge displaying the greatest amount of wear.

Three more bifaces from Batiscan have retouch on their distal end. Two are small, complete objects that could have been employed in drilling or piercing motions. The third one displays crude hafting notches 27 mm from its base and may have been a hafted celt (Figure 2.3: a). Among the five remaining bifaces, four are small proximal fragments on which use wear, if any, would have been located on their missing portions. The fifth one is a complete biface manufactured from a metamorphic rock similar to raw materials originating from the Ottawa valley and sometimes referred to as "welded tuff" (Adrian Burke, pers. comm. 2002; Table 2.3; Figure 2.3: b).

Forty bifacially worked distal fragments, ten medial portions, and seven pieces of bifacial debris were also recovered at the Batiscan site. Only three fragments show evidence of recycling: two as scrapers and one as a graving or piercing tool. Eleven distal fragments, one medial portion, and two pieces of bifacial debris possess the characteristic flaking and thinness of Meadowood bifacial tools. Due to their broken state, however, it is impossible to determine the original form and function of these objects. Forty-three percent (n=6) of these Meadowood fragments show signs of thermal alterations, compared to a proportion of 11% (n=6) for the remaining 56 finished bifaces and bifacial fragments (to the exclusion of seven funerary bifaces discussed at the end of this section).

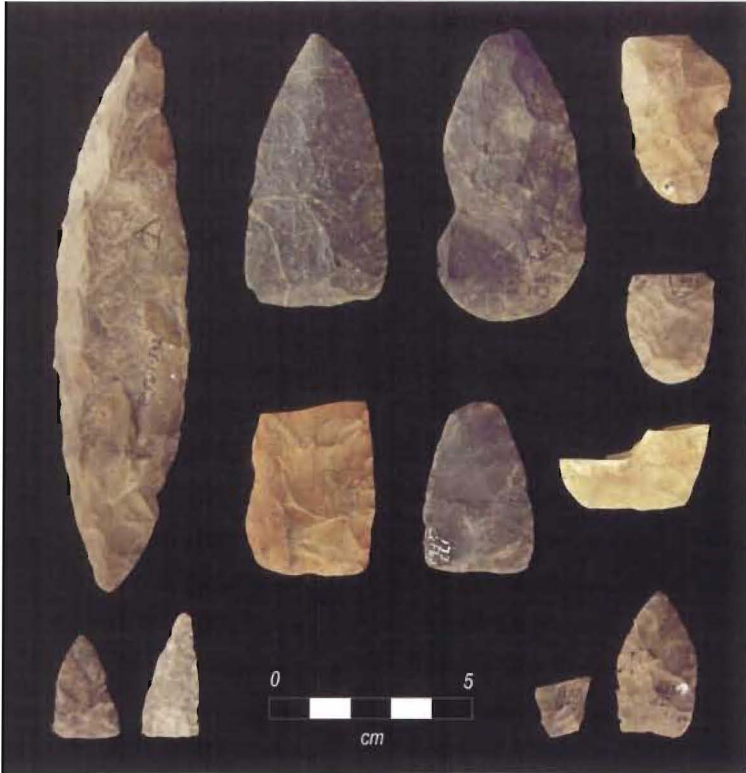


Figure 2.3 Bifaces from the Batiscan site.

(Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

Two complete and 41 bifacial fragments were recovered within the 128 features excavated at the Scaccia site. An additional 5 complete and 106 fragmented bifaces were recognized in the collection but lack any association with cultural features. The totality of the bifacial assemblage from the Scaccia site was made out of Onondaga chert. At least five mesial fragments were recycled and secondarily used as either piercing/graving tools or scrapers (Figure 2.4: a-b). In one case, a small biface was apparently manufactured from a larger one after it has been broken (Figure 2.4: c). Among the bifaces from the Scaccia site, three are thin, roughly parallel-sided objects with one or two ear notches at their base (Figure 2.4: d-f). These tools may have been used as knives, together with other bifaces with lanceolate or ovate outlines. Twenty-six percent of Scaccia's bifaces have been altered one way or another by fire, a proportion exceeding what was observed at Batiscan and Riverhaven 2, the two other habitation sites selected for this comparative analysis (Table 2.4). This may be due to the fact that most of Scaccia's assemblage is composed of thin tips and midsections that may pertain to either Meadowood points or cache bifaces (Ritchie and Funk 1973: 112).



Figure 2.4 Bifaces from the Scaccia site.

(*a-c*: Courtesy of the New York State Museum, Albany, NY; *d-f*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Table 2.4 Thermal alterations on flaked stone tools from seven Meadowood components

| | Habitation sites | | | | | | Mortuary sites | | | | | | | |
|---------------------------------|------------------|----|---------|----|------------|----|----------------|----|------------|-----|------------|---|--------------|-----|
| | Batiscan | | Scaccia | | Riverhaven | | Hunter | | Muskalonge | | Bruce Boyd | | Oberlander 2 | |
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Preforms | 6 | 21 | 2 | 5 | 51 | 10 | – | – | – | – | – | – | – | – |
| Bifaces | 19 | 25 | 40 | 26 | 5 | 17 | 1 | 40 | 1 | 100 | 0 | 0 | 5 | 25 |
| Cache bifaces | 2 | 33 | 7 | 18 | 42 | 6 | 0 | 0 | 1,208 | 70 | ? | ? | 37 | 23 |
| Meadowood projectile points | 5 | 25 | 14 | 20 | 9 | 17 | 1 | 20 | 2 | 18 | 0 | 0 | 6 | 55 |
| Non-Meadowood projectile points | 2 | 4 | 21 | 14 | 3 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 16 |
| Bifacial scrapers | 10 | 13 | 0 | 0 | 5 | 5 | 4 | 33 | 2 | 67 | ? | ? | 5 | 42 |
| Unifacial scrapers | 12 | 17 | 0 | 0 | 3 | 3 | 1 | 25 | – | – | ? | ? | 2 | 40 |
| Drills / graving tools | 4 | 24 | 11 | 22 | 4 | 8 | 0 | 0 | 0 | 0 | ? | ? | 7 | 54 |
| Strike-a-lights | 0 | 0 | 0 | 0 | – | – | 0 | 0 | 6 | 100 | ? | ? | 1 | 100 |

Among the four mortuary sites included in my analysis, Oberlander 2 is the only one that yielded a significant number of bifaces not classified as stage IV blanks (Granger 1978: 17) or cache bifaces. Six whole and 14 bifacial fragments were recorded at this site, among which ten were associated with features, five were altered by fire, and five displayed use wear. Except for one complete and two fragmented bifaces from the Hunter site, and three miscellaneous bifacial fragments found in three features at the Bruce Boyd site, all unnotched bifaces recovered from these three other mortuary sites are either typical Meadowood cache bifaces, or some kind of ceremonial or funerary bifaces. Both Batiscan and the Muskalonge Lake sites yielded funerary bifaces (Figures 2.5-2.6). Their large size, fine craftsmanship, exotic raw materials and typical fragmentation pattern set these items apart from the bulk of the bifacial assemblage.



Figure 2.5 Funerary bifaces from the Batiscan site.
(Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)



Figure 2.6 Ceremonial knife from the Muskalonge Lake site.
(Courtesy of the New York State Museum, Albany, NY).

Mistassinni quartzite, employed in the manufacture of the single ceremonial knife from the Muskalonge Lake site (c. 800 km from the source in a straight line) and in the making of five out of an estimated total of seven funerary bifaces from the Batiscan site (c. 500 km from the source as the crow flies), seems to have been the favored raw material for these exceptional objects. Ramah quartzite and Onondaga chert, with known sources located respectively 1400 and 700 km in a straight line from the Batiscan site, were used to fashion the remaining two bifaces from Batiscan (Figures 2.5, 2.6). The knife from the Muskalonge Lake, 265-mm long by 70-mm wide and characterized by a maximum thickness of 18 mm, was found as a killed offering in a burial feature (Figure 2.7). The funerary bifaces from the Batiscan site, intentionally “killed” or fragmented in a crematory fire, were found in the upper area of the site, near the exposed cremation remains on the surface and the native copper beads.

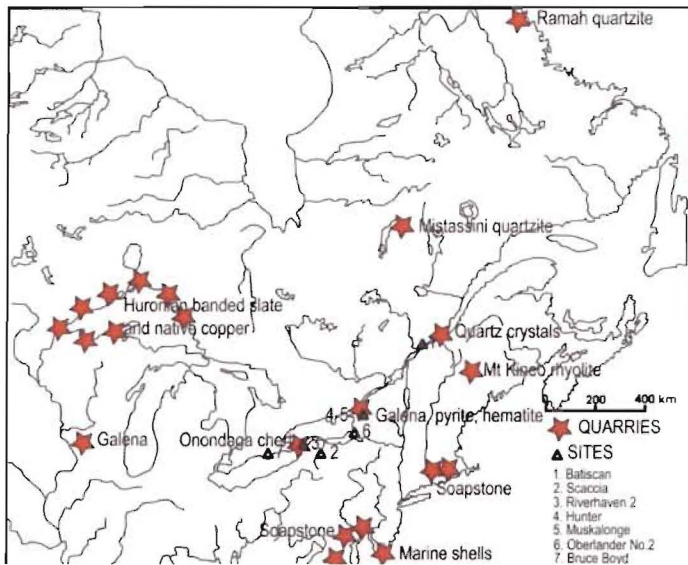


Figure 2.7 Location of quarries and Meadowood sites mentioned in the text

Meadowood Cache Bifaces

Cache bifaces, side-notched projectile points, and bifacial scrapers are three typological markers used to identify Meadowood components in the archaeological record. Meadowood flint knappers are well known for their production of thin, subtriangular bifaces ideal for transport and future modification into functional tools such as projectile points and scrapers. As Granger (1979: 106) observed, “the optimum single object for maximal tool form production at minimum subsequent modification is the quaternary blank”.

Four complete and two fragmented cache bifaces were recovered at the Batiscan site. One cache biface manufactured from Ramah quartzite has only the tip missing, and the distal end was apparently recycled into a scraper after breakage. Another one appeared to have been secondarily used as a drill. Thirty-seven cache bifaces—17 complete and 20 proximal fragments—were documented at the Scaccia site, and among them 18—10 complete and 8 proximal fragments—were excavated within features⁷. Two of the complete cache bifaces have spurs at the junction of the base and one edge that are reminiscent of the ear notches observed on the parallel-sided bifaces from the same site (Figure 2.8). At the Riverhaven 2 site, 705 cache bifaces were recorded, adding up to the 513 primary, secondary, and tertiary preforms described above.

⁷ While only five whole or nearly whole, and five fragmented cache bifaces were recovered at Scaccia during the 1965 excavations conducted by the New York State Museum, the Charles Wray collection contains 27 additional cache bifaces.



Figure 2.8 Cache bifaces from the Scaccia site (note the basal spurs on bifaces in square). (a,c-d,g-h,j: Courtesy of the New York State Museum, Albany, NY; b,e-f,i,k-l: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Large numbers of Meadowood cache bifaces are found in special contexts or features. Most of these, such as cremated burials, burials containing killed offerings, or crematories, obviously involved thermal effects. Hence, the thermal alterations and the ochre still adhering to a number of cache bifaces are often interpreted, even in the absence of contextual associations, as evidence of the ritual treatment of these artefacts by the Meadowood communities. Such an interpretation is probably also valid for the Batiscan site, where cache bifaces represent the category of flaked stone tools with the highest proportion of thermal alterations (Table 2.4). The presence of red ochre on approximately 30% of the cache bifaces recovered from Batiscan also suggests some ritual treatment.

However, a comparison of the occurrence of thermal alterations on Meadowood cache bifaces recovered from various mortuary sites or features suggests a differential use of fire in rituals. For example, the complete absence of thermal alterations and red ochre on cache bifaces from the Hunter site is in drastic contrast to what was observed at the neighbouring Muskalonge site (Figure 2.9). The interpretation of this variability remains conjectural but it could be related to a desire of contemporaneous kin or corporate groups to distinguish themselves from one another. The proportions of thermal alterations on cache bifaces recovered at Meadowood habitation sites vary within ranges similar to what is recorded for other chipped stone tool categories, such as the bifaces, the projectile points, and the drilling tools (Table 2.4). However, the fragmentation rate of cache bifaces is higher in domestic contexts, which may in part be why they were abandoned at such locales.



Figure 2.9 Meadowood cache bifaces from the Hunter and Muskalonge Lake sites. (Courtesy of the New York State Museum, Albany, NY).

Projectile Points

Meadowood points often serve as typological markers in the classification of archaeological sites, much to the detriment of other types of projectiles potentially used by Meadowood communities. This is partly due to the mixed contexts that are unfortunately so typical of archaeological sites in northeastern North America. In this regard, the seven

assemblages analyzed in this chapter—selected in part because they contained single or isolated components—represent a unique opportunity to document other types of projectile points associated with Meadowood contexts. Doing this will not only highlight a class of artefacts that has traditionally been neglected, but will also allow a better understanding of the role of Meadowood points as items circulating within the Interaction Sphere. The identification of an artefact as a projectile point implies that the proximal end of the tool, or at least part of it, is still present and has been modified for hafting⁸. Consequently, distal bifacial fragments are not included in the following discussion, although some of them may well represent broken projectile points.

The Meadowood Type. The Meadowood point type was described in Ritchie's (1961: 35) typology of New York State projectile points. The flat, well-controlled pressure flaking technique used to make these points shows great skill. Moreover, their morphological characteristics (i.e., extreme thinness, medium-to-large size, side-notching with points of medium sized breadth) suggest that many were probably manufactured with slight alteration from the typical Meadowood cache bifaces (Figure 2.10). Their straight or convex bases are frequently thinned and often show deliberate grinding of the edge, usually accompanied by grinding of notches. This attribute, resulting in a rounded basal edge, is likely to reflect a manufacturing process that minimized the damage to binding points and the foreshaft.

“Box-base” points, with small side notches located about 10 mm above the base, and corner-notched points have also been observed, adding some variability to Ritchie's original definition (Figure 2.11). The box-base points have been defined by Granger as an Ontario variant (Granger 1978: fig. 2.2, see also Ellis et al. 1988: 7), but their discoveries in several regions outside of Ontario—in the upper and Middle St. Lawrence valley, Abitibi, Lac St-Jean area, New Brunswick, around Oneida Lake, and on the Niagara Peninsula—does not support this stylistic regionalisation hypothesis (Clermont and Chapdelaine 1982: 60; Côté 1993: 14; Erik Langevin, pers comm 2007; Lévesque et al. 1964: 53; Marois et Ribes 1975: 90, 96; McEachen 1996: 50; Ritchie 1944: 182, 1965: 185).

⁸ This observation would not apply to Late Woodland assemblages from northeastern North America since the diagnostic triangular points of this period have no hafting device.



Figure 2.10 Typical side-notched Meadowood projectile points.

(*Scaccia a-d,k,n,r-s,ee,gg* & *Muskalonge* & *Hunter*: Courtesy of the New York State Museum, Albany, NY; *Scaccia e-j,l-m,o-q,t-dd,ff,hh-kk* & *Oberlander 2*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *Bruce Boyd*: Courtesy of the University of Western Ontario, London; *Batiscan*: Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

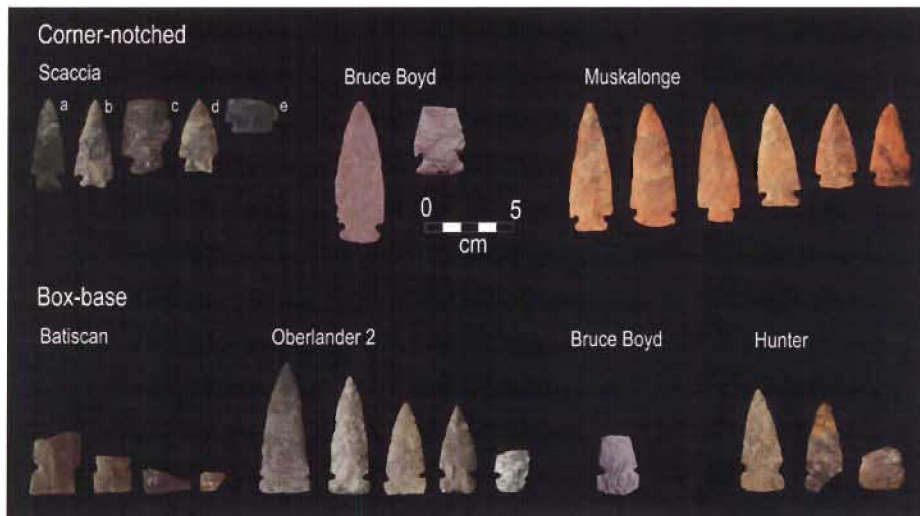


Figure 2.11 Corner-notched and box-base Meadowood projectile points

(*Scaccia e* & *Muskalonge* & *Hunter*: Courtesy of the New York State Museum, Albany, NY; *Scaccia a-d* & *Oberlander 2*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *Bruce Boyd*: Courtesy of the University of Western Ontario, London; *Batiscan*: Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

William Ritchie (1961: 35) also noted that Meadowood points can be double notched, an attribute that has now been observed on points from several regions, including one from the Speedway site, three from the Siller collection, and several from the nearby Scott O'Brien in Ontario (Ellis 1999: fig. 2; McEachen and Williamson 1995: 5; Wilson 1993, 1997). At the 20GR33 site in Michigan, six of the 14 Meadowood points with sufficiently preserved basal portions are also characterized by double-notching. While Scott Beld proposed that this trait allowed securer hafting for use of lateral edges as knives (Beld 1991: 26), it is equally possible that multinotches were stylistic elements meant to convey social information. This function was proposed for multinotched points found in the Interior Plateau of British Columbia, based on the uniqueness of such objects (Hayden and Schulting 1997: 72).

Other Types. Non-diagnostic and/or other types of projectiles were also found on all the Meadowood sites in this study. While these points show a high degree of variability in size and shape, most of them are reminiscent of small and narrow stemmed point varieties generally associated with the Terminal Archaic period, spanning from 4000 to 3000 years BP (Figure 2.12). Stemmed point types from Batiscan however, are not mainly of the small and narrow variety. They are generally larger, and mostly of unidentified types, although Snook Kill points, common in the Hudson valley and associated with occupations ranging between 3700 and 3600 BP, appear to be represented (Figure 2.12). What could be a local variant of the large corner notched or stemmed point variety was recognized by Yves Chrétien in the Québec city area, and named Chaudière points. At the Lambert and Désy sites, this type was found in association with Meadowood points. In one instance, it was directly associated with an Early Woodland structure radiocarbon dated to 2700 ± 80 years BP, suggesting that Chaudière points could represent an Early Woodland local production in the Québec city area (Chrétien 1995: 120).

A number of notched projectile points resemble the Late Archaic Brewerton variety and a point recovered in a feature at the Scaccia site was classified as such by Charles Wray (1965: 4). However, the otherwise Early Woodland content of this feature and the general absence of a Late Archaic component at the Scaccia site suggest that this object more likely represents a reworked Meadowood point.

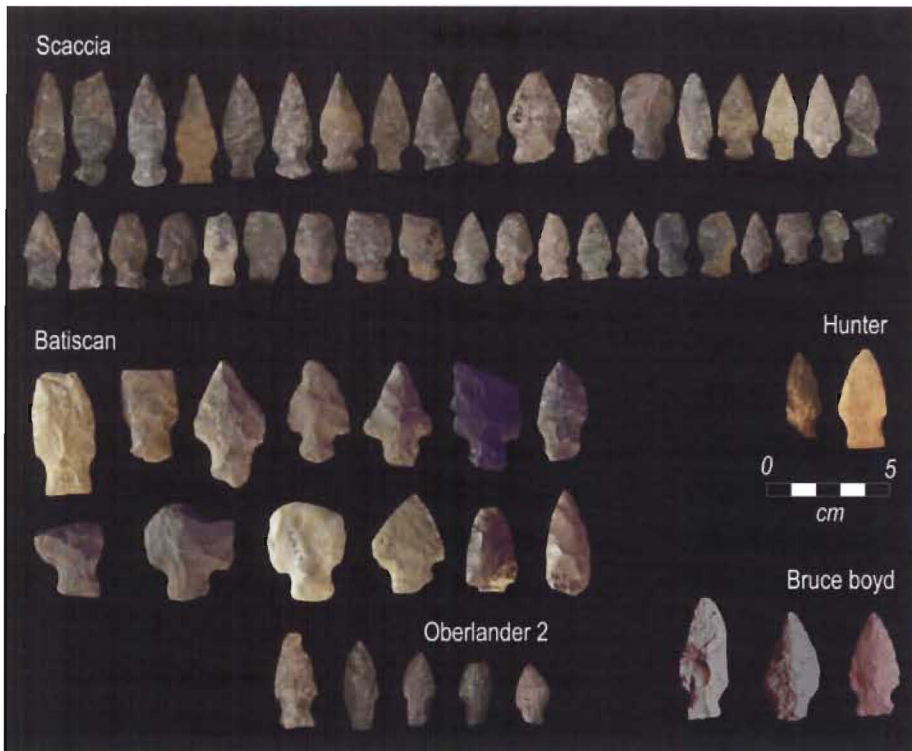


Figure 2.12 Small and narrow-stemmed projectile points from Meadowood components. (*Hunter*: Courtesy of the New York State Museum, Albany, NY; *Scaccia* & *Oberlander 2*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *Bruce Boyd*: Courtesy of the University of Western Ontario, London; *Batiscan*: Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

Two Fulton Turkey Tail points have also been documented in the studied assemblages, one from Oberlander 2 and one from Scaccia sites (Ritchie 1965: 184; Wray 1965: 3). Although the Scaccia site is a major Meadowood habitation area, it also includes a number of burial pits, and the Turkey Tail point was found at the bottom of an Adena grave containing the remains of an adult and a child (Figure 2.13: a). Another expanded stem biface made of Indiana hornstone was found at the Scaccia site (Figure 2.13: b).

In the Northeast, a Fulton Turkey Tail made of Flint Ridge chert has also been documented at the Boucher cemetery (Heckenberger et al 1990: fig. 5). Another specimen made of green chert has been recovered at Pointe-du-Buisson (Clermont et Chapdelaine 1982: 65), two in Onondaga chert come from Oka (Chapdelaine 1990: 23), and finally a number of Turkey Tail points originate from surface sites in New York State (Ritchie 1965: 65). A point of this type is also owned by the former owner of the farm where the Bruce Boyd site was found, but its association with the burial site is uncertain (Spence et al. 1978: 36).

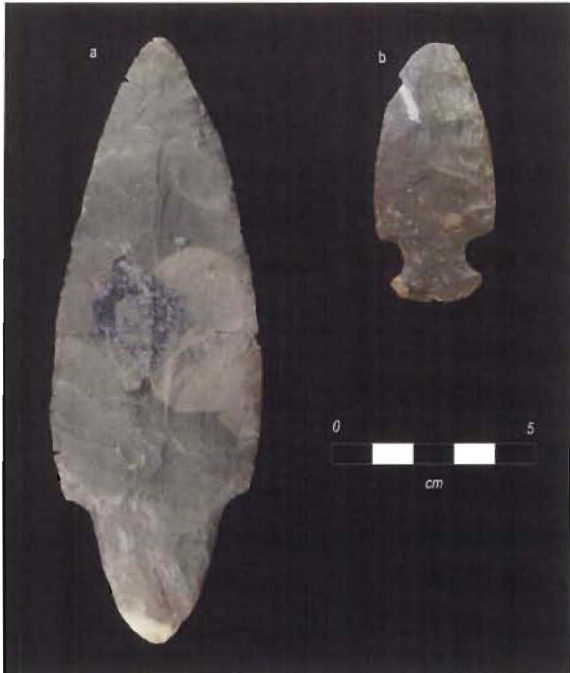


Figure 2.13 Indiana hornstone stemmed bifaces from the Scaccia site. (*a*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *b*: Courtesy of the New York State Museum, Albany, NY).

The presence of Fulton Turkey Tail points in Meadowood contexts likely reflects contact between midwestern and northeastern Early Woodland communities. Indeed, Fulton Turkey Tail points are typical of midwestern Red Ochre mortuary contexts contemporaneous with Meadowood manifestations. They are generally made of hornstone-related nodular flints from southern Indiana, northern Kentucky or southern Illinois. A cache of Fulton Turkey Tail preforms was found at the Sidecut Crematory site (Stothers and Abel 1993: 68). According to Lewis Binford:

(t)he very narrow dimension between the haft elements of the *Turkey Tails* suggests that if they were hafted so that the haft was parallel to the longitudinal axis of the specimen that vigorous usage would quickly result in blade breakage just above the haft element (...) therefore, it seems logical to postulate a limited intended usage for the specimens. (Binford 1963a: 187)

Point forms associated with the end of the Early Woodland period are represented by four complete and six possible basal fragments of Adena points documented at the site of Batiscan (Figure 2.14), and at least one from the Scaccia site. Finally, two Jack's Reef points from the Oberlander 2 component suggest a minor, non-Meadowood occupation of this site during the Late Woodland time period.



Figure 2.14 Adena projectile points from the Batiscan site.
 (Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

Meadowood vs Non-Meadowood Points. What are the implication(s) of the presence of different projectile point forms or types on Meadowood sites? While deposits from other periods (mixed assemblages) could explain these occurrences, a number of factors indicate otherwise. As mentioned above, one of the criteria used to select the seven sites analyzed in this study was that they were thought to contain unique or isolated Meadowood components. This assumption could prove to be wrong, but the documentation of similar non-Meadowood points in many Meadowood sites has led several authors to suggest that these various types could, in fact, be contemporaneous. If this is the case, could the variability in point forms reflect the presence of both local and regional (Meadowood) stylistic traditions? Then, could the ratio of non-Meadowood to Meadowood points mirror the degree of participation of different Early Woodland groups to the Meadowood Interaction Sphere? Or were functional rather than cultural distinctions involved? This issue is addressed in the next section through an analysis of Meadowood and non-Meadowood point morphological attributes, use wear, raw materials, and degree of recycling, and thermal alterations.

Morphological Attributes. Were Early Woodland points employed as arrowheads, spear points, or knives? Were they used in hunting and other subsistence activities, as an offensive or defensive device against man, or both as Ritchie (1955: 34) suggested? While the presence or absence of use wear can help discriminate between utilitarian and non-utilitarian artefacts, morphological attributes of points have been employed to identify their specific

function(s). Such observations have important implications regarding the role of these objects within Meadowood communities. Arrow points, for instance, can be indicators of warfare activities. In Europe, certain types of Pre-Pottery Neolithic B (PPNB) and LBK projectile points have been interpreted as high status warrior items (Cauvin 2000: 126; Keeley: 19). Important implications could follow from interpreting Meadowood points as indicators of warfare. For example, it was mentioned in my introduction that the existence of inter-group conflicts could prevent certain communities from participating in the Meadowood Interaction Sphere, which in turn would result in a discontinuous distribution of sites and artefacts across the landscape.

Unlike in the Old World, the bow and arrow is a relatively recent technology in the New World, but as Snarey (2000: 51) mentioned, just how recent is the subject of much debate. Traditionally, most archaeologists (e.g., Baker and Kidder 1937; Bettinger and Eerkins 1999; Blitz 1988; Frison 1978; Heiser and Hester 1978; Josselyn 1961; Justice 1987; Van Buren 1974—cited in Snarey 2000: 52) believed that the bow and arrow was adopted around AD 500 or later during the Late Woodland period. This hypothesis, still popular today, is mainly based on the small size and the triangular form of the diagnostic projectile point types of this time period.

More recently, the hypothesis of an earlier adoption of the bow and arrow has been advanced by various researchers working all over North America. Although most advocates of this second theory suggest an Archaic origin for the bow and arrow (Aikens 1970; Bradbury 1997; Nassaney and Pyle 1999; Odell 1988; Webster 1980), the most extreme positions imply that that this weapon system was known by Paleoindian groups (Amick 1994, cited in Snarey 2000: 52). In northeastern North America, James Wright, who was first among the advocates of a Late Woodland introduction of the bow and arrow (Wright 1981), later proposed that the Meadowood points of the Early Woodland may, in fact, represent the first arrows (Wright 1994, 1999a). This hypothesis was based on the argument that Meadowood points are significantly thinner than earlier types, except perhaps for the finely crafted Paleoindian projectiles.

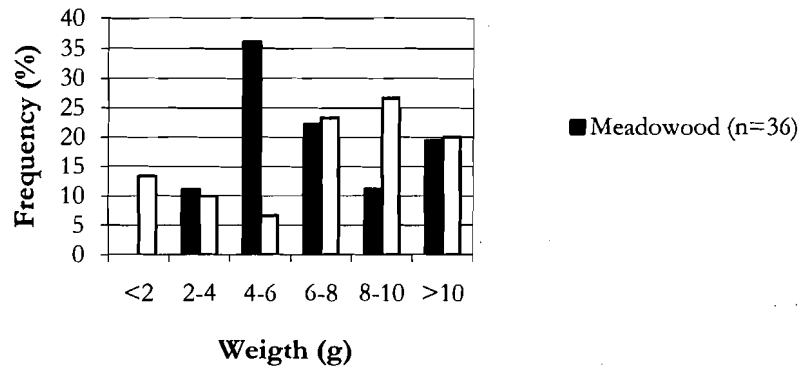
Generally, relative size is the main criterion used to distinguish between arrow and dart points. This observation is based on the physical properties of these two different weapon systems, i.e., arrows being lighter than darts, their points must be smaller and more pointed in order to maintain balance and accuracy during flight. When interpreting bimodal

distributions, however, we have to keep in mind that other factors, such as the use of bifaces as knives versus projectile points, light versus heavy foreshafts, or resharpened versus unresharpened points, may produce similar results (Snarey 2000: 58).

Weight of projectiles has often been used to distinguish between darts and arrows. Research involving more than one attributes of size generally focus on first finding a bimodal distribution for weight and then finding a correlation between this distribution and other criteria. However, dart and arrow point average weights and dimensions may overlap. Experiments show that large points can be effectively used on arrows and vice versa. Nevertheless, most archaeological and ethnographic studies establish the dividing line between darts and arrows lies somewhere between 2 and 3.5 g (Snarey 2000: 60). In the next paragraphs, the morphological attributes of Meadowood and non-Meadowood points recovered from the seven studied assemblages will be discussed to determine whether stylistic differences could reflect the existence of distinct weapons and hunting technologies (Ozker 1982: 102).

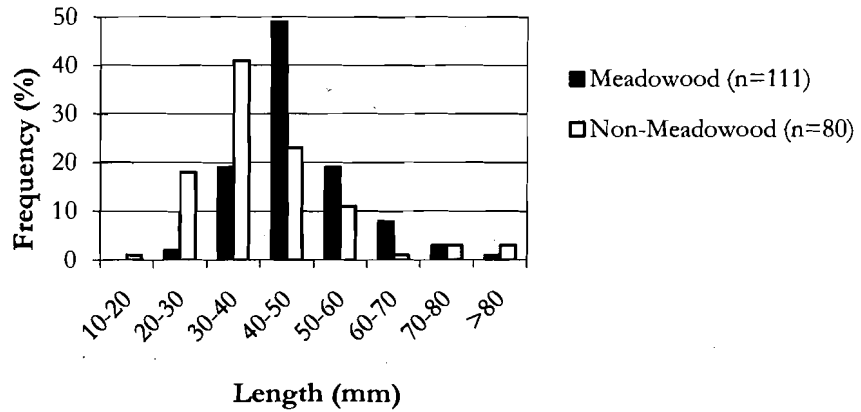
While no significant difference between the average Meadowood and non-Meadowood point weights was found (Figure 2.15), it appears that non-Meadowood projectiles documented in the selected assemblages are generally smaller than Meadowood ones. Figure 2.16 shows that while the modal value for Meadowood point overall lengths corresponds to the interval of 40 to 50 cm, 30 to 40 cm are the most frequent measures of length recorded on non-Meadowood points. Regarding point width, Meadowood points are very homogenous, with 68% of the specimens being between 20 and 25 mm in breadth. Although more variable, the modal value of non-Meadowood points for this attribute corresponds to the interval between 15 to 20 mm (Figure 2.17).

Neck width is another popular attribute used to distinguish between darts and arrowheads. This is based on both the assumption of a relationship between neck or stem width and shaft diameter, and ethnographic observations of dart shafts being generally larger than arrow shafts (Thomas 1978). Based on their neck width, it is possible to distinguish between Meadowood and non-Meadowood projectile points observed in the assemblages selected for this study. The Meadowood type seems once again more homogenous than the other types, with the majority of the points having a neck width varying between 15 and 20 mm. On the other hand, the interval of 10 to 15 mm is the modal value for the non-Meadowood points (Figure 2.18).



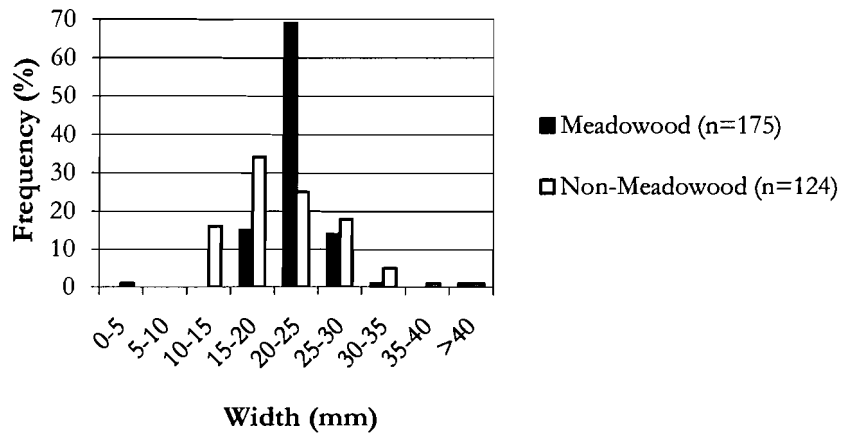
| | Meadowood | Non-Meadowood |
|------------------------|-------------|---------------|
| Mean | 7.322222222 | 7.821 |
| Variance | 10.53547492 | 20.0039472 |
| T-test, p-value | 0.612769248 | |

Figure 2.15 Comparison between Meadowood and non-Meadowood points weight, including t-test result



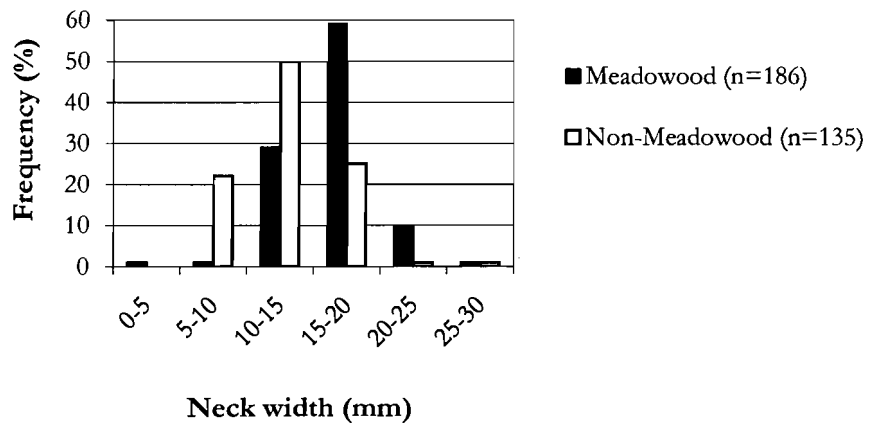
| | Meadowood | Non-Meadowood |
|------------------------|-------------|---------------|
| Mean | 47.86036036 | 39.86625 |
| Variance | 115.5369599 | 175.151884 |
| T-test, p-value | 1.69371E-05 | |

Figure 2.16 Comparison between Meadowood and non-Meadowood points length, including t-test result



| | Meadowood | Non-Meadowood |
|------------------------|-------------|---------------|
| Mean | 22.92228571 | 20.708871 |
| Variance | 14.31806371 | 39.7078068 |
| T-test, p-value | 0.000601832 | |

Figure 2.17 Comparison between Meadowood and non-Meadowood points width, including t-test result



| | Meadowood | Non-Meadowood |
|------------------------|-------------|---------------|
| Mean | 16.65053763 | 13.4059259 |
| Variance | 9.065972682 | 12.9280243 |
| T-test, p-value | 1.23504E-15 | |

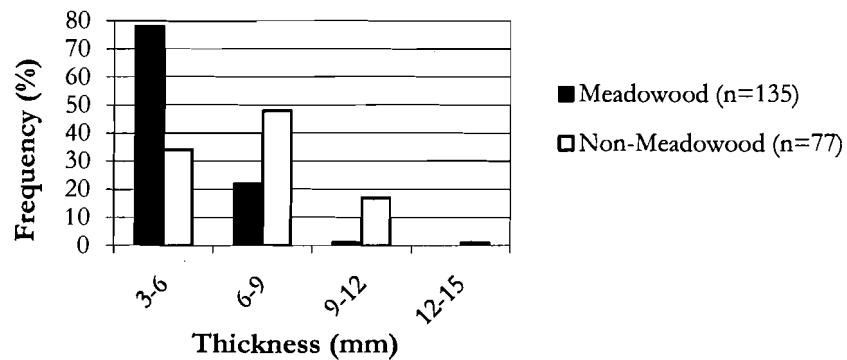
Figure 2.18 Comparison between Meadowood and non-Meadowood points neck width, including t-test result

In terms of overall length, blade width, and neck width, the distribution profiles suggest that Meadowood points are larger than non-Meadowood points. Based on various studies aimed at distinguishing dart from arrow points (Table 2.5), these measurements appear to rule out the use of Meadowood points as arrows. These objects were more likely knives, specialized hunting projectiles, and/or display pieces. A preliminary analysis of use wear conducted on Batiscan projectile points (discussed in the next section) will help clarify this issue.

The latter proposition is in contradiction with James Wright's hypothesis of an Early Woodland adoption of the bow and arrow, which was mainly based on the thinness of Meadowood points. Like neck width, the thickness of a projectile point may be related to the diameter of its shaft. My analysis confirms a bimodal distribution of Meadowood versus non-Meadowood points' thickness, with the former being generally thinner (Figure 2.19). However, thickness alone should not be used as a discriminating attribute for dart and arrow points. Besides the fact that darts can also be very thin (Shott 1997), this characteristic of Meadowood projectile points may be due to technological or social, rather than functional factors.

Table 2.5 Various researchers' criteria to distinguish between dart and arrow points

| | Weight (g) | | Length (mm) | | Width (mm) | | Neck width (mm) | | Thickness (mm) | |
|---------------------------|---------------|---------------|----------------|---------------|---------------|---------------|-----------------|-------------|----------------|------------|
| | Darts | Arrows | Darts | Arrows | Darts | Arrows | Darts | Arrows | Darts | Arrows |
| Harrington 1933 | > 4 | < 3 | | | | | | | | |
| Cressman and Krieger 1940 | > 2 | < 2 | | | | | | | | |
| Fenega 1953 | > 4.5 | < 3.49 | | | | | | | | |
| Corliss 1972 | | | | | | | > 9 | < 8.5 | | |
| Van Buren 1974 | > 20 | < 20 | | | | | | | | |
| Patterson 1985 | > 2 | < 2 | | | | | > 9 | < 9 | > 5 | < 5 |
| Thomas 1988 | 4.38 ±2.11 | 2.07 ±0.28 | 46.2 ±10.45 | 31.1 ±2.84 | 22.9 ±4.77 | 14.7 ±1.33 | 13.7 ±2.53 | 10 ±0.91 | 4.9 ±1.37 | 4 ±0.37 |
| Fawcett 1998 | | | | | | | >11 | < 10 | | |
| Nassaney and Pyle 1999 | ≥ 3 | < 3 | ≥ 36 | < 36 | | | ≥ 10.5 | < 10.5 | ≥ 6 | < 6 |



| | Meadowood | Non-Meadowood |
|------------------------|-------------|---------------|
| Mean | 5.614814815 | 7.45064935 |
| Variance | 1.084256495 | 4.08832194 |
| T-test, p-value | 3.91795E-11 | |

Figure 2.19 Comparison between Meadowood and non-Meadowood points thickness, including t-test result

Use-Wear. In the case of bifaces, it is sometimes difficult to determine, based on morphological and stylistic attributes alone, if an artefact was manufactured to fulfill utilitarian needs, if it qualifies as ritual paraphernalia, or if it is a prestige object. The presence or absence of use wear can help discriminate between utilitarian and non-utilitarian artefacts. While ritual or prestige items can show delicate designs (e.g., Fulton Turkey Tail points) and sometimes traces of use, the absence of use wear help to convincingly eliminates the hypothesis of a utilitarian function.

At Batiscan, macroscopic traces of use were present on 13% (n=2) of the unrecycled Meadowood points. In both cases, these traces were located on the distal end, or pointed part, of the tool, suggesting a use as projectile points rather than knives. On the other hand, among the 38% (n=11) of unrecycled, non-Meadowood points showing signs of use, 45% (n=5) were apparently utilized on one or both lateral edges, while 55% (n=6) are more likely to have been used as projectile points since use wear was observed on their distal ends. Non-Meadowood projectile points, more so than Meadowood ones, probably functioned as both dart or lance tips for hunting or piercing, and as tools used in butchering, woodworking, or other cutting or scraping activities. This functional diversity, suggests either a removable foreshaft or a variety of hafting features (Foster et al. 1981: 21). On the other hand, when

utilized, Meadowood points appear to have had more specialized functions. The absence of lateral use wear on the Meadowood points from Batiscan rule out their use as knives. These observations, however, are based on a very small sample and more use wear studies are needed to better document the function(s) of Meadowood points.

Raw Materials. Morphological attributes and use wear highlighted the potential function(s) of Meadowood and non Meadowood points. The use of local vs exotic raw materials in their manufacture will provide additional information on the value attached to these objects.

Just as the cache bifaces typical of this culture, Meadowood points are generally manufactured from Onondaga chert (Table 2.6). At the Riverhaven, Hunter, and Oberlander 2 sites, no exceptions to this rule were documented. In the Muskalonge Lake site assemblage, Ritchie (1955: 34) observed that one Meadowood point was produced in a very dark, brown-weathering flint of unknown origin. Personal examination of the collection suggests that rhyolite rather than chert could have been used to make this point, which is also the thickest specimen in the assemblage (7.5 mm). Non Onondaga chert or rhyolite was also used in the manufacture of a fragmented Meadowood point observed in the Scaccia collection. At the Bruce Boyd site, six Meadowood points were not positively associated with Onondaga chert, although the raw material(s) used in these cases remain unidentified (Snarey 2000: 180).

Among the selected sites, Batiscan is the only case where Meadowood points make up a minor fraction of the projectiles, and were predominantly manufactured from raw materials other than Onondaga chert. The best represented material is the local Appalachian chert, with five projectiles made out of it. A sixth proximal fragment is larger than the usual Meadowood point, but its box-base, thin profile, and the flaking technique indicate that this item was a Meadowood artefact. While their participation to the Interaction Sphere is undeniable, projectile points are apparently not the major category of items sought and acquired by the communities of Batiscan within the Meadowood exchange network.

Table 2.6 Meadowood projectile point raw materials at seven sites

| | | | SITES | | | | | | | | | | | | | |
|----------------------------|---------------------|--------------|------------|------------|-----------|------------|------------|------------|----------|------------|------------|------------|------------|------------|--------------|------------|
| | | | Habitation | | | | | | Mortuary | | | | | | | |
| | | | Batiscan | | Scaccia | | Riverhaven | | Hunter | | Muskalonge | | Bruce Boyd | | Oberlander 2 | |
| Lithic category | Lithic subdivisions | Sources | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Chert | carbonate | Onondaga | 4 | 20 | 71 | 99 | 52 | 100 | 5 | 100 | 10 | 91 | 25 | 81 | 11 | 100 |
| | | unidentified | 3 | 15 | | | | | | | | | | | | |
| | Appalachian | unidentified | 6 | 30 | | | | | | | | | | | | |
| | unidentified | unidentified | 3 | 15 | | | | | | | | | | | | |
| Rhyolite | – | unidentified | | | | | | | | 1 | 9 | | | | | |
| Quartzite | fine grained | Mistassini | 3 | 15 | | | | | | | | | | | | |
| | | unidentified | 1 | 5 | | | | | | | | | | | | |
| Unidentified | | | | | 1 | 1 | | | | | | | 6 | 19 | | |
| TOTALS ¹ | | | 20 | 100 | 72 | 100 | 52 | 100 | 5 | 100 | 11 | 100 | 31 | 100 | 11 | 100 |

1- For the Scaccia and Oberlander 2 sites, the numbers in this table are based on the number of specimens accessible for analysis. Divergences, when totals are added, with the number of projectile points showed in Table 2.1 are due to discrepancies between information in field notes and the actual collections.

The identification, at Batiscan, of six Meadowood points produced in local chert is interesting and contrasts with what has been observed by Chrétien in the area of Québec city, approximately 75 km east of Batiscan. At the Lambert and Désy sites, the two components analyzed by Chrétien, the diagnostic Meadowood points only represent a small portion of the total assemblage of projectile points. This situation mirrors the situation at Batiscan. At the Lambert and Désy sites, Chrétien also observed that diagnostic Meadowood chipped stone items were consistently manufactured from exotic materials. This pattern was interpreted as an indicator of the prestige or ideological, rather than functional, value that was attached to the Meadowood point style and flaking technique (Chrétien 1995:185). At Batiscan, however, stone knappers were apparently using local raw materials to reproduce Meadowood traded items.

At the Scaccia, Riverhaven, Muskalonge Lake, and Oberlander 2 sites, Onondaga chert remains the dominant raw material involved in the manufacture of non-Meadowood projectile points. Other types of stones were employed in slightly higher proportions than in

the case of Meadowood points. At the Hunter, Bruce Boyd and Batiscan sites, Onondaga chert does not appear to be the dominant raw material utilized to manufacture non-Meadowood points (Table 2.7). The highest variability in this regard occurs at Batiscan, where 78.3% (n=36/46) of the non-Meadowood projectile points were made of a material other than Onondaga chert, a proportion comparable to what was observed in the case of Meadowood points at this site (80%). Interestingly, four Adena points were produced out of green rhyolite, probably coming from Mt. Kineo in Maine, a source located about 215 km in a straight line from the Batiscan site (Figure 2.5).

At the Batiscan site, unifacial flaking (n=5), marginal or partial retouches (n=9), and the presence of cortex (n=4) are all attributes that were exclusively observed on non-Meadowood points. One or many of these characteristics were present on a total of 12 projectile points. Cortex is essentially absent on Meadowood projectile points, except in the case of the rhyolite Meadowood point at the Muskalonge site and one, manufactured in Onondaga chert, from the Oberlander 2 site.

What conclusions can be drawn from this material source analysis? First, it can be said that the overwhelming predominance of Onondaga chert employed in the manufacture of Meadowood points at all but one site (i.e., Batiscan) adds to the high degree of standardization involved in the production of these objects. Given the high quality of this stone, its restricted distribution, and the wide distribution of Meadowood points, it is very likely that Onondaga chert was a highly valued raw material. The value attached to Onondaga chert, however, may have varied depending on how far and/or easily accessible this stone was from a community's home territory. Where it was easily accessible, Onondaga was also used in the production of most non-Meadowood points (e.g., at the Scaccia and Riverhaven sites). It is very unlikely, given the ad-hoc manufacture of many such points, that these objects were all prestige or highly valued items. The value of non-Meadowood points recovered in mortuary contexts, however, is more ambiguous.

Table 2.7 Non-Meadowood projectile point raw materials at seven sites

| | | | SITES | | | | | | | | | | | | | |
|----------------------------|---------------------|----------------|------------|------------|------------|------------|------------|------------|----------|------------|------------|------------|------------|------------|--------------|------------|
| | | | Habitation | | | | | | Mortuary | | | | | | | |
| | | | Batiscan | | Scaccia | | Riverhaven | | Hunter | | Muskalonge | | Bruce Boyd | | Oberlander 2 | |
| Lithic category | Lithic subdivisions | Sources | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Chert | carbonate | Onondaga | 10 | 22 | 131 | 94 | 13 | 81 | 2 | 40 | 1 | 100 | | | 16 | 84 |
| | | Indiana | | | 2 | 1 | | | | | | | | | | |
| | | Bayport | | | | | | | | | | 1 | 50% | | | |
| | | unidentified | 5 | 11 | 2 | 1 | | | 1 | 20 | | | | | | |
| | Appalachian | unidentified | 14 | 30 | | | | | | | | | | | | |
| | | Heldeberg | | | | | 1 | 6 | | | | | | | | |
| | unidentified | unidentified | 1 | 2 | 2 | 1 | | | 1 | 20 | | | | | | |
| Chalcedony | – | unidentified | | | | | 1 | 6 | | | | | | | | |
| Jasper | – | unidentified | | | | | 1 | 6 | | | | | | | | |
| Rhyolite | – | Kineo | 4 | 9 | | | | | | | | | | | | |
| | | unidentified | | | 1 | 1 | | | | | | | | | | |
| Quartzite | fine grained | Mistassini | 6 | 13 | | | | | | | | | | | | |
| | | unidentified | 1 | 2 | | | | | | | | | | | | |
| Quartz | – | unidentified | 1 | 2 | | | | | | | | | | | | |
| Siltstone | – | unidentified | 2 | 4 | 2 | 1 | | | 1 | 20 | | | | | | |
| Welded tuff | – | Ottawa valley? | 1 | 2 | | | | | | | | | | | | |
| Unidentified | | | 1 | 2 | | | | | | | | 1 | 50 | 3 | 16 | |
| TOTALS ¹ | | | 46 | 100 | 140 | 100 | 16 | 100 | 5 | 100 | 1 | 100 | 2 | 100 | 19 | 100 |

1- For the Scaccia and Oberlander 2 sites, the numbers in this table are based on the number of specimens accessible for analysis. Divergences, when totals are added, with the number of projectile points showed in Table 2.1 are due to discrepancies between information in field notes and the actual collections.

The presence, at the Batiscan site, of Meadowood-like points manufactured from local or non-Onondaga exotic materials suggests that value was also associated with the morpho-stylistic attributes of Meadowood points, and/or with the ability, or the rights, to produce such objects. Exclusive rights to produce Meadowood points, on the other hand, could account for the absence of locally produced Meadowood points at sites such as Lambert and Désy close to present-day Québec city. Further investigations are needed to

clarify this question. It can be confidently affirm, however, that the use of Onondaga chert in the manufacture of Meadowood points was a key feature and enhanced the value of these objects within a trade network where Onondaga chert acquired increased value among communities located farther away from its sources.

Recycling and Fire Effects. The recycling of objects can also provide clues about the function of an object. In some cases, usually when dealing with personal regalia such as gorgets, recycling has been said to reflect the value attached to an object. The recycling of projectile points, however, was more likely an attempt at increasing their functional use-life. Within the seven Meadowood collections, recycling of points was reflected in the occasional reuse of existing edges or edges and spurs (resulting from breakage) as cutting tools, drills, piercing tools, scrapers or “pièces esquillées”.

At the Batiscan site, 25% (n=5) of Meadowood points show evidence of recycling, compared to 38% (n=17) for the remaining projectile points. A potential explanation could be that Meadowood points, at least at the site of Batiscan, were kept intact as much as possible, their value being dependent upon their very distinctive technological and stylistic attributes. Meadowood points are not very valuable once broken, at least not any more than non-Meadowood points. Recycling of projectile points is rare in the collection from Scaccia, being observed only on 6% (n=12) of the points, including six Meadowood, two small stemmed points, and four notched projectiles of unknown affiliation. No mention of recycled points could be found in Granger’s report on Riverhaven 2 site (Granger 1978). Even fewer recycled projectiles were observed in mortuary assemblages. At Oberlander, one projectile of undetermined type was recycled into a drill. A small mass of limonite adhering to a fragmented Meadowood point from the Hunter site suggests its reuse as a strike-a-light. No recycled points were observed in the Muskalonge assemblage.

Nevertheless, Ritchie (1961: 35) noted that while most Meadowood points were projectiles, others seem to have been made or modified for use as side or end scrapers, knives, and perhaps saws. Similarly, William Fox noted that Meadowood points in Ontario exhibit much more reworking and recycling than the preceding small point assemblages (Fox 1985, cited in Snarey 2000; see also Ellis and Spence 1997: 138). Variability in the way Meadowood points were used and recycled may reflect differences in the value people attached to these objects, which in turn probably depend upon their availability.

Alternatively, points may have been equally valued by all groups, but the expression of this value may have differed.

Meadowood points are more often altered by heat than non-Meadowood points. If this pattern reflects the association of the former with rituals involving fire, it could support the idea that they were more highly valued than the other styles of projectile points (Table 2.4). However, heat treatment in this case could also reflect a strategy used by flint knappers to thin preforms as much as possible. Nevertheless, Meadowood points and the bifaces from which they were transformed are finely crafted artefacts possibly produced by specialists, a hypothesis that would account for the homogeneity of these objects.

Scrapers

Notwithstanding the presumed function of the term “scraper,” this artefactual category includes objects of different shape, quality, and size that were likely used in a wide range of manufacturing and/or processing activities. Use-wear analyses have the potential to identify these different uses. Ethnographically, scrapers have been associated with the processing of animal skins and the manufacture of hide garments (e.g., Gallagher 1977, cited in Hayden 2002: 207). Where hide processing is an important activity (for the production of high-quality tailored clothes, for example) more specialized and standardized forms of scrapers, that can be hafted and reused, are usually employed (Hayden 2002: 206). Triangular scrapers transformed from Onondaga chert bifaces, another diagnostic trait of the Meadowood Interaction Sphere, fit this description. Hide garments were highly valued by indigenous communities not only in the Northeast but in many parts of the world (Hayden 2002). In early Historic times, prior to the European fur trade, they represented one of the major traded products across northeastern North America.

Within our sample of seven Meadowood components, Riverhaven 2 and Batiscan (2 of the 3 habitation sites) yielded by far the two largest collections of scrapers (Table 2.8). Such major differences in the abundance of scraping tools almost certainly reflects some sort of specialization in the activities that were carried on at some, but not all Meadowood habitation sites. Station 4 at Pointe-du-Buisson, a mixed multicomponent site not included in this analysis, is another site where a large number of Meadowood scrapers have been recovered (Clermont and Chapdelaine 1982: 61).

Abundant at the Batiscan site, scrapers have a wide variety of forms. Unifacial forms include thumb nail scrapers, tabular scrapers, and humpback scrapers with steep edges similar to the *grattoirs carénés* documented at some Paleoindian sites and at the Lambert and Hamel sites, two Meadowood components close to Québec City (Chrétien 1995: 123—Figure 2.20). Bifacial forms consist in reworked projectile points and biface tips, as well as bifacial triangular scrapers diagnostic of the Meadowood Interaction Sphere (Figure 2.21). Marks or grinding were visible on the proximal ends of three bifacial and two unifacial scrapers in the Batiscan collection, suggesting that these tools were hafted when used. Moreover, 13 bifacial and 10 unifacial scrapers were characterized by one or multiple spurs, generally located at the junction of the tool's distal end and one of its sides (n=15), or on their proximal ends (n=9). Spurs may have been used in a piercing or scoring motion, and their direct association with Meadowood scrapers suggests a combined utilisation of both tools, hypothetically in the processing of animal hides and skins. An important proportion of scrapers from the Batiscan site were used until exhausted. Among the latter, some were recycled as wedges (*pièces esquillées*). Wedges may have been used for a range of slotting and scraping functions (Wright 1990: 495), as well as butchering and skinning game animals or fish (Hayden 1980).



Figure 2.20 Unifacial scrapers from the Batiscan site. (Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

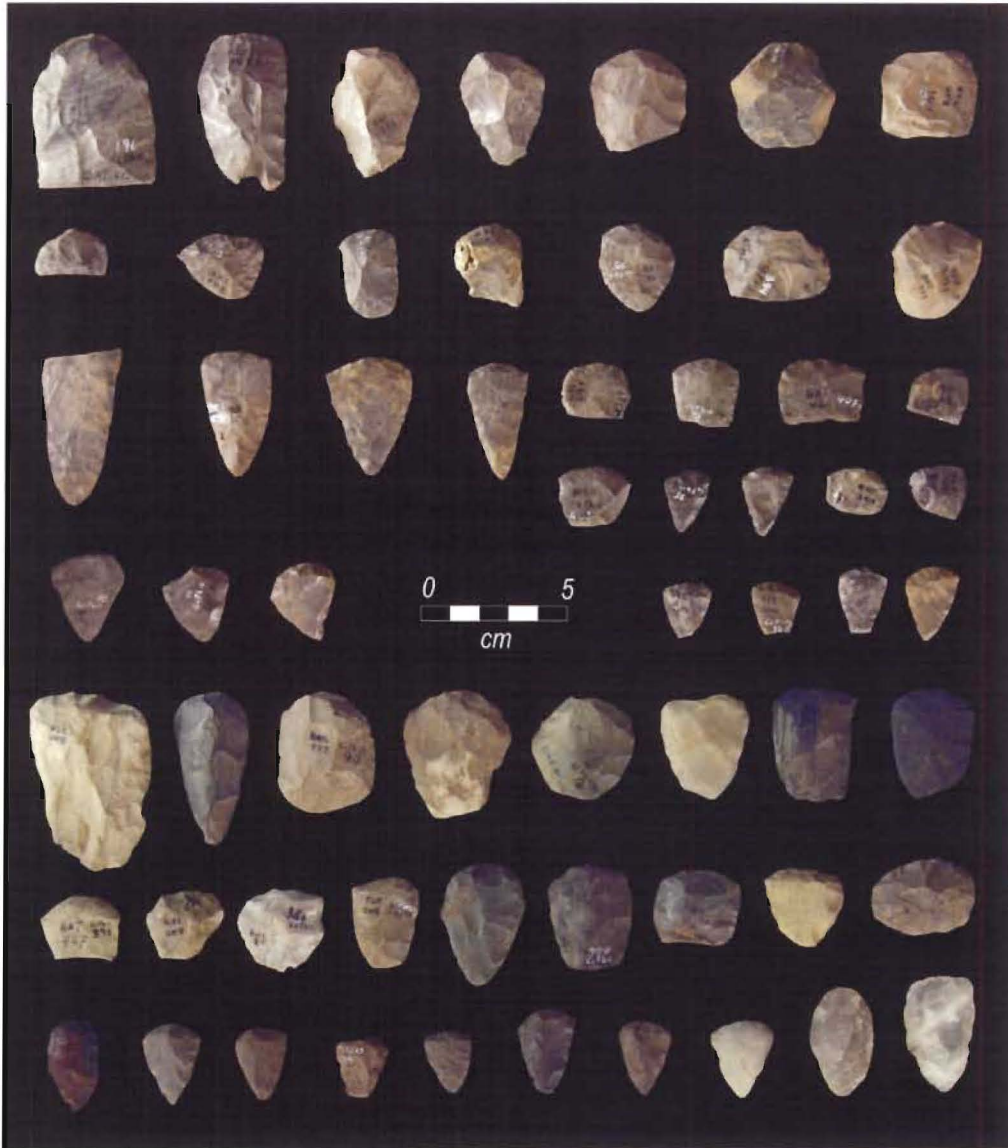


Figure 2.21 Bifacial scrapers from the Batiscan site.
(Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities)

Triangular in shape, typical Meadowood scrapers are generally characterized by steep dorsal flaking produced on the proximal ends of cache bifaces. The remaining bifacial and unifacial scrapers display a much greater variability in their general outlines, dimensions, working edge locations, and edge angles (Table 2.8). While expediently made unifacial scrapers should not be expected to show a high degree of standardization, it is possible that different forms of scrapers were involved in different activities, or in the successive steps of one activity such as hide scraping (Hayden 2002). For example, Ritchie (1965: 190) believed that the side scrapers made from retouched flakes were probably related to woodworking.

Table 2.8 Attributes of bifacial and unifacial scrapers at six Meadowood sites

| | | N | Typical Meadowood (%) | Fragmentation rate (%) | Edge location | | | | | | | Edge angle | | | | | | |
|--------------------|--------------|-----|-----------------------|------------------------|---------------|---------------|----------------------|----------|----------------|---------------------|-----------------|-----------------|----------|----------|-----------|-----------|-----------|-----------------|
| | | | | | End (%) | Both ends (%) | End(s) + Side(s) (%) | Side (%) | Both sides (%) | Circumferential (%) | Spoke shave (%) | Inderminate (%) | < 45 (%) | > 45 (%) | 45-60 (%) | 60-75 (%) | 75-90 (%) | Inderminate (%) |
| Bifacial scrapers | | | | | | | | | | | | | | | | | | |
| Habitat | Batiscan | 78 | 29 | 25 | 47 | 6 | 29 | 3 | 1 | 12 | 2 | - | 7 | - | 34 | 36 | 23 | - |
| | Scaccia | 6 | 67 | 17 | 67 | 17 | 17 | - | - | - | - | - | 33 | - | 17 | 17 | - | 33 |
| | Riverhaven 2 | 104 | 47 | 22 | - | 7 | 43 | 13 | 16 | 17 | 5 | - | 35 | 63 | - | - | - | 1 |
| Mortuary | Hunter | 12 | 83 | 25 | 75 | 8 | 8 | 8 | - | - | - | - | - | - | 33 | 17 | 42 | 8 |
| | Muskalonge | 3 | 67 | 33 | 100 | - | - | - | - | - | - | - | 33 | - | - | 33 | - | 33 |
| | Oberlander | 12 | 100 | 20 | 80 | - | 20 | - | - | - | - | - | - | - | 20 | 40 | 20 | 20 |
| Unifacial scrapers | | | | | | | | | | | | | | | | | | |
| Habitat | Batiscan | 71 | - | 17 | 34 | 4 | 49 | 3 | - | 4 | 4 | 1 | 16 | - | 31 | 39 | 14 | - |
| | Scaccia | 1 | - | 0 | - | - | - | 100 | - | - | - | - | 100 | - | - | - | - | - |
| | Riverhaven 2 | 92 | - | 15 | - | 21 | 28 | 16 | 11 | 20 | 4 | - | 32 | 68 | - | - | - | - |
| Mortuary | Hunter | 4 | - | 25 | 25 | - | - | 25 | - | 25 | - | 25 | 25 | - | 25 | - | 50 | - |
| | Muskalonge | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Oberlander | 5 | - | 0 | 40 | - | 40 | - | - | - | 20 | - | - | - | - | - | - | 100 |

With the only exception of the Batiscan site, Onondaga chert is the raw material favoured by Meadowood flint knappers producing bifacial and unifacial scrapers (Table 2.9). At Batiscan, only 15% (n=11) of the unifacial scrapers were manufactured from Onondaga chert, but this proportion increases to 43% (n=21) for the atypical bifacial scrapers and to 59% (n=17) for Meadowood scrapers. The single category of scraping tools include 53% (n=49) of the total number of flaked stone tools made of Onondaga chert at Batiscan. This raw material, typically favoured by Meadowood communities, may have been selectively used to produce scrapers at the Batiscan site. Alternatively, Early Woodland communities inhabiting the Batiscan site may have selectively acquired scrapers through trade with other Meadowood groups.

Table 2.9 Scraper raw materials at six Meadowood sites

| | | | Habitation | | | | | | Mortuary | | | | | |
|-------------------------|--------------------------|-----------------------|------------|-----|---------|-----|------------|-----|----------|-----|------------|-----|------------|-----|
| | | | Baïscan | | Scaccia | | Riverhaven | | Hunter | | Muskalonge | | Oberlander | |
| General lithic category | Lithic subdivisions | Sources | N | % | N | % | N | % | N | % | N | % | N | % |
| Bifacial scrapers | | | | | | | | | | | | | | |
| Chert | Carbonate | Onondaga | 38 | 49 | 6 | 100 | 104 | 100 | 12 | 100 | 2 | 67 | 5 | 100 |
| | | Ontario/Erie Lowlands | 22 | 28 | | | | | | | 1 | 33 | | |
| | | Munsungan | 1 | 1 | | | | | | | | | | |
| | Appalachian | Local | 7 | 9 | | | | | | | | | | |
| | Unidentified | Unidentified | 2 | 3 | | | | | | | | | | |
| Quartzite | Fine-grained | Mistassinni | 2 | 3 | | | | | | | | | | |
| | | Ramah | 2 | 3 | | | | | | | | | | |
| | Medium to coarse-grained | Sheguiandah | 1 | 1 | | | | | | | | | | |
| Quartz | - | Local | 3 | 4 | | | | | | | | | | |
| TOTAL ¹ | | | 78 | 100 | 6 | 100 | 104 | 100 | 12 | 100 | 3 | 100 | 5 | 100 |
| Unifacial scrapers | | | | | | | | | | | | | | |
| Chert | carbonate | Onondaga | 11 | 15 | 1 | 100 | 92 | 100 | 4 | 100 | | | 5 | 100 |
| | | Ontario/Erie Lowlands | 24 | 34 | | | | | | | | | | |
| | Appalachian | Local | 9 | 13 | | | | | | | | | | |
| | Unidentified | Unidentified | 2 | 3 | | | | | | | | | | |
| Quartzite | Fine-grained | Mistassinni | 6 | 8 | | | | | | | | | | |
| | | Ramah | 3 | 4 | | | | | | | | | | |
| | Unidentified | Unidentified | 5 | 7 | | | | | | | | | | |
| Quartz | - | Local | 9 | 13 | | | | | | | | | | |
| Siltstone | - | Local | 1 | 1 | | | | | | | | | | |
| Unidentified | | | 1 | 1 | | | | | | | | | | |
| TOTAL ¹ | | | 71 | 100 | 1 | 100 | 92 | 100 | 4 | 100 | - | - | 5 | 100 |

1-For the Oberlander 2 site, the numbers in this table are based on the number of specimens accessible for analysis. Divergences, when totals are added, with the number of scrapers showed in Table 2.1 are due to discrepancies between information in field notes and the actual collections.

Drills and Graving Tools

Only a minority of drills and graving tools have diagnostic value for the Meadowood Interaction Sphere. Their importance in this description resides mainly in that, like scrapers, they are indirect indicators of activities involving perishable materials such as hides, wood, shell, bone, and bark. For example, Yves Chrétien noted that piercing tools suggest activities linked to the maintenance of bark canoes (Chrétien 1995: 286). In terms of shell and bone working, graving tools could have been used to produce the geometric designs present on the two decorated bone specimens from the Scaccia and Oberlander 2 sites (Figure 2.47).

Based on the artefactual inventories compiled for seven Meadowood sites, drills have more chances to be found in large quantities in the context of habitation sites. This tendency is illustrated by the Scaccia and the Riverhaven sites. However, the site of Batiscan suggests that not all habitation sites contained a significant proportion of drilling tools. In the four mortuary contexts analyzed, drills were always present, but never in very large numbers (Table 2.1).

When reported in the literature, drills are often distinguished on the basis of their basal characteristics (e.g., expanded base, T-shape, lanceolate, hafted). These morphological attributes are often the by-product of recycling. Indeed, many drills were apparently manufactured from broken/exhausted tools. Hafted drills, for examples, are generally recycled projectile points and include side-notched and stemmed drills. Usewear observed on the proximal ends of two expanded-base drills from Scaccia suggest that these objects are in fact recycled Meadowood scrapers. In this case, however, the hypothesis that both functions were performed simultaneously can not be ruled out. Being themselves the by-products of recycling, broken or exhausted drills are generally not reused. Hence, T-shaped drills are often broken or show signs of extensive use. An exception to this rule is represented by a fragmented T-shape drill recovered from the Scaccia site, which has a second drill shank on its basal portion.

Some of the T-shape drills found in Meadowood sites were produced from cache bifaces. These drills, contrary to the recycled specimens described above, may actually be first-hand tools (possibly produced from cache bifaces broken in the process of manufacture) with a diagnostic value as Meadowood trade items. This idea is supported by

the presence of very similar objects in culturally-related Glacial Kame contexts such as the Port Franks (Jury 1978: 9), Liahn I and Hind sites (Spence and Fox 1986: 8, 13).

Both the Riverhaven and Scaccia sites included 49 drills in their assemblages. Most of these tools—94% (n=46) from Scaccia and 98% (n=48) from Riverhaven 2—are bifacial, while a very small minority are flaked on unifacial supports. At the Scaccia site, 31% (n=15) of the drills are characterized by an expanded base, 18% are hafted (n=9), 10% (n=5) have a T-shape, 8% (n=4) are lanceolate, and 33% (n=16) are represented by indeterminate shank fragments. The same categories were observed at the Riverhaven 2 site, and similar proportions were reported by Granger (1978: 218), except for a greater number of expanded-base drills, a distinction that may be caused by the greater number of indeterminate shank fragments at the Scaccia site. While the base shapes of hafted drills recovered from Meadowood contexts indicate that, in most cases, they were made from Meadowood side-notched points, one example from the Scaccia site resembles more a Susquehanna broad point.

With six fragmented and seven complete drills associated with burial features, Oberlander 2 is the mortuary site where these tools are the most abundant. Three drills are T-shaped, six have an expanded base, and four are unidentified shaft fragments. One complete side-notched drill and a fragmented shank were also found in burial pits at the Muskalonge Lake site. Four expanded base drills derived from Meadowood cache bifaces were recovered within two caches and one grave at the Bruce Boyd sites. All the drills from these four mortuary components were made in Onondaga chert.

Four drills, three complete and one proximal fragment were present in the assemblage from the Batiscan site. While all have an expanded base, none has the characteristic T-shape recorded at the other two habitation sites. At both Scaccia and Riverhaven sites, Onondaga chert is once again the material favoured to manufacture drilling tools. Three exceptions were reported from the Scaccia site, including the drill recycled from a Susquehanna broad point, which was manufactured from Upper Mercier chert. At Batiscan, Onondaga and Appalachian cherts were each used to make half of the drills (n=2).

Besides drills, a number of objects can be classified into an expedient category of piercing/graving tools. The working part of these tools generally consists in a more or less pointed spur that has been slightly retouched. Broken bifacial tools are a common support for these piercing/graving tools, although they are also manufactured from flaking debris.

The only two assemblages with piercing/graving tools are those from the Batiscan (n=13) and Scaccia sites (n=2). These objects may have been used to pierce relatively thin and soft materials such as hides, or to engrave bone, wood, or even wet clay containers. It should be noted that piercing tools such as these can cut through the materials and produce small holes (1-3 mm in diameter). Drilling holes, on the other hand, involves a rotating gesture making larger holes (5-10 mm in diameter). The main difference between drills and the more expedient piercing/graving tools is the presence of a well-defined shank on the drills. Ellis and his colleagues also observed that drills usually display heavily polished and blunted tip areas but lack use wear on the lateral edges, while the opposite is observed on piercing/graving tools (Ellis et al. 1988: 11).

Strike-a-Lights

The common presence of fire-making sets in Meadowood graves not only indicates that fire was made by percussion of stone with pyrites, but could also point to the importance of fire in mortuary rituals. Alternatively, the possibility that these offerings represent personal possessions of the deceased cannot be ruled out. Fire-making sets accompanying the dead were either rolled in bark, which served as tinder and left imprints on weathered pyrites (limonite masses), or were enclosed in a small bag (Ritchie 1965: 198).

Strike-a-lights generally consist of chert items, such as the typical Meadowood cache bifaces and scrapers. Working edges consist of a symmetrically blunted, bifacially produced margin, usually extensively polished and ground from use (Ellis et al. 1988: 9). Limonite stains on two abraders, two celts, a greywache pebble, and a pendant have also been observed at Bruce Boyd. While the association of these items with pyrites could be due to their common inclusion in a grave, use wear on the celts strongly suggest their use as strikers (Spence n.d.).

Within our sample, the only two possible examples of strike-a-lights in the context of Meadowood habitation components came from the Scaccia and Batiscan sites. The strike-a-light from the Scaccia site, associated with a basin-shaped feature, was manufactured on a mesial bifacial fragment of Onondaga chert. The hypothetical example from Batiscan, on the other hand, was produced from local sandstone and shows extensive use wear.

Polished Stone Artefacts

The “polished stone” category includes artefacts that have been intentionally and often thoroughly polished before being used. This technology, employed in the production of a wide variety of tools and ornaments, appears in the archaeological record at the beginning of the Archaic Period in the Northeast, ca. 8000 years BP. Because tools such as celts, adzes, and gouges were polished, their introduction at the beginning of the Archaic period is often thought to reflect an increased importance of woodworking activities. Without denying this argument, I believe that a number of very well-made and highly polished Archaic adzes and gouges were probably prestige items, as they were in New Guinea ethnographically and in Neolithic Europe (Hampton 1999: 150-151; Pétrequin and Pétrequin 1992: 231, 1993: 336).

In Terminal Archaic and Early Woodland times, non-utilitarian objects such as gorgets and birdstones expand the Archaic inventory of polished items and were more clearly prestige items. There is a strong correlation between the initial appearance of these objects and the emergence of elaborate burial ceremonialism in the Eastern Woodlands. The frequent association of gorgets and birdstones with burials and the exotic materials in which they are often made led many authors to see these artefacts as “trade goods and status items” (Starna 1979: 339). Trapezoidal gorgets and popeyed birdstones are diagnostic of the Meadowood Interaction Sphere. Together with celts/adzes and a few steatite sherds, they form the major categories of polished stone artefacts described in this chapter (Table 2.10).

Gorgets

The manufacture of stone gorgets would have required considerable investments of time and energy (Starna 1979: 338). Gorgets were probably worn as pendants, and they may evoke a growing emphasis on personal adornment related to social status. In the Northeast, they were made of stone, shell, or native copper. Meadowood gorgets were manufactured in stone, typically in Huronian banded slate. Stone gorgets, however, are not exclusive to the Meadowood interaction sphere. They have been documented in Early and Middle Woodland components of other cultural affiliations, and in Late Archaic contexts in the Eastern United States (Ritchie 1945: pl. 12, fig. 40, 41).

Table 2.10 Distribution of polished and ground stone artefacts at seven Meadowood sites

| | | Polished stone | | | | Ground stone | | | | TOTALS |
|------------------|------------|--------------------|----------------|----------------|-----------------|-----------------|-----------------|--------------|-----------|------------|
| | | Gorgets & pendants | Birdstones | Celts & adzes | Steatite sherds | Abrading stones | Grinding stones | Hammerstones | Nesinkers | |
| Habitation sites | Batiscan | 1 | 0 | 0 ¹ | 0 | 15 | 3 | 2 | 1 | 22 |
| | Scaccia | 9 ² | 2 | 20 | 2 | 10 | 14 | 3 | 0 | 60 |
| | Riverhaven | 1 | 2 | 7 | 0 | 25 | 8 | 10 | 25 | 78 |
| Mortuary sites | Hunter | 5 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 10 |
| | Muskalonge | 4 | 0 ³ | 4 | 0 | 2 | 1 | 2 | 0 | 13 |
| | Bruce Boyd | 8 | 0 | 3 | 0 | 8 | 0 | 3 | 0 | 22 |
| | Oberlander | 15 | 2 | 9 | 3 | 4 | 5 | 3 | 1 | 42 |
| TOTALS | | 43 | 6 | 47 | 5 | 65 | 31 | 23 | 27 | 247 |

- 1- A fragment of polished igneous rock found at the Batiscan site could be from a celt or an adze.
 2- Two unidentified polished fragments from the Scaccia site, one from a pit and one from the general surface, could be two additional gorgets.
 3- A narrow, bar-type birdstone from the Muskalonge Lake site was mentioned in Ritchie's report (1955). However, Ritchie added a question mark beside this trait, and since no other mention, description or photograph could be located, no birdstone is included in the Muskalonge Lake site inventory.

Ritchie described various gorget styles associated with Meadowood cultural contexts (Ritchie 1965: 190). In my analysis, a winged style, represented by two fragmentary gorgets found at the Hunter and the Scaccia sites (Ritchie 1955: pl. 23, fig.16; Wray 1965: 3), was added to Ritchie's list (Table 2.11). Large trapezoidal and narrow rectangular gorgets are the two most common styles. The former style has been documented exclusively in funerary contexts and is generally used as a diagnostic Meadowood style (Binford 1963b: 135-137; Clermont 1978: 9; Ritchie 1955: 57). Narrow rectangular gorgets are present at both habitation and mortuary sites. The bar shape gorget from Riverhaven is unlike other narrow rectangular gorgets (Ritchie 1965: pl. 64, fig.17), although Granger noted the presence of a similar form in the collection from the Allen site (Granger 1978: 229). A complete narrow rectangular gorget with one flat surface, notches on its lateral edges, and a keel running longitudinally across the other surface has been found in a grave at the Muskalonge Lake site (Figure 2.22: d). While this item has no stylistic equivalent at other Meadowood components, a medial keel was observed on a fragmentary slate gorget from the Scaccia site (Figure 2.23: e). At the neighbouring Hunter site, a broken dumbbell-shaped gorget is another unique

specimen (Figure 2.22: c), although Ritchie noted a possible related style in Illinois Hopewell contexts (Ritchie 1955: 57).

Table 2.11 Distribution of gorget styles at seven Meadowood sites

| | Large, trapezoidal | Narrow, rectangular | Narrow, rectangular, keeled | Dumb-bell | Rectanguloid, excuvrate | Winged | Underminate gorget style | Other pendants | TOTAL | Fragmentation rate (%) | Reworking rate (%) |
|--------------|--------------------|---------------------|-----------------------------|-----------|-------------------------|--------|--------------------------|----------------|-------|------------------------|--------------------|
| Batiscan | | | | | | | 1 | | 1 | 100 | 0 |
| Scaccia | | 3 | | | 1 | 1 | 2 | 2 | 9 | 89 | 22 |
| Riverhaven 2 | | 1 | | | | | | | 1 | 0 | 0 |
| Hunter | 2 | | | 1 | | 1 | 1 | | 5 | 100 | 60 |
| Muskalonge | 3 | | 1 | | | | | | 4 | 75 | 25 |
| Bruce Boyd | 3 | 1 | | | 1 | | | 3 | 8 | 38 | 13 |
| Oberlander 2 | 5 | 2 | | | 2 | | 5 | 1 | 15 | 100 | 13 |
| TOTAL | 13 | 8 | 1 | 1 | 3 | 2 | 11 | 5 | 43 | | |

Ritchie wrote that the one common feature of the stone gorgets from the Muskalonge Lake and Hunter sites was the choice of slate for their manufacture (Ritchie 1955: 40). According to the same author, the two trapezoidal gorgets from the Hunter site were made in a medium gray slate (Ritchie 1955: 57). However, William Kelly microscopically examined two Meadowood gorgets from the Hunter site and one from the Muskalonge Lake site. A single case was identified as probable exotic slate (Figure 2.22: b), the other two being more probably shale (Figure 2.22: a) and sandstone (Figure 2.22: c) (William Kelly, pers. comm. 2002). The gorgets from the Bruce Boyd site, all fashioned in banded slate, may have been imported as finished items, although the local availability of this raw material makes it difficult to determine (Spence n.d.).

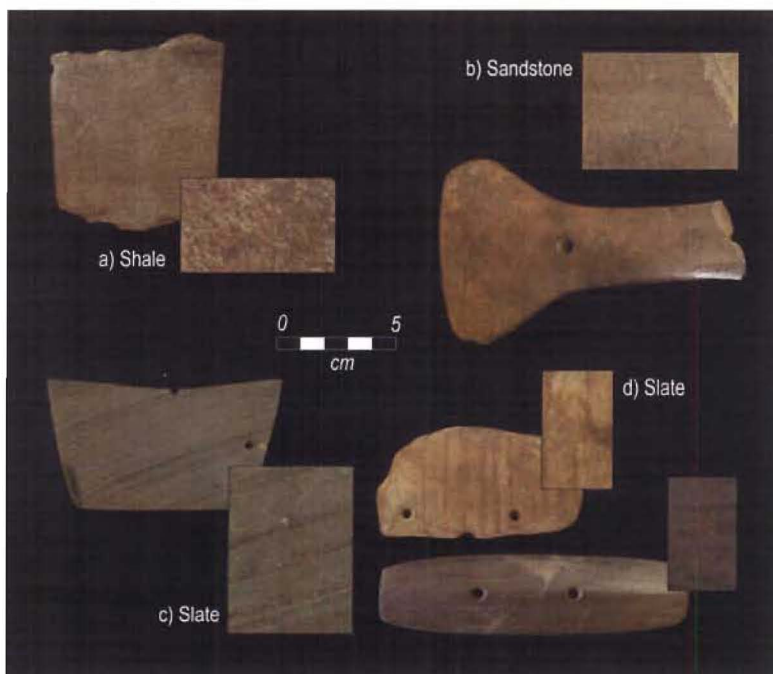


Figure 2.22 Raw materials employed in the manufacture of gorgets. (Courtesy of the New York State Museum, Albany, NY).

Other types of pendants are also present in Meadowood assemblages. At Bruce Boyd, two Early Woodland burial pits each yielded a pendant. One was made of banded slate and reworked into a celt, while the other is a piece of polished siltstone fashioned into the form of a projectile point. Narrow bands of light brown material naturally present in the stone form a zigzag design on the object. The blade and tip of the point/pendant are blunt, suggesting that it was never designed to be a projectile. Typologically, the point is characterized by a broad blade, and a short and broad stem with basal notches. According to Michael Spence, “[i]ts form, distinct from Meadowood projectile point types, raises the possibility that it may have been an import (though such material is available locally) or an heirloom” (Spence n.d.). A third, black slate pendant constitutes a non-diagnostic surface find at the Bruce Boyd site. A complete, crescentic-shaped pendant fashioned out of brown slate was the only artefact present in Feature 48 at the Scaccia site (Figure 2.23: b; Ritchie and Funk 1973: 107). Besides this well crafted item, a circular white sandstone pendant was also recovered at Scaccia (Figure 2.23: h).

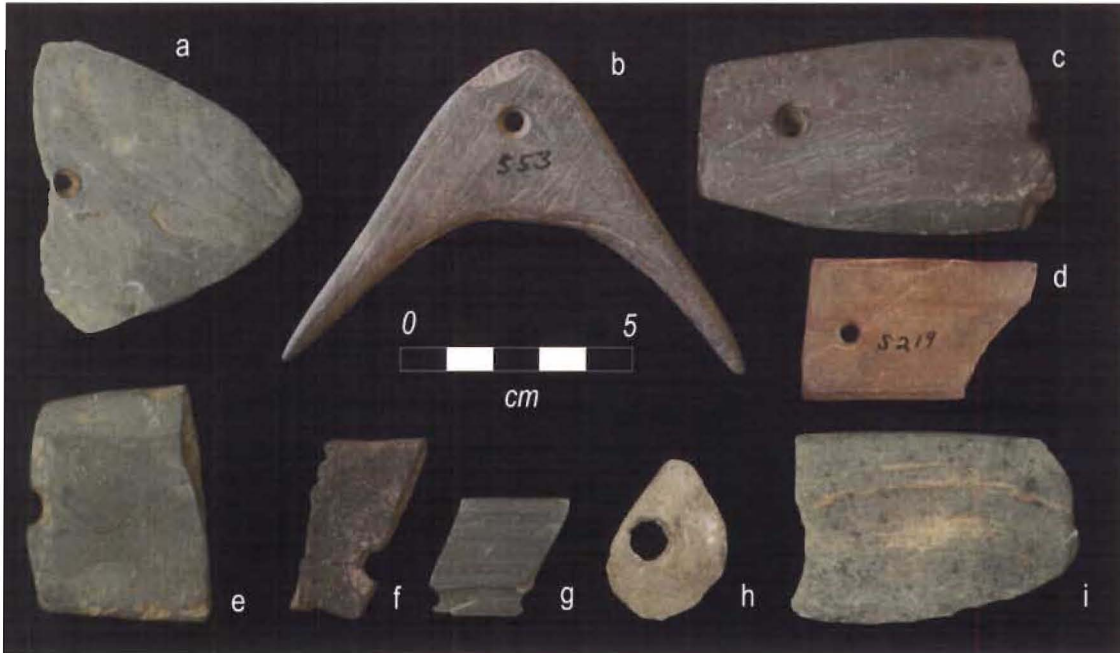


Figure 2.23 Gorgets and pendants from the Scaccia site.
(b,d: Courtesy of the New York State Museum, Albany, NY; a,c,e-i: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

The gorgets and pendants present in our seven Meadowood assemblages are characterized by a high fragmentation rate (Table 2.11). While some may have been shattered in the crematory fire or ritually killed just before their inclusion in features (Figure 2.24; Ritchie 1955: 57), many broken gorgets in pits are represented by a single fragment. A number of these items also show evidence of reworking (Figure 2.25). The rounded and polished edges of the breaks (Ritchie 1955: 57; Spence nd) and the perforations added after breakage on some specimens (Figure 2.22: d; Ritchie 1955: pl. 23, fig. 16) further suggest that breakage preceded burial in a majority of cases. A partially drilled hole on the surface of a fragmentary slate gorget from Scaccia suggests incomplete reworking (Figure 2.23: g).

A number of explanations could account for the high frequency of broken gorgets. Intentional breakage for prestige purposes may have been practised by Meadowood leaders in a way similar to the breaking of copper pieces by Northwest Coast chiefs. Such a powerful act conducted at public rituals represented a challenge to a rival, who was then obligated to respond by breaking a copper of similar value (Jopling 1989: 31). The abundance of fragmented and reworked gorgets could also support Binford's idea that the social value associated with gorgets depended upon their history of possession:

It is suggested that gorgets functioned as a material accompaniment of a system of ranking, being available only to those occupying certain defined positions within the system and subsequently deriving “ritual value” from their history of ownership (1963b: 143).

This accumulative value would explain the retention and inclusion as grave goods of fragmented gorgets. Fragmentation could have enhanced the value of gorgets:

In fact, if an analogy may be drawn with the coppers of the Northwest Coast, broken and repaired items may have been of greater significance because of the particular history of the events leading to breakage, distribution of parts, and the eventual acquisition of two or more parts by a given individual (Binford 1963b: 144).

Ritchie (1955: 57) expressed a similar idea when he wrote, referring to the reworked bell-shaped gorget recovered from a grave at the Hunter site: “[t]here seems little doubt that we have here a treasured heirloom, modified after breakage to permit continued wearing in somewhat different manner.”



Figure 2.24 Highly fragmented gorgets.
(*b,e*: Courtesy of the New York State Museum, Albany, NY; *a,c-d,f-n*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).



Figure 2.25 Reworked gorgets.

(*a*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *b-c*: Courtesy of the New York State Museum, Albany, NY).

A distinction should be made between the *retention* and the *recycling* of fragmented gorgets. Recycling, which implies reworking and functional reassignment to perform mundane tasks, would not result in an increased social value of gorgets. Besides the pendant reworked into a celt from the Bruce Boyd site, a pendant from Scaccia, and two other gorgets from the Oberlander 2 and Hunter sites were recycled into abrading stones (Figure 2.26). Pendants used as whetstones are also common at the Boucher site, an Early Woodland cemetery in the Champlain valley (Heckenberger et al. 1990: 120). Similarly, Ritchie (1955: 41) observed on a gorget from the Muskalonge site “[a] group of faint, vertical, parallel scratches along the preserved edge on one side,” which he interpreted as an indication of “secondary service as a sharpening stone for finely pointed bone implements”.



Figure 2.26 Recycled gorgets.

(*a-b*: Courtesy of the New York State Museum, Albany, NY; *c*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Birdstones

Birdstones are polished artefacts generally shaped like birds. Such artefacts have been found from the Canadian Shield province to the state of Tennessee, and from the Mississippi River to the Atlantic. However, the most examples recovered within the area between Lakes Michigan and Ontario (Tremblay 2003: 11). The oldest examples are associated with the Terminal Archaic Glacial Kame complex, but they are more commonly found in Meadowood and Middlesex-Adena components of the Early Woodland period (Tremblay 2003: 12). Birdstones are essentially absent from subsequent Middle Woodland contexts. It is possible that a relationship exists between the bannerstones of the Archaic period and the Terminal Archaic/Early Woodland birdstones. Both are polished stone tools, generally perforated, and in both cases the idea of a function as atlatl weights has been suggested. It is also worth mentioning that a particular type of bannerstone (winged bannerstones) imitates, in an abstract fashion, bird wings (Rataul 2004).

Generally speaking, the oldest examples of birdstones belong to the so-called bar-type, lacking popeyes and often characterized by a fantail. On the other hand, Meadowood manifestations in Ontario, Québec, and New York are characterized by birdstones having the same bar-type body as their Archaic predecessors, but they can be distinguished from the latter by the addition of “popeyes” located on an angle on the birdstone’s head (Figure 2.27: a). Expanded base birdstones with two transverse basal ridges are usually more recent and distributed more widely in the southern part of the Meadowood Interaction Sphere. Truncated or bust forms are associated with Adena-Middlesex manifestations (Figure 2.27: b).

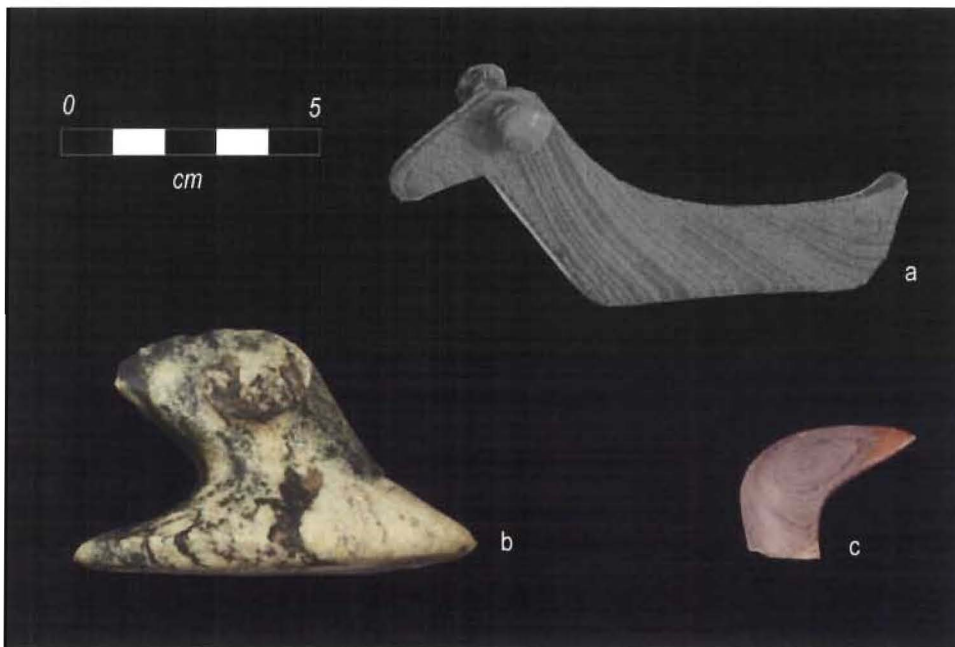


Figure 2.27 Birdstones: *a*, popeyed birdstone from Petite Nation River (Qc); *b*, truncated birdstone from Scaccia; *c*, broken birdstone from southern Ontario. (*a*: Modified from Tremblay 2003: 5; *b*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *c*: Courtesy of the University of Western Ontario, London).

Among the functions that have been attributed to birdstones, the most often cited is that of atlatl weights. The interpretation of birdstones being atlatl weights is based on a number of morphological and technological similarities between birdstones and actual atlatl weights recorded in ethnographic and archaeological contexts, especially the perforation at the base of most birdstones and atlatl weights from eastern North America. This feature would allow the attachment of the weight onto the atlatl. While many arguments support the idea that birdstones were used as atlatl weights, no birdstone has ever been found still

attached to an atlatl, or to anything else as a matter of fact. This is, of course, not a surprise given the poor preservation conditions characterizing most archaeological sites in the Northeast. The functional interpretation of birdstones is further impeded by the fact that the majority of these artefacts were found out of context (Tremblay 2003: 11).

While their function remains enigmatic, most archaeologists agree in saying that beyond their possible utilitarian function, birdstones were probably charged with a social and symbolic signification. Among the Native peoples of North America, and many other groups characterized by traditional forms of religion, birds are powerful and common symbols which, because of their ability to fly, are perceived as mediators, or messengers, between the various cosmic realms. Bird motifs or anatomical parts—feathers, beaks, claws—are often part of a shaman's costume and/or paraphernalia, conferring on him the power to communicate with creatures and spirits inhabiting beyond, or above, the world known to human beings. However, the morphological variability of birdstones is significant and archaeologists now recognize that, in some cases, they more closely resemble dogs, deer, turtles, or even beavers. This is the case of a birdstone found in the Petite Nation River in Québec, with a shape closer to a white-tailed deer than a bird (Tremblay 2003: 5; Figure 2.27: a).

Huronian banded slate is commonly employed to fashion birdstones, especially those found at Ohio and Ontario sites. Outcrops of this stone can be found around Lake Superior, approximately 1,000 km away from the Niagara Peninsula, often considered to be the core area of the Meadowood Interaction Sphere (Figure 2.5). Birdstones are often manufactured so that the colored stratification visible in “banded” slate creates circles on the eyes (Tremblay 2003: 7). Roland Tremblay (2003: 9) also observed that many damaged birdstones have notches along their ridges (Figure 2.27: a), a characteristic that has also been observed on a complete and apparently undamaged slate gorget from the Muskalonge Lake site. A broken birdstone from southern Ontario not only has notches along the ridges defining its head, but red ochre has also been applied on its beak (Figure 2.27: c). The significance of such notches remains enigmatic, despite Ritchie's attempt at elucidating their meaning while describing the Muskalonge Lake specimen:

Each lateral edge carries two groups of fairly well-delineated notches, eight in a group, except for the lower left (as shown) which consists of nine. Perhaps this

consistency reveals that in the value system of this group, eight bore some special significance (Ritchie 1955: 41).

Nevertheless, the exotic materials often employed in the manufacture of birdstones, the great time and effort investment required for their production, their rarity, and their frequent discovery in mortuary and rituals contexts support the idea of a prestige function for these artefacts.

Only six birdstones were recorded in the Meadowood assemblages compared in this study. It is clear from these numbers that not everyone possessed a birdstone, an observation that also applies to gorgets. At the Oberlander 2 site, a banded slate birdstone with an expanded body was found at the bottom of a burial feature, while a sandstone bar type birdstone was excavated near another grave (Ritchie 1965: pl. 60, fig. 16, 18). Glacial Kame sites in Ontario, Michigan, and Ohio yielded bar-type birdstones similar to the one found at Oberlander 2 (Cunningham 1948: 5, 10, 15; Ritchie 1949: 42).

Surprisingly, more birdstones were recovered from our sample of habitation sites. At the Riverhaven 2 site, a birdstone fragment was found in a hearth feature (Granger 1978: 213; pl. 32, fig. a). Fire marked scars of detachment suggest that the head was broken off by firing. The detached head, with the characteristic popeyes, of a second bar-type birdstone was found by a collector who noted that it had been associated with a “fireplace” (Granger 1978: 214; pl. 32, fig. b). Both birdstones from Riverhaven were made of Huronian banded slate. At the Scaccia site, an unfinished bar-type birdstone made of sandstone was found in one of the prolific, storage-related features excavated by Charles Wray in 1963 (Wray 1965: 3). At Scaccia, a truncated popeyed birdstone of igneous rock was also recovered from a burial pit attributed to the Adena-Middlesex phase based on its artefactual content. Besides this birdstone (of a type unknown in Meadowood—Ritchie 1965: 190), the grave contained a blocked-end tubular pipe and an Adena spearpoint.

Adzes and Celts

Depending on their attributes and contexts, adzes and celts found within Meadowood sites may thus represent additional evidence of prestige items used by these communities:

[t]he creation and maintenance of cutting edges by grinding is used under conditions of high processing volumes and/or to display control of wealth and power (Hayden 2000: 203).

These tools are identified through the presence of a cutting edge forming the bit at one end of a pecked and/or polished support, generally manufactured in hard igneous or metamorphic rocks. Plano-convex adzes and rectanguloid celts were included by Ritchie in the tool inventory of the Meadowood phase (Ritchie 1965: 190). Meadowood pecked and partially polished adzes are typically characterized by a narrow, thick, expanding, battered poll end, and occasionally, a gouge-shaped lip (Ellis et al. 1988: 13).

Scaccia yielded 21 adzes and celts, 15 of which were found in pit features, seven with other diagnostic Meadowood items. Four features were large pits probably used for storage. One celt from Scaccia is stained with red ochre. Three beveled adzes, generally attributed to the Late Archaic Lamoka culture, were also found at the Scaccia site, two of which came from the surface or plowzone. The other bevelled adze was recovered in a feature with no other diagnostic elements. According to Ritchie and Funk, “these substantiate the occurrence of the Archaic Lamoka culture on the site” (Ritchie and Funk 1973: 113). However, the co-occurrence of Meadowood and small stemmed Lamoka points at many Early Woodland sites suggests some form of cultural and/or temporal overlapping for these two types. At Scaccia, a Lamoka point has been found in a pit feature (F33), together with a side-notched Meadowood point and Vinette I pottery, and no sign of contamination or disturbance (Ritchie and Funk 1973: 105).

A beveled adze was also documented at the Riverhaven 2 site, where Granger noted that “no other such connection to Lamoka was established at Riverhaven 2 with the possible exception of (a) stemmed point” (Granger 1978: 219). Besides this bevelled adze, the Riverhaven 2 assemblage contains six celts, four of unknown provenience. The fragment of a plano-convex celt made of granite was associated with a rock heap feature, while the only complete specimen was found in a large storage/refuse basin pit.

Stone adzes and celts have been found at all four mortuary sites selected for study. The Oberlander 2 site yielded nine adzes and celts, six of which were recovered in graves, while one came from a pit feature of unknown function. At the Muskalonge Lake site, two of the three recorded stone adzes were found in a burial pit, one of which consists in the broken bit of a large, well-polished tool of gabbroic igneous rock (Figure 2.28). The latter

item would have required considerable time to manufacture. The other burial-associated adze from Muskalonge is smaller, with only the cutting end polished, and is made of granite. Granite is a rather unusual raw material for an adze, and the absence of use wear on its cutting edge suggests it may have not been functional. At the neighbouring Hunter site, a celt or adze fragment was also found in a burial pit. The fractured surface of this implement had been reworked, possibly to create a scraping tool (Ritchie 1955: 50). Four celts were found in three Meadowood graves at the Bruce Boyd site. Two of them were manufactured from Huronian banded slate, including one which was refashioned from a broken pendant (Spence nd). Two celts bear traces of use, while the other two have limonite adhering to them, suggesting their use as strikers. One also has red ochre stains on its surface.



Figure 2.28 Fragmented polished adze from the Muskalonge Lake site. (Courtesy of the New York State Museum, Albany, NY).

A high proportion of adzes and celts from mortuary sites were fragmented (45%, compared to a proportion of 22% in the context of habitation sites). While they may have been “killed” as grave goods, the presence of use wear on a fragmented adze from the Muskalonge site indicates that accidental breakage during use cannot be ruled out. A

systematic analysis of use wear on adzes and celts (not conducted in this study) would be required to better address this question.

Steatite Sherds

Steatite vessels were first produced in the Middle Atlantic region between 4,000 and 3,000 years ago (Bourque et al. 2001: 76; Custer 1987: 99; Sassaman 1993, 1999). Steatite sherds found within the context of Meadowood sites are likely to represent highly valued, ritual items. Indeed, by the end of the Archaic Period, steatite had become a dominant exotic material circulating within Eastern Woodlands interregional networks, and intentionally broken soapstone vessels are commonly found in ritual and mortuary contexts. Spatially restricted soapstone quarries occur in a belt traversing the Piedmont physiographic province, extending both to the south and north of the Middle Atlantic region (Figure 2.5; Klein 1997: 148; Stewart 1989: 50). New England Sources in Rhode Island, Connecticut and Massachusetts probably supplied the Northeast and Midwest with steatite vessels (Klein 1997: 147).

The time period covered by the Hawes funerary complex (3000-2600 BP), the southeastern New England equivalent of the richer Meadowood cemeteries of New York (Dincauze 1968: 87-88; Dincauze 1976: 131), represents the climax of the steatite industry. Sites such as Fort Hill, Hawes, Titicut and Potter are notable for the great size of their stone bowls. Moreover, the Horne Hill site (Massachusetts) yielded a radiocarbon date of 2730 ± 120 BP (Fowler 1966: 24), and the Hawes site (Massachusetts) contained Meadowood-like projectile points (Robbins 1963: 32).

It has long been assumed that, just as in the Middle Atlantic region, stone bowls were the first durable containers to be manufactured in the Northeast and that Vinette I pottery was modeled after steatite. Through a comprehensive overview of the radiocarbon ages associated with both steatite and Vinette I vessels, Hoffman (1998) proposed a revised chronological relationship in which Vinette I pottery technology overlaps with that of steatite during the Transitional Archaic stage, noting a strong probability that Vinette I even preceded stone bowls in the Northeast. Such conclusions mirror what has been observed in the Southeast, namely, a co-occurrence of steatite and pottery for a millennium or more (Sassaman 1993, 1997, 1999).

Abundant in floodplain and coastal sites, steatite sherds are much less frequent in the interior sites of northeastern North America (Funk 1976: 266; Custer 1987: 101). Only five steatite sherds were documented within our seven Meadwood sites. They were recovered from Scaccia (n=2) and Oberlander 2 (n=3). At the former site, a decorated rim sherd was recovered from a storage feature, while the provenience of the second, perforated, steatite sherd is unknown (Figure 2.29: a). At the Oberlander 2 component, on the other hand, a body sherd and a perforated steatite rim sherd were excavated in two distinct burial pits. Another perforated rim sherd was also present in the collection, but its context is uncertain (Figure 2.29: b).



Figure 2.29 Steatite sherds: *a*, Scaccia; *b*, Oberlander 2. (*a*: Courtesy of the New York State Museum, Albany, NY; *b*: Courtesy of the Rochester Museum and Science Center, Rochester, NY)

Ritchie observed a considerable diversity in the size and shape of steatite vessels from New York sites. Outlines can be oval, rectangular, nearly circular, or trough-shaped, bases are rounded or flat and slightly outslipping to vertical walls. Lugs at either end are frequent, and many vessels have cracks and reparation holes. Size ranges from about 15 to 45 cm in length and from 5 to 15 cm in height. (Ritchie 1965: 170). According to Ritchie, Early Woodland groups probably cooked, to a limited extent, in soapstone vessels (Ritchie 1965: 188). The five sherds from Scaccia and Oberlander 2 lack carbon residues to support Ritchie's hypothesis. This sample is too small, however, to rule out the potential function of

steatite vessels as cooking containers, especially given that smoke stains and grease incrusts have been observed on steatite sherds at a number of sites in the Northeast (Chrétien 1995: 139; Ritchie 1965: 170) and the Middle Atlantic region (Klein 1997: 146). However, according to Michael Klein, soapstone bowls were usually not placed directly on fire, as indicated by the location of sooting and smudging, most often on soapstone vessel interior walls. Using ethnographic documents, Klein (1997: 146) also observed that “[m]orphologically similar bowls of soapstone and clay most often performed as food serving platters, were used to brew or cook items consumed in ceremonial contexts, or served as lamps”.

In coastal New York, steatite vessels are associated with the Terminal Archaic Orient complex (ca. 3000 BP), which bear striking similarities with Meadowood burial practices (Ritchie 1959: 54). At such Orient burial sites as Stony Brook, Sugar Loaf Hill and Jamesport on eastern Long Island, New York, there is clear evidence for the burning and consumption of animal food in a funeral fire in the vicinity of burial pits. Osseous remains were subsequently poured, as part of the mortuary ritual, over the interred contents of the feature (Hoffman 1998:52; Ritchie 1959: 77). Similar burial and gathering locales are documented in the interior of northeastern North America, and it is highly probable that similar rituals and mortuary feasts were also conducted there. In the interior regions, the hypothesized role of steatite vessels in ritual and mortuary feasts on coastal sites could also have been fulfilled by other types of vessels, possibly Vinette 1 wares.

Other Polished Stone Objects

Two polished elongated objects were recorded in the Batiscan collection (Figure 2.30: a). One of them is very similar to rod-shaped objects found in a Late Archaic component in Maine, where they were associated with a secondary multiple cremation rich in grave offerings (Bourque 1995: 153). Made from soft, abrasive siltstone and exhibiting grinding wear, these elongated pebbles were interpreted by Bruce Bourque as specialized abrading stones for gouges (Bourque 1995: 119-121). Although we should not rule out the possibility that the rod-like specimen from Batiscan was an abrading stones, no gouge was found at this site. Alternatively, use wear visible at one end may indicate use as a stone flaker in the last stages of production of stone tools or in the resharpening, retouching, and recycling of used or broken tools. Similar objects have been found in other parts of the

world as well. For example, stone rods represent ritual and prestige items in the Late Jomon Period of Japan (Hall 2004: 1440).

The second enigmatic elongated object is flatter and has a blunt pointed end. A similar object was found at the Scaccia site. A cylindrical polished stone object was also found at the Muskalonge Lake, but it differs from the ones recovered at Batiscan and Scaccia by its smaller size, its high regularity, and its fine polished finish. This stone cylinder could be natural in origin, in which case it may have been picked up by Meadowood people for these very properties, in the same way that quartz crystals, smooth pebbles, or fossils were sometimes collected, brought to camp sites, and even occasionally included in graves.



Figure 2.30 Other polished stone artefacts: *a*, elongated objects from Batiscan; *b-c*, notched pebbles from Scaccia; *d*, decorated and partially drilled pebble from Scaccia. (*a*: Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities; *b-d*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Two notched sandstone pebbles of unknown function were observed in the assemblage from the Scaccia site. One has a small notch fashioned at the extremity of the pebble and resembles a plummet preform (Figure 2.30: *b*). In northeastern North America, plummets are typical of Late Archaic contexts. Their function remains enigmatic. While their use as weights for line fishing (Ritchie 1965: 12) and netsinkers (Fitzhugh 1975: 129) have been suggested, some very well made specimens were probably charged with special symbolic or identity value (Bourque 1995: 46; Clermont 1987: 37). The second enigmatic notched pebble from the Scaccia site has a notch at both ends (Figure 2.30: *c*). These two artefacts differ from netsinkers recovered in Meadowood contexts, which have notches/grooves surrounding the centre of the object. Finally, a decorated and partially drilled pebble was observed in the Scaccia collection (Figure 2.30: *d*).

Ground Stone Artefacts

Like the polished items described in the preceding section, ground stone artefacts are formed by the grinding of a coarse-grained stone. The difference between these two categories reside in the fact that polished objects are purposely and thoroughly polished into a definite shape, while, in the case of ground stone artefacts, naturally ground stones are selected and used with no or very few additional modifications. Abrading stones, grinding stones, hammerstones, and netsinkers are the major classes of ground stone artefacts recovered in Meadowood contexts (Table 2.10). Some of the netsinkers have been crudely retouched on one or both of their sides, producing “notches.” However, the overall aspect of these tools, added to the fact that pebbles with natural notches were also employed as netsinkers, justify their classification within the “ground stone tool” category.

Abrading Stones

Abrading stones were documented in the seven Meadowood assemblages analysed for this study. Given their presence in both habitation and mortuary contexts, it is probable that abrading stones had a variety of uses and values associated to them. The following section attempts to highlight such variability. Abrading stones have a widespread spatio-temporal distribution and are generally difficult to classify into discrete types. Expedient, ad-hoc abrading stones used one or a few times and then discarded would be hard to recognize in the archaeological record. Others, however, were probably kept and carried around for longer periods of time, as the use marks present on their surfaces suggest. These marks can reflect specific manufacturing activities, which in some cases are typical of a certain type of site or even a certain time period.

For example, abrading stones marked by wide or narrow grooves perpendicular to the longitudinal axis are commonly found on Meadowood habitation sites. According to Granger, such grooves argue for their use as a sharpening or shaping tool in the manufacturing of bone or antler objects of various width or diameter (Granger 1978: 134). Thus, narrow grooves could result from working needles or pointed awls, while “(t)he great frequency of the wide groove at Riverhaven 2 may be associated with the large sample of worked antler (flaking) tools which clustered at a diameter of approximately 10-20 mm (Granger 1978: 227)”. Similarly, Ritchie suggested that awl sharpening produced incisions on

abrading stones (Ritchie 1965: 192). The sharpening of beaver incisors may also produced distinctive marks (Heckenberger et al. 1990: 120). Besides bone and antler, abrading stones could have been employed in the manufacturing of wood, stone, or hides. An abrader from the Meadowood site BaDd-4 in Nova Scotia bears two large grooves on its opposite sides and may have been used to soften hide laces (McEachen 1996: 152).

Among the abundance of sedimentary rocks available in the Ontario/Erie and St. Lawrence/Champlain Lowlands, fine-grained siltstone and coarser-grained sandstone naturally occurring in tabular forms were generally selected by Meadowood communities for their abrasive qualities. Three dolomitic pebbles were also observed in the Riverhaven 2 site assemblage (Granger 1978: 226).

Although their numbers in Meadowood assemblages vary, abrading stones are consistently more abundant in habitation sites. Fifteen abrading stones are recorded from Batiscan (Figure 2.31: a-n). They consist of rectanguloid (n=12) or ovoid (n=3) slabs of siltstone (n=9) and sandstone (n=6). They have one (n=9) or two (n=6) polished surface(s) resulting from intentional rubbing. Fine striations are visible on the polished face of the three ovoid abrading stones, while broader grooves perpendicular or oblique to the tool's long axis were observed on two of the rectanguloid stones. All the abrading stones documented at the Batiscan site had their perimetres intentionally flattened (n=7), rounded (n=6), or bevelled (n=2). The only two complete specimens have an average weight of 166 g.

The largest abrading stone (110 x 106 mm) observed in the Batiscan collection consists in four fragments forming a complete specimen when reassembled (Figure 2.31: a). Although its provenience is unknown, the nature of the breakage suggests that this object was either shattered in fire or intentionally broken. Red ochre is still adhering to the abrading stone, which could indicate that it was employed, together with some kind of grinding tool, to reduce ochre into powder. Alternatively, powdered red ochre may have been poured into a feature which also contained this "killed" abrading stone.

The collection of abrading stones from the Scaccia (n=10) site is very similar to what was documented at the Batiscan site in terms of shapes, raw materials, and use marks. At Scaccia, four abrading stones were found in relatively prolific pit features. At the Riverhaven 2 site, fifteen indurated sandstone and three dolomitic grooved abrading stones were described by Granger (1978: 226). Three of them were associated with storage related features, while a fourth one was recovered from a hearth. Besides these abrading stones

bearing narrow (n=4) or broad (n=14) grooves, he also recorded four sandstone and three igneous mano abrading stones, which he described as hand size pebbles with striations (Granger 1978: 226).

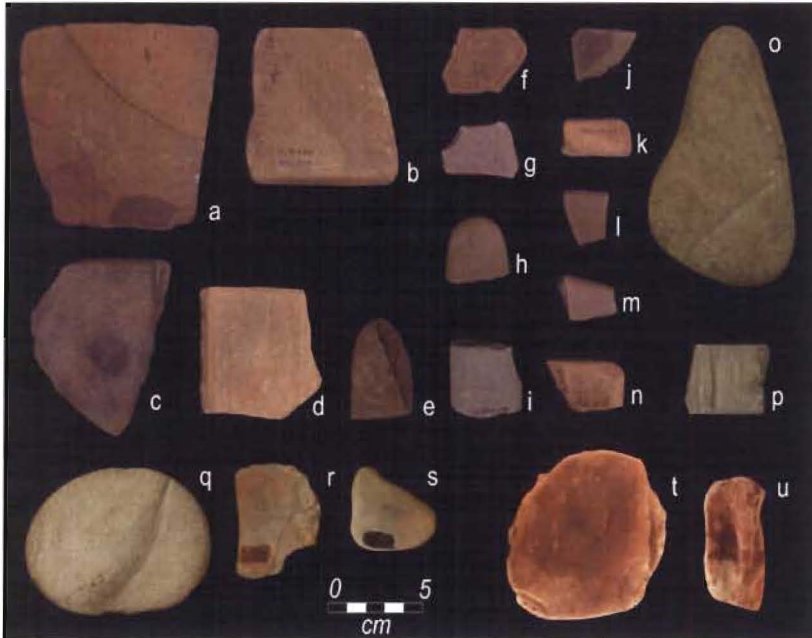


Figure 2.31 Abrading stones: *a-n*, Batiscan; *o-p*, Scaccia; *q-s*, Oberlander 2; *t-u*, Muskalonge Lake. (*a-n*: Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities; *o-s*: Courtesy of the Rochester Museum and Science Center, Rochester, NY; *t-u*: Courtesy of the New York State Museum, Albany, NY).

Abrading stones were present at the four sampled Meadowood mortuary sites, and red ochre is commonly adhering to the ones recovered from burial pits. One abrading stone from the Oberlander 2 site was recovered from a cache and has distinctive use marks consisting of deep grooves crossing either side transversely, in opposite directions (Ritchie 1965: 190; Figure 2.31: q). Similar marks were observed at the Riverhaven, Sinking Ponds (Granger 1978: pl. 10f, pl. 29a), and at the Scaccia sites (Figure 2.31: o). Two other abrading stones from burial pits at Oberlander 2 bear striations and traces of red ochre (Figure 2.31: r-s). Similarly, an abrader found at the Muskalonge Lake site has one face covered with ochre, and was probably used to grind hematite (Figure 2.31: t). However, this multi-task tool also bears faint incisions on the other face. The second abrading stone from Muskalonge Lake is characterized by a broad groove and an oblique cut along one side (Figure 2.31: u). Ritchie noted that similar objects were found within the context of an Adena mound at Natrium, in West Virginia (Ritchie 1955: 37, footnote).

The Bruce Boyd site, where eight sandstone abraders are associated with the Meadowood component, has more of these tools than all the other mortuary sites analyzed. Half of these items were associated with Early Woodland features – one cache and three burial pits – while the others were found on the surface, plowzone, or in the fill of a later period pit feature. The latter were attributed to the Meadowood component because of the red ochre still adhering on them. Two of the four feature-associated specimens from Bruce Boyd bear limonite stains or encrusted iron pyrites on one or both surfaces, probably reflecting their proximity to masses of iron pyrites. Only two abrading stones from the Bruce Boyd site (one from a cache and the other from a burial pit) show clear signs of use as abraders. The presence of red ochre on five abrading stones, and the inclusion of at least three specimens in graves could indicate some special function of these items at the Bruce Boyd site. For example, they may have been used to prepare pigment or perform some other mortuary-related task (Spence n.d.).

Grinding Stones

A second sub-category of ground stone tools, employed in the reduction/grinding of food items or pigments, includes mortars, pitted anvilstones, and pestles. Since grinding stones are often indirect indicators of food processing activities, they may highlight aspects of Meadowood subsistence strategies. Moreover, the presence of these objects in burials at two of the four mortuary components may indicate the association of food preparation and graves, or alternatively the occasional use of grinding stones as grave goods.

Mortars, anvilstones, and pestles generally consist in casually acquired cobbles, sometimes slightly retouched or locally pecked, with one or more depressions in their surface resulting from use. Their presence on a site is often interpreted as indirect evidence that plant foods such as seeds or nuts were processed. However, grinding stones can also be used to tear dry meat to shreds, crush bones, or reduce mineralized hematite into powdered ochre. For example, the presence of a reddish powdery substance adhering to a pestle from the Meadowood BaDd-4 site in Nova Scotia suggests this tool was used to grind down red ochre (McEachen 1996: 154).

One pitted anvil and two pestles of unidentified igneous rock were present in the Batiscan collection (Figure 2.32: a-b). In addition, two fragments of sandstone once formed a large pestle characterized by a natural phallic shape (200 mm length, width range of 86 to

30 mm, thickness range of 66 to 45 mm—Figure 2.32: d). A phallic effigy hammerstone, made up of two fragmented pieces, was also recovered from the Meadowood level at the Vinette site (Ritchie 1944: pl. 75, fig.53).

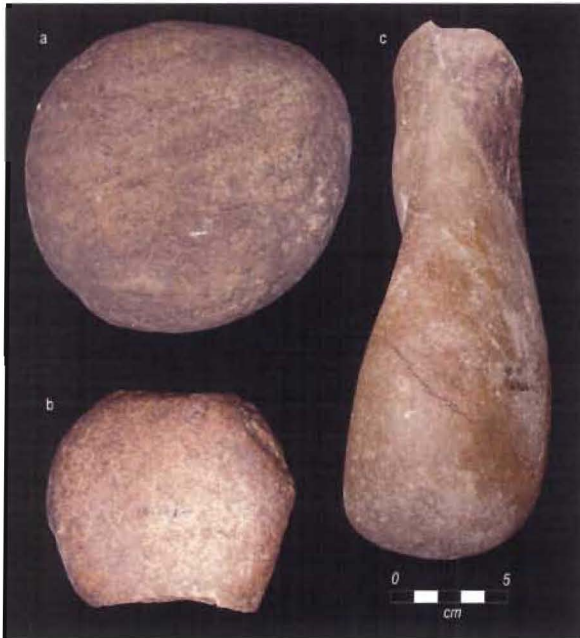


Figure 2.32 Grinding stones from the Batiscan site. (Courtesy of the Culture, Communications and Feminine Condition Ministry—collection deposited at the Québec Archaeology Laboratory and Storage Facilities).

Fourteen mortars, pestles, or pitted stones of various shape and size were present in the collection from the Scaccia site. A proportion of these ad-hoc tools (n=4) appear to have been combined grinding/hammerstones. Sandstone cobbles were generally selected for these tools (n=12), although two of them were made of igneous rock. Six grinding stones from Scaccia were recovered in features.

Three sandstone pestles and two pitted anvilstones, the latter from burials pits, were recovered at the Oberlander 2 site. Together with a single anvilstone found in a burial pit at the Muskalonge Lake site, these objects represent the only grinding tools observed among the four Meadowood mortuary sites.

Hammerstones

Hammerstones document lithic reduction strategies and are usually associated with the first steps of the production sequence, when large pieces of raw material are being shaped. The presence of ocher-stained hammerstones in Meadowood burial contexts,

however, also suggests that these objects occasionally assume a special value as grave goods. Hypothetically, this may reflect the importance of stone working and the presence of specialist flint-knappers within Meadowood communities.

Two pebble hammerstones, recognizable by the presence of end or edge battering restricted in extent (Granger 1978: 227) were found at the Batiscan site. Both tools consist of unidentified igneous rock cobbles, which are available in the vicinity of the Batiscan site. Pebble hammerstones, generally associated with the manufacture of stone tools, are present in all habitation sites selected for the present study. Riverhaven 2 is the component which yielded the most abundant assemblage of hammerstones ($n=10$), not surprisingly given the importance of flint knapping activities and the documentation of the entire production sequence of Meadowood cache bifaces at that site. At the Scaccia site, three pebble hammerstones were recorded, but these should be added to the four grinding stones also used as hammerstones discussed in the preceding section.

Among the four mortuary components analyzed, Muskalonge Lake ($n=2$; Figure 2.33), Oberlander 2 ($n=3$), and Bruce Boyd ($n=3$) yielded pebble hammerstones showing abrasion from usage. While these tools were found in burial pits at Muskalonge and Oberlander, none was recovered from the few features containing high numbers of cache bifaces. One of the pebble hammerstones from the Muskalonge Lake site is covered with red ochre. Similarly, the three pebble hammerstones from the Bruce Boyd site had red ochre adhering to them. However, they were recovered from the surface or plowzone and may not be associated with the Meadowood component.



Figure 2.33 Pebble hammerstones from the Muskalonge Lake site. (Courtesy of the New York State Museum, Albany, NY).

Netsinkers

Of low utility in defining the material correlates of the Meadowood Interaction Sphere, netsinkers are nevertheless good indicators of the practice of fishing, and more specifically of the fishing techniques favoured by the occupants of a site. Among the Meadowood habitation sites analyzed, the only one yielding a significant number of netsinkers is Riverhaven 2 (n=25). Contrary to the finely crafted and thoroughly polished plummets typically associated with Late Archaic manifestations, these artefacts consist in naturally grooved or crudely retouched ground stones. Large, flat, naturally or intentionally side-notched pebbles were selected to produce most netsinkers. Six were also chipped around their entire periphery, and a single specimen was recovered from a possible storage feature.

Like other ground stone tools, notched sandstone pebbles employed as netsinkers have a widespread spatio-temporal distribution. For example, most of the 97 netsinkers recovered at the Meadowood Sinking Ponds site are similar in plan and execution to netsinkers assigned by Ritchie to the Lamoka and Frost Island phases of the preceding Late Archaic period in the Northeast (Ritchie 1965: pl. 12; Granger 1978: 118). For example, Granger observed that endnotched round pebbles such as those documented at the Morrow site, are absent at Sinking Ponds, where flat pebbles were obviously favoured. This shape suggests a use of netsinkers on stationary nets in a weir arrangement: “A flat pebble with the line attached perpendicular to the broad surface would act as a drogue anchor in mud, possibly to hold a net edge to a muddy pond bottom, whereas such a pebble would impede a drag net” (Granger 1978: 118).

Moreover, the relatively light weight of the Sinking Ponds netsinkers reflects the calmness of the waters where Meadowood people were fishing. This situation contrasts with that of Riverhaven 2, where 76% (n=19) of the netsinkers cluster within the weight range of 200-600g, suggesting the exploitation of areas in the Niagara River with stronger swift current (Granger 1978: 213) and/or the use of larger nets.

Besides the Riverhaven 2 component, one possible sandstone netsinker was recorded at the Scaccia site, and a notched igneous rock pebble probably served the same function at the Batiscan site. One sandstone netsinker of unknown provenience was recorded in the assemblage from the Oberlander 2 site. Similarly, three sandstone netsinkers were found at

Bruce Boyd, but their presence in the plowzone makes it impossible to say to which component of the site they belong. The presence of adhering red ochre on one specimen may suggest an Early Woodland association. Netfishing is also evidenced at the Morrow site, a Meadowood mortuary component, where endnotched round pebbles still attached together by a double cord to a carbonized fish net, were found in a burial feature (Ritchie 1965: pl. 66-67).

Unmodified Stones and Minerals

Galena and Pyrites

Galena (lead sulphide) is a mineral with no apparent technological application, so its significance was probably more in the symbolic or ritual realm. Historically, galena was used by North American aboriginal groups as magical charms, ceremonial powder, or paint. Silver paint such as was observed on the face of seventeenth century-Native dancers in Virginia can be obtained by mixing powdered galena with oils (Swanton 1946, cited in Walthall 1981: 2). Galena is mostly found as grave goods in Late Archaic and Early Woodland mortuary sites in northeastern North America and evidence from Late Archaic contexts suggests that this material was occasionally used to manufacture artefacts presumed to be ornaments (Walthall 1982 et al.: 137; Wright 1982: 203).

Clumps of iron pyrites (iron sulphide) constitute the basic component of the fire-making sets commonly included in Meadowood graves. Strike-a-lights, objects producing sparks when struck against masses of pyrite, are the most common artefacts associated with iron pyrites and limonite. Moreover, pyrite disintegrated into limonite is often seen adhering to grave goods. However, Ozker interpreted the presence of limonite lumps at the Schultz site as evidence for the collecting and roasting of yellow limonite to obtain the red ochre aboriginally valued as pigment and ceremonial accoutrement (Ozker 1982: 134). Similarly, Chrétien mentioned that besides their role in fire-making, highly degraded pyrites could also have been a source of red pigment (Chrétien 1995: 136).

Sources of pyrites and galena are relatively abundant in the Adirondacks, but can also be found in the band of dolomitic rocks south of Lake Ontario, or within the metamorphic rocks near Long Island to the south. Pyrite is even more widespread than galena, since it is also present within the context of eastern New York metamorphic rocks, and more rarely in

the sedimentary rocks (William Kelly, pers. comm. 2002). Regarding the pyrites, Ritchie observed:

There are 19 occurrences of iron pyrite concentrations in the Precambrian gneisses of Jefferson and St. Lawrence counties, N.Y., the most important being found in an area about 35 miles long and 3 to 4 miles wide extending northeast from the vicinity of Antwerp, Jefferson County, on the Indian river (Ritchie 1955: 38).

Galena, on the other hand, is available in New York, in the limestone rocks outcropping in the region of Rossie along the Indian River, only about 13 km from Hunter and Muskalonge sites (Ritchie 1955: 47). Both pyrites and galena could thus have been collected in the vicinity of the Hunter and Muskalonge Lake (Figure 2.5).

Among the seven Meadowood assemblages in this study, only two burial components yielded galena. Two galena crystals measuring about 2.5 cubic cm, for a total weight of 82 g, were found in the plowzone at the Bruce boyd site (Spence nd), and four nodules of this mineral, weighing between 10 and 21.2 g (total=61.2 g), were associated with a burial pit at the Muskalonge Lake site. One nodule has red ochre adhering to it (Figure 2.34: a). Three nodules were confirmed to be galena by the geologist William Kelly, but the fourth unmodified object could consists of a different, although unidentified, mineral or rock (William Kelly, pers. comm. 2002; Figure 2.34: b).



Figure 2.34 Galena nodules from the Muskalonge Lake site. (Courtesy of the New York State Museum, Albany, NY).

While more common than galena, pyrite is almost exclusively found in Meadowood mortuary sites, where it is generally associated with only one or two burials. This raises the possibility that this mineral, like galena, was a valued prestige or ritual item. Within our sample, the Muskalonge Lake site represents the only component where pyrite was a common occurrence. At the latter site, strike-a-lights were found in six of the seven graves, and in at least three cases lumps of pyrites were also present. An emphasis on fire at Muskalonge is also reflected in the 1,500 cache bifaces discovered in a single burial feature, most of which have been shattered following contact with intense heat (Figure 2.10).

Hematite and Graphite Paintstones

Worldwide, the color red is a powerful symbol of blood and life, and red paint is sometimes applied to sick people as a symbol of well being and purification (Williamson 1982: 9). Besides this inherent symbolism, red ochre is known to have medicinal properties: “The iron salts in ochre are known to have antiseptic and deodorizing properties. It has been associated with prolonged life, and is used medicinally to treat certain conditions and infections” (Blakely 1996: 252).

Hematite and graphite paintstones, as well as powdered red ochre, are common Meadowood traits. These objects are without a doubt linked in some ways to mortuary rituals and may have provided pigment or paint for caches (McEachen 1996: 153; Ritchie 1965: 190). Hematite was probably a local commodity for the occupants of the Hunter and Muskalonge Lake sites, where considerable amounts of red ochre were recovered in graves. It would have been “obtainable within a day or two’s journey by river, either at Rossie or in the region between Antwerp and Gouverneur, St. Lawrence County” (Ritchie 1955: 48). This corresponds to the same general area where galena and pyrite are present in relative abundance (Figure 2.5). Seven small pieces of graphite, a mineral that could have been found in the local limestone, were found at the Batiscan site (Adrian Burke, pers. comm. 2002).

Fossils, Quartz Crystals, and Pebbles

Fossils, quartz crystals, and unmodified pebbles could have been expediently picked up by Meadowood people. Ten coral fossils of the order *Rugosa* have been identified at the Scaccia site, seven of which were found in large storage-related features. *Rugosa* means

wrinkled or rough, and the outer surface of these fossils is characterized by a wrinkled appearance. Rugose corals are often referred to as horn corals because of the horn shape of their calcite skeleton. Like modern corals, they once formed reefs beneath the seas, reefs that are today visible within the sedimentary rocks of the Ontario/Erie Lowlands. One archaeological fossil from the Scaccia site was still embedded within an Onondaga chert cobble (Figure 2.35: a), which is consistent with Eley and von Bitter's mention that certain species of rugose coral fossils are common in the Bois Blanc and Onondaga formations (Eley and von Bitter 1989: 48; Figure 2.5). Granger, who identified a horn coral fossil found at the Orchid site as *Lambeophyllum okalitch* of Middle Ordovician age, suggested it came from the Black River formation which outcrops in many places on the Niagara Frontier (Granger 1976: 29). Given their presence within Onondaga chert cobbles, horn corals could have been acquired during the process of flint knapping, but it is hard to say whether their presence at the Scaccia site is the result of trade, or simply a bi-product of flint-knapping taking place at the Scaccia site.



Figure 2.35 *a*, Solitary rugose coral fossils from Scaccia; *b*, quartz crystals from Hunter. (Courtesy of the New York State Museum, Albany, NY).

Five red and white quartz crystals were found at the Batiscan site, while four were associated with a burial pit at the Hunter site (Figure 2.35: b). At the latter component, Ritchie believed that they were probably acquired locally (Ritchie 1955: 60). They could also have been picked up in the vicinity of the Batiscan site, although it is impossible to completely rule out the possibility that they represent exchanged items. Quartz crystals are abundant in the area surrounding present-day Québec city, approximately 75 km east of Batiscan:

Le crystal de quartz est abondant dans la région de Québec. L'extrémité "est" de la colline de Québec tire d'ailleurs son nom de "Cap Diamant" de l'abondance de ses cristaux (Chrétien 1995: 213).⁹

In the case of the unmodified pebbles, the regularity of their shape, their bright color(s) and/or their exceptional smoothness is the only thing distinguishing them from other rocks naturally occurring in the soil matrix. For example, three greywache, unmodified smooth pebbles of unknown function were found associated with Meadowood features—two burials and one cache pit—at the Bruce Boyd site (Spence n.d.). Some unmodified pebbles may have been used as plugs for blocked-end tubular pipes (Ritchie 1944: 199).

BONE AND ANTLER

From Paleolithic times, bone and antler tools became widespread spatially and temporally. The following inventory comprises both generalized artefacts that are not exclusive to the Meadowood culture or the Early Woodland time period, and idiosyncratic items with no equivalent in other Meadowood or non-Meadowood sites (Table 2.12). Generalized artefacts include awls, needles, beaver incisors, and antler flakers, which probably represent optimal solutions to a number of functional or social needs transcending the boundaries of a single cultural group (Clermont 2003: 89).

Worked and Unworked Antlers

While antlers are sometimes highly valued materials associated with ritual contexts (Hayden 2003: 49), their contexts of discovery within our assemblages suggest utilitarian

⁹ Quartz crystal is abundant in the vicinity of present-day Québec City. Incidentally, the eastern portion of the Québec hill was named "Cap Diamant" because of its abundance in crystals (Chrétien 1995: 213).

functions for such artefacts. Indeed, none of the mortuary sites analyzed in this study yielded items made of antler. On the other hand, nine modified antler flakers were recorded at the Riverhaven 2 site, including two complete specimens associated with a refuse-storage pit, and three fragments from a hearth. Microscopic observations conducted by Granger on the six “broad head” antlers, showing skull articulations smoothed by abrasion, support their use as flakers. The surface of the “broad head” was repeatedly indented and the other extremity showed breakage or battering. Following Ritchie, Granger suggested that antler flakers were employed in the manufacture of bone tools (Ritchie 1965: 193). A tenth fragmented antler, characterized by a two mm-deep incision around its shaft, could be a flaking tool preform. Three additional antler fragments were found in storage features, but their function remains uncertain (Granger 1978: 227).

Table 2.12 Distribution of bone, antler, and shell artefacts at seven Meadowood sites

| | | BONE AND ANTLER | | | | | | | | | | | TOTALS |
|------------------|--------------|-----------------|----------|----------|---------------------------|---------------------------|----------|----------|----------|----------|----------|-----------------|-----------|
| | | Awls | Points | Needles | Worked / unworked antlers | Worked and unworked teeth | Dagger | Harpoon | Gorge | Tubes | Whistle | Turtle carapace | |
| Habitation sites | Batiscan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Scaccia | 15 | 0 | 1 | 7 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 32 |
| | Riverhaven | 20 | 2 | 0 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| Mortuary sites | Hunter | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | Muskalonge | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| | Bruce Boyd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oberlander 2 | 7 | 2 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 13 |
| TOTALS | | 42 | 4 | 3 | 20 | 13 | 2 | 1 | 1 | 1 | 1 | 1 | 89 |

Five antler flakers, with one or both ends cut and slightly smoothed by abrasion, were distributed between three pit features at the Scaccia site (Figure 2.36). Four of them were probably employed in direct flaking, while one is more likely to have been a pressure flaker (Figure 2.36: c). One piece of antler is represented by five pieces (glued together by an

earlier analyst) which could reflect how it was cut to produce a number of functional tools (Figure 2.36: d). Small tines similar to one portion of the reconstructed antler were found in other contexts (Figure 2.36: v-x). They could have been employed in pressure flaking, used as awls, or as hafting devices (Clermont 2003: 95). Unworked antler tines could also occur naturally, or as a bi-product of hunting, at the sites.



Figure 2.36 Antler flakers from Scaccia.
(Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Awls and Needles

This is a rather broad category that probably includes objects having different functions, such as mat-making needles, pressure flakers, spatulas, or gouges, but which may be hard to distinguish on typological grounds. Awls are tools of variable size and penetration angles, mainly characterized by their pointed end at the junction of two straight, or convex and converging edges. Among all the bone artefacts, awls are the most abundant in our sample of Meadowood sites. The only exception to their usual habitation context is the Oberlander 2 site, where ten awls were recovered. Six were found in three burial pits, while four came from a single cache pit feature. Additionally, two burnt eyed-needles were associated with a cremation at the latter site, one of which, flat and curved, was interpreted by Ritchie as a possible mat-making needle (Ritchie 1965: 192; Figure 2.37: r).

Among our three Meadowood habitation sites, only Batiscan did not include bone awls. Scaccia yielded twelve bone splinter awls (Figure 2.37: a-h, l-o), two deer metapodial awls (Figure 2.37: i, j), and one awl made from a deer ulna (Figure 2.37: k). Most (n=12) awls

from Scaccia came from pit features. Two elongated bone artefacts with a flat cross-section and a rounded end could have been employed to manufacture mat or net (Figure 2.37: l,n), while one object, rectangular in cross-section and without pointed extremities, may have been employed in pressure flaking (Figure 2.37: h). Finally, one awl from Scaccia is characterized by a gouge-like end (Figure 2.37: m). Besides these so-called awls, a single needle was present at the Scaccia site. It is a worked bone splinter, 7 to 8 mm wide, with a stem-like elongated shape, a flat cross-section, and a fragmented eye (Figure 2.37: p). It may have been used to make tailored clothes. The association of this needle with four bone splinter awls, among other things, in a pit feature, further supports its role in skin working.



Figure 2.37 Bone awls, antler tines, and needle from the Scaccia and Oberlander 2 sites. (a-i, k-n, p-x: Courtesy of the Rochester Museum and Science Center, Rochester, NY; j, o: Courtesy of the New York State Museum, Albany, NY)

At the Riverhaven 2 site, twenty bone or antler awls were found, including a single complete specimen made from a catfish (*Ictalurus*) spine (Granger 1978: 219). Besides this fish spine, other animal bones or antlers used include bird long bones (n=2), mammal ulna (n=2), mammal antler (n=5), and mammal long bones (n=10). At the Riverhaven 2 site, the totality of the feature-associated bone/antler awls (n=12) were found in storage-related pits. Besides the functions mentioned above, sharply pointed pieces of bone such as awls could have been employed in tattooing or piercing of the ears and/or nose, a privilege reserved to high-status individuals in many ranked cultures around the world (Hayden and Schulting 1997: 65).

Worked and Unworked Teeth

Animal teeth were used by Native communities in a number of utilitarian, social, and ritual contexts. The following discussion will highlight these various usages and identify the species more likely to be selected for their teeth by Meadowood communities. Contrasts between habitation and mortuary components will also be examined.

Beaver incisors, hafted in antler or unhafted, are commonly found in prehistoric sites across northeastern North America:

[L]es collections de Coteau-du-Lac (Lueger 1977), de Pointe-du-Buisson (Ferdais 1983), de l'île Morrison (Clermont et Chapdelaine 1998) et de l'île aux Allumettes (Chapdelaine et al. 2003) nous assurent qu'elles représentent souvent la catégorie d'outils organiques la plus commune dans les assemblages préhistoriques anciens du Nord-Est (Clermont 2003: 95).¹⁰

For whatever functional or cultural reason, this is not the case in the Meadowood assemblages considered in this study. Indeed, while beaver incisors are the most common type of animal teeth found in Meadowood contexts, only nine have been documented for the seven analyzed collections. Six of these nine beaver incisors were recovered at mortuary sites. Most archaeologists would include these artefacts within the general category of woodworking implements (Ritchie 1965: 190; Clermont 2003: 95). Polishing, planing, and sculpting mortises, masks or other forms are some of the tasks that could have been accomplished with worked or unworked beaver incisors. They thus may have been part of craft specialists' (e.g., mask sculptors) grave furniture.

The Scaccia assemblage yielded one woodchuck and two lower beaver incisors, all three associated with features. Polishing underneath the natural tooth edge of one beaver incisor suggests its use as a scraper or a gouge (Figure 2.38: b). Moreover, the breakage of the tooth's base could indicate hafting, in this case transversal to the shaft long axis. Clermont, who analyzed a collection of worked and unworked beaver incisors from the Ile aux Allumettes Archaic site, noted that the worked specimens are, in the majority, lower incisors of adult beavers, over 7-mm-wide and generally between 25 and 50 mm in length (Clermont 2003: 91). The worked lower incisor from Scaccia falls within this range (8-mm-

¹⁰ The collections from Coteau-du-Lac (Lueger 1977), Pointe-du-Buisson (Ferdais 1983), Morrison Island (Clermont and Chapdelaine 1998), and Allumettes Island (Chapdelaine et al. 2003) confirm that beaver incisors often represent the most common category of organic tools in early prehistoric assemblages from the Northeast (Clermont 2003: 95).

wide and 40-mm-long) and was thus probably used as a tool. On the other hand, the second beaver incisor from Scaccia is much smaller and shows no sign of modification (Figure 2.38: a). Finally, it is difficult to say whether or not the unworked woodchuck incisor recorded at the Scaccia site was employed as a tool (Figure 2.38: c).



Figure 2.38 Worked and unworked rodent and bear teeth from the Scaccia and Hunter sites. (a-d: Courtesy of the Rochester Museum and Science Center, Rochester, NY; d-e: Courtesy of the New York State Museum, Albany, NY).

Besides these three rodent teeth from the Scaccia site, a single beaver incisor, slightly modified by abrasion, was also reported at the Riverhaven 2 site (Granger 1978: 237). The remaining examples come from mortuary sites, where they are documented at Hunter (n=3), Muskalonge Lake (n=2), and Oberlander 2 (n=1). The Hunter and Oberlander 2 sites each yielded an example of hafted beaver incisors (Figure 2.38: b, f). The Hunter specimen is still partially hafted in a wooden handles. No incisor characterized by a beveled edge oriented obliquely to the distal end was documented within our Meadowood collections. Such tools were present at the Archaic components of Allumettes and Morrison islands, in the Ottawa River valley, where Clermont interpreted them as side scrapers (Clermont 2003: 94).

Two other animals were represented by isolated examples of their teeth within our sample of Meadowood sites. The Scaccia and Riverhaven 2 components each yielded a bear

canine, while a dog canine was also present in the Riverhaven 2 component. All were slightly polished, and the bear canine found in a pit feature at the Scaccia site has a small incision near its base that would have facilitated its attachment to a string if worn as a pendant (Figure 2.38: d).

Fishing Gear

Like netsinkers, bone fishing implements are indicators of the importance of fishing and inform us about the specific techniques favoured by Meadowood groups. These data will be included in a discussion of Meadowood subsistence strategies in Chapter 5. A single-barbed harpoon and a bone gorge from two distinct features at the Scaccia site are among the few direct indications of fishing found in the Meadowood assemblages (Figure 2.39). The polished harpoon has a whale-like shape, with a line-hole where one would imagine the whale's eye near the proximal end of the tool. Two bone points from the Riverhaven 2 site may also be fishing gear. The first one is a fractured antler tine abraded to a point. Another antler fragment has been abraded into a dull point. It has a 5-mm-wide ridge projecting perpendicular to the shaft, and Ritchie designated this object as a unibarbed point (Ritchie 1965: pl. 65, fig. 3). However, Granger argued that some of its characteristics are inconsistent with use and rather indicate a point in the process of manufacture (Granger 1978: 227). Two fragments of bone points with chisel edges were also recovered in a burial at the Oberlander 2 site (fieldnotes).



Figure 2.39 Bone harpoon and bone gorge from the Scaccia site. (Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Dagger-like implements

Bone has also been used to manufacture a few idiosyncratic items present in the seven Meadowood collections selected for this research. This is the case of the next three categories of objects discussed: bone dagger-like implement, bone tubes, and turtle shell items. Their rarity and/or exceptional workmanship point to their use as prestige items.

Two exceptional bone artefacts have been qualified as daggers even though they manifestly do not belong to the same morphological type, are unique within the seven Meadowood assemblages. A broken dagger-like implement characterized by engraved triangular motifs was recovered from a pit feature at the Scaccia site (Figure 2.40: b). In a letter written by specialist of tribal art Carl Schuster to William Ritchie in 1966, Schuster wrote about this artefact:

The piece interested me especially because of the decoration near one of the sharp ends – which seemed to me to be made by the same “walking burin” technique as the peculiar markings on one face of the Lamoka deer scapula (...) If Lamoka is 2600 and Meadowood is 600, that makes a span of 2000 years during which (I suppose) this technique must have been known and practiced at least in part of the New York State – if not, presumably, in surrounding areas. This is only the second time it has come to my notice in the eastern United States (...) As I probably mentioned to you, I first came across evidence of this technique applied to stones (not bone) in the Great Basin area of the western United States: these stones are mostly surface finds, but I think there are some indications that they fall, generally, into an “archaic” or post-palaeo bracket. What appears to be an application of this technique (though with somewhat different effect than on the Lamoka and Meadowood pieces) occurs on a piece (or implement ?) of bone (or antler ?) found by Helge Larsen of Copenhagen at the Trail Creek site in Alaska, and dated by him around 4,000 B.C. (...) Of course, how all those things hang together (if they do) is the question. (C. Schuster to W. Ritchie, letter 29 April 1966, Scaccia site notes, New York State Museum, Albany)

A similar technique was apparently employed to make some of the artistic items found in the Interior Plateau of British Columbia dated to ca. 2000-1000 BP (Brian Hayden, pers. comm. 2007). A second bone dagger comes from Oberlander 2 and is a flat, burnt and highly fragmented dagger made from a mammal long-bone and marked with faint incisions on one side (Figure 2.40: a).

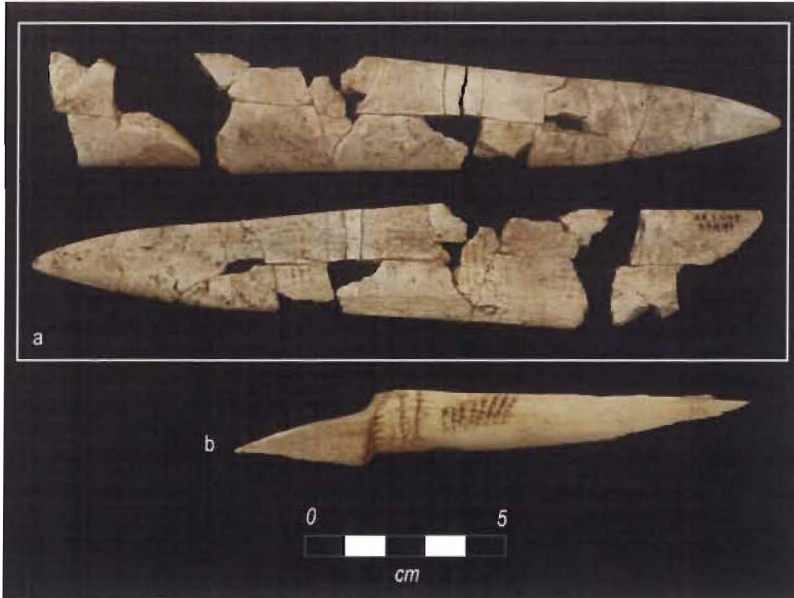


Figure 2.40 Bone daggers: *a*, Oberlander 2; *b*, Scaccia.
(Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Flute

A bone flute was found in Feature 19, a probable storage pit that yielded a radiocarbon date of 870 BC \pm 60 years, at the Scaccia site. This object consists of a broken bird bone, maybe a turkey bone, in which at least four holes were drilled (Figure 2.41). Ritchie and Funk (1973: 114) referred to this object as a whistle, but since whistles are generally defined as single-holed instrument producing more or less one note (Corbett 2004: 66), the term flute is probably more appropriate in this case.



Figure 2.41 Bone flute from Scaccia.
(Courtesy of the New York State Museum, Albany, NY).

A bird-bone tube about two inches long was found in a grave at the Muskalonge Lake site, and Ritchie believed it may have been “part of the fire-making assemblage for blowing up a newly kindled ember (Ritchie 1955: 20).” It may also have been a ritual

drinking tube similar to those used by Northwest Coast groups (Jilek and Jilek-Aall 2000: 7; Teit 1906: 261, 1909: 520, 588).

Turtle Shell Cup

Fragments of cut and ground Blanding's turtle were found in a pit feature at the Scaccia site (Figure 2.42). Ritchie and Funk hypothesized that these fragments once formed a cup or a bowl. Fragments of unmodified turtle shell were also present at the Wray mortuary component. Box, map, and slider turtles are known to be modified into containers in more southerly areas. However, the natural distribution of the Blanding's turtle includes areas north of New York State's southern boundary (Ritchie and Funk 1973: 114).



Figure 2.42 Turtle carapace from Scaccia.
(Courtesy of the Rochester Museum and Science Center, Rochester, NY).

SHELL AND NATIVE COPPER

The presence of marine shell and native copper artefacts in the Meadowood collections analyzed in this thesis represent direct evidence of long-distance exchanges. Being exotic products, it is also likely that they were prestige items. The next section assesses the abundance and compares the contexts of discovery of shell and native copper objects documented in the seven study assemblages (Table 2.13). This is essential to better

document the nature of the products circulating within the Meadowood Interaction Sphere, and eventually address the underlying incentives for participating in this network.

Table 2.13 Distribution of shell and native copper artefacts at seven Meadowood sites

| | | SHELL | | | NATIVE COPPER | | | | | | | | TOTALS |
|------------------|--------------|-------------------|-------|--------|---------------|-----------|-------|------|---------|---------------|----------|-----------------------|--------|
| | | Gorget / Pendants | Beads | TOTALS | Beads | Ornaments | Adzes | Awls | Chisels | Flaking tools | Fishhook | Waste / Miscellaneous | |
| Habitation sites | Batiscan | 0 | 0 | 0 | 200 | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 206 |
| | Scaccia | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Riverhaven | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mortuary sites | Hunter | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Muskalonge | 0 | 23 | 23 | 3 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 6 |
| | Bruce Boyd | 1 | 0 | 1 | 25 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 27 |
| | Oberlander 2 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 3 |
| TOTALS | | 2 | 24 | 26 | 2 | 2 | 2 | 4 | 2 | 1 | 1 | 2 | 242 |

Shell Beads

As will be further discussed in Chapter 4, the Mid-Atlantic States of Virginia and North Carolina—ca. 1,100 km away from the Niagara Peninsula—is a probable source for most of the marine shells found in Meadowood sites (George Hamell, pers. comm. 2002). Theoretically, however, shells from Long Island, New England, or the Maritimes could also have been used. Located approximately 550 km away from the Niagara Peninsula, the Long Island source is the closest to the Meadowood “core area.” Shell species originating from at least as far south as Southeastern Florida—over 2,500 km away from the Niagara Peninsula— have been found in Adena (Late Early Woodland) manifestations in New York. While such species have not yet been documented in Meadowood sites, it is possible that links with communities living in those southern latitudes were already being forged in the first half of the Early Woodland Period.

Twenty-three whole or fragmentary marine shell beads were found in a feature at the Muskalonge Lake site (Figure 2.43: a) preserved by the overlying copper adzes also included

as grave goods in this burial pit. Purple beads (n=12), about 1-mm thick, were strung with 3-mm thick white beads (n=11) in an alternate arrangement by units of color (Ritchie 1955: 40). Both purple and white beads are 5 to 6 mm in diameter, with a center perforation of about 2 mm. Two spherical copper beads, described in the following section, were found in the same feature. These shell and copper beads probably once formed a necklace. A portion of a two-strand left twisted thread of vegetable fibre was also associated with the beads (Figure 2.45: a). A preserved loop may have been the segment through which a separate string passed bearing the beads (Ritchie 1955: 40).



Figure 2.43 *a*, marine shell beads from Muskalonge Lake; *b*, marine shell bead (*Busycon perversum*/*Strombus* ssp.) from Scaccia.

(*a*: Courtesy of the New York State Museum, Albany, NY; *b*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

The fragment of a large barrel-shaped shell bead was found in a pit feature at the Saccia site. About 15-mm-long, it has a maximum width of 12 mm and a 4 mm perforation, with the biconal stone-drilled bore exposed (Figure 2.43: c). This bead was fashioned from the thick porcelaneous columellas of a large marine shell of the species *Busycon perversum* or *Strombus* ssp. A similar bead was recovered from a burial feature at the Cuylerville site, attributed to the Adena complex. These species live in warm Atlantic waters south of North Carolina (Ceci 1986: 6-7, 70), more than 1,500 km away from the Niagara Peninsula. A single fragment of *Balanus hameri* was recorded in the shell collection from the Batiscan site, but the absence of further information regarding its context within the site renders any interpretation very tentative; it could be a remnant of the post-glacial Champlain Sea.

Shell Pendants

A marine shell gorget was recorded in the Oberlander 2 assemblage. Unfortunately, the provenience of this object is unknown. Similar ornaments are well documented in components attributed to the Terminal Archaic Glacial Kame Culture. Besides this gorget, a fresh water mussel pendant reduced to small flakes was recovered from a Meadowood burial feature at the Bruce Boyd site. While it was poorly preserved, its association with native copper beads suggests that both were elements of necklaces. A second freshwater mussel was recovered in a similar context at the Bruce Boyd site—in a burial feature with the poorly preserved remains of a 2-3 year-old child, native copper beads, and red ochre¹¹. Bits of organic material linked the 41-mm long by 31-mm wide fresh water clam with the beads, suggesting it was originally attached as a pendant to a necklace. However, this burial feature was attributed to the Terminal Archaic Haldimand complex based on the four small corner-notched points of the Crawford Knoll type also present in the grave (Spence n.d.).

Native Copper Beads and Ornaments

Whole (n=193) and fragmentary ovoid or round native copper beads, apparently from a single necklace, were found at the surface of the Batiscan site. Ovoid beads were fashioned by hammering copper nuggets and subsequently bending and joining together both extremities of the resulting elongated form. The joints are still visible on the beads (Lévesque et al. 1964: 43).

The six complete and few partial cylindrical native copper beads recovered at Batiscan differ from the ovoid ones in that their body is straight, resulting in an equal diameter in the center and at the extremities. The bent and linked extremities also overlap more than in the case of ovoid beads (Lévesque et al. 1964: 43). A single tubular bead, a folded sheet of native copper characterized by a very irregular juncture point, was present in the assemblage from the Batiscan site (Lévesque et al. 1964: 43).

After Batiscan, the second among the seven Meadowood sites to have yielded a significant amount of native copper beads is Bruce Boyd (n=25). Five Early Woodland burials excavated from this component included between one and seventeen of these beads

¹¹ These remains could reflect child investment strategies for marriage wealth exchanges. Similar lines of evidence were documented in Meadowood contexts and will be discussed in more details in Chapter 5.

as grave goods (Figure 2.44). Muskalonge Lake site contained three rolled ovoid native copper beads, distributed between the same two graves which yielded the native copper adzes described in the next section. Two beads from one of these burials still have bits of cordage in their orifices (Figure 2.45: b).



Figure 2.44 Native copper beads from Bruce Boyd. (Courtesy of the University of Western Ontario, London).



Figure 2.45 Native copper beads and cordage from Muskalonge Lake. (Courtesy of the New York State Museum, Albany, NY).

A crescentic native copper object from Batiscan is rectangular in cross-section and has both extremities folded up as if the object was originally hafted or attached to something else. According to Lévesque, this item may have been an ornament (Lévesque et al. 1964: 44). Finally, a copper bracelet was recorded from a pit of unknown function at the Bruce Boyd site.

The most common native copper beads were manufactured by rolling a strip of flattened copper back on itself (size ranges from less than 2.5 to more than 12 mm). A second variety, documented at the Boucher and East Creek mortuary sites in the Champlain valley, is morphologically similar but larger in size (Heckenberger et al. 1990: 125), and they were probably formed from a sheet of copper rolled around itself several times to form a heavy ornament: “[t]his large, barrel-shaped variety occurs far less frequently than the thin tubular beads perhaps reflecting the value of the greater amounts of copper needed to make them” (Loring 1985: 101).

Finally, a third type of bead includes objects made from flattened sheets of copper ranging from 10 to 180 mm in length (Heckenberger et al. 1990: 125).

Native Copper Adzes

These implements consist of partially laminated masses of metal, probably shaped with stone hammers and the aid of heat annealing (Ritchie 1955: 36). Two native copper adzes have been found in a burial pit at the Muskalonge Lake site. Similar artefacts, although larger in size, have been documented at burial components such as Picton (Ritchie 1949: pl. 40, fig. 11) and Caron (Spence and Fox 1986: 12), attributed to the slightly earlier Glacial Kame complex. Additional material culture similarities between this particular grave at Muskalonge Lake and Glacial Kame sites include discoidal shell beads, spherical copper beads, and notched projectile points. Indeed, at least three points from this feature are closely related to the corner-notched Hind style (Figure 2.12). As Michael Spence and his colleagues (1990: 129) noted, “[f]eature 4 of the Muskalonge Lake site in New York state, assigned by W. Ritchie to Meadowood, is probably either Glacial Kame or at the point of transition between the two complexes”.

While the two adzes from Muskalonge are the only specimens present in my sample, a native copper celt with a portion of a wooden handle was found in a burial at the contemporaneous East Creek site, in the Champlain valley. Native copper adzes and gouges also occur in Middle Woodland Adena and Hopewellian mounds (Ritchie 1955: 36).

Native Copper Awls

Like their equivalent in bone, as well as unifacial and bifacial scrapers, copper awls are often seen as indicators of skin working (Ritchie 1965: 190). Awls, however, could have been employed in a variety of other tasks, including basket making. A bi-pointed native copper awl, 123 mm in length and almost square in cross section (seven by eight millimetres at midpoint), was recovered at the Batiscan site. Two similar specimens with fibre around their midshafts have been recorded in a burial feature at the Liahn II Meadwood mortuary component (Williamson 1982: 7). A copper awl with a partially intact wooden handle was also found within a mortuary context at the Boucher site (Heckenberger et al. 1990: 125).

Smaller copper awls have been documented in the context of burial pits at the Bruce Boyd (n=1) and Oberlander 2 (n=2) sites (Figure 2.46: a, b). Glacial Kame sites in Ontario, Michigan, and Ohio contained copper awls similar to the one found at Batiscan and Oberlander 2 (Cunningham 1948: 5, 10, 15; Jury 1978: 12; Ritchie 1949: 42). Awls were also documented at two sites of the Old Copper complex in Wisconsin (Ritchie 1955: 36, footnote; Penman 1977), as well as in later, Middlesex-Adena components (Wright and Anderson 1963: pl. XXV, fig. 13; Wright 1967: pl. VI, fig.12-16). Penman suggested that bipointed native copper awls characterized by a rectangular or square cross-section and a length of less than 20 cms were “used for hideworking and were wider at the median point and tapering at either end to facilitate widening the hole following the initial perforation of for hafting (Penman 1977: 17)”.



Figure 2.46 *a-b*, native copper awls; *c*, native copper waste product.

(*a*: Courtesy of the University of Western Ontario, London; *b-c*: Courtesy of the Rochester Museum and Science Center, Rochester, NY).

Native Copper Chisels

Two native copper items from Batiscan, each with a razor-sharp edge and a pointed (presumably hafted) end, could have been employed as chisels. Both three millimetres-thick, the larger tool measures 45 x 13 mm, and the smaller one 22 x 9mm. The blade from the former is still relatively sharp, while the other is blunt possibly as a result of use.

Native Copper Flaking Tool

A native copper flaking tool found in a grave at the Muskalonge Lake site constitutes a unique find (Figure 2.47). While the object resembles artefacts interpreted as awls and found at Wisconsin's Old Copper sites, Ritchie interpreted this one as a flaking tool because of the relatively large width of the copper element (Ritchie 1955: 36). The break of the copper element at midpoint and the resulting angled projection from the handle suggest that this tool was intentionally broken, or "killed," before its inclusion in the burial pit. This exceptional object includes a preserved wooden handle, consisting of two rectangular sections assembled in such a way that the 3-mm thick copper spike completely passes through it and projects for a distance of about 5 mm beyond the square base. Ritchie hypothesizes that this projection may have provided a second and shorter flaking point. The hafted portion of the copper flaker was wrapped with fiber cord (Ritchie 1955: 37).



Figure 2.47 Native copper flaking tool from Muskalonge Lake. (Courtesy of the New York State Museum, Albany, NY).

Starting from the base, the first 27 mm of the handle is plain. After this section, there is a transverse groove dividing the undecorated portion from the remaining preserved part of the handle, consisting of approximately 20 mm of wood marked by oblique incisions (Figure 2.47: a). According to Ritchie, this treatment “perhaps served the joint purposes of embellishment and security of grip (Ritchie 1955: 37).” A piece of bark is still adhering to the copper flaker, probably from a shroud covering the floor and walls of the grave in which it was found. A close wrapping of sinew strand was also observed at the base of the handle. Between the bark adhering to one surface of the handle and the handle itself, these strands are still clearly visible (Figure 2.47: b).

Native Copper Fishhook

A native copper fishhook, rectangular in cross-section and 31-mm long, was recovered at the Batiscan site (Lévesque et al. 1964: 43).

Native Copper Waste

At the Batiscan site, a native copper nugget flattened by hammering appears to be a waste product. An unidentified fragment of copper was also recovered from a grave at the Oberlander 2 site (Figure 2.46: c).

CERAMIC

Vinette I Pottery

In northeastern North America, the type of pottery known by archaeologists as Vinette I (named after the site in Brewerton, New York, where it was first recognized) is the most common early ceramic type. This coiled and conoidal¹² pottery, dating to 3,000 BP or earlier, was first described by Ritchie and MacNeish for sites in New York State (Ritchie and MacNeish 1949). Since then, the same diagnostic feature—cord impressions on both exterior and interior surfaces—have been used to describe Vinette I pottery across the Northeast. The adoption of pottery in the Northeast is roughly contemporaneous with the

¹² Pottery vessels characterized by straight walls converging toward a pointed or semi-pointed base. Generally speaking, early pottery types in northeastern North America are characterized by a conoidal morphology, while later types are more globular in form.

establishment of the Meadowood interaction sphere. However, a number of non-Meadowood sites across northeastern North America yielded Vinette I pottery, precluding the use of this type of ceramic as a cultural marker (Taché 2005: fig.1).

In spite of the recognition of Vinette I pottery as a significant temporal marker in the archaeological record of northeastern North America, the documentation on this ware is very limited, especially in terms of spatio-temporal variations. This is in part due to the rather crumbly and crude nature of Vinette I pottery, and to the homogeneity—at least on first examination—of its temper, surface treatment, and general morphology. Moreover, early ceramic assemblages in the Northeast are typically recovered from poorly stratified or mixed contexts, where only the most diagnostic Vinette I sherds can be identified as such. Finally, the small number of sherds generally recovered from Early Woodland sites also impedes the recognition and interpretation of variability within and/or between Vinette I assemblages. Indeed, aside from a handful of sites where a relatively large number of Vinette I sherds is thought to represent 10 to 40 vessels, most components contain only a few sherds, generally representing no more than five vessels (Taché 2005: table 1).

Vinette 1 assemblages present in the Meadowood assemblages analyzed in the present thesis were described in a recent publication (Taché 2005; Table 2.14). Deviations from the typological definition were noted, both within and between ceramic collections and involving a number of diagnostic traits, such as the presence of exterior and interior cord impressions and the absence of decoration. While part of this variability is thought to be chronological, other factors, such as the frequency and scale of production, and the possible exchange and circulation of ceramic containers, must also be taken into account when interpreting Vinette I variability (Taché 2005).

The technological and morphological attributes of Vinette 1 pots, the presence of carbonized residues on their walls, and their occasional association with hearth features suggest that many of these early vessels were used to cook food. An auxiliary use of some larger pots may have been for storing foods or other items, and the different vessel sizes could reflect such functional variability. Among the resources that would have benefited from direct-heat cooking in ceramic containers are nuts, small seeds, fish, and shellfish. Fat-rich bone greases from medium to large mammals can also be obtained by controlled, long-term boiling facilitated by ceramic technology.

Table 2.14 Distribution of Vinette 1 pottery sherds at seven Meadowood sites

| | | NUMBER OF SHERDS | | | |
|------------|------------|------------------|-----|------|------------------|
| | | Body | Rim | Base | TOTALS |
| Habitation | Batiscan | 855 | 87 | 0 | 942 |
| | Scaccia | 1609 | 71 | 6 | 1686 |
| | Riverhaven | 197 | 5 | 0 | 202 |
| Mortuary | Hunter | 80 | 12 | 1 | 93 |
| | Muskalonge | 47 | 0 | 0 | 47 |
| | Bruce Boyd | 134 | 30 | 1 | 165 ³ |

3 - A total of 400 sherds were found in association with the Early Woodland component at the Bruce Boyd site. After combining those which were clearly from the same vessel, the assemblage was reduced to 165 sherds.

Regardless of the resource(s) processed in Vinette 1 pots, the small quantity of potsherds sherds found on Early Woodland sites suggests that the adoption of pottery by these groups was determined by social rather than economical factors. Early pottery in the Northeast is generally recovered from domestic contexts. Nevertheless, the presence of Vinette 1 wares at a few mortuary sites hints at their occasional use in funerary rituals. Pyrolysis gas chromatography/mass spectrometry analysis of organic residues adhering or absorbed into potsherds suggests that nitrogen fixing plants and freshwater fish may have been cooked in the pots found at Batiscan. These preliminary results and the minimal sample size required are quite appealing for archaeological applications, notably in documenting the function of prehistoric pottery and addressing questions of shifts in subsistence economies (Taché et al., in prep).

Tubular Pipes

The important role played by pipe smoking in the ritual lives of Eastern North American Native communities, generally as a way to validate and reinforce social organization, has been widely documented historically and ethnographically. There is also a clear relationship between the holding of certain pipe rituals, such as the Calumet Dance, and intertribal treaties and trade (Springer 1981). The presence of pipes in archaeological contexts dating to the Archaic period indicates the antiquity of this practice. Banded slate, sandstone, steatite, Ohio fireclay, and clay were alternatively used by Early Woodland groups in the Northeast to make tubular pipes (Smith 1979: 14). However, since the majority of

tubular pipes encountered in our collections are made out of clay, we included these objects within the category of ceramic artefacts.

Among the seven Meadowood sites analyzed, four contained ceramic pipes. Such objects are rare finds in Meadowood contexts, and it has been hypothesized that they represented ceremonial items (Ritchie 1955: 47). The Riverhaven 2, Muskalonge Lake and Oberlander 2 sites each contained a fragmentary cigar-shaped ceramic tube (Ritchie 1965: pl. 68, figure 4; Figure 2.48: a). At the two latter components, these items were included as grave goods in burial pits, and carbonized residues were observed within the pipe from Oberlander 2. Cigar-shaped pipes were also documented at the Wray and Morrow Meadowood components (Ritchie 1965; pl. 60, fig. 13).

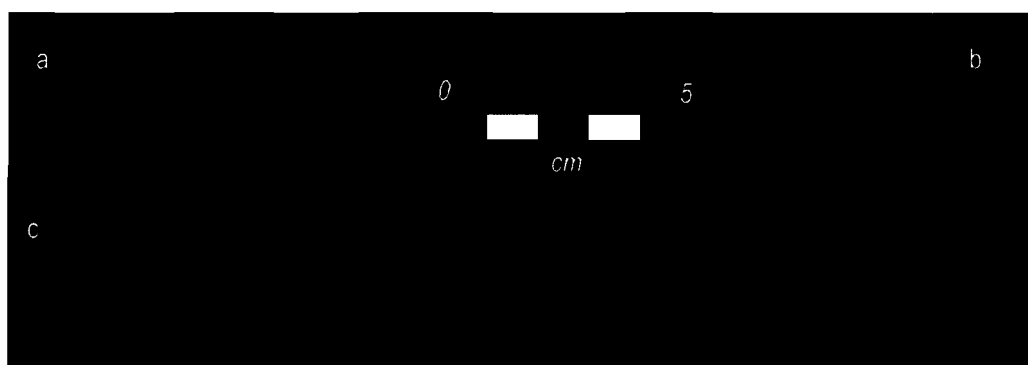


Figure 2.48 Tubular pipes: *a*, cigar-shaped ceramic tube from Oberlander 2; *b*, stone pipe from Scaccia; *c*, blocked-end tubular pipe from Scaccia. (Courtesy of the Rochester Museum and Science Center, Rochester, NY).

These items, characterized by walls of fairly uniform thickness and a cavity tapering toward one end, may be related to similar forms in stone found on related sites in New York (see Ritchie 1944: 143 and pl. 86, fig. 32), Ohio, and Indiana (Cunningham 1948: 12, 24, pl. 7, fig. 5). A fragmented stone pipe stem was recovered at the Scaccia site, although its exact provenience is unknown (Figure 2.48: b). The cigar-shaped style differs from the blocked-end tube of Adena and Middlesex provenience (Ritchie 1944: pl. 88), also documented at the Scaccia site, where it is associated with the single Adena burial excavated at this large Meadowood habitation component (Figure 2.48: c). The blocked-end pipe from the Scaccia site, 203 mm in length and 25-27 mm in diameter, appears to have been intentionally broken.

At the Muskalonge Lake, Oberlander 2, and Morrow components, the pipes were molded from grit-tempered ceramic very similar to the one used to make the Vinette I vessels also present on these sites (Ritchie 1962: 583). A number of tubular pipes from the

Great Lakes region, attributed to Late Archaic-Early Woodland manifestations (Fitting 1970: 82; Mason 1981: 201-236; Quimby 1960: 70) were made of red Ohio pipestone (Tuck 1978: 40-41; 1984: 68-69; Wright 1972: 40, 1979: 46-47).

A few examples of decorated blocked-end tubular pipes exist in the Northeast. A steatite pipe with an engraved thunderbird motif was recovered at the Swanton site, while one such object recovered from a burial feature at the East Creek site is characterized by small thick marks incised around the rim of the flaring end. Finally, an unreported specimen from the Smithsonian Institution collections, found in Woodstock in 1871, have a spiralling line encircling the pipe with short parallel hash-marks along one side of the line (Loring 1985: 97, 100).

Nineteen stone and one ceramic tubular pipes were recovered from 12 burial features at the Boucher site, the majority of which had residues within them (Heckenberger et al. 1990: 120). What was smoked in these pipes remains enigmatic, but tobacco first comes to mind since:

[t]he hearth of tobacco-growing country in North America was and is in the eastern woodlands, especially in Connecticut, New York, Virginia, the Carolinas, and the fertile zone between lakes Huron and Ontario. This was also one of the regions where tobacco shamanism and tobacco-using religious societies (such as the Iroquois False Face society) took hold (Winter 2000b: 14).

Tobacco shamanism can be defined as the use of tobacco by a shaman “who uses tobacco, whether exclusively or not, to be ordained, to officiate, and to achieve altered states of consciousness” (Wilbert 1987: 150, cited in von Gernet 2000: 80). Von Gernet suggested that this shamanistic predisposition to seek altered states of consciousness probably generated the first use of tobacco in the New World (von Gernet 2000: 79; see also Rafferty 2002: 906; Winter 2000a; Springer 1981: 219).

It is generally believed that “[t]he earliest tobacco in eastern North America dates to Middle Woodland contexts—as early as the first century B.C. to the second century AD—at sites in west-central Illinois...(Wagner 2000: 185).” The plant became more widespread after AD 300, and prehistoric charred tobacco seeds are more frequently recovered from secondary domestic contexts than from recognizably ritual or special contexts (Wagner 2000: 197). However, nicotine has recently been identified by gas chromatography/mass spectrometre analysis of residues collected in an Early Woodland tubular pipe found at the

Cresap Mound site, West Virginia. This site contained several burials and yielded radiocarbon dates covering the entire range of the Adena culture. The pipe was located near the base of the mound, suggesting that tobacco, or a plant with a high level of nicotine content, dates “very early in the Adena phase, possibly prior to 400 BC, as earlier phases of the site date to between 730 and 375 BC (Rafferty 2002: 905)”. Ethnohistorical documents mention North American groups that did not grow tobacco themselves but obtained it by trade (Springer 1981: 218). Given the actual lack of evidence for the cultivation of tobacco in the Ontario/Erie Lowlands during the Early Woodland period, it is possible that this was also the case for Meadowood populations. Alternatively, other plant species are also known to have been smoked by Native groups in the Northeast, including dogwood bark (*Cornus* sp.), juniper bark (*Juniperus* sp.), sumac leaves (*Rhus glabra*), and bearberry leaves (*Arctostaphylos uva-ursa*) (Rafferty 2002: 897).

DISCUSSION

Despite the general impression of homogeneity one gets by studying the Meadowood Interaction Sphere, this chapter has highlighted the artefactual variability between seven Meadowood assemblages. This contradiction is due to the fact that components are generally assigned the label Meadowood, based on the presence of a few “imported products.” In addition, few complete assemblages have been described. By analysing the entire assemblages of seven Meadowood sites, it becomes possible to actually differentiate between imported commercial goods from local productions, a necessary step if one wants to qualify the participation of various groups to the Meadowood Interaction Sphere.

As previously mentioned, the items traded within the Meadowood Interaction Sphere are relatively well known. Among the flaked stone tools, the only artefact category that can be confidently considered as items circulating within the Meadowood Interaction Sphere are the well-known Meadowood cache bifaces. Meadowood projectile points, bifacial scrapers, and some of the T-shaped drills may also have circulated in this network, or they could have been produced from Meadowood bifaces acquired through trade. Similarly, strike-a-lights transformed from Meadowood cache bifaces are common on all Meadowood

mortuary components analyzed in this dissertation. Other traded items include, slate gorgets and birdstones, native copper, and shell objects, plus a range of possible perishable products.

The expression “Meadowood-like” artefacts is used in this thesis to refer to objects stylistically and technologically similar to the Onondaga chert items circulating in the Meadowood Interaction Sphere. Such artefacts are Meadowood-affiliated and included in my diagnostic counts, although unlike other Meadowood goods, they were probably not exchanged within the Interaction Sphere. Meadowood-like artefacts are significant since they reflect the existence of local stone knappers having the ability (or the rights) to reproduce Meadowood traded goods. They may also reflect a desire by local elites to emulate a style of objects associated with wealth and prestige.

Meadowood Trade Items: Practical or Prestige?

I believe a good case can be made to qualify Meadowood commercial products as prestige items. In the introductory chapter, exotic/rare/unusual raw materials and high labor/skill investment are the two main criteria that were retained to identify prestige items. The discovery of these objects in graves or other special structures, although not sufficient, can also be an indication of their non-utilitarian function. Binford (1963b: 142), for example, noted that while nothing in the form of the Pomranky points in Michigan (the equivalent of Meadowood cache bifaces) suggests anything but a technomic function, the context of their occurrence indicates a social rather than a technomic function.

As will be discussed in more detail in subsequent chapters of this dissertation, there is evidence for increased control over restricted resources by Meadowood communities. Following this development, lithic raw materials that may have had practical roles in earlier periods may have become highly valued in Early Woodland times as a result of increasing control over access and distribution (see Hayden and Schulting 1997: 58 for a similar argument regarding obsidian on the North West Coast). Onondaga chert, which became the main currency of the Meadowood Interaction Sphere, is a good example of such raw material. An additional argument for considering Meadowood cache bifaces as prestige items is their high quality and standardization, which indicates not only a high labour investment but also the presence of skilled specialists among Meadowood communities (see Chapter 5 for further discussion on the topic of specialization). Moreover, a majority of Meadowood

cache bifaces were found in mortuary sites, mostly in the context of burial features, or in caches, and very few show traces of use (Williamson 1982: 6, 1988).

Native copper items and marine shells, although significantly fewer in numbers, can also be confidently associated with long-distance trade and were likely prestige objects. Again, both materials are predominantly recovered from mortuary components (see Chapter 4). A good case can also be made for the classification of gorgets and birdstones within the category of prestige items. More so than their occasional manufacture in exotic banded slate, the elaborate shape of these ground-stone objects is what is exceptional:

Unusual elaborations such as careful symmetry, carved features such as zoomorphs or anthropomorphs, and adjunct geometrical designs require considerable care, effort, time, and skill to create. Moreover, virtually all these items could be much more easily crafted of softer materials such as wood (Hayden and Schulting 1997: 59, 62).

Occasionally present in Meadowood contexts, steatite vessel sherds, and stone and ceramic tubular pipes are other exchanged goods likely to be related with rituals and/or the expression of status. In many different contexts, stone bowls have been related to emerging social inequalities and the display of power on formal occasions (Hayden and Schulting 1997: 68-69). The same can be said of the finely crafted smoking pipes and of the behaviours they imply. The act of smoking, which probably marked special occasions, was likely performed by individuals who “shared the same set of cultural values and were approximately of equal status, capable of performing as elites” (Hayden and Schulting 1997: 71).

Besides the recognizable traded items, a number of idiosyncratic objects documented in Meadowood assemblages undoubtedly also represent non-utilitarian objects, which primary function may have been to convey status. A majority of these are bone implements, two of which bear some of the few stylistic designs documented within Meadowood artefactual assemblages (Figure 2.40) According to Brian Hayden, most of these objects could have been, and probably were in a majority of cases, more easily manufactured from hard wood:

We suggest that bone was much more difficult to work than hard woods, and only those individuals who wanted to enhance the prestige of their tools took the trouble of making ordinary implements out of bone (...) Thus, we argue that to a large

extent, the very fact that bone or ground stone was used at all for some artefacts can be considered a good reason for considering these artefacts as prestige items (Hayden and Schulting 1997: 62).

Thus, non-perishable products circulating in the Meadowood network were primarily non-utilitarian items involving high labour and skill investments and manufactured from raw materials restricted in terms of their origins. These objects were recovered in various proportions at the seven sites analyzed in this dissertation, pointing to different degrees of participation of Early Woodland communities to the Meadowood Interaction Sphere (Table 2.15).

The three interaction models discussed in this study (i.e., ritual, economical, and socio-political) could theoretically involve the exchange of non-utilitarian items. Differences in the abundance, diversity, and contexts of these objects, however, should exist between these various scenarios. Within a ritual model, cult items and/or ritual paraphernalia are expected to be exchanged between groups. Like prestige items, such artefacts are often (but not always) made of exotic materials and in labor intensive fashions. To distinguish between the ritual and sociopolitical scenarios would then require a closer examination of contexts. Indeed, the recovery of significant numbers of exotic/finely crafted items in habitation sites rather than in mortuary or ritual contexts would contradict the ritual model.

A number of researchers have argued that prestige items can be used to even out environmental variability over time and space (e.g., Halstead and O'Shea 1982). The exchange of wealth among the Southern Coast Salish, for example, has been interpreted by Suttles (1960) as a regulating mechanism necessary to the survival of communities living in environments characterized by local, seasonal, and year-to-year differences in productivity. Ostentatious exchanges of valuables within the ceremonial exchange system in New Guinea have been interpreted in a similar fashion (Rappaport 1967: 106-107; Strathern 1971: 112-113). According to Suttles (1960: 303), the drive to attain high status was positively selected in the process of cultural evolution because it is prerequisite to the sorts of behaviors that keep the system working. Since environmental instability and restricted surplus are seen as the prime movers of prestige technologies in functional explanations, most economical models predict a limited production of prestige items (Hayden 2001a: 249—but see Suttle's (1960) interpretation of Northwest Coast potlatches for a conflicting view). The economical scenario is also theoretically inconsistent with the removal of wealth from circulation

through burial or destruction. There is thus no reason for prestige items to be intentionally destroyed or to occur in ritual or mortuary contexts, except perhaps as personal possessions of the deceased. A predominance of prestige items in mortuary sites, as indicated in Table 2.15, thus contradict an economical model.

Table 2.15 Proportions of traded items within the seven study Meadowood assemblages

| | | Proportions of Meadowood traded items (%) | | | | | | | | | |
|------------------|---------------------|---|------------------|--------------------|---|-----------------|--------|----------------------------|---------------------------|---------------|--------------------|
| | | Cache bifaces | Meadowood points | Meadowood scrapers | Trapezoidal gorgets & birdstones ¹ | Steatite sherds | Galena | Native copper ² | Marine shell ³ | Tubular pipes | TOTAL ⁴ |
| Habitation sites | Batscan (n=614) | 0.98 | 3.26 | 3.75 | 0 | 0 | 0 | 1.14 | 0 | 0 | 9.12 |
| | Scaccia (n=643) | 5.75 | 11.2 | 0.62 | 0.16 | 0.31 | 0 | 0 | 0.16 | 0.16 | 18.35 |
| | Riverhaven (n=1681) | 41.94 | 3.09 | 2.91 | 0.12 | 0 | 0 | 0 | 0 | 0.06 | 48.13 |
| Mortuary sites | Hunter (n=291) | 83.51 | 1.72 | 3.44 | 0.69 | 0 | 0 | 0 | 0 | 0 | 89.35 |
| | Muskalonge (n=1787) | 95.8 | 0.62 | 0.11 | 0.17 | 0 | 0.17 | 0.28 | 1.29 | 0.06 | 98.49 |
| | Bruce Boyd (n=191) | 36.65 | 16.23 | 0 | 1.57 | 0 | 1.05 | 3.66 | 0 | 0 | 59.16 |
| | Oberlander 2(n=331) | 49.24 | 3.32 | 3.63 | 2.11 | 0.91 | 0 | 0.91 | 0.3 | 0.3 | 60.73 |

1 – The truncated popeyed birdstone from the Scaccia site was excluded from this analysis since it is associated with the Adena/Middlesex complex rather than the Meadowood Interaction Sphere.

2 – Estimated number of native copper necklaces (or other ornaments) rather than number of beads was used in counting the total number of native copper artefacts in each site. The number of burial features containing native copper beads was used as minimum numbers of necklaces/ornaments.

3 – The freshwater mussel pendant from the Bruce Boyd site was excluded from this analysis because its source is probably local.

4 – Estimated number of vessels, rather than number of potsherd, was used in counting the total number of artefacts for each Meadowood assemblage (see Taché 2005: Appendix A).

Finally, within a sociopolitical model, a widespread and expanding occurrence of a variety of prestige items is expected (Hayden 2001a: 249). In this scenario, prestige items reflect increasing social inequalities and constitute evidence of ownership and competitive displays of success. Emerging elites use prestige objects to transform surplus food into more durable material items, create social bonds through gift and debt relationships, validate and materialize important events as well as to display economic success and political power (Hayden 1998). Hayden proposed that the dominant context of use of prestige items is in feasts, where they are publicly displayed and where gifting is often recorded and advertised (Hayden 2001a: 254). Consequently, the observed association of significant numbers of

prestige items with gathering and mortuary sites, but also occasionally with habitation sites, best fit a sociopolitical model in which feasts at gathering locales, funerals, and residences represent prestige items' main context of use.

CHAPTER 3 – DISTRIBUTION OF MEADOWOOD SITES AND DIAGNOSTICS IN THE NORTHEAST

If Meadowood artefacts were used to transform surplus food into durable items and display political power, as suggested in Chapter 2, Meadowood sites should concentrate in regions where resources are abundant, predictive, and spatially restricted. In this chapter, I address the ecological and subsistence foundations of the Meadowood Interaction Sphere¹³. As discussed in the introduction, the distribution of Meadowood components/diagnostics across the landscape has the potential to inform us about the motivations underlying the establishment and maintenance of the Meadowood Interaction Sphere, the underlying benefits that accrued from participating in this network, and the underlying logic of the settlement pattern.

If, as Ritchie's original definition of the Meadowood concept implies, the interaction sphere results from the spread of a burial cult, a core and peripheral area should be identifiable. In this ritual scenario, a relatively homogenous distribution of sites is expected, although the most typical and elaborate expressions are likely to occur in the sphere's core area.

If economic factors underlie the Meadowood Interaction Sphere, similarities and differences between communities should reflect the degree of resource complementarity between regions. Moreover, if exchanges are meant to be economically adaptive, we should observe declining frequencies of exotic materials as distance from their source areas increase. Indeed, beyond a certain point, the transport and exchange costs of acquiring staples or subsistence-related items inevitably outnumber the benefits gained from such exchanges. This phenomenon has been discussed by Christopher Carr, who distinguished between local symmetric exchange of valuables and subsistence items among neighbouring groups on the one hand, and regional exchange of valuables between elites on the other hand. The former had the benefit of regularly renewing and keeping open ties of mutual friendship and obligation that, in occasional years of subsistence scarcity and need, could be called upon for

¹³ I did not define geographical boundaries inside which to conduct my spatial analysis. Rather, every reported Meadowood manifestation is included in my discussion in order to portray and explain the entire distribution of Meadowood sites/diagnostics across the landscape.

obtaining staples. Regional and interregional exchange of valuables, on the other hand, were said to be largely restricted to the upper echelons of exchanging societies, and motivated simply by a desire of elites to raise prestige and bolster leadership positions within their societies (Carr 2005: 594-598).

If political factors and the development of socio-economic inequalities explain the emergence of a long distance exchange network, traded items should concentrate in communities that have the greatest potential to produce surplus and thus develop socioeconomic inequalities and engage in feasting and prestige displays. Such developments should occur in areas characterized by relatively abundant but spatially restricted resources that are not susceptible to overexploitation. These conditions would be met, for example, at locations with high fishing productivity, in nut collecting areas, areas of dense stands of wild rice, or at sites suitable for plant cultivation.

The Lake Forest concept, a region defined by Potzger (1946), more or less corresponding to the limits of the Meadowood Interaction Sphere (Granger 1978: 46). This region corresponds to the transition between the Canadian and Carolinian biotic provinces and is characterized by an overlapping of gradients in floral and faunal communities. This transitional belt comprises a mixture of southern-type deciduous species such as oak, hickory, chestnut, walnut, and beech, and northern coniferous and deciduous species such as maple, birch, pine, hemlock and spruce (Dice 1943; Karrow and Warner 1990: 8).

In terms of paleoenvironmental reconstruction, it is generally assumed that the climate and physiography closely approximate modern condition during the Early Woodland period. Pollen sequences from New England and the Mid-Atlantic regions, however, indicate a succession from oak-hickory (warm and dry) to oak-hemlock-chestnut (cool and moist) biomes at the beginning of the Early Woodland. This change may have resulted in an increase of useful resource patches to Early Woodland communities. According to Peter Pagoulatos (2002: 37), population aggregates in the states of Delaware and Connecticut would have then been able to disperse “into smaller socioeconomic units to exploit a wider range of microenvironments such as smaller feeder streams, interior wetlands and tidal estuaries.”

Changes in the configuration of the Great Lakes also affected the distribution of Meadowood sites. In the Huron and Georgian Bay basins, for example, isostatic uplift caused the North Bay outlet to rise so far as to reach the elevation at Port Huron, at which

time drainage returned southward through the Erie basin approximately 5,000 years ago. These events are referred to as the Nipissing transgression. Downcutting in the Port Huron outlet resulted in a gradual decrease in water levels, with Lake Algoma occupying to one intermediate level recorded at about 3000 BP. These water level changes seem to have had little impact on regional forests of southern Ontario, which remained stable since oak, elm, maple, ash, ironwood, hickory, basswood, walnut and beech gradually increased their numbers in the Middle Holocene period. By about 7500 BP, the forests of southern Ontario had reached relative equilibrium, with a dominance of maple and beech across a wide spectrum of moisture regimes (Karrow and Warner 1990: 20-21; MacDonald and Pihl 1994: 53).

To test the expectations of the three alternative exchange models in terms of site distribution patterns, an inventory of 226 Meadowood archaeological sites in northeastern North America was generated based on a comprehensive literature review (Appendix A). Although this list is undeniably incomplete, given limited access to the grey literature and to unpublished material, it is close to a complete coverage of the entire population of Meadowood sites reported in the literature and should be adequate for assessment of the models discussed in this dissertation. The following discussion is thus based on the assumption that this inventory is representative of the entire population of Meadowood sites.

To explore the relationships between the distribution and nature of Meadowood occupations across the landscape and specific environmental factors, the 226 archaeological sites were plotted on a map of northeastern North America (Figure 1.1). Numerous lakes and rivers facilitate the circulation of men and goods within this vast and diverse territory with no major physiographic boundaries. The process of dividing such a landscape into provinces necessarily involves some kind of arbitrariness. A number of geographical divisions for northeastern North America have been proposed, each one favouring different environmental variables and/or scales (Dice 1943; Potzger 1946). In this chapter, northeastern North America is divided into eight provinces and 27 sub-regions (Table 3.1). Care was taken to define coherent areas of somewhat comparable sizes, such as river valleys (territoriality based on watersheds or river basins has been demonstrated by a number of authors including—Mullholland 1988: 145), areas sharing similar ecological conditions, or regions that have justifiably been treated as regional band territories in the literature.

Table 3.1 Repartition of known Meadowood habitation and mortuary sites between the different physiographic provinces comprised within the Meadowood interaction sphere

| Regional physiographic provinces | Subregions | Meadowood Habitation Sites (N) | | Meadowood Mortuary Sites (N) | | Total number of sites (N) | |
|---|---|--------------------------------|----|------------------------------|----|---------------------------|----|
| | | | | | | | |
| Lakes Ontario/Erie Lowlands (Figure 3.1) | Niagara Peninsula / Haldimand Clay Plain (Grand River and Long Point) | 17 | 47 | 7 | 17 | 24 | 64 |
| | Lake Ontario / Oneida Lake | 2 | | 6 | | 8 | |
| | St-Clair Lake / Thames River | 18 | | 2 | | 20 | |
| | Auseable River / Lake Huron-Georgian Bay | 6 | | 2 | | 8 | |
| | Ontario Lake (north shore) / Trent waterway | 4 | | 0 | | 4 | |
| St-Lawrence-Champlain Lowlands (Figure 3.2) | Upper St. Lawrence valley | 6 | 37 | 5 | 9 | 11 | 49 |
| | Lake Champlain | 8 | | 4 | | 12 | |
| | Middle St. Lawrence valley | 20 | | 0 | | 20 | |
| | Ottawa valley | 3 | | 0 | | 6 | |
| Appalachian Uplands (Figs. 3.1 and 3.2) | Glaciated Allegheny Uplands | 2 | 3 | 5 | 7 | 7 | 10 |
| | Eastern Townships | 1 | | 2 | | 3 | |
| Hudson/Mohawk/Susquehanna Lowlands (Figure 3.3) | Mohawk-Upper Hudson valley | 8 | 22 | 2 | 2 | 10 | 24 |
| | Susquehanna valley | 14 | | 0 | | 14 | |
| Atlantic Coastal Plain (Figure 3.3) | Delaware valley | 6 | 15 | 3 | 17 | 9 | 32 |
| | Lower Hudson / Long Island | 3 | | 3 | | 6 | |
| | Connecticut River valley | 3 | | 5 | | 8 | |
| | Merrimack River valley | 3 | | 6 | | 9 | |
| Maine/maritimes (Figure 3.4) | Coastal Maine | 1 | 17 | 0 | 3 | 1 | 20 |
| | Southern New Brunswick | 4 | | 1 | | 5 | |
| | Tobique / Miramichi valleys | 6 | | 1 | | 7 | |
| | Halifax / Dartmouth / Minas Basin | 3 | | 0 | | 3 | |
| | Lakes Kejimikujik and Rossignol / Mersey River | 3 | | 1 | | 4 | |
| Western Great Lakes (Figure 3.5) | Saginaw Bay | 8 | 11 | 4 | 4 | 12 | 15 |
| | Lake Michigan | 3 | | 0 | | 3 | |
| Canadian shield (Figure 3.6) | Abitibi-Témiscamingue | 9 | 11 | 0 | 0 | 9 | 12 |
| | Lac St. Jean | 1 | | 0 | | 2 | |
| | Lower St. Lawrence valley | 1 | | 0 | | 1 | |
| Totals | | 163 | | 59 | | 226 | |

1 - The occasional discrepancy between the sum of habitation and mortuary sites and the total number of sites is due to a few cases where the nature of Meadowood occupations could not be determined. This is the case, for example, of isolated birdstone finds in the Ottawa valley region.

While these 27 regions may approximate Meadowood political divisions in some cases, this division of the landscape is nevertheless somewhat arbitrary. In this study, it will only be used to build general models of the distribution of Meadowood components across the landscape for analytical purposes, without the pretension of reconstructing real

ethnographic or political units. Each geographical province is discussed in a separate section of this chapter. Variables such as the total number of sites/diagnostics, the number of habitation versus mortuary components, and the existence of site concentrations are discussed in relation to resource availability and predictability, transportation routes, and access to raw materials.

LAKES ONTARIO/ERIE LOWLANDS AND NORTHERN GLACIATED ALLEGHENY PLATEAU

Appendix A: 1-64, 114-120; Figure 3.1

Lakes Erie and Ontario are vast bodies of water, and approximately 30% (n=64) of all the Meadowood archaeological sites are located in the Ontario/Erie Lowlands, with a ratio of mortuary to habitation sites of about 1 to 3. The Riverhaven 2, Oberlander 2, and Bruce Boyd sites (analyzed in Chapter 2) are located in this region.

Resources

A variety of resources, including nuts, fish, game, chert, and wild rice, were available to the Meadowood communities inhabiting the Ontario/Erie Lowlands and the neighbouring Glaciated Allegheny Plateau¹⁴ (see Chapter 5 for a discussion on environmental productivity). Within this vast area, the Niagara Frontier region is part of the Carolinian biotic province, characterized by deciduous trees and related “southern” species, including red oak, black walnut and ash trees. Three thousand years ago, forest types of the area were similar to the existing vegetation, excluding species introduced by the Europeans. The Onondaga Escarpment, the principal source of the high grade Western Onondaga chert (Granger 1981:100), is part of the Niagara peninsula physiographic province.

¹⁴ The Glaciated Allegheny Uplands (portions of the Appalachian Highlands in south-central New York and northern Pennsylvania) are so called because they were covered by glaciers during the last glaciation, which rounded the ridges and filled major valleys with thick deposits of sand and gravel. Old drainage systems were disrupted, resulting in the creation of extensive bogs and swamps. Moreover, the region now contains notable moraine, drumlin, kettle, scour, and other glacial features.

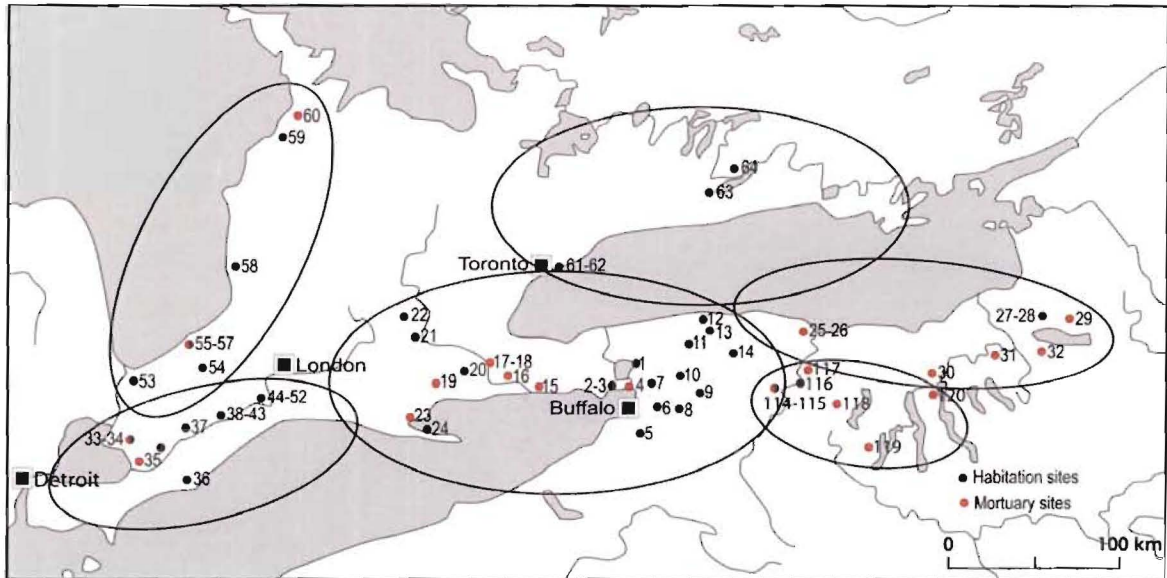


Figure 3.1 Distribution of Meadowood sites in the Lakes Ontario/Erie Lowlands and northern Glaciated Allegheny Plateau

Ontario/Erie Lowlands

NIAGARA PENINSULA: 1-Riverhaven 2, 2-Orchid B, 3-Surma, 4-Buffalo G, 5-Winters, 6-Petrie, 7-Spicer Creek & Riverhaven IV, 8-Sinking Ponds, 9-Allen, 10-Larkin, 11-Divers Lake, 12-South Waterport, 13-F Forrestel, 14-Frank, 15-Haldimand County, 16-Cranberry Creek, 17-Moerschfelder, 18-Hoover, 19-Nanticoke, 20-Slack-Caswell, 21-Billiard, 22-Cashbrown, 23-Bruce Boyd, 24-Boyd Lakefront.

LAKES ONTARIO & ONEIDA: 25-Point Pleasant, 26-Irondequoit Creek, 27-Vinette, 28-Wickham, 29-Oberlander 2, 30-Rene Menard Bridge II, 31-Jack's Reef, 32-Pickens.

ST. CLAIR LAKE & THAMES RIVER: 33-Liahn I, 34-Liahn II, 35-Rickely, 36-Morpeth South, 37-near Kent Bridge, 38-Welke-Tonkonoh, 39-Glen Oak, 40-Lambert, 41-Willow, 42-Hamet, 43-Cushman, 44-Neeb, 45-Brodie, 46-Pocock, 47-Belvoir, 48-Old Channel, 49-Paddock, 50-Speedway, 51-Scott Wales; 52-Wishing Wells.

AUSEABLE RIVER & LAKE HURON: 53-Parker, 54-Wyoming Rapids, 55-Parkhill, 56-Pinery Provincial Park, 57-Thedford, 58-Ben Miller-Williams, 59-Ferris, 60-Donaldson.

TRENT WATERWAY: 61-Siller, 62-Scott O'Brien, 63-Dawson Creek, 64-McIntyre.

Appalachian Uplands

ALLEGHENY UPLANDS: 114-Scaccia, 115-Cuylerville, 116-Macaulay, 117-Wray, 118-Morrow, 119-Yates County, 120-Canoga.

The Haldimand Clay Plain province, lying between the Niagara Escarpment and Lake Erie, is a region with heavy clay soils over Devonian-aged bedrock (limestone, dolomite, chert, sandstone, shale), characterized by low relief and moderate to poor drainage (Chapman and Putnam 1966). This environment is similar to the lake plain areas of Northwestern Ohio and Saginaw Bay, Michigan, to the west (Parker 1997: 141). Northern Lake Erie tributaries, such as Cates Creek, are home to many spawning fish species, including northern pike, bullhead, bass, freshwater drum, gar, sucker, yellow perch and several panfish. Pollen cores from the southern Niagara peninsula indicate that, 2,200 years ago, lake levels were at about 175 m asl, compared to modern levels near a mean of 173 m asl. Ecologically rich locations like the Cates Creek estuary may have offered some stability

in the context of fluctuating water level (Parker 1997: 141). Other rich aquatic niches in Southern Ontario, where Meadowood sites tend to concentrate, include Long Point and Rondeau Bays on Lake Erie, the east shore of Lake St. Clair, and the lower reaches of the Grand, Thames, and Aulseable rivers (Spence and Fox 1986: 15).

Early forest surveys and the analysis of wood charcoal samples from the Thames River Basin suggest a mixed xeric, beech/maple forest cover, most probably a local oak-hickory dominated area. The analysis of a wood charcoal sample collected at the Pocock site, located in the meander belt on the Middle Thames River valley at the abandoned confluence of the Thames and Dingham Creek, suggests an access to microenvironments associated with both upland and lowland habitats (Wilson 1997: 38).

To the north, within the Canadian biotic province, Meadowood components have been found along the east shore of Lake Huron and on the north shore of Lake Ontario, characterized by gently rolling terrain sloping towards the lake and a sequence of rivers and creek flowing in at more less regular intervals (MacDonald and Pihl 1994: 49). Kettle point chert is native to the east shore of Lake Huron. While not necessarily as productive as more southern riverine locations, the lacustrine estuaries occurring along northern Lake Ontario's waterfront could have attracted human populations for several related reasons. First, estuaries constitute extensive and rich wetlands, an ecosystem known for its diversity and productivity. Within this rich habitat, seasonal runs of spawning fish and migrating waterfowl would have been particularly important. Such estuaries are also important transitional zones between the inland drainage system and Lake Ontario. Finally, the various terrestrial/aquatic interactions occurring within these environments were undoubtedly attractive (MacDonald and Pihl 1994: 53-54). For example, beavers live in both terrestrial and aquatic habitats, while a variety of other mammals use aquatic environments as water sources or for predation.

Along the Trent waterway, Rice Lake is actually a widening of the Trent River and part of a convenient water transportation route connecting the eastern end of Lake Ontario with the southern end of Lake Huron. The area surrounding Rice Lake is also characterized by productive wild rice stands, a situation replicated at Lake Scugog (north of Rice Lake along the Trent waterway—Wright 1990: 497): “[t]he shallow and marshy Rice Lake waters today bounding the peninsula Dawson site probably hosted extensive wild rice beds and associated fauna in the Early Woodland period” (Jackson 1982: 26).

While part of the Appalachian uplands, the northern periphery of the Glaciated Allegheny Plateau was probably periodically visited by the same Meadowood groups who exploited the Ontario/Erie Lowlands. The rolling topography of this region is dissected by numerous eastward-flowing creeks, such as the Honeoye Creek in the vicinity of the Morrow site, which empty into the Genesee River and eventually Lake Ontario to the north (Granger 1979: 100; Ritchie and Funk 1973: 99).

Cultural Inventory

Within the Ontario/Erie Lowlands and the northern periphery of the Glaciated Allegheny Plateau, burial sites cluster on the terraces of major streams, often on higher ground above these waterways, or near large lakes. In the Niagara Peninsula, Granger (1979:100) observed that habitation components are more diverse in terms of their location, but that large sites like Scaccia and Riverhaven 2 are located in physical settings comparable to burial sites. Besides these large habitation sites, Granger (1978: 295) identified smaller extractive camps, mainly concerned with fishing during the summer (see discussion of Granger's settlement model in Chapter 5). Similarly, Spence and Fox noted that in southern Ontario, Meadowood sites concentrate around productive fishing grounds such as the Long Point and Rondeau bays on Lake Erie, the east shore of Lake St. Clair, and the lower reaches of the Grand, Thames, and Aulseable rivers (Spence and Fox 1986: 15).

In this vast province, a majority of sites (n=24) concentrate around the north shore of Lake Erie east of Long Point, the Niagara Peninsula, and Lake Ontario's southwestern shore. Wright (1990: 495) argued for an east-west regional cultural differentiation, with the major boundary being the Niagara Escarpment at 79 degrees of longitude west, resulting from differences in the Holocene vegetation between southwestern and southeastern Ontario:

[S]pruces of the mixed coniferous-deciduous forest association, and in particular coniferous elements, are more characteristic in the southeastern segment of the province, largely because soils are poorer, more acidic, developed on bare bedrock, and are sandy and clayey as a result of the former presence of the Champlain Sea. Consequently, there are fewer food-producing deciduous trees to provide a source for human subsistence (Karrow and Warner 1990: 33).

According to this view, the Early Woodland archaeological record from the Niagara Peninsula would be more closely affiliated with New York State than Ontario. In southwestern Ontario, 18 small habitation and two mortuary components with Meadowood diagnostics have been documented in the Thames River Basin: “The Thames River drains an area of 2,200 square kilometres, second in southwestern Ontario only to the Grand River. From its source near Brodhagen to its embouchure with Lake St. Clair, the Thames is about 125 miles in length, and flows through two distinct physiographic regions” (Wilson 1997: 8).

To the east, the southeastern shore of Lake Ontario and the nearby Lake Oneida are characterized by a high proportion of ritual/mortuary sites compared to other areas. Indeed, the ratio of habitation to mortuary sites is inverted here, with six of the eight Meadowood components being caches and/or mortuary sites. Vinette and Oberlander 2 are major habitation and mortuary components, respectively, quite possibly related to each other, located near the outlet of Oneida Lake. This area was historically renowned for its abundance of fish, especially Atlantic salmon (but see footnote 6 [p.30]).

While a few Meadowood sites can be associated with rich wild rice areas along the Trent waterway, other such locations (such as Lake Scugog along the Trent waterway) are devoid of known Meadowood sites. Moreover, it does not appear that productive wild rice stands yielded unusually large Meadowood sites compared to other regions. This contrasts with Middle Woodland settlement patterns. Indeed, by about 2500 BP, the Rice Lake area witnessed an increasing degree of summer sedentarism, recognized archaeologically by the appearance of large shell middens. These base camps are associated with ceremonial centers marked by burial mounds. Increasing reliance upon plant food, fishing, and the collecting of large quantities of mussels, together with greater residential stability, may have led to an increase in band leaders' authority (Wright 1999b: 683). Discussing the influence of the Hopewell Interaction Sphere in southern Ontario during the Middle Woodland period, Michael Spence and his colleagues noted that the abundance of western Onondaga chert in Ontarian sites, particularly in the vicinity of Rice Lake, possibly represents an exchange product for furs and native silver from the east (Spence et al. 1979: 120). Silver, obtained in a pure form in the town of Cobalt in eastern Northern Ontario, is relatively common in the Rice Lake burial mounds and has been recorded from sites in New York and Ohio using trace element analysis (Wright 1999b: 653; Spence and Fryer 2004).

The Dawson Creek and McIntyre sites suggest that the Rice Lake area was already a strategic link in long distance trade networks in the Northeast during the Early Woodland period. Although silver has not been documented in Meadowood sites, furs from Northern Ontario and Northern Quebec were probably highly prized commodities and could have been acquired by groups farther south, through intermediaries in the Rice Lake area, in exchange of Onondaga chert and other valuable items.

The northern fringes of the Glaciated Allegheny Plateau in central and western New York is home to a number of important Meadowood sites, such as the Scaccia site. Like Oneida Lake and Lake Ontario to the north, this region is characterized by a relatively high proportion of mortuary sites, the ratio in this case being nearly one habitation to two mortuary sites.

ST. LAWRENCE/CHAMPLAIN LOWLANDS AND EASTERN TOWNSHIPS

Appendix A: 65-113, 121-123; Figure 3.2

The physical characteristics of the St. Lawrence/Champlain Lowlands derive from a time, between 12,500 and 9,800 years ago, when this territory was submerged under cold marine water from the Atlantic. Layers of clay and silt deposited by the post-glacial Champlain Sea covered the area's Quaternary glacial materials, resulting in the plain that today characterises the St. Lawrence/Champlain Lowlands. The Montérégiennes hills are the only elements contrasting with the otherwise flat relief of these Lowlands. The Champlain Sea, replaced by Lampsilis Lake's fresh waters, impeded the colonization of the area before around 6000 BP. The upper and Middle St. Lawrence valley, the Ottawa valley, and the Champlain valley are four sub-regions of the St. Lawrence/Champlain Lowlands.

The St. Lawrence Lowlands stretch for over 700 km between Lake Ontario and Cap Tourmente/Montmagny. Of variable width, this plain tends to narrow progressively as one moves north-eastward, to disappear around Cap Tourmente on the north and Montmagny on the south shore of the St. Lawrence River. The hydrographical system of this province is characterized by the St. Lawrence River, a major transportation route linking the Atlantic coast and the Great Lakes, and the numerous streams and rivers emptying into it. Major tributaries of the Upper St. Lawrence include the Richelieu (linking the St. Lawrence River and Lake Champlain), Assomption, Châteauguay, du Nord, and Rigaud rivers. St. François,

St. Maurice, and Batiscan are important rivers in the Trois-Rivières area, while the Chaudière River in the vicinity of Québec city represents an important transportation route, leading to Lake Mégantic close to the American border. Also around Québec city, the narrowest point of the St. Lawrence River, where the crossing would have been facilitated, is located in front of the Désy site (Chrétien 1995a: 282).

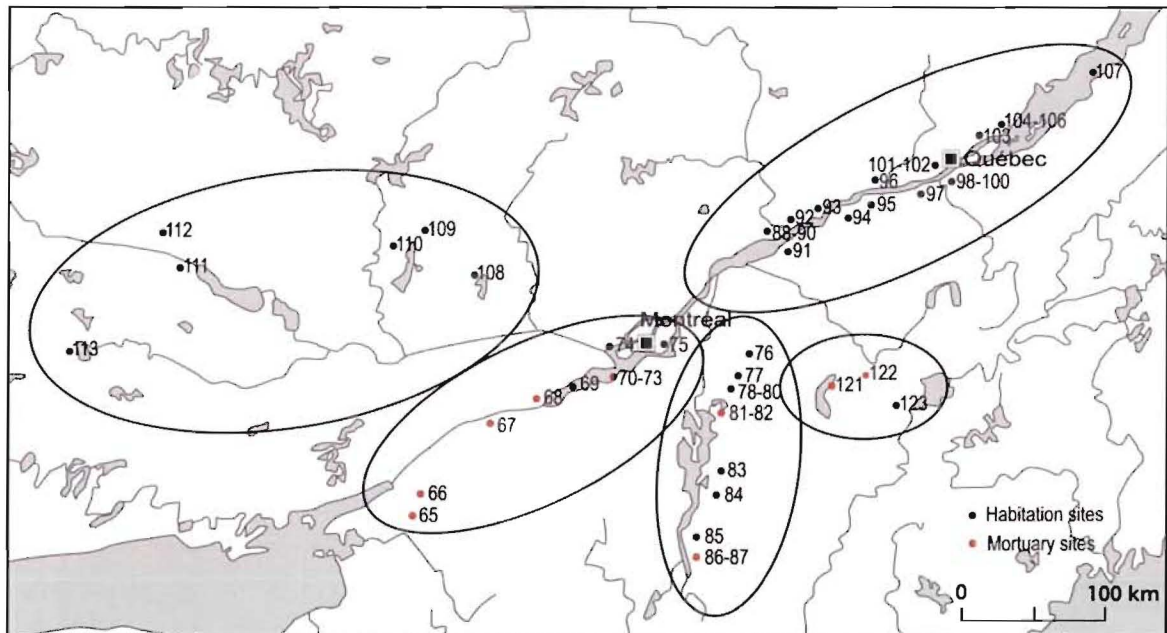


Figure 3.2 Distribution of Meadowood sites in the St. Lawrence/Champlain Lowlands and Eastern Townships.

St. Lawrence-Champlain Lowlands

UPPER ST. LAWRENCE VALLEY: 65-Hunter, 66-Muskalonge Lake, 67-Rockway Point, 68-Ault Park, 69-Cadieux, 70-Pointe Thibodeau, 71-Roy, 72-Pointe-du-Buisson, 73-Pointe-du-Buisson (stn.5), 74-Oka, 75-Lemoyne-Leber.

LAKE CHAMPLAIN: 76-Husler, 77-Jetté, 78-Bilodeau, 79-Gasser, 80-MacFarlane, 81-Boucher, 82-Swanton, 83-Pearl Street Park, 84-Ewing, 85-Lemon Fair, 86-East Creek, 87-Bennett.

MIDDLE ST. LAWRENCE VALLEY: 88-Ferme Boucher, 89-Ruisseau St. Charles, 90-Camp St. Dominique, 91-De la Butte, 92-Red Mill, 93-Batiscan, 94-Tousignant, 95-Hamel, 96-Frenette, 97-Lambert, 98-CeEt-482, 99-CeEt-565, 100-Désy, 101-Maison Hazeur, 102-Rue sous le Fort, 103-Gagnon, 104-Du Verger, 105-CgEq-25, 106-CgEq-22, 107-Ile aux Corneilles.

OTTAWA VALLEY: 108-Rivière Petite Nation, 109-Wabasse, 110-Lac Trente et Un Milles, 111-Deep River, 112-Rivière Dumoine, 113-Rosebary.

Appalachian Uplands

EASTERN TOWNSHIPS: 121-Pointe-Merry, 122-Butler, 123-Canaan Bridge.

Small lakes are rare in the St. Lawrence valley, contrasting with the higher grounds of the Laurentides to the north and the Appalachian mountains to the south. On the other hand, four important bodies of water representing widening of the St. Lawrence River, characterize this hydrographic system. Lake St. Pierre (364 km²) is located between Sorel and

Trois-Rivière while Lake St. François (241 km²), Lake St. Louis (148 km²), and Lake des Deux Montagnes (151 km²) result from the union of the St. Lawrence and Ottawa rivers in the plain of Montreal (Clermont 1982: 21). The Ottawa valley, where three Meadowood sites and two birdstone isolated finds were reported, is another major highway in northeastern North America, connecting the lowlands of the St. Lawrence valley with the higher grounds of the Canadian Shield to the north.

Resources

Maple groves once covered most of the St. Lawrence/Champlain Lowlands. In southern latitudes, around Montreal and Lake St. Louis, the maple forests include hickory, oak and walnut trees, species also found in the deciduous forest of the Ontario/Erie Lowlands to the south. The Laurentian maple forest, a domain par excellence for sap and sugar production¹⁵, is the most common vegetation type encountered in the Upper St. Lawrence valley (Grandtner 1966, cited in Clermont 1982: 22).

When they are pressed by famine, they eat the shavings, or bark of a certain tree, which they call Michtan, which they split in the Spring to get from it a juice, sweet as honey or as sugar. I have been told of this by several, but they do not enjoy much of it, so scanty is the flow (JR6: 273).

The Middle St. Lawrence valley, between Trois-Rivières and Québec city, is at the northeastern extremity of the St. Lawrence Lowlands (Clermont 1982: 19). While the Ontario/Erie Lowlands, often considered as the “core area” of the Meadowood Interaction sphere, are located between the 43th and the 44th degrees of latitude north, the Middle St. Lawrence valley is situated between the 46th and the 47th degrees north. This difference has an effect on the climate, and thus on the vegetation characterizing these two general areas.

In the Middle St. Lawrence valley, the forest types are dominated by the sugar maple (*Acer saccharum*) and the American beech (*Fagus grandifolia*). This contrasts with the more thermophile forest types surrounding Lakes Ontario and Erie, characterized by a dominance of white oak, hickory (*Carya ovata* and *cordiformis*), and horse chestnut (*Aesculus hippocastanum*).

¹⁵ While the possible use of maple sap by Early Woodland communities has been evoked (Spence and Fox 1986: 30), evidence to support this claim is lacking. Based on historical sources, the use of unprocessed sap as a drink was common among early historic Native groups, but the process of transforming sap into sugar did not spread before the end of the seventeenth century, when Europeans began to show serious interests in the sugar (Mason 1986: 308-309).

Although butternut trees (*Juglans cinerea*) is present in the area of Quebec City, nut bearing trees are more abundant in the lowlands around lakes Ontario and Erie (Chrétien 1995a: 53), a difference that should be kept in mind when attempting to reconstruct Meadowood subsistence strategies. Moreover, the colder climate and longer winters of the Middle St. Lawrence valley were undoubtedly less conducive to agriculture than in more southerly areas. This distinction, however, should not affect Early Woodland subsistence strategies since plant domestication in the St. Lawrence Lowlands began approximately 1,500 years after the end of the Early Woodland period.

In terms of faunal resources, a few key species occur in varying abundance across the lowlands. For example, caribou and moose were more common in the northeastern part of the province, while deer are mostly encountered in the southwest. Wapiti, a species that may have been sporadically present in the southern areas, was probably absent in the north. On the other hand, salt water fish species are only available east of Quebec City. Nevertheless, a brief study of the physical and biological elements of the St. Lawrence Lowlands led Claude Chapdelaine (1989: 30) to conclude that homogeneity, rather than contrasts, characterizes this vast biogeographical province.

The diversity and abundance in faunal resources noted by the first European explorers in the St. Lawrence/Champlain Lowlands undoubtedly also characterized this region three thousand years ago. Fishing grounds are particularly productive, with more fish species encountered in the waters of the upper and Middle St. Lawrence valley than in the remaining Lake Forest region. Indeed, at least five species—the American brook lamprey, Atlantic sturgeon, American shad, Atlantic tomcod, and the striped bass—are absent from more southern latitudes, and among them, the sturgeon and the tomcod still represent important fishing resources today. With the exception of a few salt water species that may have been exploited by Meadowood communities living in the northeastern portion of the St. Lawrence Lowlands, economically important fish species are encountered all across the province (Chapdelaine 1989: 31). The ichthyological fauna of the St. Lawrence Lowlands is, still today, considered as one of the world's richest (Scott and Crossman 1973).

In the present-day state of Vermont, the gently rolling hills of the Champlain Lowlands are part of a longer corridor opening to the north into the St. Lawrence valley and running south through Lake George and the Hudson valley. Around Lake Champlain are extensive wetlands, providing a habitat for muskrat and beaver and attracting over 30 species

of seasonal waterfowl (Haviland and Power 1981: 8). Chert, jasper, and quartzite outcrops are present in the region, with large chert quarries identified at Mount Independence and St. Albans, and a quartzite quarry at Monkton Ridge (Haviland and Power 1981: 8). Canoe travel across the Champlain Lowlands is facilitated by the lake and its rivers, while major rivers also provide access to the Green Mountains to the east. Averaging 600 m in height, the latter are 30-40 km in width and extend into Quebec to the north and northern Massachusetts to the south (Haviland and Power 1981: 9-11). This topographic feature is important since “by moving back and forth between uplands and lowlands, people had available far more in the way of resources than they would have by limiting their activities exclusively to one or other zone” (Haviland and Power 1981: 7).

A number of river valleys allow traveling through the Green Mountains, from Lake Champlain to Lake Memphramagog and the Connecticut River valley. Lake Memphramagog is the largest body of water in the Vermont Piedmont, a region of low rolling hills with numerous small streams, lakes and ponds containing a number of cold water fish species such as rainbow, lake, and brook trout. From Lake Memphramagog one can easily reach the St. Lawrence valley via the St. François, the Connecticut River valley via the Passumpsic, or Lake Champlain via Lamoille or Missisquoi rivers (Haviland and Power 1981: 11-12). In eastern Vermont, the Connecticut valley shares a lot of physical and biological characteristics with the Champlain valley on the west side. In the seventeenth century, the Connecticut River and its tributaries was known as one of the highest fur-yielding regions in New England. Moreover, native communities would have had access to annual runs of Atlantic salmon and shad in the Connecticut River. As with Lake Champlain, the Connecticut valley is part of the Atlantic Flyway, and travel is easy all the way from Canada to Long Island Sound (Haviland and Power 1981: 9).

In Late Woodland/early historic times, communities living in the St. Lawrence Lowlands also exploited areas along the Richelieu River and Lake Champlain, as indicated by Iroquoians remains found at Chambly and in northeastern Vermont (Chapdelaine 1989: 25). This cultural connection between the St. Lawrence and Lake Champlain Lowlands also existed in the Early Woodland period. In this respect, similarities between Boucher and Batiscan components are interesting. At both sites, local raw materials were predominantly involved in the manufacture of their respective flaked stone tool assemblages. However, a variety of exotic stones was shared by both sites, including not only Onondaga chert but also

Mistassinni quartzite, Cheshire quartzite and Kineo rhyolite (Heckenberger et al 1990: 115-116).

Cultural Inventory

Thirty-seven habitation and nine Meadowood mortuary sites are recorded within the St. Lawrence/Champlain Lowlands. Only in the Upper St. Lawrence and the Champlain valleys were mortuary sites documented. While Meadowood burial or ritual features are by no means absent from the Middle St. Lawrence valley, they are typically found in the context of secular sites. This is the case, for example, of a burial feature at the Batiscan site, and a cache of Meadowood bifaces at the Lambert site.

There is a notable absence of reported sites over 100 km between Trois-Rivières and Ste. Thérèse Island (Chérien 1995a: 291). Whether this absence is real or the result of sampling biases remains uncertain. The floral and faunal resources characterizing the St. Lawrence valley between Montréal and Québec being relatively evenly distributed, this gap in the distribution of Meadowood sites is probably not caused by environmental factors. It could be attributed, however, to transportation routes and regional relationships, where for example Meadowood groups around Montreal were linked to groups inhabiting territories to the west, while groups located in the Middle St. Lawrence valley maintained closer contacts with Champlain Lowlands communities via the Richelieu River. A similar polarization of Iroquoian sites around Montreal and Quebec cities, with a few possible exceptions at the mouth of the St. Maurice and Richelieu rivers, is also suggested by ethnohistorical documents and still not contradicted by archaeological evidence (Chapdelaine 1989: 25). Similarly, west of Pointe-du-Buisson, four Meadowood mortuary components—Rockway Point, Ault Park, Hunter and Muskalonge—are distributed in a pattern comparable to observed concentrations of St. Lawrence Iroquoian remains around Summerstown-Cornwall, Prescott, and Watertown (Chapdelaine 1989: 26).

The Upper St. Lawrence offers many favourable stopping points and camp sites, some of which were repeatedly used by Meadowood communities. One of them is the large multicomponent site of Pointe-du-Buisson, where secular and ritual evidence of a Meadowood occupation were found. Clermont (1982: 18) characterizes this locality as the gateway to the Upper St. Lawrence valley. Traveling by water beyond this point of land

required important portages since there is a series of rapids between Lake St. François, at an altitude of 46 m, and Lake St. Louis at an altitude of 21 m.

Contrary to what is observed closer to the “heartland,” the diagnostic Meadowood objects recovered in the vicinity of present-day Québec City and analyzed by Chrétien only formed a small portion of the total assemblages. Chrétien attributed this difference to the peripheral position of the “Québec city group” within the interaction sphere, and concluded that the Meadowood influence in this area was neither economical nor technological. Early Woodland communities around Québec city had easy access to good quality cherts with which they manufactured a range of unifacial and bifacial tools distinct from the typical Meadowood “toolkit.” However, the fact that hundreds of Meadowood bifaces were found in caches and possibly other ritual contexts, coupled with evidence of fire effects observed on these objects in the form of thermal cupules, suggested to Chrétien that the main influences of the Meadowood Interaction Sphere on the “Québec city group” was ideological in nature. The concentration of exotic items in cache features is also coherent with a socio-political exchange model (Table 1.1). Distribution patterns of Meadowood sites across northeastern North America will help discriminate between these two suggestions and will be discussed in more detail at the end of this chapter.

Meadowood points are widely distributed in the Champlain valley, from the Canadian border to the Poultney River (Haviland and Power 1994:108). The dominant raw material represented by these artefacts is western Onondaga chert, although local cherts and quartzites were also observed (Haviland and Power 1994: 108).

In the Champlain valley, the Boucher cemetery is included in the present inventory of Meadowood sites, although it should be stressed that no diagnostic Meadowood lithic artefacts were recorded in this component. Meadowood points and cache bifaces were found in three partly contemporaneous components in the Champlain valley at the Swanton, East Creek, and Bennett sites. The Boucher and the Swanton sites, less than 4 km apart, are both located along the Mississquoi River, the major tributary for the northern part of Vermont’s Lake Champlain drainage (Loring 1985: 96).

On the shore of Lake Champlain to the south, the East Creek and Bennett sites are two other Meadowood cemeteries found less than 4 km apart. The East Creek site includes a habitation area and a cemetery, something also observed at other Meadowood sites such as Batiscan and Pointe-du-Buisson. Of special interest here is the north-south division and the

geographical pairing of these Early Woodland sites, hence the inclusion of the Boucher site in this discussion. Inspired by this spatial distribution, Loring (1985, cited in Haviland and Power 1994: 105) has suggested some sort of relationship between these four cemeteries, either a duality based on kinship principles or a temporal distinction. The latter hypothesis is unlikely since research at Boucher has demonstrated that the cemetery spans the entire Early Woodland period (Haviland and Power 1994: 105). Moreover, differences in assemblages (lack of shell beads at East Creek and lack of copper beads at Bennett) could be interpreted as evidence of group control of different artefact classes and/or raw materials (Loring 1985: 105).

In addition to these important mortuary sites, Meadowood habitation components were recorded in the Champlain valley. Adjacent to the East Creek site, a large multicomponent village yielded Meadowood diagnostic items (Haviland and Power 1994:104). Three more habitation sites are located between the Boucher-Swanton and East Creek-Bennett cemeteries. The overall impression one gets from the distribution and size of Meadowood sites in the Champlain valley is one of “dispersed, and highly mobile groups of hunter-gatherers (that) may have used ritual and religion to achieve some level of social integration, using mortuary systems as one expression of that integration” (Versaggi 1999: 53).

As the northern Glaciated Allegheny Plateau, adjacent to the Ontario/Erie Lowlands, the Eastern Townships are part of the Appalachian uplands physiographic province. The Eastern Townships likely represents an extension of the exploitation territories surrounding Lake Champlain and/or the Middle St. Lawrence valley, and rich fishing grounds may have attracted Meadowood groups in the area. This is suggested by the location of the Canaan Bridge habitation site near a falls line and riffles where fish are still taken today (Haviland and Power 1994:107). Moreover, two isolated birdstone finds from the Eastern Townships could indicate some form of ritual activity.

HUDSON/MOHAWK/SUSQUEHANNA LOWLANDS

Appendix A: 124-147; Figure 3.3

Resources

The Hudson-Mohawk-Susquehanna Lowlands are located between the Meadowood “core area” in the Ontario/Erie Lowlands and the Champlain Lowlands, where distinctive mortuary and habitation components of the Meadowood complex are known (Versaggi 1999: 50). Following the pattern observed in other regions, the Early Woodland economy in the Hudson/Mohawk/Susquehanna Lowlands was based on the exploitation of wild game, fish, and food plants. Spring fisheries in the rivers of the Atlantic drainage involved different fish species than in Great Lakes/St. Lawrence river drainage. Sea bass and the shad were the principal fish taken historically by the Mohawk people, who sometimes traveled as much as four days in early spring to fishing stations located to the south (Webster 1983: 111).

At the Schuylerville site, on the north shore of Fish Creek, soil samples from Transition and Early Woodland features yielded carbonized nuts, goosefoot seeds, and calcined fragments of fish and mammal bones. Among the identified fish remains were anadromous shad or herring. Until the early 1800s, large amounts of these fish ran up Fish Creek to spawn in the upper creek and Saratoga Lake (Brumbach 1979: 22). Similarly, the availability of aquatic fauna in the little River probably attracted people to the Dennis site (Funk 1976: 40).

Among the resources available in the Susquehanna valley, rhyolite (with sources in South Mountain in the vicinity of Gettysburg, Southern Pennsylvania), may have circulated along with steatite during the Terminal Archaic and Early Woodland periods (Custer 1989; Ritchie and Funk 1973: 72).

Cultural Inventory

Relatively few Meadowood sites/components are located in the eastern or southern portions of New York State. In the Mohawk and Middle Hudson drainage, ten archaeological sites contain Meadowood diagnostics but very few include substantial Early Woodland components. Based on a comprehensive literature review, Bender and Curtin (1990, cited in Versaggi 1999: 50) also highlighted gaps or discontinuities in the distribution

of Early Woodland in the upper Hudson valley. They suggested a reinterpretation of the Transitional period, in which the Orient phase would be placed within the Early Woodland, to account for such low Early Woodland frequencies. This scenario is “compatible with Kraft’s association of Orient points with Early Woodland contexts in the upper Delaware valley (Kraft 1986)” (Versaggi 1999: 50).

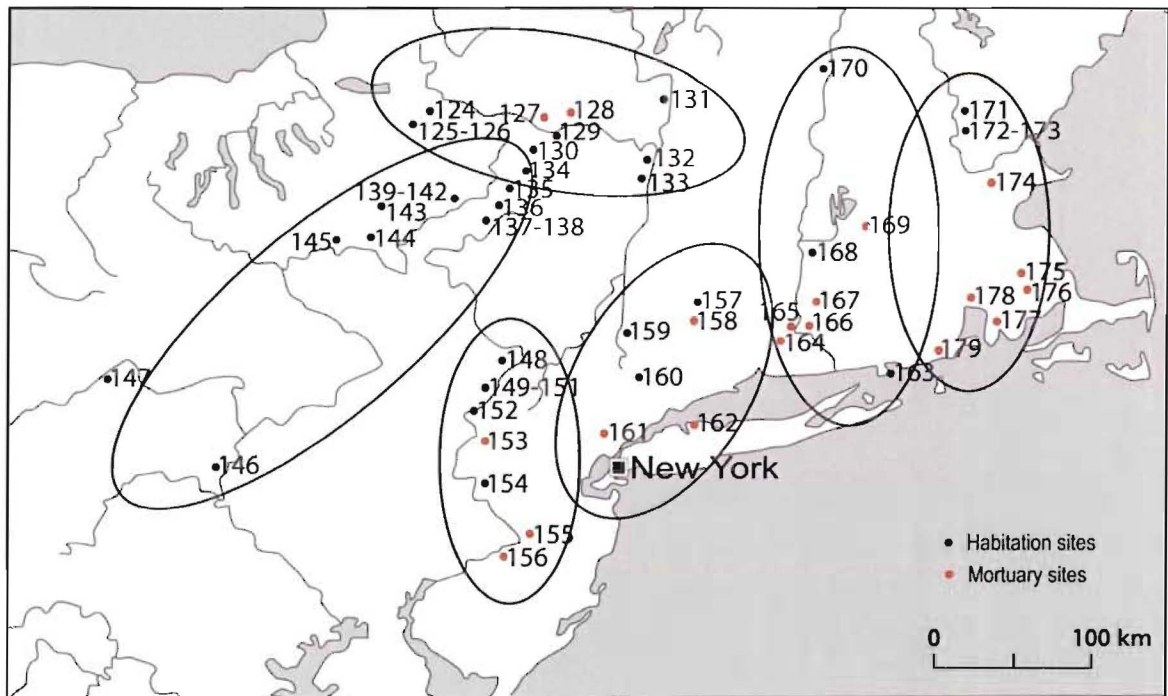


Figure 3.3 Distribution of Meadowood sites in the Hudson/Mohawk/Susquehanna Lowlands and the Atlantic Coastal Plain.

Hudson/Mohawk/Susquehanna Lowlands

MOHAWK & UPPER HUDSON VALLEYS: 124-Nine Mile Swamp VII, 125-Eaton, 126-Zimmer, 127-Palatine Bridge, 128-Tribes Hill, 129-Dennis, 130-Nahrwold II, 131-Schuylerville, 132-Menands Bridge, 133-Barren Island.

SUSQUEHANNA VALLEY: 134-Munsun, 135-Maple Terrace, 136-West Creek, 137-Russ, 138-Johnsen No.1, 139-Gardepe, 140-Camelot No.1, 141-Camelot No.2, 142-Enck No.2, 143-Jamba, 144-Fortin, 145-Cottage, 146-Oscar Leibhart, 147-Memorial Park.

Atlantic Coastal Plain

DELAWARE VALLEY: 148-Zimmerman, 149-Faucett, 150-Harry’s Farm, 151-Tocks Island reservoir, 152-Bushkill area, 153-Gray, 154-Byram, 155-Abbott Farm, 156-Rancocas creek.

LOWER HUDSON & LONG ISLAND: 157-Hopkins, 158-Bristol, 159-Tamarack, 160-Dogan Point, 161-Fairfield, 162-Fresh Pond.

CONNECTICUT VALLEY: 163-Fishers Island, 164-Seward, 165-Wethersfield, 166-Smith Brook, 167-South Windsor, 168-Springfield, 169-Ferguson, 170-Skitchewan.

MERRIMACK VALLEY: 171-Beaver Meadow Brook, 172-Smyth, 173-Neville, 174-Call, 175-Titicut, 176-Hawes, 177-Mansion Inn, 178-Fort Hill, 179-Potter.

Two exceptions are the Dennis and Narwhold II sites, which yielded a variety of Meadowood diagnostics in good stratigraphic contexts. Moreover, significant numbers of cache bifaces were recovered from two sites in the Hudson-Mohawk valley (Granger 1981: 66). It is also worth noting that Early Woodland sites with dated features, Vinette I pottery but no other Meadowood traits are present in the Hudson-Mohawk Lowlands (Wiegand 1978), but were not included in the present inventory. As demonstrated earlier, the presence of Vinette I pottery alone does not appear sufficient to identify an archaeological component as Meadowood.

At the Dennis site, Meadowood artefacts were recovered at the base of the Middle Woodland level, and at the contact of the latter with the earlier Orient level. The high proportion of Western Onondaga chert used to make these objects contrasts with the other lithic artefacts from the Dennis site, mostly manufactured from local Normanskill chert (Funk 1976: 39). However, the fact that two of the ten Meadowood points were produced from Normanskill chert is also noteworthy, since this differs from the almost exclusive use of Onondaga chert in neighbouring areas of New York State.

Meadowood components in the Susquehanna valley are generally situated along river banks or, in the case of the Oscar Leimbhart site in the middle Susquehanna valley, on a bluff overlooking the river (Kinsey 1975:41). More recently, a number of Meadowood sites were found in the Chenango River valley, west of the upper Susquehanna River (Klein 1985: 892; Nicholas 1993: 580). Meagre, surface-collected evidence of a Meadowood presence was noted along the Susquehanna's West branch, consisting mainly of projectile points, Vinette I pottery and one birdstone (Turnbaugh 1977, cited in Funk 1993: 199). Most Meadowood remains, however, come from the Susquehanna's East Branch. Thirteen components found in or close to the Susquehanna valley are included in the present Meadowood site inventory. Some of them, however, do not have clear Meadowood components. At the Camelot 1 and Camelot 2 sites, for example, Meadowood points and cache bifaces were found in seeming association with Frost Island assemblages (Funk 1993: 199) and whether or not there is an *in situ* development from Frost Island to Meadowood is uncertain. Meadowood points, a minor Early Woodland type in the Upper Susquehanna valley, are the sole diagnostics representing the Meadowood complex in approximately 70% of the sites (n=9) recorded in the upper Susquehanna valley (Funk 1993: 199).

Nevertheless, two large Early Woodland base camps (1 or more acres), with numerous hearth features and an abundance of artefacts, were excavated at Brown Knoll, a glacial feature at the confluence of Schenevus Creek and the Susquehanna River. This complex identified in the Upper Susquehanna valley suggests that while Early Woodland sites are not as numerous as those on the Niagara Frontier, there clearly is a more established presence than in the Hudson valley. Another interesting observation for this valley concerns the absence of extractive camps, i.e., the fission of base camps into small household or work groups that foraged throughout a valley during dispersed resource seasons (as identified by Granger [1978: 295] in the Niagara Peninsula). One explanation for this absence may be that large residential base camps just did not dissolve seasonally into smaller foraging groups. Alternatively, as was noted for other areas (e.g., Champlain valley, Genesee valley, and part of the Niagara Frontier), we may be faced with a situation in which small foraging groups actually are the basic residential unit (Versaggi 1999: 52).

ATLANTIC COASTAL PLAIN

Appendix A: 148-179; Figure 3.3

The Atlantic Coastal Plain province stretches over 3,500 km in length from Cape Cod to the Mexican border and southward another 1,600 km to the Yucatan Peninsula. Meadowood components/diagnostic artefacts are only found in the northern portion of this physiographic province, between Cape Cod and Long island, east of the Appalachian Highlands, within what archaeologists have called the Middle Atlantic culture area (Kroeber 1939; Willey 1966: 248; Custer 1994: 329).

Resources

Significant environmental changes took place in the Middle Atlantic Region approximately 5,000 years ago (Late Archaic). Among them was a switch from oak-hemlock to more productive oak-hickory forests, resulting in an increasing number of areas suitable for human habitation and resource procurement. Around the same period, the rate of sea-level rise slowed dramatically, enabling the formation of large coastal estuaries marshes. Accumulations of shellfish, namely oyster and clams, became the focus of midden sites throughout the region (Custer 1994: 337-338). In regions such as the Lower Hudson, it has

been proposed that fresh water replenishment associated with the end of the Climatic Optimum halted shellfish production after 3000 BP. However, spring runs of anadromous fish, such as Atlantic salmon, shad, alewife, and sturgeon, would have continued to attract people in the region (Vargo and Vargo 1986:15).

Cultural Inventory

Environmental changes that affected the Middle Atlantic Region about 5,000 years ago in turn fostered a number of cultural transformations. These include a more intensive use of productive estuarine environments, the appearance of multi-house settlements, a growing number of large storage pits together with hearth and earth oven features associated with the processing of fish and plant food resources (e.g., seeds such as amaranth and goosefoot, and nuts such as hickory and acorns of various oak species — Custer 1994: 341), and an increase in exotic materials and specialized grave goods. These traits undoubtedly reflect more profound transformations, such as the appearance of semisedentary communities and a concomitant decrease in territory size, cooperative resource exploitation by multiple families, and participation in long distance trade networks (Custer 1994: 338-339). Regular inter-group conflicts, however, do not occur prior to the first millennium AD (Milner 1999: 122). Mauer (1991) considers the Late Archaic period in the Middle Atlantic Region as a “Formative” period, in some ways comparable to traditional Formative communities from other parts of North America and Mesoamerica, forming the basis for later development of more complex societies (Custer 1994: 339).

As in the Northeast, ceramics define the beginning of the Woodland period in the Middle Atlantic region. The above mentioned changes in site locations, settlement patterns and the increased frequency of storage features both inside and outside houses suggest a link between the appearance of ceramics and increasingly intensive storage and food processing activities (Custer 1987). Current data, however, do not support a relationship between these changes and the use of cultivated plants, since the adoption of maize-based horticulture in the Middle Atlantic Region is not older than a thousand years (see Snow 1980 for a different opinion). The limited variety of wild plant remains commonly recovered from storage and refuse pit features suggests an intensified use of selected plant resources (amaranth, goosefoot, hickory and acorns) that were especially productive and well suited for storage. Massive accumulations of shellfish at midden sites also suggest an intensified use of coastal

resources, especially oysters and clams, in Late Archaic and Early Woodland times (Custer 1994: 341). In terms of shape and function, Early Woodland ceramics from the Middle Atlantic Region are a direct development from the stone bowls that were manufactured at the end of the Late Archaic period (Custer 1994: 340). The fact that this relationship between steatite vessels and pottery is not evident in the Northeast, and the demonstration that at least some of the early clay containers from northeastern sites represent imported goods indicate contacts between the Northeast and the Middle Atlantic Region in Terminal Archaic and Early Woodland times, with steatite and pottery being one of the items circulating northward.

Most of the Meadowood diagnostics recorded in the Atlantic Coastal Plain were surface-collected or found in the context of mixed multicomponent sites (Kinsey et al. 1972: 361,433). Moreover, Meadowood diagnostics recovered in this province are often associated with other local Early Woodland phases rather than distinct Meadowood components: the Bushkill phase of the Fishtail tradition (3100-2700 BP) in the Lower Hudson valley; the Orient phase on Long Island; the Broader Point Phase (2700-2000 BP) in Connecticut (Pagoulatos 2002: 36); the Hawes funerary complex in eastern Massachusetts. Various interpretations have been offered to account for the presence of Meadowood diagnostic artefacts in this province.

Along the Delaware River, the Ridge and Valley province, Piedmont Lowlands, and Inner Coastal Plain are the three physiographic provinces where Meadowood sites were documented. These regions are all part of an interior riverine ecozone. No sites were found in either of the other two ecozones in Delaware, i.e., the coastal zone or the upland zone (Pagoulatos 2002: 34-35). Meadowood habitation sites concentrate in the Ridge and Valley physiographic province, extending from the Delaware water Gap to the New York State border. Interestingly, the current distribution of Meadowood components in the Delaware valley diverges from what Pagoulatos (2002: 29) observed in his study of other Early Woodland settlement patterns in Delaware, where there is little evidence for use of the Ridge and Valley province. The Meadowood communities that were exploiting the resources from the Delaware valley apparently did so in a way that differs significantly from other Early Woodland groups in the area. This in turn may suggest transitory travellers, with habits and habitats differing from those of resident populations (archaeologically designated as the Bushkill culture, a component of the more widespread Fishtail tradition). Other researchers

came to a similar conclusion, after observing that besides projectile points and cache blades, other diagnostic traits of the Meadowood complex are essentially absent from the Delaware valley. Burials and food storage pits are also rare or missing. These data have been interpreted as the result of brief and transitory occupations, probably by groups of Meadowood hunters intermittently visiting the area as a consequence of their trade-travel activities (Kinsey et al. 1972: 362; Kraft 1975: 41, 57).

The Meadowood occupation of the Delaware valley is best known from evidence found in subsurface contexts at the Zimmerman and Faucett sites (Kinsey 1975: 88). The Gray site, a cache of 246 Onondaga chert bifaces, was also recorded in the Ridge and Valley province. Staats (1984: 58) hesitates to classify these bifaces as Meadowood cache bifaces because they are thicker than most specimens from New York sites and manufactured in the eastern rather than the western variety of Onondaga chert. However, the lack of a better explanation (Staats 1984: 59), and the presence of a Meadowood cache with cache bifaces produced in the eastern variety of Onondaga chert in the Quebec City area support the present attribution of the Gray cache to the Meadowood culture. Variability in cache biface dimensions probably reflects different stages of biface completion and may point to a need for more flexibility in the use of Onondaga chert by Early Woodland groups in the Delaware valley. Meadowood bifaces from the Delaware valley are predominantly made from Onondaga chert, and many show a great deal of resharpening and reuse indicating that this raw material was a rare commodity requiring Early Woodland groups to be conservative of their equipment (Kraft 1975: 57).

A single Meadowood point was found at the Byram site, located in the Piedmont Lowlands province of the Delaware valley. Farther east in the Piedmont Lowlands, a Meadowood cremation feature has been identified in Fairfield. Two ceremonial sites containing Meadowood cache bifaces are located in the Inner Coastal Plain province, characterized by tidal and freshwater lowlands and extending from Delaware River to Raritan bay. It is in this region that Pagoulatos (2002: 32) recorded the highest number of Early Woodland sites (n=34) in Delaware. That cache bifaces are the only evidence of a Meadowood presence here is interesting and may indicate that contacts and exchanges between Meadowood communities and the resident population occurred primarily in the Inner Coastal Plain province.

The Lower Hudson, the terminal reach of the Hudson River, runs north-south for about 97 km between the Hudson Highlands gorge and the Narrows, a strait between Long Island and Staten Island. To the east, the land becomes an upland forest of mixed hardwoods and conifers, which likely provided various plant and animal resources. In the southern portion of the Lower Hudson, the Fairfield site is a well-dated mortuary component that yielded a typical Meadowood burial with typical Meadowood grave goods (diagnostic projectile points, cache bifaces, and a classic Meadowood gorget — Kraft 1989). The site is located on a high sandy terrace in the Passaic drainage, a tributary of Newark Bay at the mouth of the Hudson River. This location offers a number of advantages: it is a level and well-sheltered tract of land, within easy access to the Passaic River, which was undoubtedly teeming with fish in the Early Woodland period (Kraft 1989: 51). According to Herbert C. Kraft, the use of local stones to manufacture a high proportion of the Meadowood points from the Fairfield site indicates that “this band of Meadowood people had been in New Jersey for some time and that they were using local materials to replace equipment lost or broken in use” (Kraft 1989: 54).

On the other side of the Narrows, on Long Island, shell middens attest to the “abundant local sources of shellfish, waterfowl and other aquatic animals of the neighboring tidal bays and marshes” (Ritchie 1959: 14). According to Ritchie, Orient cemeteries on Long Island result from an eastward diffusion through New York and other portions of the Northeast, of an “Early Woodland Burial Cult” containing not only the first pottery and stone gorgets in the area, but also a “burial ritualism characterized by cremation, use of red ochre, abundant grave offerings, intentional breakage of grave goods and other traits” (Ritchie 1959: 89). Moreover, Ritchie (1959: 91) observed an absence of habitation sites in the vicinity of Orient cemeteries in eastern Long Island. The notion of a sacred precinct, sometimes distant from settlement sites, characterizes the “Early Woodland Burial Cult,” and certain hills of eastern Long Island were apparently selected by Orient culture groups for burial purposes. Comparing Orient and Meadowood complexes, Ritchie wrote that “the disparity in the majority of specific artefact traits leads to the assumption of the spread of a religious concept concerned with the welfare of the dead, rather than an actual movement of people and their goods onto Long Island” (Ritchie 1959: 91).

A cache of 263 Onondaga chert Meadowood bifaces from the Fresh Ponds site (Northport, Long Island), however, suggests at least occasional circulation of people and/or

goods from the Ontario/Erie Lowlands. Similarly, most of the Meadowood diagnostics from Connecticut come from five caches, four of which are located in the Connecticut River valley, containing altogether more than 1,000 Onondaga chert cache bifaces. The Seward cache is the best documented of these components. Sixty-seven metres above mean sea level, it is located on a ridge above a large marsh on a tributary of the Connecticut River (Granger 1981: 70). This setting is similar to that of many habitation (e.g., Scaccia, Vinette, Nine Mile Swamp) and mortuary (e.g., Muskalonge Lake, Hunter, Pickens, Oberlander 2, Morrow) Meadowood sites in New York (Granger 1978: 58-63).

Rather than actual Meadowood populations inhabiting the Atlantic Coastal Plain, Joseph Granger believes that “Meadowood trade can be adduced to account for all known occurrences of Meadowood Phase diagnostic artefacts” (Granger 1981: 70). However, Meadowood diagnostics produced from local lithic materials are also commonly found in the Atlantic Coastal Plain. For example, cache bifaces from the Tamarack site in the Lower Hudson valley were produced from local Normanskill chert. Following Granger’s scenario, the manufacture of Meadowood point forms from local raw materials could be explained by the imitation, by local communities, of a foreign style and technology.

Notwithstanding the above cases, I believe that Granger’s hypothesis, where Meadowood diagnostics represent trade items in the Atlantic Coastal Plain province, best accounts for most situations. The predominance of Meadowood diagnostics in a few mortuary sites or caches that generally yielded large numbers of items could support Ritchie’s explanation of the Meadowood Interaction Sphere reflecting the spread of cult concepts. However, another likely explanation could be that most Meadowood objects represented rare, prestige items, which only a few individuals/corporate groups could afford to own/include in their burials. In this scenario, the high proportion of Meadowood-like artefacts made from local raw materials may reflect a desire by local elites to emulate a style of objects associated with wealth and prestige.

MAINE–MARITIME PROVINCES

Appendix A: 180-199; Figure 3.4

The territory influenced by the Meadowood Interaction Sphere is vast and it is improbable that shifts perceived in subsistence strategies and social organization occurred all at once and everywhere at the same time. Population movements and/or reorganization of trade networks in Early Woodland times may have occurred and could account for some of the variability observed in Meadowood manifestations across northeastern North America. In the Maine-Maritime province, for instance, a peak in social complexity based on thriving marine-based economy has been recognized during the Late Archaic Period. This was apparently followed by a population decline and a decrease in social complexity (Sanger and Renouf 2006). Social inequalities during the Early Woodland intensified during its later connection to the Adena Interaction Sphere. It is possible, as suggested by Paul McEachen (1996), that Meadowood manifestations in the Maritimes represent a population movement in the region at the end of the Early Woodland period. This migration hypothesis is supported by glottochronological research (Fiedel 1987), as well as a shift from marine-oriented subsistence strategies to a riverine/lacustrine, hunting and fishing pattern, with a particular emphasis on freshwater and anadromous fish.

Resources

In New Brunswick (Deal 2002) and Nova Scotia (Nash and Miller 1987), resources show considerable variation and potential for interregional trade. Michael Deal (2002) reviewed the archaeological information on faunal, floral and inorganic resource use for the Late Woodland and Prohistoric periods in New Brunswick, which can be easily projected back to the Early Woodland. A wide variety of edible wild berry fruits and grapes, nuts (acorns, butternuts, beechnuts, walnuts), and groundnut tubers were available in the Maritimes. Plant fibre mats, bags, and baskets, as well as birchback items, have been recovered in archaeological contexts (Deal 2008). The exchange of botanical products and plant knowledge is well documented for northwestern North America, including seaweeds, berries, roots, bulbs, nuts, wood, baskets, mats, and fibres and twines (Turner and Loewen 1998). Smoked fish, eels, shellfish, and fowl, grease and oils from various animals (e.g.,

beaver, moose, seal), and animals pelts (moose, deer, caribou, beaver, mink, etc.) were also available.

Furthermore, several important lithic quarries are known in the region. Small amounts of native copper were also available, but probably not in large enough quantities for trade. Finished items from a Meadowood burial at Tozer and an Adena burial at Red Bank constitute the earliest archaeological evidence of native copper in the Maine-Maritime province. These artefacts are believed to have been manufactured from Lake Superior copper. By the Middle Woodland Period, the use of exotic copper diminished and a local industry developed, featured the cold hammering (and possibly annealing) of small copper nuggets into sheets and bars that were made into a variety of artifacts (Leonard 1996:80-102; Monahan 1990).

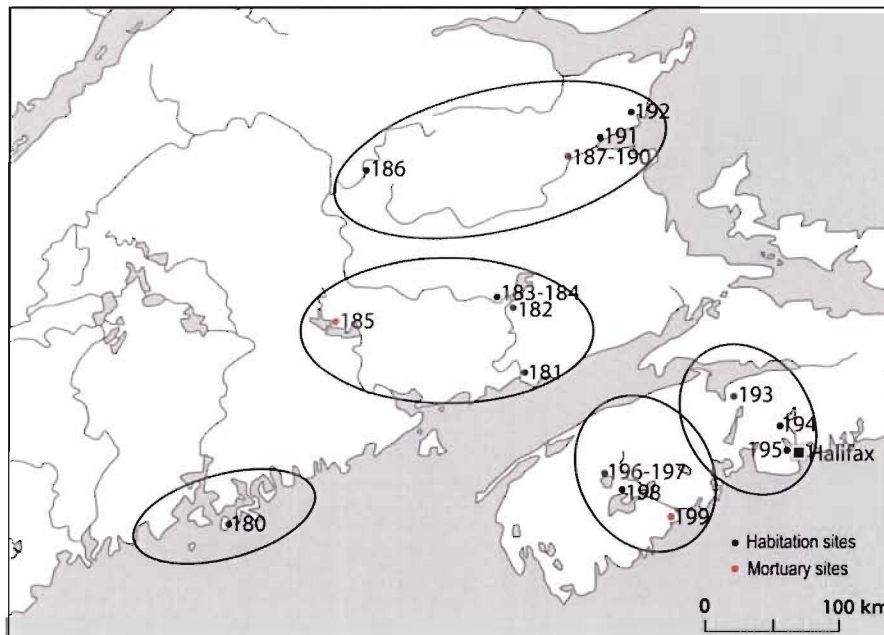


Figure 3.4 Distribution of Meadowood sites in Coastal Maine-Maritime provinces.

COASTAL MAINE: 180-Knox.

SOUTHERN NEW BRUNSWICK: 181-Portland Point, 182-Grand Lake, 183-Upper Jemseg, 184-Maquapit Lake, 185-Mud Lake Stream.

TOBIQUE & MIRAMICHI VALLEYS: 186-Odell, 187-Wilson, 188-Howe, 189-Hogan-Mullin, 190-Tozer, 191-McEachern's Point, 192-Tracadie.

HALIFAX, DARMOUTH & MINAS BASIN: 193-St. Croix, 194-Rafter Lake, 195-Halifax.

LAKES KEJIMKUJIK & ROSSIGNOL, MERSEY RIVER: 196-Merrymakedge, 197-Ell Island, 198-Eel Weir, 199-BaDd-4.

The distribution of Meadowood sites in the Maine-Maritime province shows a strong correlation with the distribution of productive fishing locales. Known habitation sites are located on terraces beside major river systems, while mortuary sites are located near habitation sites, or on the coast (Figure 3.4). Alewife and shad spawning in the upper portions of the Chiputneticook Lake or in the falls near the mouth of the St. Croix River in New Brunswick probably represented an important source of food. Reporting nineteenth-century descriptions of enormous numbers of herrings, shads, and alewives running up the Atlantic rivers from the sea, Rostlund (1952: 14) observed that “[a]s a food resource the herring family must be placed in a very high rank, perhaps alongside the Pacific salmon and the whitefishes or at least not much below them.” Due to such abundance and predictability, these fish resources were certainly of great importance to the aboriginal economy of the Northeast coast.

The importance of fish is also reflected by data from Nova Scotia. The exploitation of anadromous fish was probably the main activity at the Rafter Lake site, situated in a riverine habitat in the Halifax area (McEachen 1996: 58). To the north, the inhabitants of the St. Croix site, located at the head of tide in the Minas Basin area, likely exploited spawning salmon and gaspereau in the spring and fall (McEachen 1996: 59). In interior southwestern Nova Scotia, the Mersey River “is a valuable source of landlocked salmon as well as anadromous and catadromous species. Gaspereau come up river to spawn between the chains of lakes in the spring and ‘millions’ of eel move toward the Atlantic to spawn each fall” (McEachen 1996: 62). Meadowood projectile points were found at the Eel Weir 6 site, situated on a plain beside the Mersey River. This component owes its name to the presence of a stone eel weir in the immediate vicinity of the site. A similar fish weir found in central Maine was dated to 2940 ± 70 BP (McEachen 1996: 62).

The use of non-Onondaga lithic materials to produce Meadowood cache bifaces and projectile points, already noted for other regions participating in the Meadowood Interaction sphere, is common in the Maine-Maritime province. For example, of the five Meadowood points recovered at the Eel Weir 6 site, three were made from quartzite, one from tuff and one from agate, all locally available materials (McEachen 1996: 62). Also, recent neutron activation and thin section analyses of a cache blade recovered at the Tozer site suggest that the material used to manufacture these Meadowood-like artefacts may be local rhyodacites (McEachen 1996: 47). If McEachen’s (1996) hypothesis is correct, migrating groups may

have included craft specialists who began to use local cherts for the production of Meadowood style cache bifaces. Interestingly, the discovery of artifacts made from Mistassini quartzite at the Gaugenn site (Tracadie River, New Brunswick) and the St. Croix site, Nova Scotia, suggest a connection to the Middle St. Lawrence area (McEachen et al. 1999: 161-162).

Cultural Inventory

Whether they were new migrant or long-established communities, the participation of Maine-Maritime populations to the Meadowood Interaction Sphere is attested by numerous sites and artefacts. Rather than travelling along the Middle Atlantic Coast, Meadowood people apparently favoured inland, riverine transportation routes. The spatial distribution of Meadowood components and diagnostics shows the Delaware, the Hudson, the Connecticut, and the Merrimack rivers as paths linking the core area of the Meadowood interaction sphere and the Atlantic Coastal Plain. Archaeological research in New Brunswick was primarily conducted in the Northwest Miramichi River and the Chiputneticook/St. Croix/Passamaquoddy Bay regions so that most of our knowledge about this provinces' prehistory comes from sites in its northeastern and southwestern corners (McEachen 1996: 42). Four habitation and one mortuary Meadowood sites are located in southwestern New Brunswick, while six habitation and one mortuary sites are documented in New Brunswick's northeastern corner. In Nova Scotia, Meadowood habitation sites occur in the Halifax area (n=2), the Minas Basin area (n=1), and along the Mersey River in interior southwestern Nova Scotia (n=3).

Site BaDd-4 at Port Medway, in southwestern Nova Scotia, yielded the largest in situ Meadowood assemblage in the Maritimes (McEachen 1996: 64). This component may represent a burial or ceremonial site situated near the rich fishing grounds of the Medway River. It consists of two ceremonial features. One is a small circular pit with an artifact cluster, including Meadowood points, cache blades, copper awls, gorgets, and red ochre. The second feature consists of a row of artifacts, about one metre long, which includes Meadowood style points, cache blades, abraders, birdstone fragments, celts, and hammerstones. The function of these features is unknown. The circular feature was originally interpreted as a burial pit, although no bones were recovered. Both features could represent caches associated with ritual feasting. The single Meadowood point manufactured

from Onondaga chert is almost identical to a specimen from the Bruce Boyd site in southern Ontario: “[s]ome specimens made out of slate are very similar in size to the one of Onondaga chert. In fact, it is possible that the population that left the points were replicating the Onondaga point with their own local raw material” (McEachen 1996: 136).

The Mud-Lake Stream site, another Meadowood-affiliated mortuary components in the Maine-Maritime region (Deal 1986), further supports the association between ceremonial/gathering sites and productive spring fishing locales (Abel 1997; a similar idea has also been proposed in Dincauze [1975: 31] for Late Archaic times in southern New England). Three Meadowood features were excavated at the Mud Lake Stream site. Feature 20 was a burial pit that had been partially eroded at the beach face. It contained faunal elements that have been identified as dog, beaver, and a salmonoid fish species. No human remains were included, which led Deal to suggest that it may have been a dog burial. Several artifacts, some of which were intentionally broken, were placed in the grave, including a slate gorget, a side-notched projectile point, and a serrated biface. It is also possible that the burial was a human interment (long since disintegrated) that included charred animal remains from a burial feast, and possibly a dog sacrifice. Feature 23 consisted of a small cache of nine Meadowood projectile points, 11 cache bifaces and two end scrapers. A third feature, tentatively associated with the Meadowood component, contained only a calcined fragment of a barbed bone point. Charcoal from this feature has been dated to about 2750 B.P. The Meadowood component at this site might have been a ritual/mortuary site at this important fish exploitation location, which was later converted to a habitation site by later occupants.

The best candidate for the kind of wealthy communities associated with the sociopolitical model is that represented by archaeological remains from Red Bank (Metepanagiag), in New Brunswick. Red Bank offers easy access to coastal resources and was densely populated throughout the Woodland Period. It is also in this area that Patricia Allan (1991: 16) found the best evidence of prehistoric large-scale storage in New Brunswick. She recorded over 60 large storage pits or cellars (elsewhere referred to as large underground food storage vaults [Allan 1990: 20]) along the higher terraces surrounding Red Bank. These features were described as being as deep as two metres, 4-5 m in diameter, and dug into heavy gravel to allow drainage. No artifact or ecofact were recovered from the tested features, but work at one site suggests bark or sod roofs. The pits situated on the terrace between the Oxbow site (Early-Late Woodland) and the Augustine (Adena) burial mound,

known as the Two Hole site, are particularly interesting. Allan suggests that they were used for storing pots and baskets of dried and smoked fish, smoked fowl, fruits, nuts, and wild grains. The features are undated but Allan believes that they are at least 1200 years old, and it seems likely that the Two Hole site dates at least to the late Early Woodland.

Burials rich in prestige items have also been excavated in the Red Bank area. These include both Meadowood (copper items and slate gorgets) and Adena-related (copper beads, Ohio pipestone, exotic cherts) components, with differential burial practices definitely associated with the latter (Turnbull 1976). There is also evidence of intentional breakage of prestige items. Meadowood cache bifaces made from local materials may have been produced by local craft specialists. Put together this information suggests a community with the potential to foster successful traders (rich resources, storage, and craft specialization) and the beginnings of social inequalities during the Meadowood period, which only intensified during its later connection to the Adena Interaction Sphere.

The near absence of sites in Maine suggests that north-south circulation of Meadowood people and/or artefacts was infrequent between the Merrimack River and the Chiputneticook/St. Croix drainage system forming the boundary between Maine and New Brunswick. In his most recent synthesis of Maine archaeology, Bourque (2001: 92) observed little evidence for long-range exchange with people in other regions during the early Ceramic period. In Maine, the earliest connections with distant neighbours appear to post date the Meadowood episode and relate to the following Adena complex, and the only evidence of a Meadowood presence in Maine appears to come from the Knox site, where two Meadowood points were found.

If this absence of sites is an accurate reflection of the past ethnographic reality, it may reflect some sort of cultural and/or ecological boundary, where Meadowood people were in contact with southern New England communities, but not with groups living north and east of the Merrimack River. In historic times, the Kennebec River in Maine represented the northern known limit of maize cultivation, and thus a cultural/ecological boundary between hunter-gatherer and agriculturalist communities (Mulholland 1988: 144). It is possible that this cultural division of the Atlantic Coast, caused by ecological factors, started well before the adoption of agriculture in the south.

While the absence of Meadowood sites in Maine may be partly caused by environmental factors, one should not conclude that the resources of this region were

poorer than elsewhere in the Maine/maritime province. The inhabitants of the Knox site and other Early Woodland sites on the coast of Maine gathered large quantities of clams and mussels from nearby intertidal mudflats. Moreover, faunal remains associated with these components indicate that fish and mammals were also part of the diet (Bourque 1995, 2001). At the Knox site, a majority of the identified fish remains belong to the longhorn sculpin, while extinct sea mink and deer are the most important mammal species (Belcher 1989: 185).

WESTERN GREAT LAKES

Appendix A: 200-214; Figure 3.5

Resources

The distribution of Meadowood artefacts and sites demonstrate important contacts or interactions between populations inhabiting the western Great Lakes region and groups farther east in the Ontario/Erie and St. Lawrence Lowlands. In the Western Great Lakes, the Transitional Archaic (3000-2600 BP) encompasses most of the temporal span associated with the Early Woodland period in the Northeast (3000-2400 BP—Stothers and Abel 1993: 30). Early on, Taggart (1967) proposed a coalescence/dispersal settlement model to characterize Late Archaic annual cycle in the Saginaw Bay region of Michigan (see Damas 1969: 127, 131; Helm 1969: 5; Steward 1955: 144 for ethnographic analogies). According to this scenario, populations coalesced into river-edge components in the spring, taking advantage of spring runs on the major rivers.

A majority of the Meadowood diagnostics documented in this province occur within the Saginaw Bay watershed. Draining approximately 15% of Michigan's total land area, this is a rich and diverse area. The Shiawassee Flats, located approximately 40 km south of Saginaw Bay and part of the Saginaw Bay watershed, represent one of the largest and most productive wetland ecosystems in Michigan. The habitat of this vast low lying flatland consists of riparian, floodplain/bottomland hardwood forests and emergent marshes. Four rivers (Tittabawassee, Flint, Cass, and Shiawassee) converge in the Shiawassee Flats, forming the Saginaw River. These waters are retained in the flats by the configuration of the Saginaw Moraine, which creates a vast extent of prairie and swamp where a variety of aquatic

resources, such as mollusks, fish, and mammals with semi-aquatic habits can be found (Ozker 1982: 7-9).

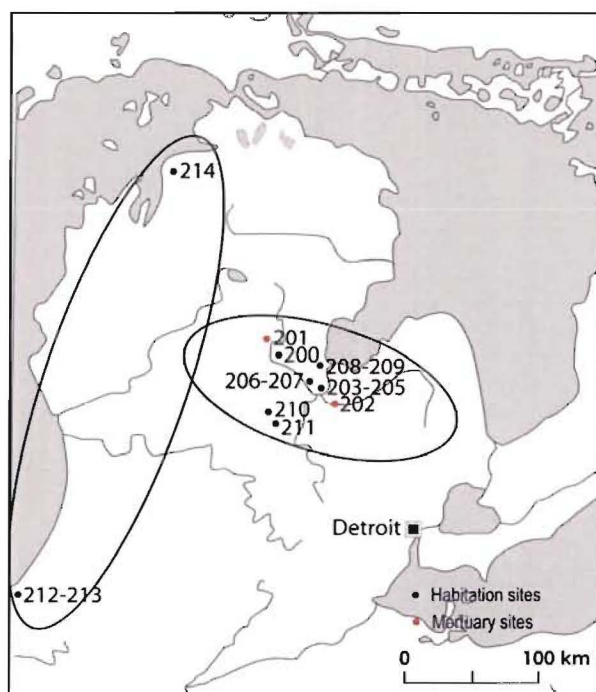


Figure 3.5 Distribution of Meadowood sites in the Western Great Lakes province.

SAGINAW BAY: 200-Naagle, 201-Pomranky, 202-Hodges, 203-Green Point, 204-Schultz, 205-Stroebel, 206-Andrews, 207-Frazer-Tyra, 208-Butterfield, 209-20BY79, 210-Conservation Park.
 LAKE MICHIGAN: 211-20GR176, 212-Strover, 213-Eidson, 214-Eastport.

The Saginaw Bay watershed is located within the Carolinian Biotic Province, which supported a rich array of tree species and animal life. An abundance of hickory, oak, walnut, and butternut trees in many regions of the Midwest would have provided a large nut harvest that could be used both as a direct food source and as an indirect source of large game populations (Stothers and Abel 1993: 64). Most importantly, the western Lake Erie basin also comprises major waterways where several fish species (including walleye, sturgeon, bass, and sucker) spawn annually (Abel et al. 2001: 301). “This combination of forest land and wetland resources forms an edge area of rich resources for human settlement” (Ozker 1982: 10, see also Nicholas 1991a, 1991b, 1992, 1998a, 1998b).

Moreover, the gray-brown podzols and the temperatures of this region are suitable for plant cultivation. Saginaw Bay is advantageously set within a climatic pocket where the growing season extends to 150-160 frost-free days, conditions that are similar to those in southwestern Michigan. Data from Early Woodland sites such as Schultz and Green Point

(Ozker 1982) suggest that some groups were practicing small-scale garden plot cultivation of sunflower, sumpweed or marsh elder, goosefoot, amaranth, and perhaps cucurbit as early as 2550 BP (Beld 1991: 38; Spence et al 1990: 131; Stothers and Abel 1993: 65).

Based on squash remains recovered at the Schultz and Green site, Ozker (1982: 37) proposed the use of cucurbits, instead of the porous Early Woodland vessels, as containers for the storage nut oils. To support her hypothesis, she mentions various caves and rockshelters where the use of gourds as containers is indicated. Moreover, a seventeenth-century narrative describing the stay of Spanish explorers at the village of Chiaha, in present-day North Carolina, reveals that “there was an abundance of lard in calabashes drawn like olive oil, which the inhabitants said was the fat of the bear. There was found likewise much oil of walnuts, which like the lard was clear and of good taste” (Battle 1922: 174).

The discovery of a squash seed imprint on one of the potsherds from the Schultz site could not only suggest that cucurbits and pottery were indeed associated in the preparation of food, but also that squash seeds themselves were being processed for oil (Ozker 1982: 77; see also Sassaman 2002: 399). Cucurbit seeds are relatively high in fat and protein. For example, *Cucurbita pepo* seed has 46% fat, 34% protein, and 10% carbohydrate (Ozker 1982:41). Small cucurbit seeds, however, are deficient in several additional amino acids which must be supplemented from other sources for their protein to be useable. They also have a higher “harvest cost” than nuts, with about half the caloric value per unit edible portion, i.e., 300 cal/100g (Ford 1979: 235).

Cultural Inventory

Eleven habitation and four ceremonial components with Meadowood diagnostics were found in the state of Michigan. Twelve of these sites are located in the area surrounding Saginaw Bay, a southwestern extension of Lake Huron located in the east central portion of Michigan's lower peninsula. It includes the entire 35 km length of the Saginaw River and all of Saginaw Bay (2,960 km²).

Lovis and Roberston (1989: 237) identify a Meadowood phase in the Saginaw Bay area, dating between 3000 and 2500 BP, and possibly developing *in situ* from the Late Archaic Feeheley phase (4000-3000 BP—Parker 1997: 137). It is characterized by Meadowood-like points, also called Pomranki, Hunt, Davis, Hodges, or Green Point Side-notched points by various authors (Binford 1963b: 129-133; Binford and Papworth

1963:102-104; Garland 1986; Ozker 1982: 97-98; Parker 1997; Spence et al. 1990: 131). These projectiles generally show extensive use and reworking (Beld 1991: 24).

Bayport chert, characterized by a nodular structure and frequent concentric bandings (Ozker 1982: 85), is native to the Saginaw region. The overwhelming predominance of Bayport to non-Bayport lithic material characteristic of all prehistoric time periods in the broad Saginaw valley drainage also applies to the Early Woodland time frame (Fitting 1970: 68-95; Ozker 1976: 318). However Meadowood points are more frequently manufactured from exotic lithic materials, including Onondaga chert (Beld 1991: 25). Meadowood cache bifaces, called Pomranki points in Michigan (Beld 1991: 24), are also documented (Binford 1963a, 1963b). At the Pomranky site, 516 cache blades similar in shape and dimensions to specimens recovered from the Muskalonge Lake and Hunter sites were recovered and analyzed by Lewis Binford (1963a: 166). Onondaga chert was not used to manufacture those bifaces.

Based on data from the Schultz site, Ozker (1982: 167) defined another Early Woodland complex in Michigan characterized by low floodplain site locations, presumably for squash cultivation and mussel collecting, Kramer points, and thick pottery thought to have been employed in the processing of nuts. The latter interpretation is based on the association of crushed hickory, butternut, walnut and other unidentified nut species with hearths and sherds at the Schultz site (Ozker 1982:77). Whether this complex is contemporaneous with or succeeds the aforementioned Meadowood components is unresolved (Beld 1991: 35; Ozker 1982; Parker 1997: 128).

CANADIAN SHIELD

Appendix A: 215-226; Figure 3.6

The Canadian Shield, also known as Precambrian Shield or Laurentian Plateau, is a vast territory (4.4 million square kilometres) covering about half of Canada. It is the oldest part of North America and is composed of granite and exposed Precambrian rock (igneous and metamorphic). It is also a rich source of metallic minerals, among which native copper was exploited by Meadowood communities.

Resources

The Canadian Shield is distinguished by long, cold winters and short, hot, wet summers. It is a territory of boreal forests made up mostly of coniferous trees such as pine, cedars, spruce, and fir trees, and it separates the Arctic tundra from the deciduous forests. This province, shaped by a glacier that left large depressions in the land 10,000 years ago, is characterized by a large number of freshwater lakes, which provide habitat for abundant land and water life.

The rigorous climate and high seasonal contrasts of the Canadian Shield are not favourable to high population densities. Remains of the mobile populations who inhabited this region throughout prehistory are elusive, often meager, and very widely dispersed. Not surprisingly, the Meadowood complex is poorly represented in this vast area of boreal forest covering most of northern Ontario and northern Quebec. Nevertheless, there can be no question that these populations were aware of and occasionally participated in the Meadowood interaction sphere. This contradicts earlier interpretations that perceived the Canadian Shield as Archaic and isolated, from its initial colonization until historic times (Clermont 1998: 58).

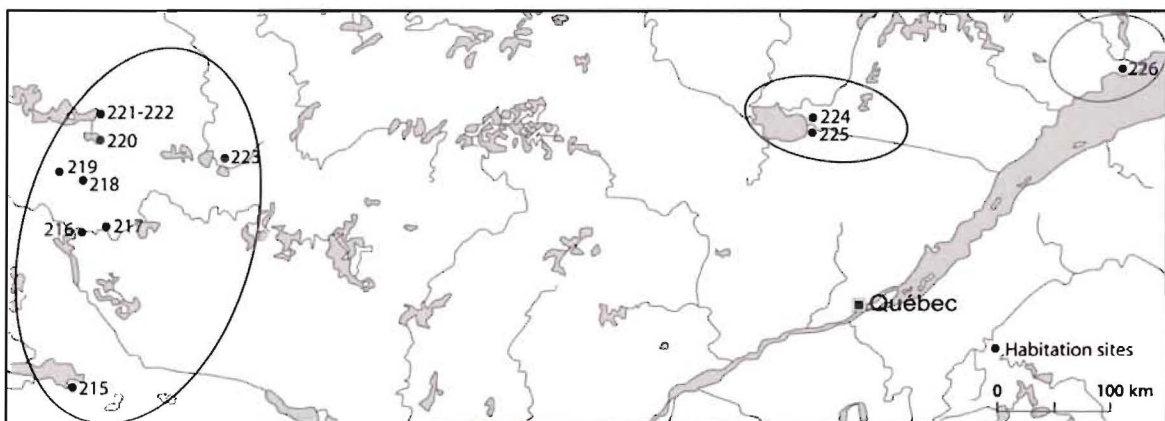


Figure 3.6 Distribution of Meadowood sites in the Canadian Shield province.

ABITIBI-TÉMISCAMINGUE: 215-Frank Bay, 216-Fort Témiscamingue, 217-Lac des Quinze, 218-DaGt-1, 219-Pearl Beach, 220-DdGt-29, 221-Lac Abitibi, 222-DdGt-5, 223-Lac Montigny.

LAC ST. JEAN: 224-DdEw-12, 225-St. Gédéon.

LOWER ST. LAWRENCE VALLEY: 226-Rivière aux Outardes.

Cultural Inventory

Nine sites yielded Meadowood diagnostics in the Abitibi-Témiscamingue region, with at least one additional site in the area surrounding Lac St. Jean, and one in the Lower St.

Lawrence valley. In the Abitibi-Témiscamingue region, only two Meadowood points and one Meadowood triangular scraper were made of Onondaga chert, the other diagnostic items from this period being mainly manufactured in local materials such as quartzite, rhyolite, and “pélite.” The manufacture of Meadowood items in local raw materials has also been observed in the Lac St. Jean area (Langevin 1990: 67, cited in Côté 1993: 13). In these northern areas, Vinette I pottery is a rare, but definite occurrence.

Abitibi-Témiscamingue covers an area of approximately 60,000 square km. At the confluence of two major hydrographic basins, the Hudson Bay and the St. Lawrence, this region is a crossroad where prehistoric populations met and exchanged materials (Côté 1993: 6). Once again, Meadowood diagnostics are recovered at an important transport location. In historic times, the middle Ottawa valley represented a permeable boundary between the Iroquoian and Algonquian worlds. We know, for example, that at the beginning of the seventeenth century, the Algonquian community living around Allumette Island claimed rights-of-way from the Hurons who were circulating on the river (Tooker 1967). Assigning ethnic identities to Early Woodland groups is a difficult enterprise that will not be attempted here. However, the middle Ottawa valley undoubtedly represented a major circulation axis throughout prehistory, linking the St. Lawrence valley, the Great Lakes, and the Canadian Shield’s higher latitudes. Thus, resident groups may well have exerted similar control over traders or travelers transiting these communication corridors.

The presence of Meadowood diagnostics has been recorded as far north as Lac St. Jean, and Rivière aux Outardes in the Lower St. Lawrence valley. While trade may be responsible for these isolated finds, it is also possible that they were abandoned there by Meadowood communities or traders adventuring outside of their normal habitation territory. In historic times, Cap Tourmente represented the northern range of the St. Lawrence Iroquoians habitation territory, and it also appears to have been the northern range of Meadowood community for this region. Nevertheless, archaeological and ethnohistorical evidence indicate that St. Lawrence Iroquoian travels to the St. Lawrence estuary and along the Saguenay River were not uncommon. Claude Chapdelaine (1989: 27) thus included these regions in their “exploitation territory”, as opposed to habitation territory.

DISCUSSION

Following the grouping of sites in Table 3.2, Figures 3.7 to 3.9 show the number of diagnostic artefacts, large mortuary and large habitation sites, respectively, in the 27 subregions defined in this study. Regions are grouped in these figures according to their distance from the Meadowood “core area” (defined as the Onondaga chert source region), using 200 km intervals except for the most distant (1,000-2,000 km) group. Each bar represents total numbers of diagnostics/sites for one subregion. Distances between regions were calculated by following probable travel routes along rivers rather than simply measuring straight line distances between two points (Granger 1979: 117). Indeed, based upon site locations, it is likely that goods and raw materials circulating in the Meadowood Interaction Sphere were transported primarily by water (Stothers and Abel 1993: 82).

Table 3.2 Classification of geographical areas according to their relative proximity to Onondaga chert sources/Meadowood Interaction Sphere’s “core area”

| 0-200 km | 200-400 km | 400-600 km | 600-800 km | 800-1,000 km | 1,000-2,000 km |
|--|--|--|---|---|---|
| Niagara Peninsula; Lakes Ontario & Oneida; Allegheny Uplands; Thames River & St. Clair Lake | Mohawk & Hudson valley; Trent waterway; Susquehanna valley; Auseable River & Lake Huron | Upper St. Lawrence valley; Lower Hudson; Delaware valley; Saginaw Bay | Middle St. Lawrence valley; Lake Champlain; Eastern Townships; Ottawa valley; Lake Michigan | Connecticut valley; Merrimack valley | Lower St. Lawrence Valley; |
| | | | | | Lac St. Jean; |
| | | | | | Abitibi-Témiscamingue; |
| | | | | | Tobique & Miramichi valleys; |
| | | | | | Southern New Brunswick; |
| | | | | | Halifax, Dartmouth & Minas Basin; |
| | | | | | Lakes Kejimikujik & Rossignol / Mersey River; |
| | | | | | Coastal Maine |

Minimum numbers of objects were used to compile Figure 3.7. When the presence of Meadowood artefacts was mentioned in the literature without precise data regarding their abundance, the letter “P” was entered in the inventory. Figures 3.8 and 3.9 only include sites

containing more than 20 Meadowood diagnostic artefacts. Indeed, looking at the total number of recorded Meadowood sites as an indicator of spatial distribution poses a number of problems. While sites with significant Meadowood components were probably all or almost all included in the present inventory, this is not necessarily the case for smaller components in peripheral areas. Thus, some regions would appear to have been densely populated by Meadowood groups if one considers the number of sites alone, but a closer examination of the data indicate that only a few Meadowood artefacts were actually recorded, often in the context of mixed multicomponent sites without any distinct Meadowood component. This discrepancy results from an unequal documentation of the Meadowood presence in the literature, and also from the author's biases, being more familiar with certain areas than others. However, the number of obscure small sites included in this inventory will not affect spatial distribution patterns if one only considers major sites (arbitrarily defined here as sites containing more than 20 Meadowood diagnostic artefacts).

Figures 3.7 and 3.8 show no direct relationship between the number of Meadowood diagnostics, or the number of large Meadowood mortuary sites, and the distance from the core area of the interaction sphere.

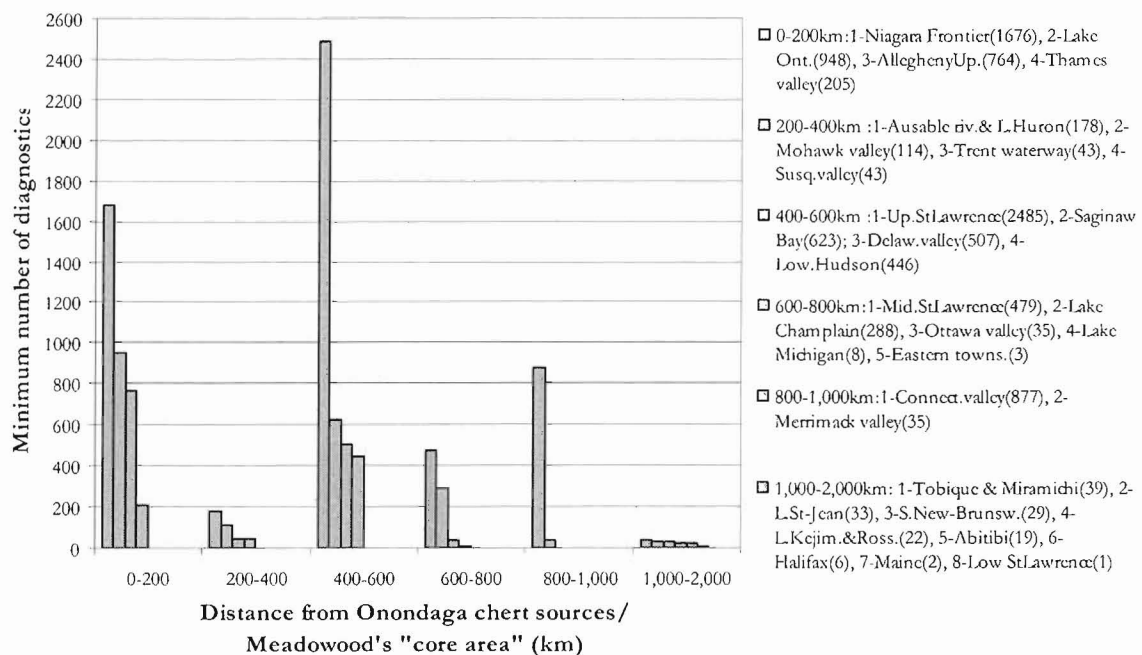


Figure 3.7 Distribution of Meadowood diagnostics in function of distance from Meadowood's "core area"

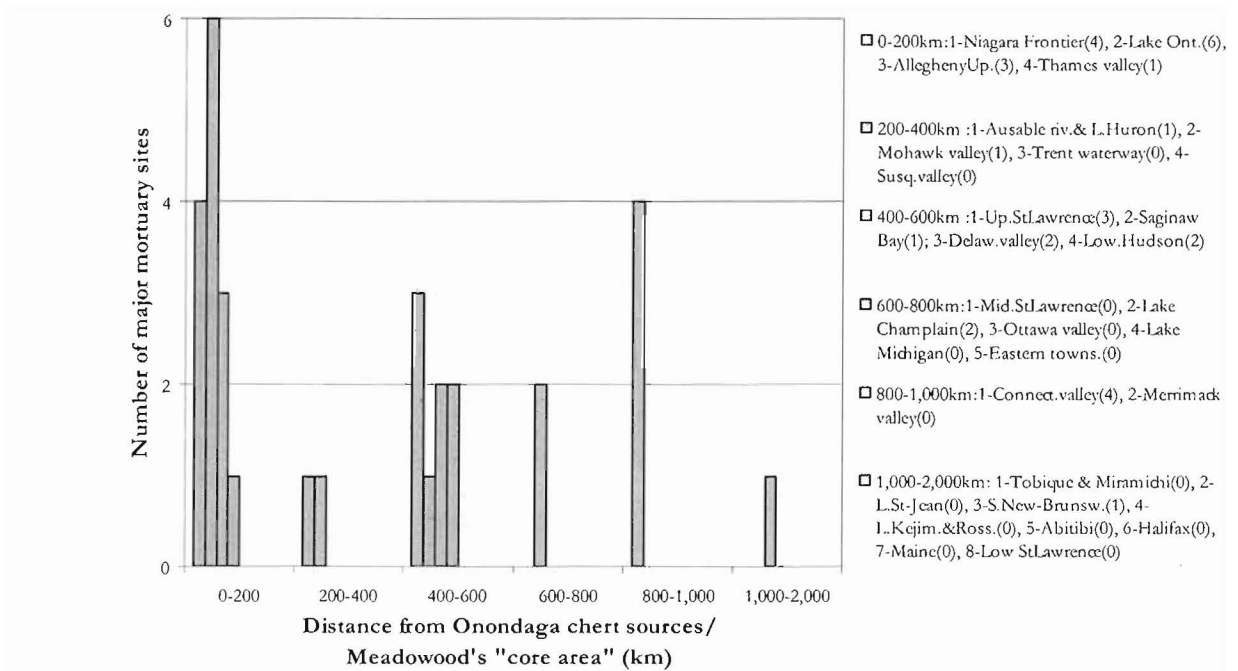


Figure 3.8 Distribution of major Meadowood mortuary sites in function of distance from Meadowood's "core area"

Figure 3.9, on the other hand, indicates that large Meadowood habitation sites occur predominantly in regions closer to the "core" area. The only region that does not follow this pattern is the Middle St. Lawrence valley, where large sites are more numerous than expected. This could be due to sampling biases. Alternatively, it may reflect the strategic position of this area within the Meadowood Interaction Sphere. The procurement of Mistassinni quartzite and deer hides from northern groups, for example, could have attracted Meadowood communities to the Middle St. Lawrence valley. Interestingly, no major habitation sites are reported beyond 600-800 km of Onondaga chert sources.

Looking more closely at the distribution of Meadowood diagnostics (Figures 3.7 and 3.10), regions where Meadowood trade items concentrate can be identified. The Niagara Peninsula, the Glaciated Allegheny uplands, and the southern shore of Lake Ontario all yielded a large number of diagnostics. Together, these three regions represent a first concentration area, after which the number of diagnostic artefact decreases. Farther away, the number of Meadowood trade items increases again in the St. Lawrence/Champlain Lowlands. Within this province, artefacts are mainly distributed in the upper and Middle St. Lawrence valley. Another concentration area is observed in the Atlantic Coastal Plain

province, where Meadowood diagnostics are found in greater numbers in the Connecticut, Lower Hudson and Lower Delaware River valleys. Finally, Saginaw Bay in Michigan is another region where items circulating in the Meadowood interaction sphere occur in significant numbers. Between these concentration areas, a number of regions yielded smaller amounts of Meadowood diagnostics. This is the case, for example, of the Hudson-Mohawk Lowlands and the upper Susquehanna valley, located between the Niagara Peninsula and the Atlantic Coastal Plain. Concentrations of diagnostic items do not occur beyond 1000 km from the Niagara Peninsula.

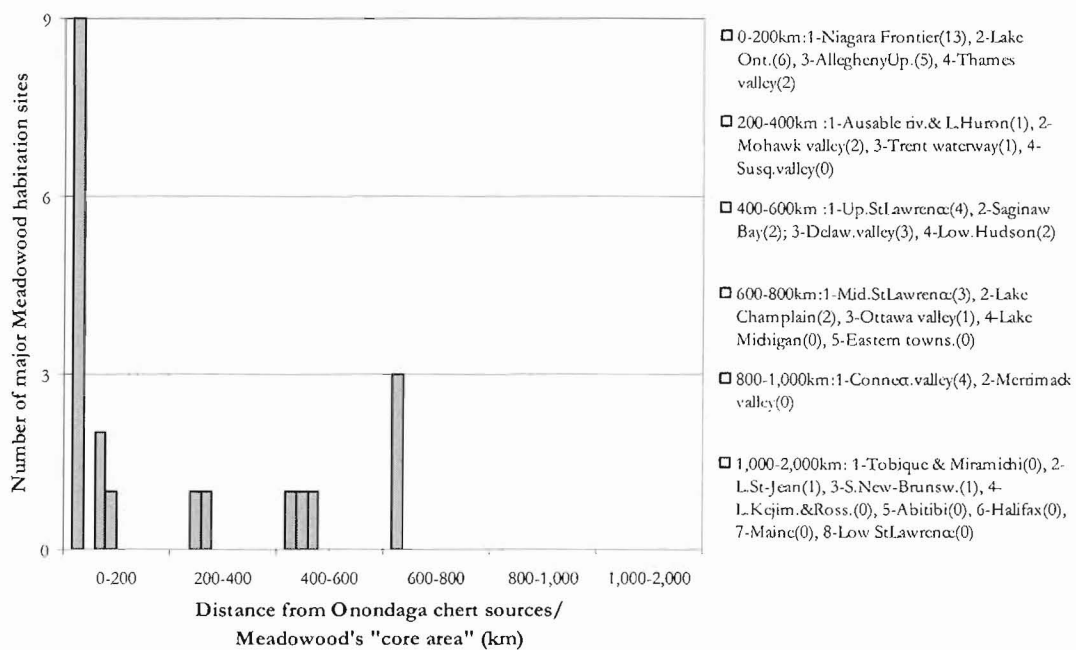


Figure 3.9 Distribution of major Meadowood habitation sites in function of distance from Meadowood's "core area"

Environmental productivity will be discussed in detail in Chapter 5, but it can already be emphasized that areas with the most Meadowood items are all resource-rich environments, where communities could have produced surpluses and developed socioeconomic inequalities. The first concentration area (formed by the Niagara Peninsula, Lake Ontario's south shore, and the Allegheny uplands) occur within the rich Carolinian biotic province. Nut bearing trees, abundant in this province, represented a significant source of food and attracted cervidae in the region. Numerous lakes and rivers provided excellent fishing grounds and facilitated the movement of goods and people. Finally, the Onondaga Escarpment supplied high grade Onondaga chert.

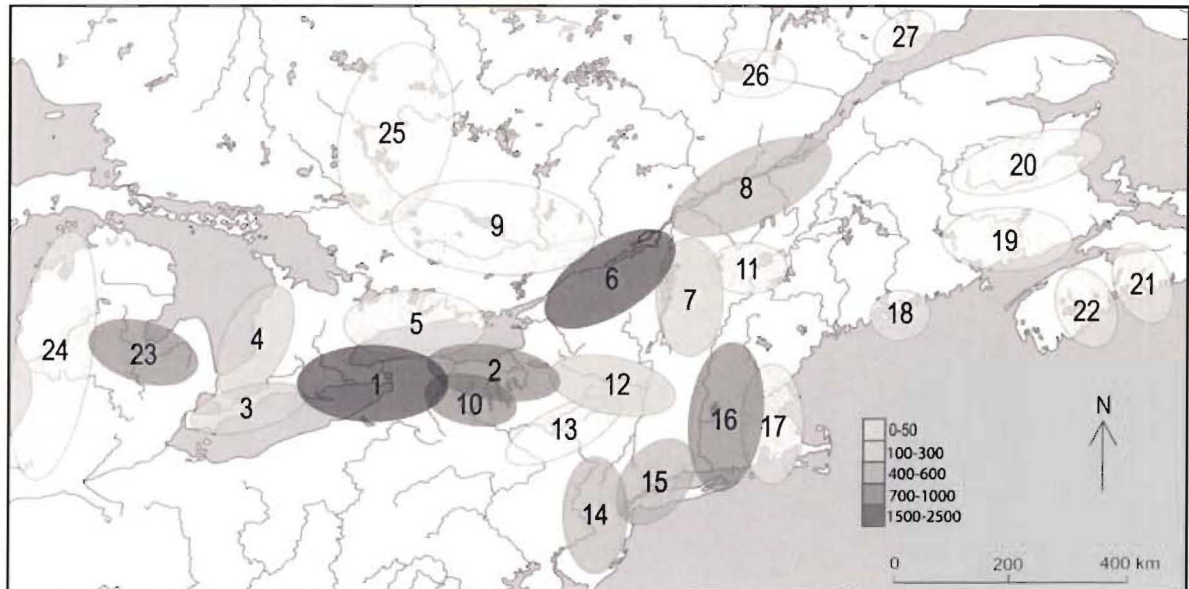


Figure 3.10 Distribution of Meadowood diagnostic items

LAKES ONTARIO/ERIE LOWLANDS: 1-Niagara Peninsula, 2-Lakes Ontario&Oneida, 3-Thames River & St. Clair Lake, 4-Auseable River & Lake Huron, 5-Trent Waterway.
 ST. LAWRENCE/CHAMPLAIN LOWLANDS: 6-Upper St. Lawrence valley, 7-Lake Champlain, 8-Middle St. Lawrence valley, 9-Ottawa valley.
 APPALACHIAN UPLANDS: 10-Glaciated Allegheny Uplands, 11-Eastern Townships.
 HUDSON/MOHAWK/SUSQUEHANNA LOWLANDS: 12-Mohawk & Upper Hudson valley, 13-Susquehanna valley.
 ATLANTIC COASTAL PLAIN: 14-Delaware valley, 15-Lower Hudson & Long Island, 16-Connecticut valley, 17-Merrimack valley.
 MAINE/MARITIME: 18-Coastal Maine; 19-Southern New-Brunswick, 20-Tobique & Miramichi valleys, 21-Halifax, Darmouth & Minas Basin, 22-Lakes Kejimikujik & Rossignol.
 WESTERN GREAT LAKES: 23-Saginaw Bay, 24-Lake Michigan.
 CANADIAN SHIELD: 25-Abitibi-Témiscamingue, 26-Lac St. Jean, 27-Lower St. Lawrence valley

Fishing was also extremely productive in the St. Lawrence valley, where a second concentration of Meadowood artefacts is noted. A good example of fish abundance within the St. Lawrence valley is provided by the site of Pointe-du-Buisson, where thousands of sturgeons, walleyes, northern pikes, and perch gathered to spawn in early spring (Courtemanche 2003: 250). Pointe-du-Buisson, bordering Lake St. Louis, is also where most of the Meadowood remains from the Upper St. Lawrence valley have been found.

The Atlantic Coastal Plain, another area where Meadowood diagnostics concentrate, was also characterized by abundant and spatially restricted resources during the Early Woodland period. The sea can be viewed as an “inexhaustible ‘catchment area’ where resource depletion is unlikely even if a permanent land base is established” (Carlson 1988: 75). In many areas worldwide, coastal hunters-gatherers appear to be more sedentary, more resource-intensive, and less egalitarian in social structure than their inland counterparts

(Carlson 1988: 47; Yesner 1980). Lewis Binford, for example, suggested that cultural diversity and complexity observed in Coastal Virginia and North Carolina in historic times is directly relatable to the efficiency with which aquatic resources could be exploited. On the other hand, no relation exists between the local abundance of deer or floral resources and human population density (Binford 1991: 144-145).

Notwithstanding debates about the relative importance of anadromous fish species compared to marine fish and other coastal resources (Carlson 1988), the Atlantic Coastal Plain is clearly characterized by restricted human habitats with high resource density and predictability. Besides Meadowood diagnostics, other products were moved over long distances to reach the Middle Atlantic Region, including native copper artefacts from the Great Lakes and lithic materials from southern Ohio (Stewart 1989). These goods indicate contacts between the Middle Atlantic Region and midwestern United States, where another concentration of Meadowood diagnostics has been noted around Saginaw Bay in Michigan.

Like the Ontario/Erie Lowlands, the Saginaw Bay region is located within the Carolinian Biotic Province, which supported a rich array of tree species and animal life. This region also included a large and productive wetland ecosystem, and as Ozker (1982: 10) noted, such a “combination of forest land and wetland resources forms an edge area of rich resources for human settlement”. The gray-brown podzols and the temperatures of this region are also suitable for plant cultivation, and evidence from a number of sites suggests that Early Woodland communities were already practicing small-scale garden plot cultivation.

The spatial distribution of Meadowood artefacts does not seem to follow the “risk-buffering” exchange model, where diagnostics are expected to concentrate in complementary ecological zones, and gradually decrease in quantity as one moves away from Onondaga chert sources. Moreover, the presence of several regions where Meadowood diagnostics concentrate, divided by areas of low artefacts/sites density, is difficult to account by a ritual model. The next section is an attempt at explaining the nature of these multiple concentration areas.

Multi-Scalar Interaction Networks

The absence of overlapping between the Meadowood presence in the Ontario/Erie Lowlands, the St. Lawrence-Champlain Lowlands, the Atlantic Coastal Plain, and the

Western Great Lakes indicate geographical discontinuity between these four concentration areas, which in turn suggest that we are dealing with distinct regional networks. The spatial distribution of Meadowood diagnostics, however, clearly show that these networks interacted, and probably affected each other during the Early Woodland period.

These various regional networks should not be seen as hierarchical, where one region dominates other regions economically, politically, and/or ideologically. Rather, the idea of nested webs of increasing spatial scales better suits the juxtaposition of networks observed in northeastern North America. The nested network approach was developed by Chase-Dunn and Hall (1991, 1997) as a modification of the World System approach to account for the various types of interactions that occur between societies. More specifically, Chase-Dunn and Hall defined four scales of networks involving (1) information (largest scale), (2) prestige items, (3) alliances/conflicts, (4) everyday necessities (smallest scale).

The present study highlighted networks of two different spatial scales in northeastern North America. A pan-eastern network would have covered the entire Northeast and involved the exchange of marine shells and native copper, prestige goods with high value/weight ratio. Smaller regional networks characterize the Ontario/Erie Lowlands, the St. Lawrence/Champlain Lowlands, the Middle Atlantic Region, and midwestern United States. Based on Chase-Dunn and Hall's (1991, 1997), these networks would be composed of polities that are allying with one another. It should be added, however, that these smaller networks also involved the circulation of prestige items. For example, the circulation of finely made Onondaga chert bifaces characterized the Ontario/Erie Lowlands. Mistassinni quartzite and hide garments are some of the possible prestige items circulating within the St. Lawrence-Champlain Lowlands.

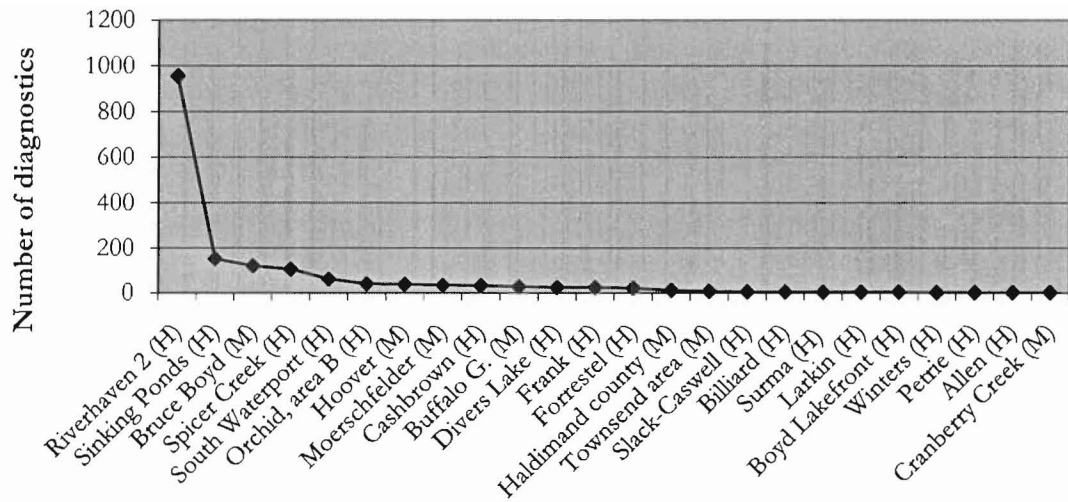
Communities living in the St. Lawrence/Champlain and Ontario/Erie Lowlands may have taken advantage of their intermediary position in a pan-eastern exchange network to establish contacts with groups living to the east and south, along the Atlantic Coastal Coast, and with groups inhabiting the Saginaw Bay area to the west. The benefits ensuing from middlemen positions probably favoured pressures to intensify the production of such tradable items as Onondaga chert bifaces. Already valued for its technological properties, Onondaga chert acquired new socio-political qualities, accounting for its widespread distribution after 3000 BP. Community leaders inhabiting the Niagara Escarpment area used Onondaga chert, perhaps transformed into finely made bifaces by specialists, to obtain

exotic items and, through this ability, enhanced individual and kin group prestige and power. Pleger (2000: 180) suggests that “[s]uch individuals—aggrandizers—may have been able to enhance their influence through ritual and feasting associated with trade and mortuary ceremonialism.”

A Hierarchical System of Social Interaction

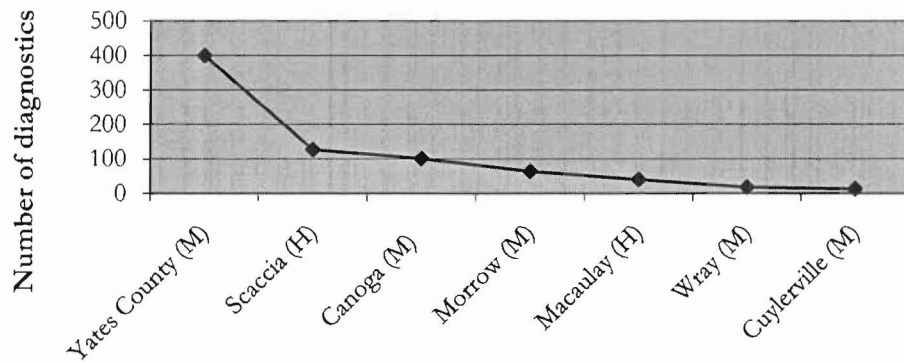
Variability in the distribution and quality of trade items characterizes each regional network. To account for this variability in the Western Lake Erie Basin of northern Ohio, Stothers and Abel (1993: 87) suggested the existence of a hierarchical system of social interaction that includes regional centers, local centers, and nuclear-family hunting and collecting camps. The Williams Cemetery, located on the floodplain of the Maumee River, yielded 20 burial features (containing between 650 and 1,000 individuals) and an abundance of exotic goods in graves and caches. The Sidecut Crematory site is associated with the Williams Cemetery and contained clusters of burned limestone slabs which, due in part to their association with calcined human bone fragments and three non-burial cache pits, were interpreted as crematory platforms (Stothers and Abel 1993: 68) similar to some Meadowood occurrences. Together, the Williams and Sidecut components have been interpreted as a “large focal interaction centre, where several related but autonomous local bands periodically coalesced into a regional band community” (Stothers and Abel 1993: 73). Influential “elite” corporate bodies, who engaged in ritual/mortuary activities and trade at these centers, are believed to have controlled the flow of information and commodities (Stothers and Abel 1993: 53). Pleger (2000: 185) also recognized the development of social inequality, a dramatic increase in trade, and the use of exotic items to enhance prestige between 3000 and 2500 BP in the western Great Lakes.

In the Ontario/Erie and St. Lawrence/Champlain Lowlands, subregions with the most Meadowood diagnostics include the Niagara Peninsula, the Allegheny uplands, Lakes Ontario and Oneida, the Upper St. Lawrence valley, the Middle St. Lawrence valley, and Lake Champlain (Figures 3.11-3.16). Within these subregions, significant differences exist in the distribution of diagnostics among individual sites. Generally speaking, a few mortuary sites yielded most of the trade items recorded in a region. As will be argued below, these locales can tentatively be interpreted as regional centres of redistribution.



Mortuary (M) and habitation (H) sites in the Niagara Peninsula

Figure 3.11 Distribution of Meadowood diagnostic artefacts among sites in the Niagara Peninsula



Mortuary (M) and habitation (H) sites in the Allegheny uplands

Figure 3.12 Distribution of Meadowood diagnostic artefacts among sites in the Allegheny Uplands

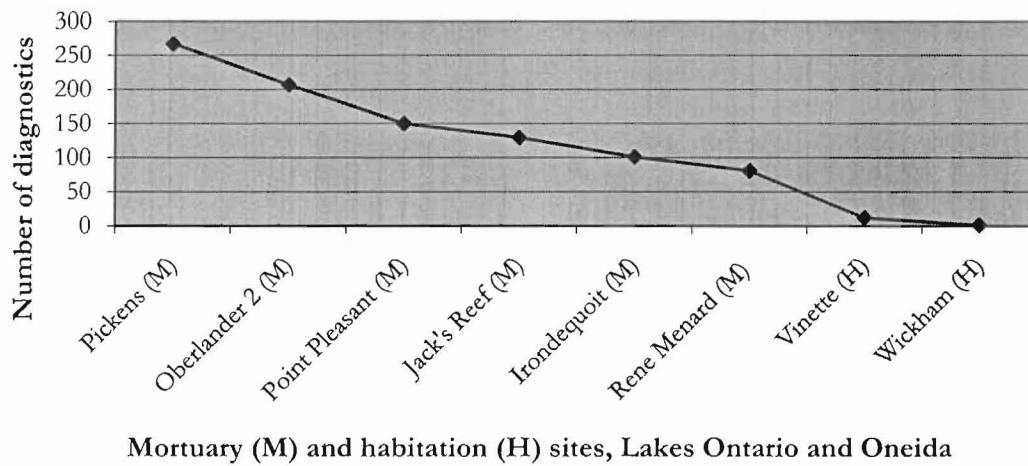


Figure 3.13 Distribution of Meadowood diagnostic artefacts among sites south of Lake Ontario and in Lake Oneida Basin

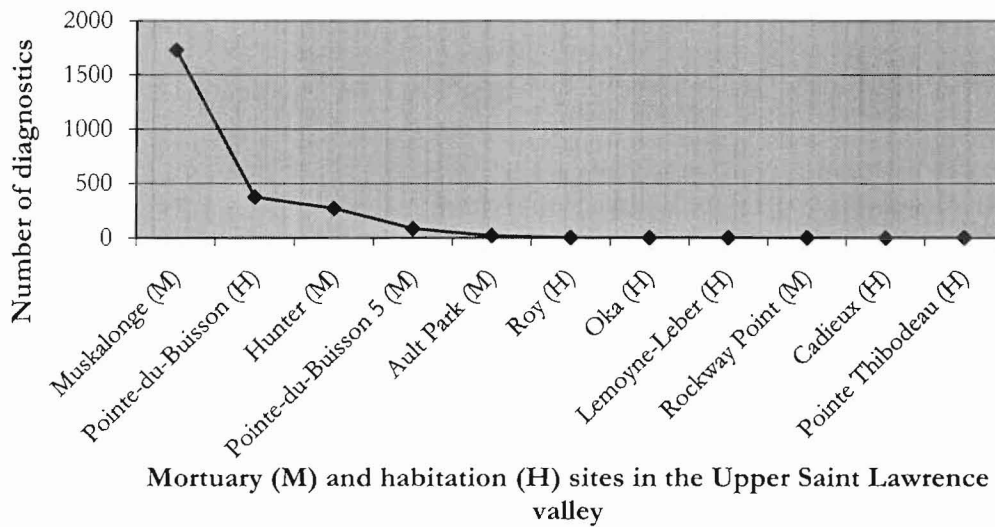


Figure 3.14 Distribution of Meadowood diagnostic artefacts among sites in the Upper St. Lawrence valley

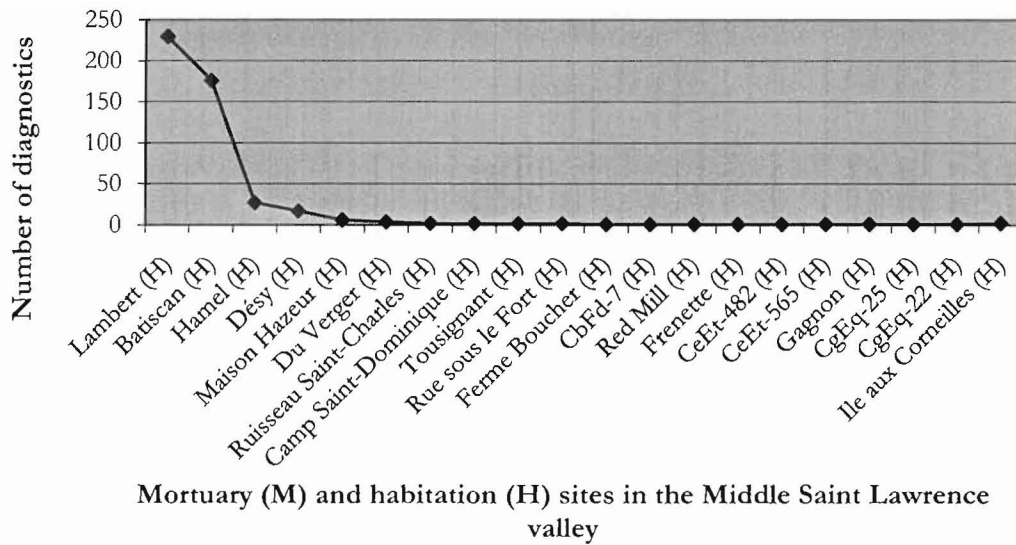


Figure 3.15 Distribution of Meadowood diagnostic artefacts among sites in the Middle St. Lawrence valley

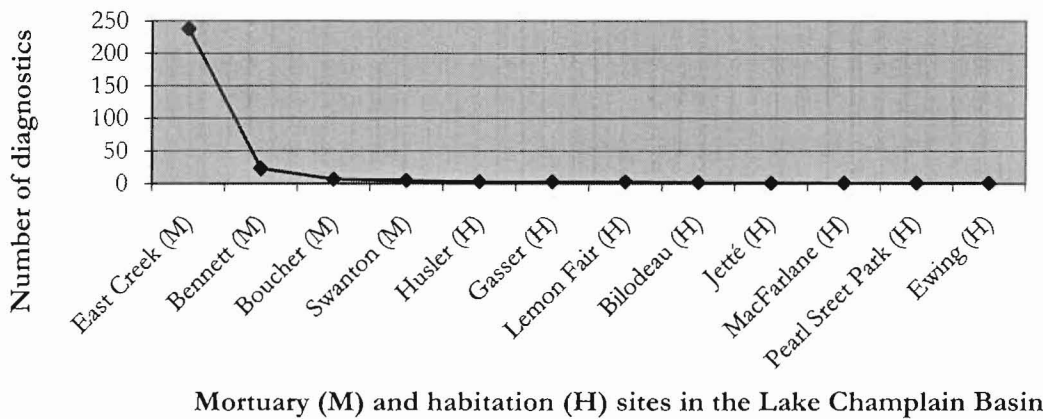


Figure 3.16 Distribution of Meadowood diagnostic artefacts among sites in the Lake Champlain Basin

In the Niagara Peninsula and the Middle St. Lawrence valley, habitation instead of mortuary sites yielded the most Meadowood diagnostics. In the first region, concentration of trade commodities in domestic contexts is probably due to the production of trade goods at such locales, located near Onondaga chert sources. In the case of the Middle St. Lawrence valley, the concentration of diagnostics in habitation contexts reflects an absence of mortuary sites in the region. A large cache of Meadowood bifaces at the Lambert site, however, probably reflects the occurrence of ritual activities.

A different pattern of distribution characterizes sites around Lake Oneida and south of Lake Ontario (Figure 3.13), and in the Upper St. Lawrence valley (Figure 3.14). In these regions, Meadowood diagnostics concentrate in up to five locales rather than only one or two sites. The presence of multiple local centres of redistribution, or areas of local band interaction, may account for this pattern. Like regional gathering sites, local centres are situated in environmentally rich riverine and lacustrine habitats (Stothers and Abel 1993: 73), such as the Upper and Middle St. Lawrence valleys, Lake Oneida, and Lake Champlain.

In the Atlantic Coastal Plain and Western Great Lakes, subregions with the most Meadowood diagnostics are Saginaw Bay, the Delaware, Lower Hudson, and Connecticut valleys (Figures 3.17-3.20). In these areas, concentrations of trade goods are almost exclusively observed in mortuary sites, interpreted as regional centres of redistribution. Local centres probably existed in these regions as well, but since they are part of distinct regional networks, the types of prestige goods recovered from local distribution centres are likely to differ from those found within the Ontario/Erie and St. Lawrence/Champlain Lowlands (i.e., high grade Ohio cherts and steatite vessels rather than Onondaga chert bifaces).

Variability in the size and nature of Meadowood sites within the Ontario/Erie and St. Lawrence/Champlain Lowlands, and the concentration of Meadowood diagnostics within a small numbers of mortuary/ritual sites in the Middle Atlantic and Saginaw Bay regions, support Abel and Stother's idea of a hierarchical system of social interaction. In such a system, a minimal number of consistent "centres" connected a number of nested networks together (Stothers and Abel 1993: 83). The abundance of Meadowood diagnostics in the Saginaw Bay region of Michigan suggests the existence of links between Meadowood communities and groups centering in Western Lake Erie and aggregating, perhaps once a year, at the Williams Mortuary complex. The location of this complex on the Maumee River, the second-largest river in the western Lake Erie basin, satisfies the common characteristics of ethnographically known "trade fairs": it is easily accessible and located near reliable resources:

Accounts written during the War of 1812 by officers and enlisted men stationed at Fort Meigs, a few miles downriver from the Williams site, document that these spawns were so prolific that one could literally cross the river by walking on the backs of fish (Lindley 1944: 92, 107-108; Simmonis 1979: 59, 62-63) (Abel et al. 2001: 302).

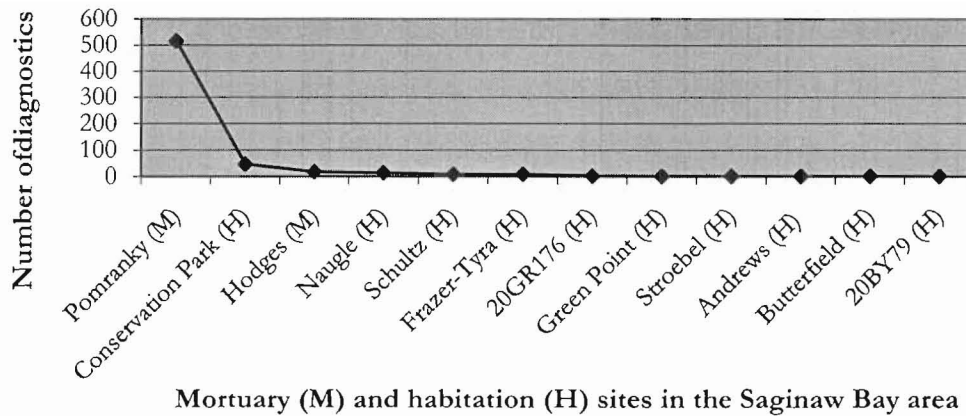


Figure 3.17 Distribution of Meadowood diagnostic artefacts among sites in the Saginaw Bay area

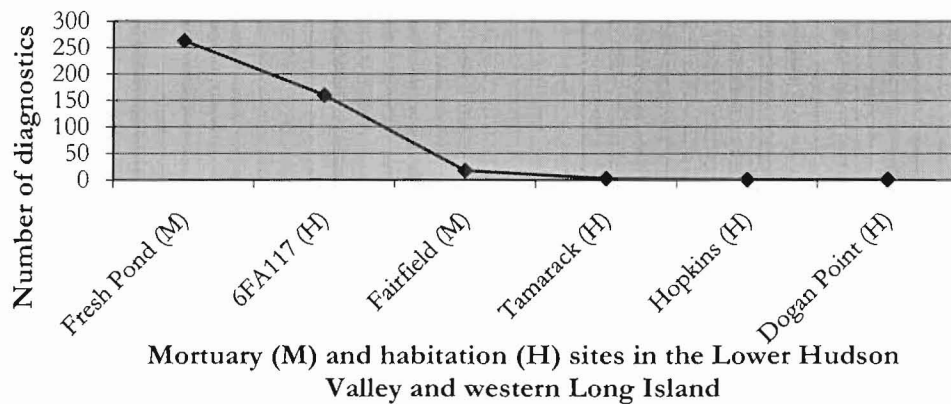


Figure 3.18

Distribution of Meadowood diagnostic artefacts among sites in the Lower Hudson valley and on western Long Island

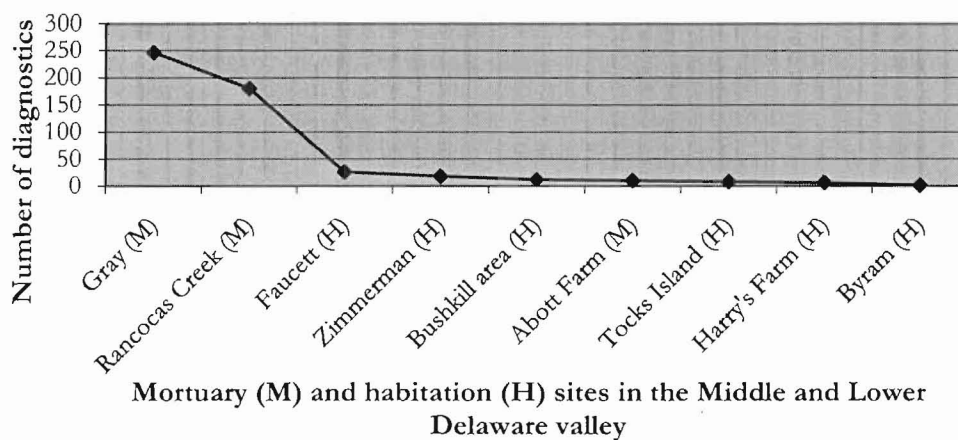


Figure 3.19 Distribution of Meadowood diagnostic artefacts among sites in the Middle and Lower Delaware valley

c

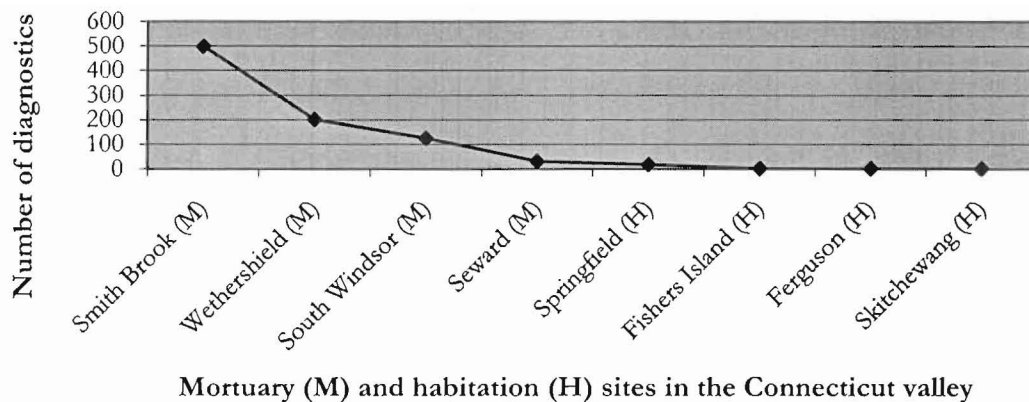


Figure 3.20 Distribution of Meadowood diagnostic artefacts among sites in the Connecticut valley

The Muskalonge and Hunter sites in New York bear striking similarities to occurrences from the Williams Mortuary complex in northern Ohio. In both cases, separable loci of crematoria and burial pits were recorded, and trade goods from various regions were found in large quantities (e.g., Onondaga chert bifaces from the Niagara region Onondaga bifaces, Mistassinni quartzite bifaces from northern Quebec, native copper and banded slate from Lake Superior, and marine shells from the Atlantic coast). Both the Indian River and the Williams sites could represent Regional Band cemeteries, where several related but autonomous local bands periodically gathered to perform rituals and trade. Both site complexes are dominated by prestige items, the main distinction being the caches of triangular Onondaga chert preforms at the Indian River sites, versus caches of bipointed Indiana hornstone preforms at the Sidecut Crematory site. The former are preforms for Meadowood side-notched projectile points, while the latter were probably used to manufacture Turkey-tail points. Based on such data, it is possible to postulate that high-quality cherts were controlled resources within each regional band territories.

In sum, the spatial analyses conducted in this chapter have highlighted a remarkable preponderance of sites along major waterways, indicating a reliance on large quantities of fish and/or the importance of trade. Admitting a survey and collection bias to these environments, I argue that it cannot alone account for the riverine focus described in this chapter. Indeed, within the vast territory considered in this study, a number of non-riverine/non-lacustrine/highland areas have been the focus of archaeological fieldworks (e.g., Pagoulatos 2002; Ramsden 1993) and revealed few Meadowood sites relative to components from other time periods. Moreover, if survey and collection biases were

responsible for the distribution of archaeological sites along major waterways, a similar pattern should characterize all time periods. This is not the case, and many Late Woodland sites, for example, are located on high grounds, away from major waterways (Ritchie and Funk 1973: 363).

The distribution pattern of Meadowood diagnostics in the Ontario/Erie Lowlands, St. Lawrence-Champlain Lowlands, Atlantic Coastal Plain and around Saginaw Bay is most intelligible in terms of the socio-political model, where traded items are expected to concentrate in communities that have the greatest potential to produce surplus and to develop socioeconomic inequalities. Distribution data also suggest a superposition of regional networks, in which Meadowood communities probably benefited from their intermediary position between the Middle Atlantic region and midwestern United States. Changes in social organization and interaction occurring in the Midwest and in the Middle Atlantic Region in Late Archaic times may have engendered similar changes in the Ontario/Erie and St. Lawrence/Champlain Lowlands:

By some time in the third millennium BC, while Late Archaic peoples were going about their business in Vermont, important changes were beginning to take place in the late Archaic cultures of what is now the midwestern United States. (Haviland and Power 1981: 90)

Marine shells, primarily from the Middle Atlantic Region, and Lake Superior native copper were the two main raw materials circulating across northeastern North America in Terminal Archaic times. In this context, the benefits ensuing from middlemen positions in the Ontario/Erie and St. Lawrence/Champlain Lowlands cannot be overemphasized. Finally, the distribution patterns of Meadowood diagnostics among individual sites within various regions point to a hierarchical system of social interaction at the regional level, in which a minimal number of centers connected the nested interregional networks together.

CHAPTER 4 – ENVIRONMENTAL AND CULTURAL CONTEXTS OF MEADOWOOD MATERIAL MANIFESTATIONS

In the preceding chapter, I hypothesized that the distribution of Meadowood artefacts across the landscape reflects the existence of multi-scalar networks, and that Meadowood communities took advantage of their intermediary position between the Atlantic Coast and Midwestern United States. Are all Meadowood diagnostics used the same way or can variability be detected in terms of their spatial distribution, cultural contexts, and/or associated features? In the latter case, what does such variability say about the item's role within the Meadowood Interaction Sphere?

The first half of this chapter focuses on finished products, and the second half deals with raw materials. In both cases, spatial distributions among the different provinces and regions defined in Chapter 3 are analyzed. The rationale for this approach is to determine whether the distribution of Meadowood trade goods is homogenous (i.e., supporting a ritual model), nodal and associated with resource-rich areas (i.e., supporting a socio-political model), or function of distance from sources (i.e., supporting an economic model). Finished products discussed in this chapter include cache bifaces, side-notched points, bifacial scrapers, and birdstones. The exotic raw materials analyzed, on the other hand, are Onondaga chert, Mistassinni and Ramah quartzites, banded slate, native copper, and marine shells. It should be mentioned that none of these materials is exclusive to the Meadowood Interaction Sphere. While the widespread circulation of Onondaga chert distinguishes the Early Woodland from the preceding Archaic and the following Middle Woodland periods, the mere presence of this material on a site is insufficient to identify a member of the Meadowood Interaction Sphere. Onondaga chert is generally believed to have been controlled by Meadowood communities or individuals within these communities (e.g., Chrétien 1999), while the other raw materials included in my analyses were probably controlled by neighbouring regional networks. They nevertheless appear in Meadowood contexts, once again suggesting that a pan-eastern, inter-regional network was operating in the Northeast between 3,000 and 2,400 years ago.

In order to better understand the function of Meadowood trade goods, this chapter also examines the distribution of finished products and raw materials in habitation versus mortuary components, emphasizing their association with specific cultural features when possible. If Meadowood represents the spread of a burial cult, trade items are expected to be primarily non-utilitarian ritual objects. Moreover, they should be found mostly in mortuary or ritual sites, associated with graves or caches. On the other hand, if the function of interaction and exchange is to increase the stability of the local subsistence system, one would expect lithic raw materials or food resources necessary for subsistence to circulate in the network. Limited quantities of wealth items may also be exchanged for food, operating as a regulating mechanism in environmental contexts characterized by variability over time and space. In an economic scenario, most traded goods are likely to be found in domestic sites, in contexts such as middens or houses.

Finally, if political factors and the development of socioeconomic inequalities are responsible for the emergence of an interaction sphere, trade goods should predominantly be prestige items. Among the items that can be considered prestige items are exotic stone, metal, shells, animal skins, and finely crafted artefacts. These objects are expected to occur in large gathering sites and/or cemeteries, associated with special structures, graves, or caches. It is often assumed that artefacts found in habitation contexts are less likely to be prestige items than those recovered in mortuary sites. While this may be true, one must be careful before making such an assessment since ethnoarchaeological studies also attest to households as frequent localities for feasts and political gatherings (Adams 2001; Clarke 2001; Hayden 2001a). One must therefore look for possible associations between finely crafted or exotic artefacts, prestige or rare foods, and special features before assigning strictly utilitarian functions to artefacts recovered from habitation sites. A roasting pit excavated at the Pearl Street Park habitation site, for example, is a good candidate for a feasting feature. Approximately 60 cm deep and basin-shaped, its contents included Vinette I pottery, fire-cracked rocks, and a large quantity of deer and beaver bones. Although not in the contents of the roasting pit, snapping turtles were also identified at this site. Historically, all three species were consistently, although not exclusively, consumed in feasts. Differential distribution of prestige items in some structures or some graves is also expected in a socio-political scenario (although the relationship between mortuary behaviour and living society is not always straightforward [see Schulting 1995]).

In sum, looking at the archaeological contexts of diagnostic artefacts and raw materials will enable us to test predictions regarding the types of sites and features where Meadowood items are expected to be found. As a way to infer artefact functions, examining contexts will also help test predictions about the nature of the objects/raw materials circulating in the Meadowood network. It is important to keep in mind, however, that contexts of discovery reflect at best the last usage of an artefact, even when it is not a refuse, or abandonment context. When coupled with other data, contextual analysis can nevertheless help answer some important anthropological questions.

FINISHED PRODUCTS

In this section, I examined the environmental and social contexts, as well as the associated features of four Meadowood diagnostic traits: 1) cache bifaces, 2) projectile points, 3) bifacial scrapers, and 4) birdstones. Such a contextual analysis of Meadowood artefacts should help determine whether their roles occurred more within the ritual, economical, or sociopolitical sphere of activities.

Meadowood Cache Bifaces

Environmental and Social Contexts

Cache bifaces represent 81% (n=7,994) of the total number of recorded Meadowood “diagnostics” (Table 4.1). With such a proportion, it is not surprising that trends seen in the distribution figure of all Meadowood diagnostics in northeastern, midwestern, and Middle Atlantic regions of North America closely parallels the distribution of cache bifaces in the same area. Not only have large quantities of Meadowood cache bifaces been found in every area of diagnostic concentration outlined in Chapter 3, but in some regions this item is the only Meadowood diagnostic found in significant number (compare Figures 3.7 and Figure 4.1).

Table 4.1 Distribution of Meadowood diagnostic artefacts among different northeastern provinces and subregions

| provinces | Subregions | | Meadowood points | | scrapers | | Cache bifaces | | Birdstones | |
|--|-----------------------------------|------------------------------|------------------|----------------------------|------------|----------------------------|---------------|----------------------------|------------|------------|
| | sites(N) | objects(N) | sites(N) | objects(N) | sites(N) | objects(N) | sites(N) | objects(N) | sites(N) | objects(N) |
| Lakes Ontario/Erie Lowlands (Figure 3.1) | Niagara Peninsula | 16 | 231 | 11 | 237 | 19 | 1,190 | 4 | 5 | |
| | Lake Ontario / Oneida Lake | 1 | 11 | 1 | 16 | 7 | 903 | 1 | 2 | |
| | St-Clair Lake / Thames River | 14 | 92 | 7 | 20 | 7 | 69 | 6 | 13 | |
| | Auscable River / Lake Huron | 2 | 4 | 0 | 0 | 2 | 167 | 2 | 2 | |
| | Trent waterway | 4 | 26 | 1 | 4 | 3 | 13 | 0 | 0 | |
| St-Lawrence-Champlain Lowlands (Figure 3.2) | Upper St. Lawrence valley | 6 | 137 | 7 | 250 | 7 | 2,079 | 1 | 2 | |
| | Lake Champlain | 5 | 11 | 6 | 9 | 4 | 252 | 3 | 4 | |
| | Middle St. Lawrence valley | 13 | 56 | 11 | 26 | 7 | 221 | 0 | 0 | |
| | Ottawa valley | 3 | 12 | 2 | 17 | 0 | 0 | ? | 2 | |
| Appalachian Uplands (Figs. 3.1 and 3.2) | Glaciated Allegheny Uplands | 4 | 95 | 3 | 9 | 7 | 644 | 3 | 4 | |
| | Eastern Townships | 1 | 1 | 0 | 3 | 0 | 0 | 2 | 2 | |
| | Mohawk-Upper Hudson valley | 6 | 20 | 2 | 4 | 5 | 88 | 0 | 0 | |
| Hudson/Mohawk/Susquehanna Lowlands (Figure 3.3) | Susquehanna valley | 11 | 23 | 0 | 0 | 4 | 23 | 0 | 0 | |
| | Delaware valley | 6 | 61 | 2 | 3 | 5 | 442 | 0 | 0 | |
| | Lower Hudson / Long Island | 2 | 15 | 0 | 0 | 4 | 428 | 0 | 0 | |
| | Connecticut River valley | 2 | 7 | 1 | 6 | 5 | 866 | 0 | 1 | |
| Atlantic Coastal Plain (Figure 3.3) | Merrimack River valley | 9 | 19 | 3 | 11 | 0 | 0 | 1 | 1 | |
| | Coastal Maine | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Southern New Brunswick | 5 | 17 | 0 | 0 | 1 | 11 | 0 | 0 | |
| | Tobique / Miramichi valleys | 5 | 15 | 1 | 1 | 2 | 21 | 43 | 1 | |
| | Halifax / Dartmouth / Minas Basin | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Western Great Lakes (Figure 3.5) | Lakes Kejimikujik and Rossignol | 4 | 8 | 0 | 0 | 1 | 11 | 1 | 1 | |
| | Saginaw Bay | 11 | 72 | 3 | 10 | 5 | 533 | 0 | 0 | |
| | Lake Michigan | 2 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | |
| | Abitibi-Témiscamingue | 3 | 9 | 1 | 1 | 1 | 3 | 0 | 0 | |
| Canadian shield (Figure 3.6) | Lac St. Jean | 1 | 2 | 0 | 1 | 1 | 30 | 0 | 0 | |
| | Lower St. Lawrence valley | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Totals | 140 (113H, 25M) | 959 | 62 (48H, 13M) | 789 | 97 (52H, 44M) | 7994 | 24 (11H, 13M) | 44 | |

H=Habitation sites / M=Mortuary sites

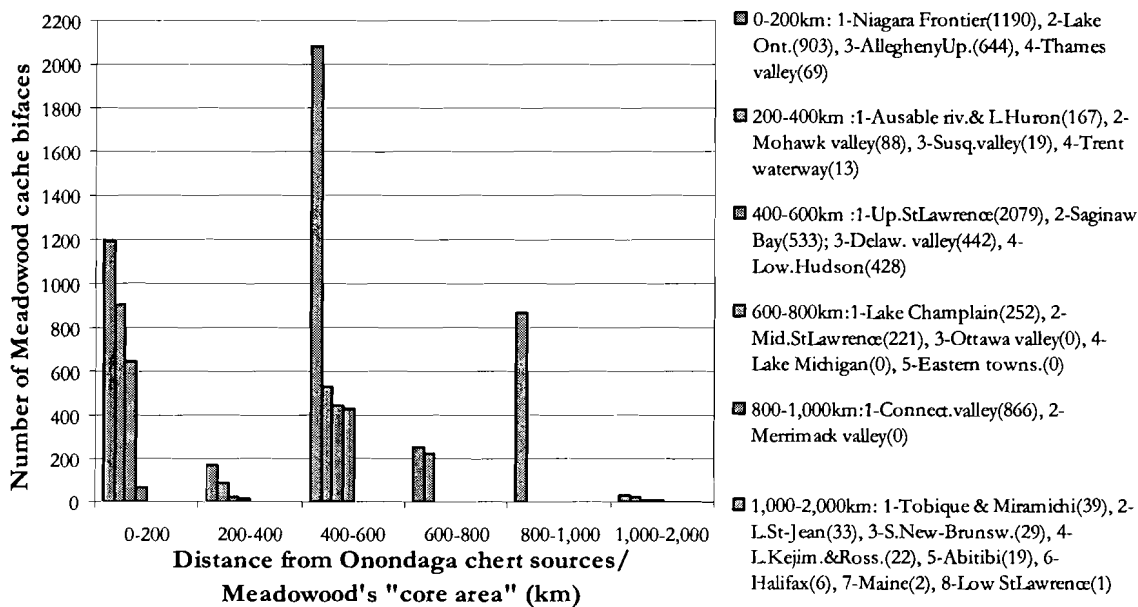


Figure 4.1 Distribution of Meadowood cache bifaces among different geographic areas

Granger observed that earlier stages of Meadowood cache bifaces are essentially absent from mortuary sites and from both habitation and mortuary sites outside the Ontario/Erie Lowlands (Granger 1979: 109, 1981: 65). Without denying the general validity of this observation, it should be noted that at least 22 Onondaga cache bifaces associated with a Meadowood occupation at Pointe-du-Buisson are thicker than the average cache biface (Clermont 1982: 71). Pointe-du-Buisson is located in the Upper St. Lawrence valley, approximately 520 km away from the primary sources of Onondaga chert. The Batiscan site also yielded a small number of tertiary and secondary blanks manufactured from carbonate cherts with sources in the Ontario/Erie Lowlands. One of these materials has been identified as Onondaga chert.

Caches are pit features which typically contain large quantities of Meadowood bifaces, and nothing else. Over 62% of these special features (n=23, on a total of 37, occurring in 2 habitation and 17 mortuary sites) and 37% of the Meadowood cache bifaces (n=2,986) have been found in the Ontario/Erie Lowlands and the northern periphery of the Glaciated Allegheny uplands. The main area of distribution of caches and Meadowood cache bifaces in these regions includes the Onondaga escarpment, and extends between Long Point to the west and Oneida Lake to the east.

Meadowood cache bifaces were the favoured long-distance exchange product circulating within and beyond the Meadowood Interaction sphere. Ideal for transport, caching, and future modification, cache bifaces are well suited for exchange. The interpretation of Meadowood bifaces as long-distance trade items “par excellence” is supported by their stylistic and technological homogeneity, which likely indicates production by part or full-time specialists. Skilled crafting has been associated with long-distance trade for practical reasons, such as the need to efficiently produce large quantities of items, but also because objects produced by skilled artisans are generally attributed high value. This is explained by the quality of the products themselves, but it may also be due to the social status of the artisans or their association with individuals of high status (Helms 1993: 17).

It was suggested earlier that in order to participate and benefit from long-distance exchange networks (established since Late Archaic times in various regions of the Northeast), Meadowood communities intensified the production of Onondaga chert tradable items to exchange in return for exotic products from neighbouring regions. The spatial distribution of cache bifaces further support this scenario and suggest that finely crafted Onondaga chert bifaces were the favoured trade item between Meadowood communities and groups from the Midwest and the Atlantic Coast. Through a distributional study of Meadowood cache bifaces in the Northeast Granger (1979: 116) concludes that “the data demonstrate the existence of an exchange and intercommunication network between cultural groups living in a common adaptive sphere in the Northeast.” Comparing the distribution of cache bifaces with that of Meadowood projectile points, he also observed a “distinct difference in occurrence between “cache blades” and projectile points and (...) that the uniformity of the “cache blade” was such that it, not the characteristic side-notched projectile point was the best indicator of information sharing between cultural groups” (Granger 1981: 93).

Meadowood cache bifaces have been recorded in 52 habitation and 44 mortuary sites. Taking into account the total number of habitation and mortuary components, these results indicate that Meadowood cache bifaces are more often present in mortuary contexts (chi-square=32.1, $p < 0.0001$). This tendency is confirmed when the actual numbers of items in habitation ($n=1,531$) versus mortuary sites ($n=6,433$) are compared. Statistical analysis of these data using Student’s t-test reveals that the mean number of Meadowood cache bifaces is significantly larger in mortuary components ($p=0.003$).

With only a slight majority of cache bifaces in mortuary sites (55%), the Ontario/Erie Lowlands is the province where the proportion of cache bifaces in habitation contexts is the highest (Table 4.2). This concentration in habitation contexts reflects the manufacture of cache bifaces at sites such as Riverhaven and Sinking Ponds, where earlier stages of biface manufacture as well as a significant number of finished products occurred (Granger 1981: 63). Outside the Ontario/Erie Lowlands, most provinces show a much higher concentration of Meadowood cache bifaces in mortuary contexts. The Hudson-Mohawk-Susquehanna Lowlands is the only exception, where a majority of the few Meadowood cache bifaces recorded in this region came from a cache found at the habitation site of Nine Mile Swamp (Granger 1981: 66)¹⁶.

Table 4.2 Relative proportions of Meadowood diagnostics within habitation (H) and mortary (M) sites

| | Cache bifaces | | | Projectile points | | | Scrapers | | |
|---|-----------------|-----------------|-------------------|-------------------|----------------|-------------------|---------------|----------------|-------------------|
| | M | H | Unident. contexts | M | H | Unident. contexts | M | H | Unident. contexts |
| Lakes Ontario/Erie Lowlands | 55% (n=1296) | 45% (n=1046) | | 14% (n=50) | 86% (n=314) | | 11% (n=29) | 89% (n=245) | |
| St-Lawrence-Champlain Lowlands | 89% (n=2269) | 11% (n=283) | | 17% (n=36) | 80% (n=172) | 3% (n=8) | 8% (n=40) | 88% (n=419) | 4% (n=15) |
| Appalachian Uplands | 88% (n=567) | 12% (n=77) | | 24% (n=23) | 76% (n=73) | | 22% (n=2) | 78% (n=7) | |
| Hudson/Mohawk/Susquehanna Lowlands | 19% (n=21) | 81% (n=90) | | 0% (n=0) | 100% (n=43) | | 0% (n=0) | 100% (n=4) | |
| Atlantic Coastal Plain | 99% (n=1717) | 1% (n=19) | | 27% (n=28) | 73% (n=74) | | 50% (n=8) | 50% (n=8) | |
| Maine/Maritime | 91% (n=39) | 9% (n=4) | | 25% (n=12) | 75% (n=36) | | 0% (n=0) | 100% (n=1) | |
| Western Great Lakes | 98% (n=523) | 2% (n=9) | | 11% (n=9) | 89% (n=70) | | 10% (n=1) | 90% (n=9) | |
| Canadian shield | 0% (n=0) | 9% (n=3) | 91% (n=30) | 0% (n=0) | 82% (n=9) | 18% (n=2) | 0% (n=0) | 100% (n=1) | |

¹⁶ Granger observed a second case of exception in the Susquehanna-Delaware lowlands but data from a number of additional mortuary/ritual components such as the Gray cache reversed the tendency, as Granger (1978: 76) himself predicted when he wrote that “the Susquehanna-Delaware distribution is of such low frequency as to be in doubt.” It is probable that future data from the Hudson-Mohawk Lowlands will similarly modify the present figure. Granger (1978: 76) also suggested that Nine Mile Swamp might be better classified as a possible ceremonial site pending additional information.

Associated Features

At Meadowood mortuary sites, a large number of cache blades are typically found within the context of a few features, while cache blades recovered in habitation sites are more commonly isolated finds (Table 4.3).

At Riverhaven, a site where cache bifaces were being produced, these artefacts were recovered in a variety of different features. Surprisingly though, only one was found in a “manufacture” pit with manufacturing debris (Granger 1978: 225). When both artefact types are present, the average ratio of cache bifaces to projectile points is 19:1 in mortuary contexts, compared to 2:1 in habitation contexts.

Table 4.3 Distribution of Meadowood cache bifaces within features

| | Proportion in all features | Relative proportions within features | | | | | | | |
|-----------------------------|----------------------------|--------------------------------------|---------------|------------------|---------------|------------------|---------------|----------------|--------------------------|
| | | Hearths | Storage pits | Manufacture pits | Rock Heaps | Clay heaps | Caches | Burials | Unknown feature function |
| Scaccia (n=37) | 49% (n=18) | | 6% (n=1) | | | | | 11% (n=2) | 83% (n=15) |
| Riverhaven (n=705) | 15% (n=105) | 8% (n=8) | 77% (n=81) | 1% (n=1) | 10% (n=11) | 4% (n=4) | | | |
| Hunter (n=243) | 100% (n=243) | | | | | 100% (n=243) | | | |
| Muskalonge (n=1712) | 100% (n=1712) | | | | | 100% (n=1712) | | | |
| Bruce Boyd (n=70) | 64% (n=45) | | | | | | 71% (n=32) | 29% (n=13) | |
| Oberlander 2 (n=163) | 99% (n=161) | | | | | | 29% (n=47) | 68% (n=110) | 2% (n=3) |

Meadowood Projectile Points

Environmental and Social Contexts

A minimum of 959 Meadowood projectile points distributed across the Northeast have been reported in the literature (Table 4.1). This is significantly less than the 7,994 reported Meadowood cache bifaces in the same territory. Nevertheless, these artefacts remain the most commonly used diagnostic to identify Meadowood occupations in sites. Indeed, 140 components (111 habitation, 27 mortuary, and 2 sites of unknown nature)

yielded at least one such point, compared to the 97 sites on which Meadowood cache bifaces occurred. The tendencies observed for Meadowood cache bifaces are reversed in the case of Meadowood projectile points, the latter being more often present in habitation contexts (chi-square=9.19, $p : 0.002$). Although less pronounced, the statistical difference between the number of Meadowood projectile points occurring in habitation sites ($n=790$) versus mortuary sites ($n=159$) is also noteworthy ($p: 0.08$, Student's t-test). In other words, Meadowood projectile points do not appear to be randomly distributed in habitation and mortuary contexts.

Seventy-one percent ($n=676$) of the recorded Meadowood points were found in the Ontario/Erie Lowlands, the St. Lawrence/Champlain Lowlands, and in the Appalachian uplands (Figure 4.2). While these numbers reflect a more homogenous distribution than observed for Meadowood cache bifaces, only 11 Meadowood sites yielded 20 points or more, with Pointe-du-Buisson having the greatest number. The single mortuary component with more than 20 Meadowood projectile points is the Bruce Boyd site ($n=31$), and half of these artefacts were found within three caches. Among the ten remaining habitation components that yielded more than 20 points, six are located in the Ontario/Erie Lowlands and the northern periphery of the Glaciated Allegheny uplands, two are in the St. Lawrence/Champlain Lowlands, one in the Atlantic Coastal Plain, and finally one is in the Saginaw Bay area of the Western Great Lakes province (Table 4.4). The great majority or even all of the points occurring at the sites included in Table 4.4 were made of Onondaga chert, except at the Batiscan site where only four Meadowood points are manufactured in Onondaga chert. It can be argued that in regions distant from Onondaga chert sources, high frequencies of Meadowood projectile points (made from Onondaga chert) imply trade rather than local production.

Unlike cache bifaces, Meadowood projectile points are more abundant in habitation contexts (Table 4.2). If the quantity of Meadowood points reflects intensity of occupation, the above numbers suggest a limited number of reoccupied base camps occurring in the "core area" of the Meadowood Interaction sphere as well as in peripheral regions. However, some authors have challenged the idea that Scaccia and other large Meadowood sites were base camps, proposing the alternative scenario that they represent rare aggregation sites occupied by multiple groups only occasionally (Versaggi 1999: 49).

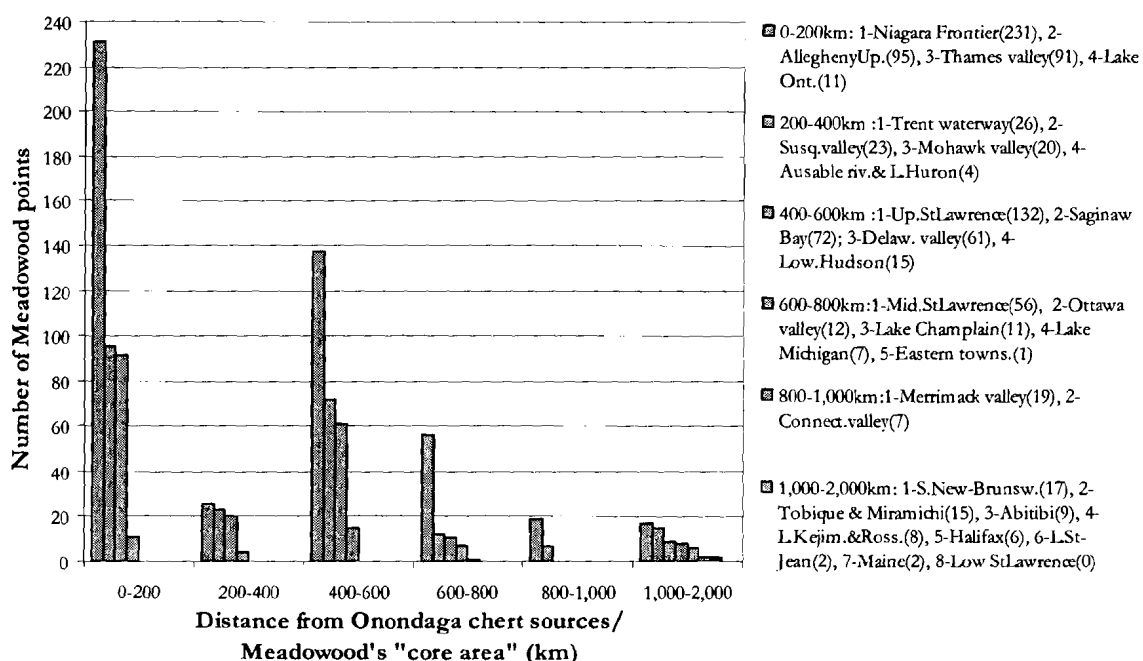


Figure 4.2 Distribution of Meadowood projectile points among different geographic areas

Table 4.4 Assemblages containing ≥ 20 Meadowood projectile points

| SITES | PROVINCES | NUMBER OF POINTS |
|-------------------|--------------------------------|------------------|
| Batiscan | St-Lawrence-Champlain Lowlands | 20 |
| Frank | Lakes Ontario/Erie Lowlands | 23 |
| Faucett | Atlantic Coastal Plain | 24 |
| Sinking Ponds | Lakes Ontario/Erie Lowlands | 30 |
| Bruce Boyd | Lakes Ontario/Erie Lowlands | 31 |
| Conservation Park | Western Great Lakes | 34 |
| Welke-Tonkonoh | Lakes Ontario/Erie Lowlands | 48 |
| Riverhaven 2 | Lakes Ontario/Erie Lowlands | 52 |
| South Waterport | Lakes Ontario/Erie Lowlands | 56 |
| Scaccia | Appalachian Uplands | 72 |
| Pointe-du-Buisson | St-Lawrence-Champlain Lowlands | 107 |

Associated Features

Table 4.5 shows the various Early Woodland features in which Meadowood projectile points were recovered. At Batiscan, provenience data were insufficient to allow contextual analysis. The only mention regarding the features and their contents states the presence of four hearths and three refuse pits, with artefacts being generally more abundant

around the hearth features (Lévesque et al. 1964:4). It is also worth mentioning that projectile points at Batiscan were all recovered on the lower terrace where the habitation component was located. No projectile point or scraper was associated with the Meadowood cremation found on the upper terrace.

Table 4.5 Distribution of Meadowood points within features

| | Proportion in all features | Relative proportions within features | | | | | |
|-------------------------------|----------------------------|--------------------------------------|---------------|-------------|---------------|----------------|--------------------------|
| | | Hearths | Storage pits | Refuse pits | Caches | Burials | Unknown feature function |
| Scaccia (n=72) | 51% (n=37) | 11% (n=4) | 41% (n=15) | | | | 48% (18) |
| Riverhaven 2 (n=52) | 13% (n=7) | | 100% (n=7) | | | | |
| Hunter (n=5) | 40% (n=2) | | | | | 100% (n=2) | |
| Muskalonge (n=10) | 100% (n=10) | | | | | 100% (n=10) | |
| Bruce Boyd (n=31) | 100% (n=31) | | | 6% (n=2) | 52% (n=16) | 32% (n=10) | 10% (n=3) |
| Oberlander 2 (n=11) | 100% (n=11) | | | | | P | |

At the Riverhaven 2 and Scaccia sites, projectile points and scrapers were predominantly associated with what were interpreted as storage features¹⁷. Unlike processing tools such as knives or scrapers, the presence of projectile points within some of these features cannot simply be linked to their uses as food storage pits. Based on the fragmentary discards found within them, Granger (1978:251) suggested that the storage pits excavated at the Riverhaven 2 site may ultimately have served a refuse function. At the Scaccia site, Ritchie and Funk (1973: 347) similarly suggested that “some of the pits, perhaps even a majority, probably served originally to store foodstuffs and were later used for refuse disposal.” Alternately, they could have been accidentally included in the pits when the latter

¹⁷ Based on the metric attributes of each pit recovered at the Scaccia site in 1965 (Ritchie and Funk 1973), together with a typology of northeastern North American archaeological pits published by Marilyn C. Stewart (1977), some inferences were made about the function of the features found at the Scaccia site. This reconstruction suggests that at least two additional cache bifaces, fourteen Meadowood projectile points, and four bifacial scrapers came from storage pits, even though the function of these features is not defined in the report on Scaccia site (Ritchie and Funk 1973).

were filled with adjacent sediments. Thus, a number of projectile points found within features at the Scaccia and Riverhaven 2 sites may represent discarded or lost items. Finally, it is also possible that some of these features were used to store non-perishable items or valuables in view of a future utilization.

While Meadowood points are generally more abundant in habitation contexts, they also occur in mortuary sites, often within burial features. At Bruce Boyd, however, approximately half of the points were found in three caches. Because they yielded more artefacts than any one of the Meadowood burials from Bruce Boyd, Spence (n.d.) suggested that these caches “may be community offerings to the band dead, made apart from the specific offerings placed with individuals.” Tools found in the three caches are characterized by a higher proportion of edge wear and breakage caused by use, something that could indicate that “these artefacts were utilized during preparation for mortuary ceremonies and discarded thereafter” (Spence and Fox 1986: 26). Moreover, the morphological and metric variability of the tools suggest that two or more artisans are responsible for the manufacture of each pit’s content (Spence et al. 1990: 133).

In sum, projectile points are recovered from markedly different contexts in habitation and mortuary sites, indicating different functions or roles for these objects. In habitation components, the presence of a majority of feature-associated Meadowood points in storage and refuse pits is more in line with a utilitarian function (unless they represent discarded prestige or ritual items). In mortuary sites, on the other hand, the fact that Meadowood points are mostly found in caches and burials indicates that, under certain circumstances, these artefacts lost their utilitarian function to become grave goods and/or prestige items. The low percentage of use wear on Meadowood projectile points occurring in mortuary sites contrasts with the common presence of such wear on points from habitation sites. These data in turn suggest that some of the Meadowood points were produced as ritual or prestige items, while others were meant to be used (rather than multiple functions or roles occurring within the lifespan of a single object).

Meadowood Bifacial Scrapers

Environmental and Social Contexts

The distribution of Meadowood bifacial scrapers in habitation versus mortuary components is similar to that of projectile points, although scrapers are not quite as commonly encountered (Table 4.2). Compared to the 969 Meadowood projectile points discussed above, 789 Meadowood bifacial scrapers were found in 62 sites (Table 4.1). These artefacts, predominantly produced from Onondaga chert, are common in only three regions: the Niagara Peninsula, the Upper St. Lawrence valley and the Middle St. Lawrence valley (Figure 4.3). Within each of these regions, they are unusually abundant at the Riverhaven 2 (n=196), Pointe-du-Buisson (n=209) and Batiscan (n=149) sites. These three sites alone account for approximately 70% of all known Meadowood bifacial scrapers. This distribution is very interesting and suggests some form of specialization in the activities carried on at some sites. A majority of these Meadowood scrapers were modified from Onondaga chert cache bifaces.

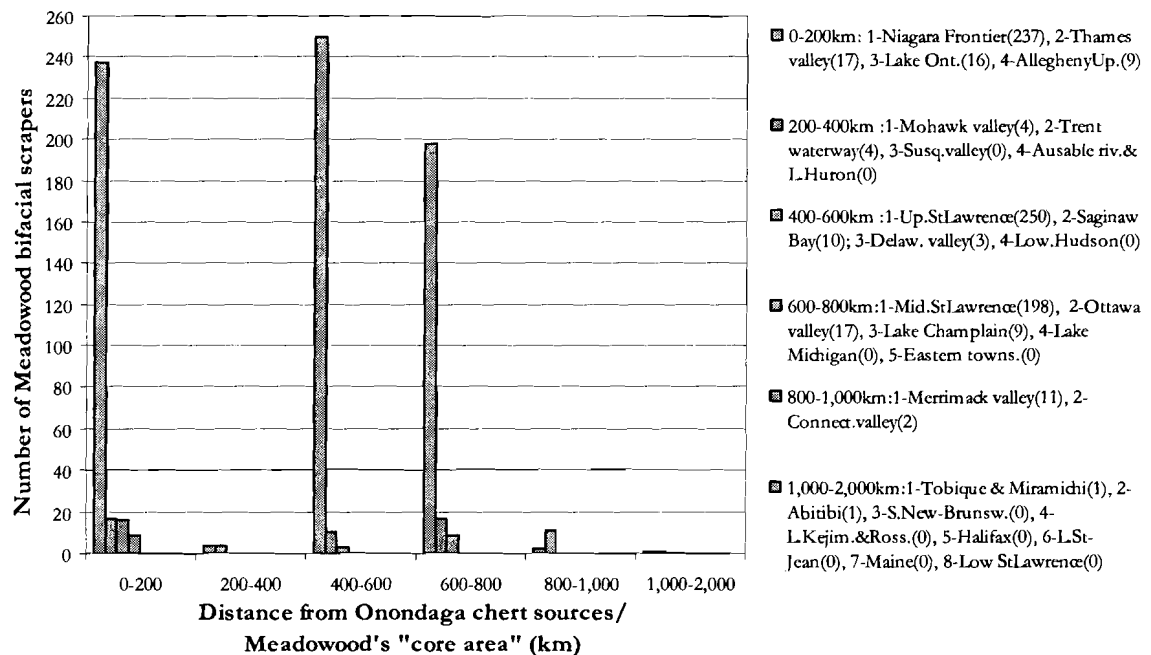


Figure 4.3 Distribution of Meadowood bifacial scrapers among different geographic areas

Given that efficient (predominantly unifacial) scrapers can, and were being produced using raw materials other than Onondaga chert and stylistic guidelines other than Meadowood, it could be argued that such specialisation in activities was closely linked to the role of a limited number of communities within the Meadowood Interaction Sphere. Pushing this argument further, this specialization could also provide clues as to which environmental elements of the Upper and Middle St. Lawrence valleys are responsible for the concentration of Meadowood sites observed in those regions. Since scrapers are generally associated with hide processing, we can speculate that Meadowood groups in the Upper and Middle St. Lawrence valley were well positioned to secure and process deer and other species of mammal hides during seasons when they aggregate. A similar hypothesis was proposed for the Meadowood groups in the Upper Susquehanna valley (Versaggi 1999: 53).

Associated Features

Table 4.6 lists the types of features recorded at the sites selected for this study which contained Meadowood bifacial scrapers. In habitation contexts, storage pits are the features which yielded the most Meadowood bifacial scrapers, an observation that also applied to Meadowood projectile points. At the Riverhaven 2 site, the nine deep pits interpreted as storage facilities were clustered at the base of the first terrace of the Niagara River. It is reasonable to believe that such features were used during the dry fall and cold winter months, since they would have been wet during other times of the year. In light of this seasonal assumption and the high frequency of scrapers and processing tools in and around these features, Granger (1978: 251) proposed the use of these pits to store meat in cool locations.

Like projectile points, bifacial scrapers are less abundant, but always present, in mortuary contexts. In three of the four mortuary components analyzed in this dissertation, all of the recorded Meadowood bifacial scrapers were found in burial pits. The only exception is Bruce Boyd, where all of the Meadowood scrapers (n=9) were recovered from the three caches mentioned above. High proportions of scrapers bearing fire effects were recorded in the Meadowood mortuary sites (Table 2.4), an observation consistent with the hypothetical relationship between these alterations and the practice of ritual involving fires. Batiscan is the habitation site where scrapers with fire effects are the most abundant.

Although this slight occurrence may be insignificant, it may also be related to the occasional ritual or funerary practices occurring at this site.

Table 4.6 Distribution of Meadowood bifacial scrapers within features

| | Proportion in all features | Relative proportions within features | | | | | |
|-------------------------------|----------------------------|--------------------------------------|--------------|--------------|---------------|----------------|--------------------------|
| | | Hearths | Storage pits | Rock heaps | Caches | Burials | Unknown feature function |
| Scaccia (n=4) | 100% (n=4) | | | | | | 100% (n=4) |
| Riverhaven 2 (n=49) | 24% (n=12) | 8% (n=1) | 67% (n=8) | 25% (n=3) | | | |
| Hunter (n=10) | 70% (n=7) | | | | | 100% (n=7) | |
| Muskalonge (n=2) | 100% (n=2) | | | | | 100% (n=2) | |
| Bruce Boyd (n=9) | 100% (n=9) | | | | 100% (n=9) | | |
| Oberlander 2 (n=12) | 100% (n=12) | | | | | 100% (n=12) | |

Birdstones

Environmental and Social Contexts

A total of 31 finished and 13 unfinished birdstones were found in the Meadowood contexts inventoried for the present study. They are distributed between 11 habitation and 13 mortuary sites. Two isolated finds without site association also occurred in the Ottawa River valley. The distribution of birdstones across the landscape and the recovery of unfinished specimens reveal some important information concerning areas of manufacture and circulation routes (Figures 4.4 and 4.5). Pop-eyed birdstone blanks in various stages of manufacture have been found on Ontario sites from the Lake St. Clair vicinity in the south to the Donaldson site in the north, suggesting that, at least during Meadowood times, birdstones were being manufactured in this area (Spence and fox 1986: 15). For example, a flaked and pecked grey banded slate fragment representing the head and foreportion of a birdstone preform broken in production was recovered at the Ferris site. This artefact is very

similar to others found in southwestern Ontario, such as two unfinished specimens from the Brodie site, one from the Scott Wales site and six from the Wishing Well site (Ellis et al. 1988: 13; Fox 1984a: 8-9; Wilson 1993: 18). The birdstone preforms recovered at the Scaccia and Oberlander 2 sites differ from the previous items, being manufactured from sandstone instead of slate.

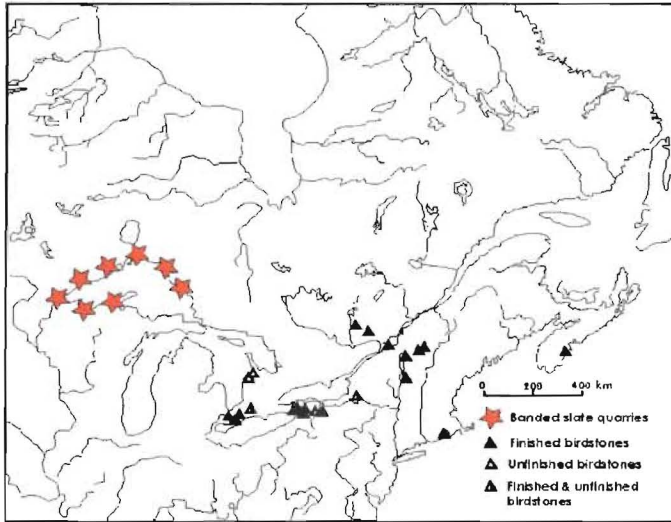


Figure 4.4 Distribution map of finished and unfinished Meadowood birdstones

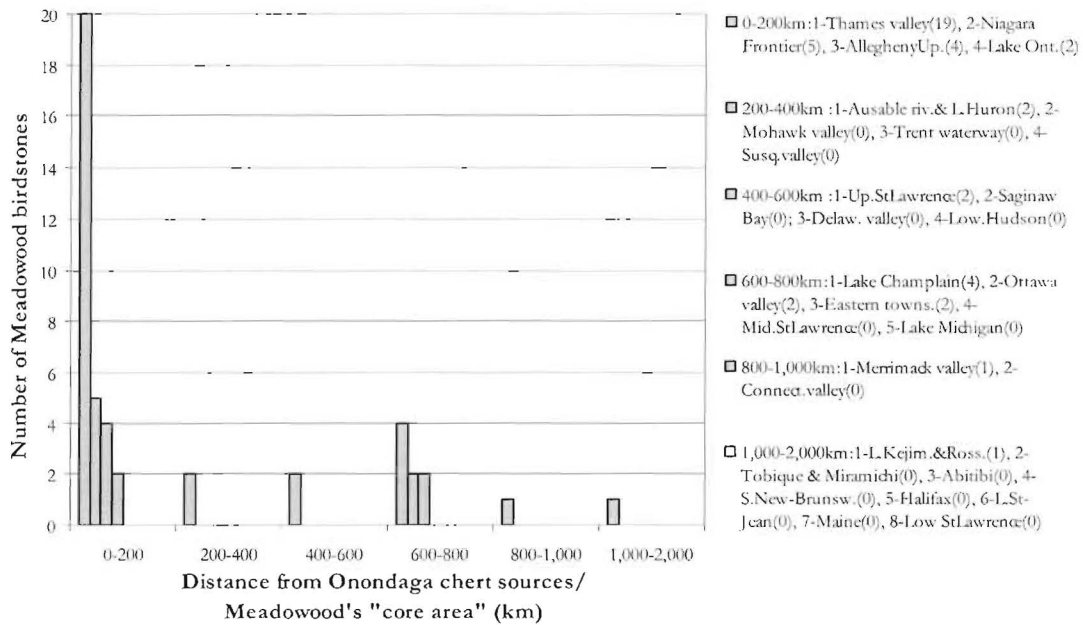


Figure 4.5 Distribution of Meadowood birdstones among geographic areas

Slate birdstones appear to have been traded from Lake Hudson/Lake St. Clair/Thames River to the Niagara Frontier region, probably via Grand River and the northern shore of Lake Erie. Birdstones also appear to have moved north, from Lake Hudson/Georgian Bay to the Ottawa River valley via Lake Nipissing, and south to Lake Champlain, the Eastern Townships, and the Upper St. Lawrence valley. The birdstone recovered at the BaDd-4 site in Nova Scotia was manufactured from local Halifax slate and reflects the emulation of a particular style of finely crafted items by communities located over 1,500 km (as the crow flies) from banded slate quarries. The recovery of birdstones in upland areas, such as the southern periphery of the Laurentides uplands (Ottawa valley), the Eastern Townships and the Allegheny uplands, is very interesting and contrasts with the more common recovery of Meadowood sites in lowland locations. This distribution could reflect the selection, by Meadowood communities, of marginal and higher locales for the performance of funerary rituals.

Seventeen finished and eleven unfinished birdstones were found in habitation components, while thirteen finished and only two unfinished specimens come from mortuary contexts (Table 4.7). Taking into account the total number of habitation and mortuary components, these results indicate that finished birdstones are more often present in mortuary contexts (chi-square=9.79, p: 0.002).

Table 4.7 Distribution of unfinished and finished birdstones in Meadowood mortuary and habitation sites

| | | Mortuary | Habitation | Unknown function | Total |
|--------------|--------------|-----------|------------|------------------|-----------|
| Unfinished | | 2 | 11 | | 13 |
| Finished | Broken | 4 | 8 | | 12 |
| | Whole | 7 | 2 | 2 | 11 |
| | Info missing | 2 | 6 | | 8 |
| Total | | 15 | 27 | 2 | 44 |

The contexts in which birdstones were recovered, in both habitation and mortuary sites, can provide valuable information regarding their function. The detached head of two birdstones were associated with hearth features at the Riverhaven 2 site, and in at least one case fire marked scars of detachment suggest that the head was broken off by a fire. At the Sinking Ponds site, a birdstone fragment with its head intentionally detached by a blow, and tail battered off was found in a pit feature tentatively interpreted as a cache or manufacture pit. The presence of notches along the ridges of many damaged birdstones suggests that

these notches were produced after breakage (Tremblay 2003: 9; Pl. 2.22). The significance of these notches remains enigmatic, although William Ritchie suggested that they reflect aspects of Meadowood groups' value system (Ritchie 1955: 41). Alternatively, they could reflect a notation system used to record special events or debts for example.

A broken birdstone from southern Ontario not only has notches along the ridges defining its head, but red ochre applied on its beak (whether before or after breakage is impossible to say — Figure 2.26). A number of observations can be made from the birdstones in Meadowood habitation contexts. First, complete and undamaged specimens are seldom found in such components (Table 4.7). Secondly, in some cases, birdstones appear to have been intentionally broken. Finally, in almost all cases these artefacts were subjected to some sort of special treatment after breakage.

Given their esthetic nature, the exotic materials often employed in their manufacture, and the great deal of time and effort investment required for their production, it is unlikely that birdstones were simply disposed of in fire places or elsewhere. Therefore, while the possibility that the fragmented birdstones from Riverhaven 2 were broken in use cannot be ruled out, their association with hearth features may also reflect ritual, feasting, or funerary practices taking place in habitation contexts. Hayden has suggested that intentional breakage or destruction of prestige items is characteristic of competitive feasts (Hayden 2001a: 53). Wealth destruction can create and reproduce social inequalities, by enabling "the donor to keep things while giving them to others, thereby disguising the reality of exchange" (Küchler 1997: 41-42). The ritual destruction of goods also validates claims to highly valued non-material possessions such as ancestral claims, titles, special ritual prerogatives (Codère 1950, cited in Harrison 1992: 236). In that regard, "killed" prestige items can be seen as "information goods" reflecting lineages, as well as social roles and status (Harrison 1992: 237).

While tentative, the association of birdstones with the practice of funerary rituals is supported by the recovery of such objects in habitation components closely related to Meadowood mortuary sites. For example, the recovery of birdstones at Scaccia, one of which was found in a burial feature, could be linked to the nearby presence of the Cuylerville cemetery. At the latter site, a truncated birdstone (identical to the finished specimen found in a grave at Scaccia) was included as an offering in one of the 21 burial features. Similarly, birdstones were found at Liahn 1, a habitation site associated with the mortuary component

designed as Liahn 2. Broken and/or feature-associated birdstones found in mortuary sites also corroborate the idea that these objects were given special treatment prior to their final interment. For example, it was suggested that breakage of the two birdstones found in burials at the Pointe-du-Buisson site occurred before or during cremation, which probably took place outside the cemetery's perimeter (Clermont 1978: 10). Similarly, a bar-type birdstone was found in a crematory pit at the East Creek site in Vermont.

RAW MATERIALS

Onondaga Chert

It is generally stated that Early Woodland's flaked stone tool assemblages located within the Meadowood Interaction Sphere's core area are characterized by a focus on primary sources of Onondaga chert to the exclusion of virtually every other chert material available in the area (Ellis et al. 1988: 15). While hard to believe, this does not only apply to the production of diagnostic artefacts, but to all flaked stone tools. Such a strategy differs from the one favoured in the preceding Late Archaic period in the same area, when the norm was the direct-embedded procurement of various local lithic resources in an episodic and sequential manner. Moreover, in Late Archaic times "biface preforms were over-produced in anticipation of future demand at or near the time of lithic procurement episodes, and usually in the vicinity of the stone sources employed" (Ellis and Spence 1997: 137). The Early Woodland focus on Onondaga chert even at sites far away from the source suggests well organized procurement events, either through long-distance trips or trade. It has been argued that:

[t]he only situations in which one would not find direct-embedded procurement of multiple sources are those ... where social/ceremonial factors apparently outweigh purely practical considerations of tool production and use, or where access to the higher quality sources is restricted (Ellis and Spence 1997: 139).

More recent data recovered in the Middle Thames River valley show that such exclusive use of Onondaga chert can no longer be assumed (Wilson 1997: 45). Other sources were occasionally used also. At the East Creek site in Vermont, for example, Onondaga chert was used to make 95% and 66% of the cache bifaces from the burial and habitation areas, respectively. Surprisingly, local Mt. Independence chert was involved in the

production of 96% of a sample of 73 cache bifaces recovered from a crematory at this site (Loring 1985: 101). At the Pocock site, local Thames River gravel Onondaga chert and non-local Kettle Point chert dominate in the debitage collected from Early Woodland features. Moreover, a few locally available cores of Onondaga chert recovered from Middle Thames River Meadowood sites exhibit a portion of water worn rind or patina. This indicates occasional local production of the basic Meadowood tool kit. Nevertheless, primary outcrops of Onondaga chert were used to produce the artefacts from the larger Meadowood caches (Spence and Fox 1986: 31; Spence *et al.* 1990: 135).

Provenience and Sourcing

Onondaga chert is of Middle Devonian age and occurs in the Onondaga Formation. Onondaga chert-bearing limestone outcrops for over 100 km along the north Lake Erie shore, stretching from Fort Erie on the Niagara River and swinging westward and inland to the Slack-Caswell quarry (Spence and Fox 1986: 21). The Onondaga chert occurs both as nodules and as thin layers seldom over four or five inches thick and not continuous (Wray 1948: 41). Relatively few cases of prehistoric Onondaga chert quarrying has been recorded in the literature. Exceptions include the multicomponent quarry of Divers Lake, a kettle lake of glacial origin bordering an escarpment of Onondaga limestone. In historic times, this lake was considered sacred ground by the Senecas (Prisch 1976: 8-9).

Exploitation of Onondaga chert is also documented at the Slack Caswell quarry (Spence and Fox 1986: 21), at the Fort Erie-Orchid and Surma sites (Emerson and Noble 1966), and possibly at the Bruce Lakefront component (Jarvis 1988: 23; Spence and Fox 1986: 21). Beyond the area of primary outcrops secondary deposits of Onondaga chert (transported by glacial and outwash activity) continue well to the west along the northern Lake Erie shore and in the gravels of a number of drainages, such as the Thames River (Parkin 1977: 85; Wilson 1997: 20). While the Onondaga Formation is widely assumed to have provided the dark gray and mottled tan chert used in the manufacture of Meadowood cache bifaces, points and scrapers, precise sources are generally not discussed, or they have been assumed to have been nearby (Jarvis 1988: 24). The use of trace element analysis has been successful in distinguishing between Onondaga and other carbonate cherts such as those from the lower Devonian Bois Blanc Formation (Parkins 1977: 94). However, when comparing various outcrops of Onondaga chert, visual and microscopic studies have only

been able to demonstrate gross differences between outcrops at the eastern and western ends of the Onondaga Formation (Hammer 1976). Because intra-outcrop variation in chert is often greater than inter-outcrop variation, the precise sourcing of artefacts made from Onondaga Formation stones is problematic (Jarvis 1988: 56).

Fortunately, the identification of the general area where Onondaga chert originates is adequate in the case of regional studies such as this one. The territory is so vast that an error, even of up to 100 km (which corresponds to the approximate coverage of Onondaga chert outcrops) in the estimated distances between various geographical areas and Onondaga chert sources should not significantly alter the regionally-based interpretations. In fact, when comparing the distribution of Onondaga chert tools with the geological provenience of this lithic material, subregions situated at about the same distance from Onondaga chert sources, i.e., plus or minus 100 km, were grouped together (Figure 4.6)

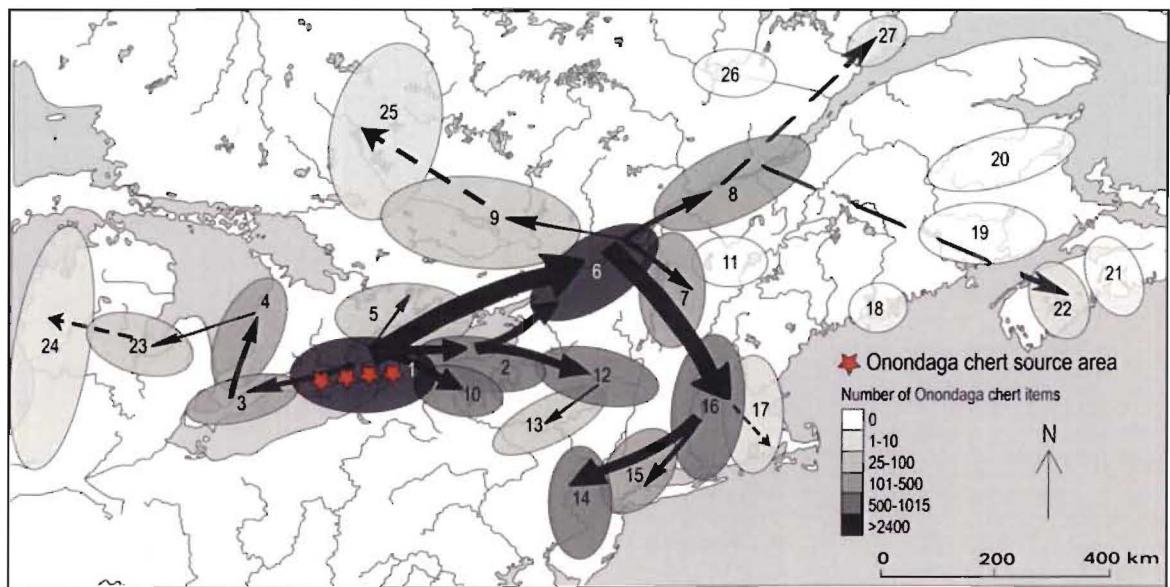


Figure 4.6 Distribution map of Meadowood Onondaga chert items

ONTARIO/ERIE LOWLANDS: 1-Niagara Peninsula, 2-Lakes Ontario&Oneida, 3-Thames River & St. Clair Lake, 4-Auseable River & Lake Huron, 5-Trent Waterway.

ST. LAWRENCE-CHAMPLAIN LOWLANDS: 6-Upper St. Lawrence valley, 7-Lake Champlain, 8-Middle St. Lawrence valley, 9-Ottawa valley.

APPALACHIAN UPLANDS: 10-Glaciated Allegheny Uplands, 11-Eastern Townships.

HUDSON/MOHAWK/SUSQUEHANNA LOWLANDS: 12-Mohawk & Upper Hudson valley, 13-Susquehanna valley.

ATLANTIC COASTAL PLAIN: 14-Delaware valley, 15-Lower Hudson & Long Island, 16-Connecticut Valley, 17-Merrimack valley.

MAINE/MARITIME: 18-Southern New-Brunswick, 19-Tobique & Miramichi Valleys, 20-Halifax, Darmouth & Minas Basin, 21-Lakes Kejimikujik & Rossignol.

WESTERN GREAT LAKES: 22-Saginaw Bay, 23-Lake Michigan.

CANADIAN SHIELD: 24-Abitibi-Témiscamingue, 25-Lac St. Jean, 26-Lower St. Lawrence valley

Spatial Distribution within Meadowood Components

The reconstruction of raw material distribution patterns is essential to understanding the structure, participants, and motivations underlying past exchange networks. This section addresses the distribution and relative frequency of Onondaga chert items at Meadowood residential and burial sites. When data concerning the quantity of Onondaga chert associated with a Meadowood occupation at a site was lacking or incomplete, the following procedure was adopted: for sites within the Ontario/Erie Lowlands, Allegheny uplands, and Upper St. Lawrence valley, where Meadowood diagnostics are almost exclusively manufactured in Onondaga chert, the cache bifaces, points and scrapers reported to be typically Meadowood were assumed to have been made in Onondaga chert. For others regions, such assumption were not made since the exclusive or almost exclusive use of Onondaga chert does not necessarily apply in those cases, so only sites were used where specific raw materials were quantified.

The figures used in this study represent minimum numbers of Onondaga chert tools associated with Meadowood occupations. There are a number of sites where only the presence of diagnostics made from Onondaga chert is mentioned, in which case the minimum number entered in the data was one (one diagnostic being sufficient to identify a Meadowood occupation/influence), unless photographs could be used to more accurately estimate the number of Onondaga chert items (e.g., Loring 1985: fig 3.1). Furthermore, because this cultural episode is mainly identified through its highly diagnostic elements, the presence of non typical Onondaga chert tools on multicomponent sites could not be associated with Meadowood occupations with any certainty, although in some cases there probably were many nondiagnostic Meadowood artefacts made from Onondaga chert. This is the case for example at the Husler site, where besides the three Meadowood diagnostics, 42 tools or tool fragments and 103 flakes were identified as Onondaga chert. This is the highest number of Onondaga objects recorded in the region of Brome-Mississquoi, and it is very likely that such a high representation results from participating in the Meadowood Interaction Sphere (Forget 1996: 60).

Figure 4.7 and Table 4.8 show the resulting distribution of identifiable Meadowood Onondaga chert items between regions. In Figure 4.7, regions were grouped according to their distance from primary outcrops. The first observation that can be made is that the

abundance of Onondaga chert at a locale does not appear to be function of the distance from its source(s). Instead, concentrations of Onondaga chert items occur in a limited number of regions located between 0 and 800-1,000 km from primary outcrops. Very high concentrations of Onondaga chert (>2400 items) are noted in the Niagara Frontier and the Upper St. Lawrence valley. Since primary sources of this raw material are found in the former region, the abundance observed here, and the fact that 90% (n=2,162) of the Niagara Frontier Onondaga chert artefacts come from secular contexts, are not surprising (Table 4.8). It is interesting, however, that the Upper St. Lawrence valley yielded the most Onondaga chert artefacts. This high density should be somewhat modified since 78% (n=1,998) of these items come from Hunter and Muskalonge, two mortuary components on the Indian River, with 59% (n=1,500) of them found in a single burial feature from the Muskalonge Lake site.

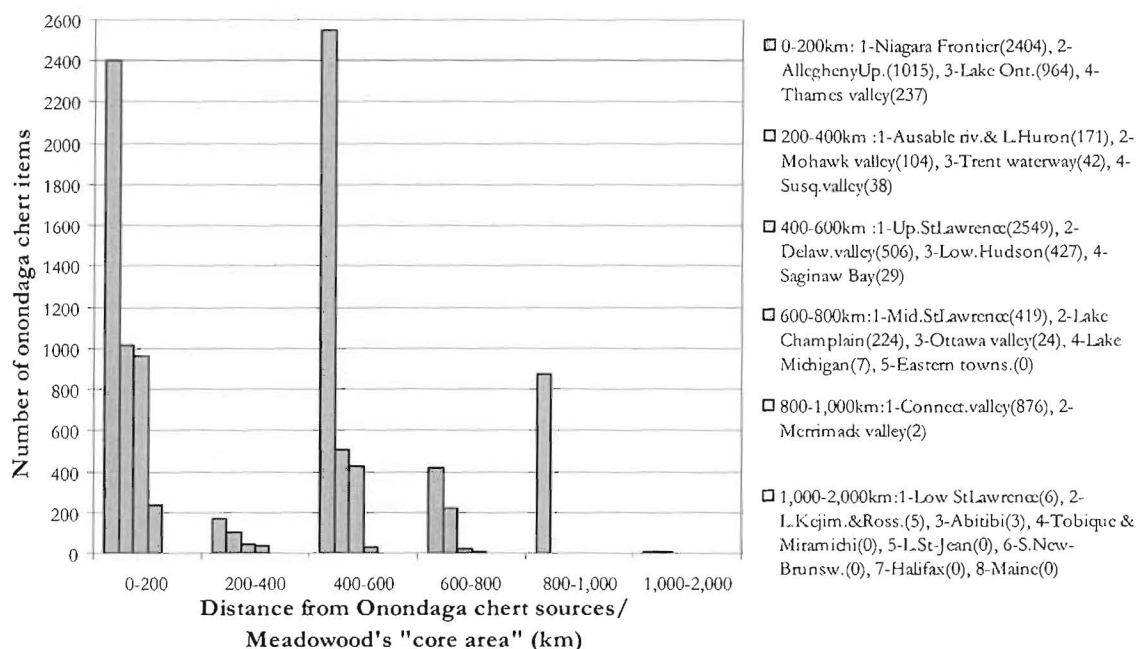


Figure 4.7 Distribution of Meadowood Onondaga chert items among different geographic area.

No other region contains such high numbers of Onondaga chert artefacts associated with Meadowood occupations. In fact, the northern periphery of the Glaciated Allegheny uplands, where the third highest concentration of Onondaga chert is recorded, yielded less than half (n=1,015) as many items.

Table 4.8 Number of Meadowood Onondaga chert items in habitation vs mortuary sites

| Regional physiographic provinces | Subregions | Onondaga chert (N) | | | |
|---|---|--------------------|-------|----------------|-------|
| | | Habitation sites | | Mortuary sites | |
| Lakes Ontario/Erie Lowlands (Figure 3.1) | Niagara Peninsula | 2,161 | 2,398 | 242 | 1,419 |
| | Lake Ontario / Oneida Lake | 12 | | 952 | |
| | St-Clair Lake / Thames River | 182 | | 55 | |
| | Auseable River / Lake Huron-Georgian Bay | 1 | | 170 | |
| | Ontario Lake (north shore) / Trent waterway | 42 | | 0 | |
| St-Lawrence-Champlain Lowlands (Figure 3.2) | Upper St. Lawrence valley | 531 | 976 | 2,018 | 2,220 |
| | Lake Champlain | 22 | | 202 | |
| | Middle St. Lawrence valley | 419 | | 0 | |
| | Ottawa valley | 4 | | 0 | |
| Appalachian Uplands (Figs. 3.1 and 3.2) | Glaciated Allegheny Uplands | 397 | 397 | 618 | 618 |
| | Eastern Townships | 0 | | 0 | |
| Hudson/Mohawk/Susquehanna Lowlands (Figure 3.3) | Mohawk-Upper Hudson valley | 83 | 125 | 21 | 21 |
| | Susquehanna valley | 42 | | 0 | |
| Atlantic Coastal Plain (Figure 3.3) | Delaware valley | 70 | 92 | 436 | 1,719 |
| | Lower Hudson / Long Island | 1 | | 426 | |
| | Connecticut River valley | 20 | | 856 | |
| | Merrimack River valley | 1 | | 1 | |
| Maine/maritimes (Figure 3.4) | Coastal Maine | 0 | 0 | 0 | 5 |
| | Southern New Brunswick | 0 | | 0 | |
| | Tobique / Miramichi valleys | 0 | | 0 | |
| | Halifax / Dartmouth / Minas Basin | 0 | | 0 | |
| | Lakes Kejimikujik and Rossignol | 0 | | 5 | |
| Western Great Lakes (Figure 3.5) | Saginaw Bay | 27 | 34 | 2 | 2 |
| | Lake Michigan | 7 | | 0 | |
| Canadian shield (Figure 3.6) | Abitibi-Témiscamingue | 3 | 9 | 0 | 0 |
| | Lac St. Jean | 0 | | 0 | |
| | Lower St. Lawrence valley | 6 | | 0 | |

Besides the Allegheny uplands, three other regions produced between 500 and 1,000 Onondaga chert artefacts. Within these “secondary distribution areas,” Onondaga chert objects concentrate in mortuary contexts (Table 4.8). One of these regions is adjacent to the Niagara Frontier and may represent down-the-line exchange. The two other areas—the Connecticut River valley (n=876) and the middle Delaware valley (n=506)—are located far away from the source(s) of Onondaga chert, between the Meadowood core area and the Atlantic Coast.

The distribution of Onondaga chert items in the six areas mentioned above appear to support the idea of several subregions acting as distribution centers. Indeed, a number of

regions adjacent to high density areas also yielded Onondaga chert items, but never in comparable quantity (between 10 and 500) and in a pattern suggesting down-the-line exchange from primary and secondary distribution centers (Figure 4.6). In Figures 4.8-4.10, sites within regions rich in Onondaga chert were ordered in descending order according to the number of Onondaga chert items they contain. The presence of marked discontinuities at the beginning of the curve (between a single or a few sites having unusually large numbers of Onondaga chert items and all the other sites) appears to reflect the existence of “centres” of distribution. Results of such rank ordering suggest that outside the Ontario/Erie Lowlands, Onondaga chert items concentrate in a few mortuary sites, where most of the trade and redistribution probably took place. This in turn emphasizes the role of Onondaga chert for use in a prestige/ritual sphere rather than a practical/economical sphere.

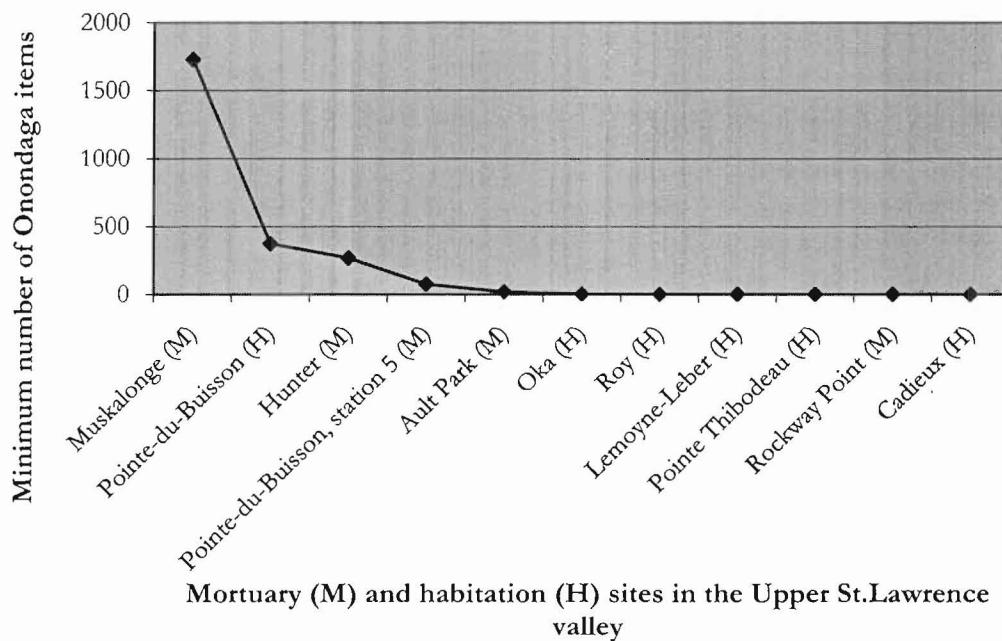
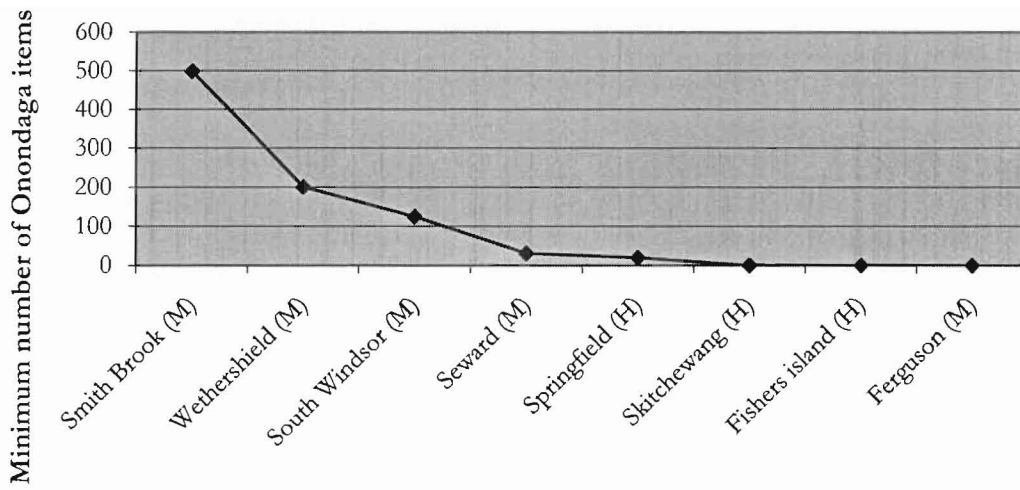
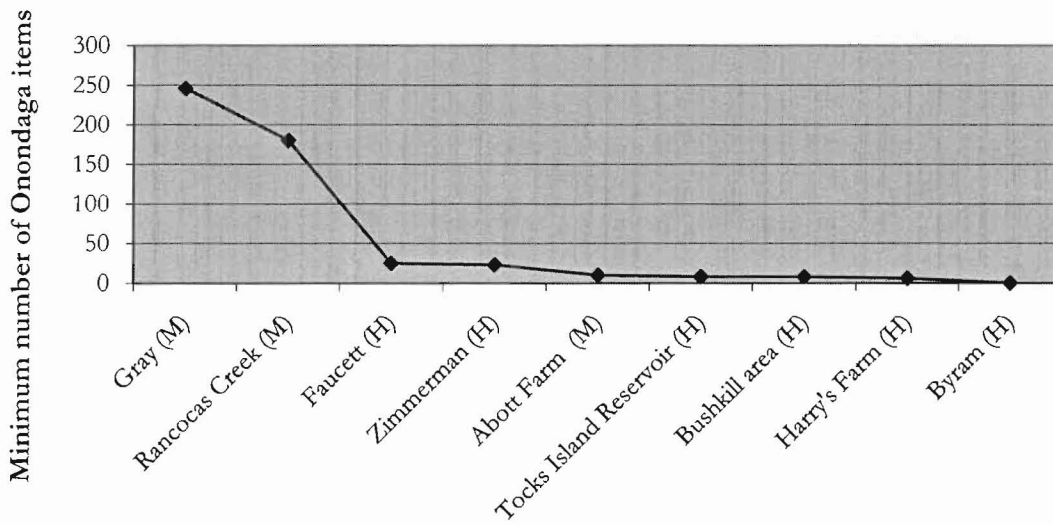


Figure 4.8 Distribution of Meadowood Onondaga chert items among sites in the Upper St. Lawrence valley



Mortuary (M) and habitation (H) sites in the Connecticut valley

Figure 4.9 Distribution of Meadowood Onondaga chert items among sites in the Upper Connecticut valley



Mortuary (M) and habitation (H) sites in the Delaware valley

Figure 4.10 Distribution of Meadowood Onondaga chert items among sites in the Delaware valley

Small numbers of Onondaga chert artefacts associated with Meadowood occupations are typically observed in peripheral and sometimes less productive regions such as the Maritimes to the east or the Canadian Shield to the north. The only exception to this pattern is the Saginaw Bay area in Michigan, where the small number of Onondaga chert items cannot be explained by the low productivity of this area. Given the presence of high quality cherts in the Midwest, it is possible that other products were actually being sought by the communities living in the Saginaw Bay area. The question then becomes “what potential resource(s) exploited and possibly controlled by Meadowood communities could have been valued by midwestern communities?” Since the archaeological record from the Saginaw Bay region lacks consistent evidence of non-perishable products originating from the Meadowood core area, perishable items such as food or secondary animal products would appear to be the most likely candidates in this case.

Hypothetically, it is proposed here that animal hides, finished buckskin garments, or furs processed in the upper and Middle St. Lawrence valley (where the highest concentrations of Meadowood bifacial scrapers have been recorded) could have been traded to midwestern communities as in the later historic fur trade. The exchange of highly valued hides and garments has also been documented in Siberian cultures, and proposed for Upper Paleolithic Europe (Hayden 2002).

Comparing the spatial distribution of Onondaga chert items within habitation and mortuary contexts also produces interesting results (Figures 4.11 and 4.12). Generally speaking, small numbers are represented in habitation contexts outside the Niagara Frontier region, where the sources of Onondaga chert are located. Two notable exceptions to this pattern, however, are the upper and middle sections of the St. Lawrence valley. This can probably be interpreted as evidence that St. Lawrence valley communities were integral parts of the Meadowood network, and not just peripheral areas. In sum, the distribution of Onondaga chert suggests that while the concepts of core and periphery may apply to the Meadowood Interaction sphere, peripheral regions exist in relatively close proximity to the Onondaga Escarpment, while inversely major redistribution/secondary distribution are sometimes situated at a substantial distance from Onondaga chert sources (up to 1,000 km). In turn, this probably indicates that Onondaga chert was not the only raw material exploited and exchanged by Meadowood communities. Animal hides, furs, or garments were proposed as one likely candidate.

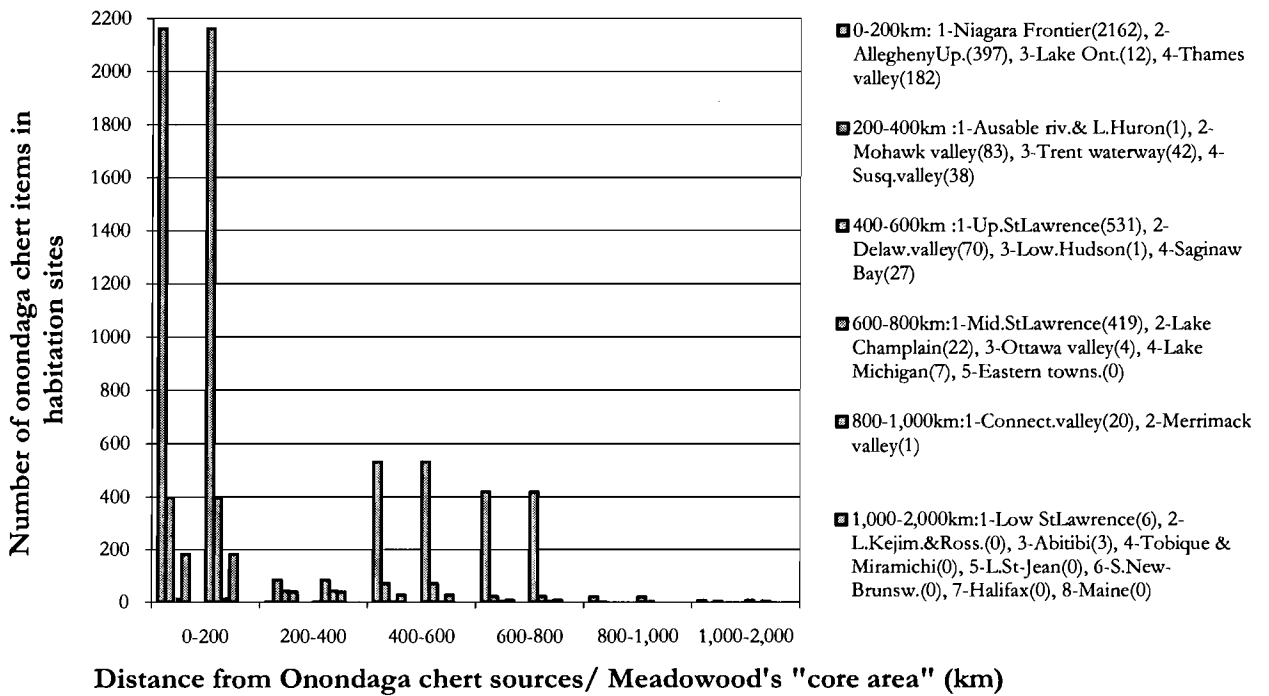


Figure 4.11 Distribution of Meadowood Onondaga chert items in habitation contexts among different geographic areas

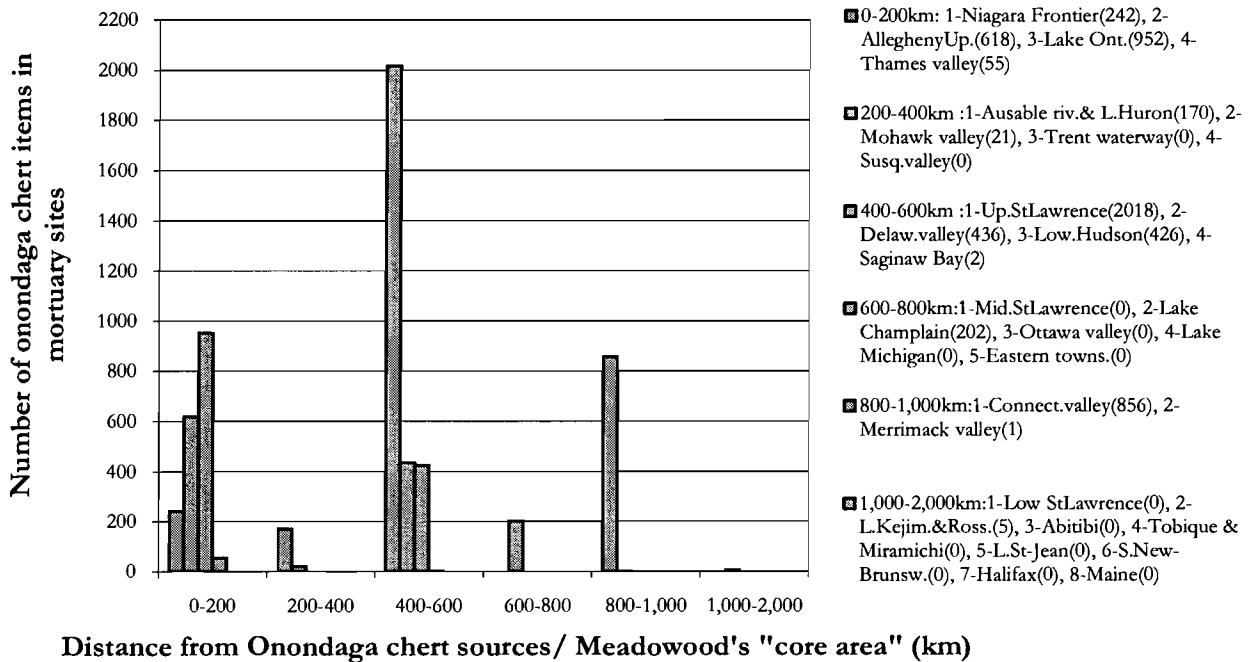


Figure 4.12 Distribution of Meadowood Onondaga chert items in mortuary contexts among different geographic areas

Mistassinni and Ramah Quartzites

Mistassinni quartzite quarries are located in the area of the Colline Blanche on the Temiscamie River near Lake Mistassini and Albanel, approximately 500 km north of the St. Lawrence valley. This fine-grained quartzite contrasts with the absence of high quality lithic resources that generally characterizes regions comprised within the vast Canadian Shield province. Macroscopically, Mistassinni quartzite can be defined as an aphanitic or very fine siliceous stone, relatively opaque, with a polish varying from matt to waxy. Its color also varies from white to grayish and the stone may or may not contain black, grey, orange, pink or green smoky inclusions (Denton 1998). This variability overlaps with other sources of quartzite, especially Ramah quartzite from Labrador, and it has been estimated that 10 to 30% of what is visually identified as Mistassinni quartzite may in fact come from a different source, particularly when dealing with very small flakes (Duval 2008). Despite this error margin, the presence of Mistassinni quartzite on a number of Meadowood sites is certain.

In his Ph.D. dissertation, Yves Chrétien noted that Mistassinni quartzite was used by Early Woodland groups of the Québec city area to produce Meadowood-like artefacts. One point and one bifacial scraper from the Désy site, both diagnostic, were manufactured in this white quartzite, as were two additional Meadowood bifacial scrapers documented in the region. Chrétien proposed that Early Woodland groups inhabiting the area of present-day Québec city and participating in the Meadowood Interaction Sphere were acquiring white quartzite preforms through exchanges with more northern groups. He then goes on to suggest that this exotic material probably had a high or special value for St. Lawrence communities, since they used it to produce items stylistically and technologically similar to the ones circulating in the Meadowood interaction sphere and typically made of Onondaga chert (Chrétien 1995a: 321).

At Batiscan, even more Meadowood-like artefacts were made of this fine-grained quartzite. Indeed, the site revealed three Meadowood side-notched points, one bifacial scraper, and five funerary bifaces fragmented by fire, all manufactured in the same exotic quartzite. Besides these diagnostic objects, white quartzite was also used to manufacture six non-Meadowood points, six unifacial and one non-Meadowood bifacial scraper, one bifacial fragment, one piercing tool, one pièce esquillée, with accompanying flaking debris. As mentioned in Chapter 2, Mistassinni quartzite was probably used to manufacture the large

ceremonial knife found at the Muskalonge Lake site, and an almost identical object of Mistassini quartzite was recorded at the Boucher site (Heckenberger et al 1990: figure 5). Additionally, two triangular scrapers made from this material, and similar to specimens from the Batiscan site, were recovered within burials at the Boucher cemetery. Contrary to what was observed at Batiscan, however, no Mistassini quartzite flakes were recorded from the Boucher or the Muskalonge Lake components. Finally, a side-notched, Meadowood-like projectile point from the St. Croix site in Nova Scotia was manufactured in an exotic, milky-white material that may also be from the Mistassini region (Denton and McCaffrey 1988).

It seems probable that white quartzite from the Alanel Lake region was highly prized by Meadowood communities of the St. Lawrence valley and beyond. These observations bring about additional questions. What was the role of the groups exploiting the Alanel Lake region in the Meadowood interaction sphere? Were they interacting directly with various Meadowood communities or only a few intermediaries? Who transformed the fine grained quartzite into artefacts that later found their way into the Meadowood interaction sphere? Were specialists involved? What did they offer in exchange for Mistassini quartzite?

While these questions remain open, it is interesting to note the presence of Mistassini quartzite flaking debris from the Batiscan site. The Lambert and Désy sites around Quebec City also yielded white, fine-grained flakes tentatively identified as Mistassini quartzite (Chrétien 1995a: 95). While representing small proportions of the total debitage assemblages, the number of Mistassini quartzite flakes is significant—second in importance at both Désy and Lambert sites after local chert (green appalachian chert with a known source three kilometres from the Lambert site)—and sufficient to infer bifacial reduction or resharpening activities (Chrétien 1995a: 213). These flakes were associated with the last stages of biface production, not only suggesting that bifaces arrived at the sites in an advanced state, but also that the artisans from the Québec City area were responsible for the final products' style, minimally involving resharpening. The recovery of tertiary preforms of Mistassini quartzite at both Lambert (n=4) and Désy (n=3) sites support this hypothesis. The same pattern is true at the Batiscan site, where a large tabular scraper indicates that some of the quartzite may also have arrived at the site as tabular preforms (Figure 2.21).

It is very likely that Meadowood groups who occupied the Middle St. Lawrence valley played an active role in the transformation and exchange of Mistassini quartzite which

circulated in small quantities within the Meadowood Interaction Sphere. Contacts between northern groups and the inhabitants of the Batiscan site are also suggested by the presence at the site of one cache biface, three other bifaces (including one funerary specimen), two bifacial and three unifacial scrapers manufactured from what appears to be Ramah quartzite. This material originates from the Torngat region in northern Labrador (Loring 1989: 49). Unlike Mistassini quartzite, however, Ramah quartzite appears to have arrived in finished form at Batiscan and its circulation beyond the Middle St. Lawrence valley during the Early Woodland period remains to be demonstrated. While no Meadowood diagnostic traits have been recorded in Labrador so far, evidence exists that link this region to the Upper St. Lawrence valley during the subsequent Adena/Middlesex episode (Loring 1989: 53). It is not too far a stretch, then, to postulate that contacts between some Meadowood communities and groups from the middle Labrador coast were already taking place at the beginning of the Early Woodland period.

Native Copper

The oldest native copper artefacts documented in northeastern North America have been tentatively associated with the Late Paleoindian period (Martin 1999: 147; Steinbring 1968), but extensive use of this metal only began with the Old Copper complex, approximately 6,000 years ago (Robertson et al. 1999: 115)¹⁸. Artefact types associated with the Old Copper complex—adzes, knives, conical points and tanged points—remain relatively unchanged for the 2,000 year period associated with this complex. Moreover, the few copper artefacts found across the Northeast tend to mimic midwestern styles, where sources of native copper are found (see next section). This uniformity suggests a single area of production, likely near the favored source(s) of copper, and possibly the manufacture of artefacts by specialized workers (Vernon 1984: 162).

¹⁸ The fashioning of copper was done through cold hammering and annealing. Occasionally, copper was also ground, cut, embossed, perforated, or polished. Technologically, these actions are not significantly different from those involved in working stone (Martin 1999: 117). Annealing consists in raising the temperature of a metal to restore grain deformation that results from hammering and regain the malleability of copper (Martin 1999: 119). Analyses of copper artefacts from the Great Lakes area suggest annealing temperatures between 600°C and 800°C (Schroder and Ruhl 1968 in Martin 1999: 121). To achieve melting, native copper must be subjected to temperatures exceeding 1083°C. In the context of an open fire, such heat can only be achieved by using fuel other than wood, e.g., charcoal, or by providing an artificial draft to improve combustion. In North America, no prehistoric evidence of melting, smelting or casting metals has been found to date (Martin 1999: 135).

Native copper can be compared to ground slate technology in terms of energy investment, potential prestige roles, and being shared by a number of distinct cultural groups in Late Archaic and Early Woodland times (Mason 1981). The long-lived prehistoric exchange of native copper objects and its common occurrence in ritual contexts leave little doubt about the high social and spiritual value attributed to this raw material. Stories and descriptions collected by a wide range of European observers from the seventeenth to the twentieth centuries confirmed this allegation (Crucefix 2001: 62; Martin 1999: 201-204). For example, in the 1920s, John Linklater remembered the gathering, ceremonies, dance, and appeal to the Spirits that were deemed necessary before traveling to Isle Royale, where primary deposits of native copper are located (Fox and Fox 1929: 317-319, cited in Martin 1999: 202). Other accounts suggest that copper was thought to bring good fortune. Father Allouez reported in 1665 that native copper pieces were kept “as so many divinities, or as presents which the gods dwelling beneath water has given them and on which their welfare is to depend (Kellogg 1917: 105, cited in Martin 1999: 204).

Provenience and Sourcing

Lake Superior’s north and south shores contain the world’s largest concentration of native copper¹⁹. Major deposits are found in upper Michigan along the Keweenaw Peninsula, a 110-km-long finger of land where primary exposures of native copper occur within a 3-6 km wide belt. This copper-rich area extends for an additional 200 km southwestward into Wisconsin, with probable prehistoric sources of bedded copper at the Brule River and other locations in northwestern Wisconsin (Levine 1999: 186; Martin 1999: 28). Native copper is also present along Lake Superior’s north shore from Duluth to Grand Portage and on the 70-km-long island of Isle Royale. Some areas selected for industrial-scale exploitation in the nineteenth and twentieth centuries also yielded traces of prehistoric mining. Such evidence has been observed near Mass City (Ontonagon County), on hillsides bordering the Portage Waterway, along the traprock from Cliff Mine to Copper Harbor, and on the Minong Ridge at Isle Royale (Martin 1999: 28).

¹⁹ Lake Superior copper occurs both as native copper and copper sulfide ores, but only the former was exploited prehistorically (Martin 1999: 28).

The displacement of copper nodules by erosion, water, or glaciation resulted in the presence of secondary deposits over a wide area. According to a map published by Salisbury in 1885, glacial action caused some copper to spread for over 1,100 km east-west, and approximately 950 km to the south (Martin 1999: 35). Native copper occurs in various sizes and shapes, from small bits of metal to pebbles, sheets and occasionally boulder-sized masses. Thin sheets found in fissure veins or copper masses could have been relatively easily transformed into a tool or ornament without any major reduction efforts (Martin 1999: 29).

While Lake Superior has long been assumed to be the source of all prehistoric native copper artefacts found in eastern North America, some researchers are now turning their attention to other deposits that may have been used in prehistory (Levine 1999). There are a number of potential sources in eastern Canada, mainly in Labrador, New Brunswick, and Nova Scotia. Aboriginal sources in New Brunswick probably include Clark Point, Passamaquoddy Bay, and Southwest Head, Grand Manan Island. Both appear to be primary copper sources, existing as copper nuggets (nodules), narrow veins, or patches in trap rocks (Sabina 1965:24, 29). At least six source areas have also been identified in Nova Scotia, including the well known source at Cape D'Or. Native copper deposits are also present in New England, mainly in Connecticut, and in the Middle Atlantic Region. Specimens from these areas, sometimes of remarkable size and purity, "could have been transformed into a variety of tools without difficulty" (Levine 1999: 198).

The efforts required for the transformation of copper into objects and the success of such an operation depended upon the purity and composition of the raw material and it is probable that prehistoric artisans were aware of these variable properties among copper sources (Martin 1999: 119). Based on a growing data base of trace element profiles for native copper specimens, attempts at comparing copper outcrops and sourcing artefacts have been made. Sharon Goad and John Noakes studied copper specimens from the Southeast using spectrographic analysis, neutron activation analyses, and optical-emission spectroscopy and concluded that favoured sources of copper may have shifted in time (Levine 1993: 10; Martin 1999: 32). Others, however, argue that incomplete sampling and the high heterogeneity of copper sources limit the utility of such analysis for establishing provenience (Rapp et al. 1980, cited in Wright 1994: 63). Nevertheless, the earliest, most abundant, and consistent evidence for the exploitation of native copper comes from the Lake Superior region, where mining and manufacturing activities have been widely documented. Such

evidence, on the other hand, is lacking from Late Archaic and Early Woodland sites east of the Ottawa valley, suggesting that more easterly copper deposits were not, or only marginally, exploited during those time periods.

Spatial Distribution

Glacial Kame Culture sites, associated with the Terminal Archaic (3500-2500 BP), include native copper objects such as beads, celts, paired adzes, and awls. Other diagnostic artefacts comprise marine shell beads, shell gorgets of sandal-sole or circular outlines, bar birdstones without protuberant eyes, bear maxilla masks, tubular stone pipes, and constricted center gorgets (Robertson et al. 1999: 116). While Glacial Kame components concentrate in northwestern Ohio, Michigan and southern Ontario, Isle La Motte, a cemetery located near the northern end of Lake Champlain and radiocarbon dated to 2930±80 BP, represents the easternmost expression of this complex. Artefacts recovered at Isle La Motte include sandal-sole gorgets made from knobbed whelk (*Busycon carica*), a circular shell three-hole pendant and an oblong three-hole gorget probably made from Queen Conch (*Stombus gigas*, indigenous only to the Caribbean), rolled copper beads, copper adze heads, discoidal shell beads, and unmodified lumps of galena (Blakely 1996: 240). There are, during the Terminal Archaic period, long-distance exchanges between midwestern and Atlantic communities, with at least one example of an intermediary locale in the Lake Champlain area.

A westward extension in the spatial distribution of native copper items could reflect a reorganization of the circulation networks at the beginning of the Early Woodland, a reorganization which, according to Fogel (1963), coincided with increasing social complexity among communities south of the Great Lakes. During this time period, Red Ocher and Adena complexes are represented by components in western Ohio and parts of Illinois, Indiana, Michigan, Minnesota, Wisconsin, and Ontario. Interestingly, and continuing from Terminal Archaic times, a concentration of native copper and marine shell artefacts continued to exist in the Lake Champlain area remains after 3000 BP (Table 4.9).

The cultural affiliation of the communities that occupied Terminal Archaic and Early Woodland sites in the Lake Champlain area is problematic (Heckenberger et al. 1990: 141). Hypothetically, this region may have been a favored locus where group delegates from distinct regional networks periodically gathered. This could, in turn, account for some unique patterns observed in the Lake Champlain Meadowood components, such as the large

size, long-term use and apparent pairing of cemeteries, the variability in the style of burial interments, and the presence of diagnostic artefacts and raw materials associated with a number of distinct interaction spheres.

Table 4.9 Distribution of Meadowood-associated marine shell, native copper, and banded slate items in different subregions

| Subregions | Copper | Banded slate | Marine shells |
|-------------------------------|--------|--------------|---------------|
| Niagara Frontier | 27 | 2 | 0 |
| Lakes Ontario & Oneida | 3 | 1 | 1 |
| St-Clair Lake & Thames River | 3 | 1-16 | 1 |
| Auseable River & Lake Huron | 0 | 2-4 | 0 |
| Upper St. Lawrence | 6 | 1 | 23 |
| Lake Champlain | 6,765 | 2-5 | 1,014 |
| Middle St. Lawrence | 209 | 1-2 | 0 |
| Ottawa valley | 0 | 2 | 0 |
| Glaciated Allegheny Uplands | 55 | 0-1 | 16 |
| Lower Hudson | 0 | 1 | 1 |
| Merrimack valley | 1 | 2 | 0 |
| Tobique & Miramichi valleys | 1 | 0 | 0 |
| Lakes Kejimikujik & Rossignol | 3 | 0 | 0 |
| Saginaw Bay | 11 | 1-5 | 0 |

The spatial patterning of exchanged copper goods forms the basis for various models of distribution, each with their respective implications in terms of trading dynamics. For example, Renfrew (1977) distinguished between *down-the-line* and *directional* exchange models. The former is characterized by a falloff distribution of commodities and results from minor episodes of acquisition and exchange which decrease significantly outside the source area. Directional trading, on the other hand, occurs when people at a distance from the source preferentially acquire, concentrate and control the subsequent distribution of traded goods.

The spatial distribution of a given commodity may also vary depending on the scale of the network under consideration. It has been suggested earlier that a superposition of regional networks existed in eastern North America during the Late Archaic/Early Woodland periods, something that has been observed by other researchers as well:

The Red Ocher trade system (...) could be considered a regional variant of a larger interaction sphere, connected through social alliances that may have included social marriages, religious practices, and trading relations. This interaction sphere likely

included the Adena and Glacial Kame cultures to the southeast and the Meadowood culture of the eastern Great Lakes (Pleger 2000: 180).

Primary sources of native copper are located within the boundaries of the Red Ocher trade system mentioned above, where a “*down-the-line* model appears to fit the distributions of copper artefacts” (Martin 1999: 180; see also Brose 1994: 219). Within this regional network, Ira Fogel (1963), who conducted one of the first comprehensive attempts to plot the spatial, temporal, and frequency distributions of prehistoric copper materials, observed an association between native copper and the major waterways of northeastern North America. In Ontario, copper artefacts concentrate around the Lake Nipigon region north of Lake Superior, the Thames River area of southwestern Ontario, and the Trent Waterway to the north of Lake Ontario. These three areas coincide with historically known transportation and trade routes, which linked the Upper Great Lakes with the St. Lawrence River valley and regions to the east. Data supporting this model eventually came from Jury’s research into the locations of copper caches in Ontario, which were spatially linked with routes of presumed trade (Jury 1965, 1973).

However, within a larger interaction sphere, one that includes the Meadowood network, *directional* trading also characterizes the distribution of copper objects as well as Onondaga chert. Indeed, it appears that communities living around Lake Champlain, approximately 1,500 km from primary sources of native copper, preferentially acquired and used this raw material. The few native copper and marine shell items found at other Meadowood components may represent occasional exchange episodes with midwestern groups or redistribution from the Lake Champlain region. In any case, the distribution of native copper is not a function of the distance from its sources around Lake Superior, nor is it homogeneous across the Meadowood landscape.

Banded Slate

Slate is often cited as the raw material of choice for the manufacture of gorgets, birdstones, and other finely polished items attributed to Meadowood people. More specifically, archaeologists have suggested that Huronian banded slate was the favoured stone from which these artefacts were fashioned. Banded slate can be found at various locations in the Northeast, but the geological source(s) exploited prehistorically remains unknown (Tremblay 2003: 5). More than 50 years ago, Ritchie (1955: 40) hypothesized that

banded slate originated from a broad zone of metamorphic Precambrian rocks surrounding almost the entire periphery of Lake Superior, except along its southeastern shore. Nearby, on the Keweenaw Peninsula and Isle Royal, are important sources of native copper. This vicinity has led many archaeologists to believe that the gorgets and native copper items found at Meadowood sites were all produced, probably in excess of local need, by Early Woodland communities inhabiting the Lake Superior area, who traded them to groups to the south and east in exchange for other commodities. Caution is required before assuming that all gorgets and other polished tools associated with Meadowood sites were made of banded slate. This is important since slate, sandstone, and shale are widely available across the Ontario/Erie and St. Lawrence/Champlain Lowlands.

Both native copper and banded slate artefacts were documented in 11 distinct geographical areas, and 82% of the time (n=9), both raw materials are present in the same region (Table 4.9). While more provenience data are necessary to draw firm interpretations, the observed distribution pattern does not contradict the hypothesis that slate and native copper circulated together. In southwestern Lake Erie, the manufacture of banded slate items is evidenced by several workshop stations dated to the Late Archaic period (4500-3000 BP), suggesting “a specialized site location and possibly the beginnings of craft specialization, involving manufacture and repair for the purpose of trade and exchange” (Stothers and Abel 1993: 43).

On the other hand, the production of native copper items has been documented at the Morrison Island and Allumettes Island sites, two Late Archaic components in the Ottawa valley which yielded an abundance of copper debitage as well as finished products. If we accept the hypothesis that banded slate also originates from the Lake Superior region, the discovery of at least two banded slate birdstones in the Ottawa valley may indicate that circulation between the upper Great Lakes and the Ottawa River, probably via Lake Huron/Georgian Bay and Lake Nipissing, continued into the Early Woodland period.

Marine Shells

Marine shells are relatively rare in Meadowood contexts, contrasting in some regions of the Northeast with their abundance in the preceding Late Archaic period (Ritchie 1949; Spence n.d.; Spence et al. 1990: 129, 136):

Perhaps at the time of the Bruce Boyd site regional trading networks were organized in such a way that access to marine shell goods was difficult or impossible. An alternative explanation is that marine shell items were simply no longer valued as ornaments or considered appropriate as grave goods. As more contemporaneous sites are explored, the distribution of marine shell in space and time should become clearer (Spence nd).

Shell trade is better represented on Late Early Woodland sites from the central Midwest, and five out of the six Meadowood regions which yielded marine shells also yielded native copper and banded slate (Table 4.9). This pattern indicates a close association of these materials in trade cycles (Martin 1999: 196) and supports the scenario of a pan-eastern network linking midwestern and Atlantic populations, with Meadowood communities acting as middlemen.

The Mid-Atlantic province of Virginia and North Carolina, where discoidal and barrel-shaped (columella) shell beads were historically manufactured and exchanged, was probably the area where most of the shell beads were obtained (George Hamell, pers comm 2002). While marine shells circulated over long distances, beads may have been produced locally. At the Boucher site, for example, “shell beads were strung on fibers, and their appearance and numbers suggested local manufacture” (Heckenberger et al. 1990: 190). Among the identifiable shell species used to fashion the beads found at Meadowood sites, most have their northernmost distribution in the warm waters of the Mid-Atlantic States. Among these are a number of *Busycon* ssp. (columellae shell beads), *Marginella* ssp., and *Olivella* ssp. (Heckenberger et al. 1990: 127; Loring 1985: 97; Ceci 1986).

A small number of shell beads found in Early Woodland contexts appear to have been manufactured from shell species present even further south than the Mid-Atlantic States. For example, a burial feature at the Cuylerville site, attributed to the Adena complex, yielded 11 beads fashioned from the *Prunum guttatum* marine species (origins in Southeast Florida and the Caribbean), and 42 beads of the *Jaspidella jaspidea* marine species. The latter are tiny size shells with apex spires perforated or ground open for stringing, distributed from Southeast Florida to West Indies, Bermuda (Ceci 1986: 7; Ritchie and Dragoo 1960). The Knobbed Whelk (*Busycon carica*) and the Northern Quahog (*Mercenaria mercenaria*) were used to fashion a minority of shell beads found on Early Woodland archaeological sites. These species are found as far north as eastern Massachusetts (Heckenberger et al. 1990: 127).

Theoretically, shell species living in the vicinity of Long Island, New York, could also have been used (George Hamell, pers. comm 2002).

Discoidal shell bead strings historically produced in the Mid-Atlantic were called "roanoke." Roanoke is also the name of an island, off the coast of North Carolina, where a native village stood at the time of contact with Europeans. According to Gerard (1907: 106), "roanoke" as a name for the shell beads used by the natives as ornaments and as a medium of exchange is a misnomer resulting from colonists' mishearing of the original word. The correct word would be rawrenock, or rarenow, meaning smoothed shells. Roanoke, on the other hand, would be an adaptation of the native term Roanoak, or Roanoac, signifying "northern people," or "northereners" in the Eastern Algonkian languages.

This may suggest that the people who lived on Roanoke migrated from a northern ancestral land. It has been hypothesized that Algonquian groups of coastal Virginia and Carolina migrated from an earlier home in the general area of the Great Lakes (Birket-Smith 1930). This migration may have occurred between 5500 and 2100 BP, when Binford (1991: 252) observed "the first glimpse of the later-known distribution of the coastal Algonquian speakers." This change also reflects a shift to a more efficient exploitation of aquatic resources, in which the impounding weir is seen as a major innovation (Binford 1991: 252-253). The Algonquian groups newly established along the Atlantic coast may have maintained contacts with their ancestral territory, possibly resulting in the inland movement of marine shell beads. Alternatively, this new home along the Atlantic coast may have long been known to Algonquian groups as the source for highly prized marine shells that found their way inland during the Early Woodland period and may have motivated their movement to the coast.

DISCUSSION

In this chapter, I have examined the environmental and social contexts, as well as the associated features of four Meadowood diagnostic traits: (1) cache bifaces; (2) projectile points; (3) bifacial scrapers; and (4) birdstones. I have also analyzed the distribution of some of the most ubiquitous exotic raw materials recovered in Meadowood sites to determine whether their occurrence is governed by distance to sources (down-the-line exchange) or by monopolized access to these materials by a few communities (directional exchange). I will

now summarize the conclusions of these contextual analyses in terms of the roles and underlying motivations of the various communities participating in the Meadowood Interaction Sphere.

The contexts and associated features of Meadowood artefacts helped determine whether their roles occurred more within the ritual, economic, or sociopolitical domain. In a ritual model, exchange goods are expected to be primarily found in mortuary sites, associated with graves or ritual features. An economic scenario, on the other hand, implies the recovery of most traded items in residential sites where they should be associated with middens, houses, or other mundane features. Finally, prestige items associated with special features or graves in gathering sites and/or cemeteries would be most intelligible in terms of a sociopolitical model.

In this chapter, Meadowood bifaces were defined as favourable long-distance exchange products, which were likely manufactured by specialists and highly valued across northeastern North America. Their widespread distribution, from the Saginaw Bay region to the Atlantic Coastal Plain, support the idea that Meadowood groups intensified the production of Onondaga tradable items to exchange in return for exotic products such as native copper and marine shells. The role of Onondaga chert bifaces as prestige items is further supported by their predominance in mortuary sites, where they are generally found in graves or in special caches.

Meadowood points and scrapers, on the other hand, are predominantly found in habitation sites. Interestingly, however, both artefact types are also common in mortuary sites, where they are generally associated with burial features. The absence of use wear and the higher proportion of thermal fractures observed on the points and scrapers recovered in mortuary contexts suggest that some of these objects were produced as prestige items, while others were meant to be used. The few Meadowood habitation sites that yielded a significant number of projectile points and scrapers are also good candidates for being regional gathering sites. These contexts favour a sociopolitical explanation of interactions, where exchange goods are expected to occur in large gathering locales and in cemeteries. Finally, the distribution of Meadowood scrapers suggests that a few groups, located in the Middle and Upper St. Lawrence valley, specialized in securing and processing animal hides, probably to exchange within the Meadowood Interaction Sphere.

The distribution of Meadowood birdstones also revealed a number of interesting trends. First, it was observed that finished birdstones occur predominantly in mortuary contexts. Their common presence in upland locations (Laurentides, Eastern Townships, and Allegheny uplands) may reflect the selection of marginal and higher locales for the performance of funerary rituals. Habitation sites that yielded birdstones are often located in close proximity to Meadowood cemeteries, further supporting the link between birdstones and funerary rituals. When present in habitation sites, birdstones are often damaged by fire or intentionally broken. Intentional destruction of prestige items has been observed in the context of competition between groups (Hayden 2001a: 53). This kind of behaviours would be expected if Meadowood interactions resulted from an attempt by a few corporate groups to enhance their status through privileged access to rare goods. It would be incongruous, however, with an economic scenario, where wealth items are used to even out environmental variability over time and space.

Onondaga chert outcrops concentrate along the north shore of Lake Erie near the Niagara Peninsula, and were likely controlled by Meadowood communities in Early Woodland times. The focus on Onondaga chert exerted by Meadowood groups suggests that social/ceremonial factors rather than strictly practical considerations were involved in this choice of raw material (Ellis and Spence 1997: 139). A spatial analysis of Onondaga chert items among Meadowood sites showed no relationship between distance from source and the frequency of this stone in Meadowood archaeological contexts. Rather, Onondaga chert distribution revealed the existence of primary and secondary distribution areas. While secondary distribution areas are sometimes located at substantial distances from Onondaga chert outcrops, numbers of regions closer to the source have yielded very few Onondaga chert items. Such a distribution pattern reflects directional trading rather than down-the-line exchange. In secondary distribution areas, Onondaga chert concentrates in a few mortuary sites, supporting the role of this raw material within the prestige/ritual sphere rather than the economical/practical sphere of activities.

The presence of Mistassini and Ramah quartzites on Meadowood sites has highlighted contacts between Meadowood groups and communities living in the Canadian Shield province to the north. These populations may have played an important role in securing and providing mammal hides for exchange in the Meadowood Interaction Sphere. I have also suggested that northern communities maintained regular contacts with

Meadowood groups exploiting the middle and Upper St. Lawrence valley, who were apparently involved in the transformation and redistribution of Mistassini quartzite in the Meadowood network.

Other exotic raw materials commonly recovered in Meadowood sites include native copper, banded slate, and marine shells. The access to native copper and banded slate (originating from the Lake Superior region) was probably controlled by midwestern communities. Groups living along the Atlantic Coast, on the other hand, would have managed access to marine shells. Within a pan-eastern network, native copper, banded slate, and marine shells artefacts concentrate in a few localities. As with Onondaga chert, this distribution favours a directional trading model in which a few wealthy communities had a monopolized access to highly valued raw materials. Moreover, the common association of native copper, banded slate, and marine shell items in Meadowood contexts supports the scenario of a pan-eastern network linking midwestern and Atlantic populations, with Meadowood groups acting as Middlemen.

CHAPTER 5 : ENVIRONMENTAL PRODUCTIVITY AND MEADOWOOD COMMUNITIES

To reconstruct the specific roles of communities participating in the Meadowood Interaction Sphere and to understand how they were related to one another, it is necessary to go beyond the study of exchanged goods and their distribution. Subsistence strategies, technological specialization, settlement patterns, and burial practices are aspects of Meadowood communities that can provide valuable information on their economic and social organization. Such analyses also allow an assessment of the relative development of socioeconomic inequalities within these communities, and this may ultimately allow us to broach the question of what benefits accrued from participating in the Meadowood network.

Unless they require very little labour investment, the production of cult-related items expected in the ritual model implies a certain stability of the resource base. This in turn is not inconsistent with the existence of storage, social inequalities, and craft specialization. Predictions associated with an economic scenario, on the other hand, include the presence of complementary ecological niches and/or some form of resource uncertainties. Under such conditions, storage, like inter-group exchanges, may have represented one of many risk-buffering strategies. Social organization, in this case, is generally assumed to be egalitarian. Alternatively, the social inequalities implied by the socio-political framework depend upon subsistence intensification and the relative amount of surplus that could be produced on a consistent basis by families or larger economic groups (Price and Brown 1985; Plegler 1998: 20). The recognition of corporate labour subsistence practices (Hayden 1995: 17-20), storage facilities, or concentrations of Meadowood prestige items in localities with unusually productive resources are thus indicators that would tend to favour the socio-political model. Archaeological indicators of social differentiation and inequalities, such as the presence of skilled specialists or the differential distribution of Meadowood items in graves, should also be observed if the “trade fair” exchange model is favoured.

Without necessarily adhering to theories that perceive ecological conditions as prime movers of cultural development, very few archaeologists would disagree on the idea that a community’s historical trajectory is affected by its surrounding environment. As outlined

above, the abundance and predictability of food resources, and the ability to accumulate surpluses play crucial roles in evaluating which explanation of an interaction sphere best fits the available data. In this Chapter, I therefore outline the subsistence resources available to Meadowood groups and examine environmental productivity in terms of resource uncertainties and/or potential for accumulating and storing surpluses. To have useful interpretive value, statements about past ecological conditions should be based on a detailed knowledge of available floral and faunal resources. They should also take into account local and regional variability, as well as potential shifts in ecological conditions from past to present times. This kind of knowledge is still very incomplete in Northeastern North America and the conclusions of this chapter are based on a variety of sources, including floral and faunal remains associated with Meadowood components, ethnographic and ethnohistorical accounts of resource abundance/poorness, as well as current productivity figures. The consequences that these ecological conditions have on Meadowood settlement patterns are also discussed. Finally, I examine evidence for Meadowood craft specialization, corporate labour, as well as social differentiation reflected in funerary practices.

SUBSISTENCE STRATEGIES

Meadowood subsistence strategies are based on a hunting-fishing-gathering economy and involved resources unequally distributed over space and available at different times of the year (Binford 1980; Ritchie and Funk 1973: 96). The Ontario/Erie and St. Lawrence/Champlain Lowlands, as well as adjacent areas where Meadowood communities concentrated are characterized by a diverse and rich floral biota supporting a variety of fauna (Granger 1978: Appendix 3). The following sections discuss the most important floral and faunal resources available in the Meadowood landscape and recovered from archaeological sites in terms of seasonality, abundance, and predictability. The main focus of this discussion will be to highlight the possible consequences of subsistence constraints and choices on Meadowood's technology, social organization, and trading strategies.

Floral Remains

Floral remains were recovered from at least 17 Meadowood archaeological sites, a majority of which are located within the Ontario/Erie Lowlands (n=7) and Western Lake

Erie (n=4) provinces (Table 5.1). Identified nut remains include acorns, hickory nuts, walnuts, butternuts, and beech nuts. Generally speaking, nut remains suggests a late summer to late fall occupation, when these resources are available (Fecteau 1997: 45-46). The availability of floral resources, especially from nut bearing trees, varies within the study area. This is reflected in the distribution of nut remains within Meadowood archaeological sites. Nut bearing trees are more abundant in the deciduous forests of the Ontario/Erie Lowlands than in the mixed forests of the St. Lawrence/Champlain Lowlands (Chrétien 1995a: 53). In the Middle St. Lawrence valley, nevertheless, butternuts may have been a minor part of the diet (Chrétien 1995a: 144).

Retrieving nut meat from their hard shells is a painstaking task (especially for wild walnuts, butternuts, and hickory nuts), and if nut meats and pieces of shell were sometimes swallowed indiscriminately, a more palatable way to consume this resource would be in the form of nut oil (Ozker 1982: 35). Given the high nutritive value of nut resources, it is not surprising to find archaeological and ethnographical evidence of the importance of nut oil in Indian diets:

I have seen above an hundred bushels of these nuts, shell-barked hickory...stored up by one family (of the Creeks). They pound them to pieces, and then cast them into boiling water, which after passing through strainers, preserves the most oily part of the liquid; this they call by a name which signifies hickory milk. It is as sweet and rich as fresh cream, and is an ingredient in most of their cookery, especially homony and corn cakes (Battle 1922: 177).

Hickory nuts recovered at the 20AS1 site in Michigan have been pounded to small fragments and charred, probably representing “the crushing and boiling of nuts for the speedy extraction of the dry nutritious nut oil. The boiled water would be cooled, and the congealed nut oil removed and stored as a cake” (Wright 1964: 20). While walnut or hickory could conceivably have been simply collected and eaten without further preparation, acorns required processing to remove tannin. Red oak acorns were boiled with ashes of rotten maple wood to remove tannic acid. Other methods include boiling or soaking with wood ash lye, leaching in sand, or boiling and letting stand in cold water changes for several days (Powell 1981:84; Howe 1988:96). Essentially, these methods of preparation are simple ones, but they require time as well as some skill in handling the materials.

| PROVINCES & SUBREGIONS | | | | Number of occurrences | | |
|-----------------------------|----------------------------------|------------------------|--------------------|-------------------------|----------------|---|
| | | Western Great Lakes | Saginaw Bay | Habitation sites | Mortuary sites | |
| Lakes Ontario/Erie Lowlands | Atlantic coastal plain | Susqueh./ Delaware | Delaware valley | 20SA1 (H) | 1 | 0 |
| | | | | Pomranky (M) | 1 | 0 |
| | | | | Hodges (M) | | |
| | | | | 20GR33 (H) | | |
| | | Hudson-Mohawk Lowlands | Mohawk River | Beaver Meadow Brook (H) | | |
| | | | | Zimmerman (H) | | |
| | | Appal. Uplands | Allegheny Uplands | Schuylerville (H) | | |
| | | | | Zimmer (H) | | |
| | St. Lawrence/ Champlain Lowlands | Middle St. Lawrence | Wray (M) | | | |
| | | | Lambert (H) | | | |
| | Lakes Ontario/Erie Lowlands | Trent Waterway | Dawson Creek (H) | X | | |
| | | | Wyoming Rapids (H) | X | | |
| | | Thames River | Pocock (H) | X | | |
| | | | Morpeth South (H) | | | |
| Niagara Peninsula | | Neeb (H) | | | | |
| | | Billiard (H) | | | | |
| SITES | | | | | | |
| Purslane | | | | | | |
| Wood sorrel | | | | | | |
| Dogwood | | | | | | |
| Hawthorn | | | | | | |
| Sedges | | | | | | |
| Bedstraws | | | | | | |
| Unidentified | | | | | | |

X=Present

Boiling white oak acorns also brings clear and sweet oil to the surface, without bitter tannins, which could then be served as butter or as a dipping sauce. Ceramic technology could have facilitated or improved nut oil extraction, although nut processing did not necessarily require the use of pottery, as pre-pottery data from northern New England, as well as evidence from California demonstrate (Fagan 2003: 129, 136; Spiess, pers comm. 2005; Taché, in prep; Wilson 1993: 17, 1997: 61).

Ford (1979: 235) noted that whole hickory, butternut, and walnut (not acorn or chestnut) can be short-term sources of full proteins that require few supplements of essential amino acids. More importantly, these species of nuts are high in calories, averaging more than 500 cal/100g edible portion. In terms of fat content, between 3.8 and 4.5 litres of oil could be extracted from 45 kg of hickory nuts, while black walnut is higher in protein content but lower in fat content, producing about 2.4 litres of oil per 45 kg of whole nuts (Sassaman 1995: 227; Ozker 1982: 36; Wilson 1997: 45-46). Rice (1999: 33) believes that nut oils would have been especially valued in feasting activities and provided essential oils relatively difficult to obtain otherwise in the environment, although fish and turtles are alternative sources. The labour intensive production, small quantities, and high calorie characteristics also make nut oil a prime candidate for a prestige feasting food.

The species of nuts exploited by Meadowood populations varied from one locale to the other, probably as a result of local availability at the time of occupation. At the Pocock site, black walnut was found in five of the six Early Woodland features and account for 88.4% of the total nut weight. The high fragmentation of the nutshell remains was interpreted as evidence of deliberate crushing in order to aid the recovery of nut oil by boiling. A sample of walnut shell from one feature was radiocarbon dated to 2390±50 BP (uncorrected). A single *Chenopodium* (goosefoot) seed was also recovered in this feature (Wilson 1997: 41, 56, 61).

Walnut shell fragments and white-tailed deer remains were also associated with an Early Woodland component at the Wyoming Rapids site, interpreted as a “fall-season deer-hunting and nut-processing camp” (Spence and Fox 1986:18). Oak and hickory nut, on the other hand, were of peripheral importance at the Pocock and Wyoming Rapids sites (Fecteau 1997: 43). This contrasts with the Dawson Creek site, where acorns dominate the inventory of nut remains associated with the Early Woodland period. At the latter site, 96.4% (49.13g)

of the total charred acorn shells and 97.6% (0.41g.) of the total acorn meat were excavated within the context of Meadowood hearth features. The importance of these resources drops off significantly during the subsequent occupation, which according to Lawrence Jackson, “may be related to the late Middle Woodland appearance of highly portable maize” (Jackson 1988: 79).

Wild rice is the only cereal native to North America. While it is now mostly found in the lakes of northern Minnesota, Wisconsin, Manitoba, and northwest Ontario, wild rice was once present across much of eastern North America (McAndrews and Thompson 2000: 17). Despite this widespread occurrence, wild rice has a patchy distribution due to very specific habitat requirements. Under favorable conditions (i.e., in wetlands with mud bottoms), it can grow in large beds several miles long (Lee et al. 2004: 412; Moffat 2000: 50) and be a very productive annual grass:

A rice stand could produce approximately 100 pounds per acre when harvested by hand, and it was possible for a woman to harvest several hundred pounds of rice a day (Vennum 1988: 107).

Within our area of study, important wild rice stands occur at a few localities around the Great Lakes, notably in the vicinity of Rice Lake, Lake Scugog, and from Long Point to the Niagara River in Southern Ontario, in the Sanduska Bay area of Ohio, and around Saginaw Bay in Michigan (Parker 1997: 141). Wild rice (*Zizania* sp.) is well documented as an important staple resource for several historic Great Lakes Native groups, including the Ojibway, Winnebago, Menomoni, and Eastern Dakota (Lee et al. 2004: 411; Moffat 2000: 49). The Ojibway moved into the rice district in the late seventeenth century (Vennum 2000: 4). Historically, harvests took place over a 10 to 14 day period from late August to early September. The explorer Jonathan Carver observed in 1767 an entire rice field marked off in different styles of binding:

Each family having its allotment and being able to distinguish their own property by the manner of fastening the sheaths gathered in the portion that belongs to them (Vennum 2000: 2).

Although there are ethnographic and historic records of wild rice exploitation by native groups in northeastern North America, the antiquity of this practice and the relationship between prehistoric communities and wild rice remain unclear (Lee et al. 2001:

411; Moffat 2000: 49). In general, wild rice appear to have flourished in the later Holocene, with expansion of many rice beds beginning from 4,000 to 2,000 years ago (McAndrews and Thompson 2000: 17). In Minnesota, however, where the harvesting of wild rice is also typically linked with the Late Early/Middle Woodland periods, a limited amount of palynological data indicate that this cereal was also present in harvestable quantities during the Paleoindian and Archaic periods (Huber 2000: 40).

Macrobotanical remains of wild rice are rarely recovered in archaeological contexts, perhaps due to the fragility of charred grains. Nevertheless, remains of wild rice grass and the proximity of sites to wetlands that supported wild rice increase in Middle Woodland (Hopewell) times, reflecting greater dependency on this plant in later times (Crawford and Smith 2003; Lee et al. 2004: 412). Despite their paucity, evidence from earlier contexts indicates that wild rice could have been important in some locations from Late Archaic times. Macrobotanical remains have been found in Late Archaic /Early Woodland contexts in southern Iowa and in Michigan (Moffat 2000: 52). Spikelets of wild rice were found for the time period from ca. 4300 BP to AD 1800 in pollen core samples from the southern Niagara peninsula (Parker 1997: 141). Moreover, two Late Archaic/Early Woodland components — Petaga Point in Minnesota and McIntyre in Southern Ontario — yielded jig pits where wild rice may have been parched or hulled (Bleed 1969; Johnston 1984). Studies in Minnesota have reported phytoliths from wild rice chaffs in carbonized food residues on pottery dated between 2650 and 2750 BP (Thompson et al. 1994).

Thus, while confirmation of this hypothesis will need further supporting evidence, a good argument can be made for wild rice being an important plant resource for the few Meadowood communities inhabiting productive wild rice locations, such as the Dawson Creek and McIntyre sites along the Trent waterway. However, as mentioned in Chapter 3, one cannot say that these productive wild rice locations yielded more or unusually large Meadowood sites compared to other regions. Thus wild rice does not seem to play a determinant role at this time in terms of regional interactions, surpluses, or economic exchanges.

While the majority of the floral remains associated with Early Woodland sites represent the harvesting of wild plants, small-scale ‘garden-plot’ horticulture may be reflected by some of the seeds recovered from Early Woodland sites (Stothers and Abel 1993: 65). Evidence from sites in Illinois, Tennessee and Kentucky indicates that nondomesticated

cucurbit occurs as early as ca. 7,000 years BP. Mid-Holocene wild *Cucurbita* were also recovered at from the Sharrow site in Maine (AMS dated to 5695 ± 100 BP) and at the Memorial Park site in north-central Pennsylvania (AMS dated to 5404 ± 552 B.P) (Hart and Asch Sidell 1997: 525). In the Great Lakes region, the only reports of *Cucurbita* usage prior the 2000 BP occur at sites near Saginaw Bay (Monaghan et al. 2006: 219). There, a charred *Cucurbita* rind, AMS-dated to 3840 ± 40 ^{14}C yr BP was recovered from a large, basin-shaped storage/refuse pit at Marquette Viaduct, a Late Archaic site occupied between 4500 and 3500 ^{14}C yr BP. While the thickness of this specimen suggests it was from a wild gourd, its presence indicates that Late Archaic people in the Saginaw Bay region were aware of *Cucurbita* and incorporated it into their economy:

Although it could represent an exotic exchange item, its occurrence in the upper Great Lakes may also show either that local populations cultivated or managed squash or that native, free-living *Cucurbita* populations developed in the Great Lakes during the Mid-Holocene and were reliable enough to be exploited by Archaic people (Monaghan et al. 2006: 220).

Recently, analysis of phytolith assemblages recovered from charred food residues has shown that *Cucurbita* was used in central New York by 2945 BP, well before the date indicated by macrobotanical remains (Hart et al. 2007). Interestingly, this early date comes from the Scaccia, one of the seven Meadowood assemblages analyzed in this study. While this discovery is not a surprise given the early evidence of *Cucurbita* mentioned above, it confirms the use of *Cucurbita* by Meadowood communities.

It is now agreed that squash was independently domesticated in the Eastern Woodlands. The timing of this mid-Holocene domestication, however, is not firmly established:

Taken as a whole, standard domestication criteria applied to data from eastern North America generally indicate that *Cucurbita* older than about 4000 ^{14}C yr BP represent wild varieties, and those younger than about 3000 ^{14}C yr BP are mainly domesticated varieties (Monaghan et al. 2006: 217).

After 3000 BP, when domesticated squash generally replaced wild varieties at archaeological sites, horticultural practices which probably began 1000 years earlier continued. Indeed, actual data do not support the existence of intensively cultivated gardens in the Great Lakes region until the Middle Woodland period. (Monaghan 2006: 220-221)

Two uncarbonized domesticated seeds of *C. pepo*, related to a transitional Late Archaic-Early Woodland occupation, were found at the Green Point site from a non-cultural, peaty-loam stratum. Another domesticated uncarbonized squash seed was recently recovered at this locality in similar off-site, non-cultural, organic-rich alluvium. The latter specimen was directly AMS-dated to 2820 ± 40 BP, representing to date the earliest domesticated squash in northeastern United States (Monaghan et al. 2006: 216). A domesticated squash seed impression was also noted on an Early Woodland (2400-2700 BP) ceramic vessel fragment from the adjacent Schultz site. Finally, macrobotanical remains of domesticated squash were recovered at the Memorial Park site in north-central Pennsylvania, where it was associated with a Meadowood feature and AMS-dated to 2625 BP (Hart and Asch Sidell 1997: 531; Monaghan et al. 2006: 217).

At the Green Point site, the occurrence of *Cucurbita* seeds in alluvial sequence implies that these plants were common on the landscape surrounding the site. William Monaghan and his colleagues proposed that Archaic and Early Woodland populations in the Saginaw Bay region "did not just exploit existing naturalized *Cucurbita* but actually introduced and then managed them or their domesticated counterparts in semi-ruderal or informal stands" (Monaghan et al. 2006: 221). However, the absence of squash remains in adjacent archaeological contexts suggests that it was not a significant subsistence in Late Archaic/Early Woodland times (Monaghan et al. 2006: 220). It is possible that wild gourds and the first varieties of domesticated squash were raised primarily for use as containers, floats, rattles, and such, contributing little to the native diet (Fritz 1990:424). In Early Woodland times, Ozker (1982: 37) similarly proposed the use of cucurbits as containers for storing nut oils.

Alternately, the discovery of a squash seed imprint on one of the potsherds from the Schultz site could suggest that *Cucurbita* and pottery were associated in the preparation of food. It is possible, for example, that squash seeds were being processed for oil (Ozker 1982: 77; see also Sassaman 2002: 399). Presumably seed oil could have been extracted using watertight bark baskets and heated rocks as early as the Archaic, but ceramic technology could have improved the efficiency of the process considerably, especially under semi-sedentary conditions (Taché, in prep). *Cucurbita pepo* seeds consist of 46% oil/lipid, 34% protein, and 10% carbohydrate (Ozker 1982: 41). Other wild seeds such as sunflower (*Helianthis annuus*) and sumpweed (*Iva*) share this relatively high oil and protein content but

are deficient in several additional amino acids, which must be supplemented from other sources for their protein to be useable. Moreover, the small cucurbit seeds have a higher “harvest cost” than nuts, with about half the caloric value per unit edible portion, i.e., 300 cal/100g (Ford 1979: 235).

Other plants indigenous to the Eastern Woodlands that were cultivated by native populations include sumpweed (*Iva annua* var. *macrocarpa*), chenopod (*Chenopodium berlandieri*), and knotweed (*Polygonum erectum*), which show evidence of domestication by 4000 BP, 3400 BP, and 950 BP, respectively. In addition, little barley (*Hordeum pusillum*) and maygrass (*Phalaris caroliniana*) were likely domesticated in the Eastern Woodlands. The area of domestication and primary cultigen use in the Eastern Woodlands is generally considered to be the mid-latitude riverine interior in midwestern United States. In this latter region, clearly recognizable gardening had begun between 5000 and 4000 BP (Fecteau 1997: 27; Yarnell 1978: 296, cited in Jackson 1988: 79). Cultigens would thus have been integrated into a system of plant husbandry already in place in various areas of the Northeast.

Native to western North America, sunflower (*Helianthus annuus* var. *macrocarpa*) shows evidence of domestication in the Eastern Woodlands by 4200 years BP (Hart and Asch Sidell 1997: 523-524). Maize, on the other hand, was domesticated in Mexico and later diffused to the Eastern Woodlands. Macrobotanical remains of *Zea mays* have been dated to ca. 2000 BP in the Mississippi valley (Riley et al. 1994, cited in Hart and Asch Sidell 1997: 523). Recently, analysis of phytolith assemblages recovered from charred food residues has shown that maize was used in central New York by 2270 BP, well before the dates indicated by macrobotanical remains (Hart et al. 2007). The first date comes from the Vinette site and is about 500 years younger than Ritchie’s estimated date for the Wray site in New York, where a 2.54-cm-long corncob fragment denuded of kernels was found in a burial context. When this discovery was made in 1930, its importance was not recognized, and subsequent disintegration of the stored floral specimen made it impossible to confirm or reject this botanical identification (Ritchie 1965: 188). Since then, two cob fragments were found in an Early Woodland feature at the Pocock site, although Fecteau (1997: 53) considers this discovery suspect because of the extremely small size of the corn remains.

Other floral remains have been identified in Meadowood components, including goosefoot, amaranth, sunflower, brambles (e.g., raspberry, blackberry), elderberry, cherry, hawthorn, plum, blueberry, sumac, dogwood, grape, purslane, wood sorrel, sedges, and

cleavers (bedstraw). A number of these plants (e.g., raspberry, bedstraw, goosefoot, grape and purslane) are commonly encountered in disturbed habitats such as human occupation sites or stream banks (ruderals) (Wilson 1997: 56). Another finding worth of mention is a single sunflower seed from an Early Woodland hearth feature at the Dawson Creek site, which could represent some of the earliest evidence of cultigens in Ontario (Jackson 1988: 15). Of course, several additional plant species not represented within Meadowood assemblages (possibly due to sampling or preservation biases) could have played an important role in Early Woodland subsistence economy. Wetland resources, especially *Typha*, may have provided an important year-round resource, including high calorie pollen that could be made into flour (Nicholas 1998: 722).

Most floral remains were found in habitation contexts, but exceptions include seeds of uncultivated *Chenopodium* (goosefoot) and *Polygonum* (smartweed) found in the grave fill of cremations at the Red Ocher²⁰ sites of Hodge and Pomranky sites in Michigan. This floral material could have been an accidental inclusion in the fill, or it could represent mortuary offerings. According to Ozker (1982: 207), in the fall these species were available wild in the floodplain of the Saginaw valley and Lake Erie drainage. Ritchie (1965: 188) also proposed that the seeds could have been used to make flour, while shoots and leaves were edible greens.

Due to a variety of limiting factors (e.g., differential preservation of plant parts, wide dispersion of seeds, accidental or natural carbonization, contamination) the presence of a few carbonized seeds in the archaeological record is usually considered suspect (Fecteau 1997: 52). Thus, while Early Woodland data from the Saginaw Bay region may reflect incipient horticulture (Stothers and Abel 1993: 65), firm evidence of this sort is still lacking in the Ontario/Erie and St. Lawrence/Champlain Lowlands. Thus, Meadowood's economy was almost completely based on hunting, gathering, and fishing rather than gardening.

Nuts and nut oil appear to have been one of the most important plant resources, and wild rice of some local importance. Other plants assumed minor subsistence roles, although some domesticates (as well as nut oils) may have been important as prestige foods.

²⁰ A discussion of the nature of the Red Ocher culture is beyond the scope of this paper (see Pleger 2000), but Hodge and Pomranky sites are contemporary with the Meadowood Interaction Sphere and share many cultural attributes with Meadowood sites located in the Lake Forest region.

Fish

Approximately 185 species of fish are unequally distributed in the waters of the Great Lakes/St. Lawrence hydrographic basin (Underhill 1986). Fish are available year-round in this region, and at least one native group, the Huron, is known historically to have exploited this resource throughout the entire year (Heidenreich 1971: 208).

When comparing lists of species found in the major divisions of the Great-Lakes/St. Lawrence drainage, the St. Lawrence River appears more similar to the Ottawa River and Lake Champlain than to the Great Lakes. Generally speaking, species diversity increases from east to west in this basin. Waters between Lake St. Pierre and the brackish estuary are poorer than those upstream from Lake St. Pierre. On the other hand, fluvial Lakes St. Pierre and St. François are poorer than Des Deux Montagnes Lake and St. Louis Lake adjoining the island of Montreal, and small water bodies such as the Lachine Rapids, Des Cèdres Rapids and the Mille-Iles River are rich relative to their sizes. St. Louis Lake is the richest body of water within the St. Lawrence River drainage. In the Upper St. Lawrence valley, it was also observed that fish are relatively sedentary and occupy restricted territories (Mongeau et al. 1980, cited in Courtemanche 2003: 228). A good example of fish abundance within a restricted territory is provided by the Pointe-du-Buisson site, where hundreds of thousands of sturgeon, walleye, northern pike, and perch gathered to spawn in early spring (Courtemanche 2003: 250). Pointe-du-Buisson, bordering Lake St. Louis, is also where most of the Meadowood remains from the Upper St. Lawrence valley have been found.

The spatial distribution of Meadowood sites has led various authors to suggest that summer and spring fishing was a major subsistence activity among these communities (Abel 1997; Chrétien 1995a: 11; Granger 1978: 117-118; Ritchie 1965: 184; Spence and Fox 1986: 30). Besides the location of sites, evidence for Meadowood fishing and its importance comes from fishing gear and actual fish remains recovered in the archaeological sites.

Fishing Gear

Apparently very little fishing gear has survived archaeologically. Nevertheless, netsinkers from the Sinking Ponds, Vinette, and Morrow sites, single barbed points from Scaccia, Wray, and Riverhaven components, and one bone bipoint from Scaccia provide evidence of fishing. At the Morrow site, one netsinker was still attached to a carbonized fish

net, and a cache of 17 netsinkers excavated at the Sinking Ponds site has been interpreted as a manufacture or repair station for nets (Granger 1978: 118). As mentioned in Chapter 2, the flat pebbles found at the Sinking Ponds site suggest the use of stationary nets in a weir arrangement. Granger (1978: 257) also noted that the location of the Sinking Ponds and Allen sites on projecting ridges in proximity to embayments is ideal for establishing strategically located fish traps or weirs. Similar settings characterized the Petrie and Larkin sites.

In northeastern North America, weirs have been documented ethnographically and archaeologically in a variety of geographical and temporal contexts. The oldest known examples date to the Late Archaic period and were found at the outlet of Lake Simcoe in Ontario, in Massachusetts, and in Maine (Johnston and Cassavoy 1978; Petersen et al. 1994). During the Early Woodland period, the association of small Meadowood sites with shallow lakes and marshes could reflect the efficiency of weir-net fishing in these environments (Granger 1978: 295).

Net fishing is a very lucrative fishing technique, but it requires increasing cooperation and logistics within the communities compared to spearing or angling. Seines and nets also necessitate large quantities of cordage, the production of which requires great investment of time and energy as well as specialized skills. The first of a long list of steps involved in the production of cordage is the late summer/fall gathering of plants (Courtemanche 2003: 180-181). This activity may require the participation of a relatively large group, as attested by an ethnohistorical source recording the departure of forty persons to collect wild herbs used to make fishing nets (JR26: 26). Quoting an experienced faunal technician, Courtemanche (2003: 200) reported that with raw materials at hand, it takes about 60 hours to manufacture a net measuring nine metres in length and one metre high, with 10-cm mesh. A net also requires a lot of maintenance. Given the high investments in time and labour required to make cordage and nets, it is probable that this piece of equipment was highly valued, the nets owned as personal or family property, and their usage carefully monitored with loan charges applied (Courtemanche 2003: 184). In historic times, nets were traded between Huron and Algonquian groups (Moussette 1973: 46).

Fish Remains

Unfortunately, fish skeletal remains recovered from archaeological sites do not always reflect the importance of this activity, a misrepresentation that can be explained by a number of factors such as processing techniques (e.g., removal of vertebrae, ribs, and heads at procurement sites and their discard into rivers or lakes), a lack of preservation, and possible sampling biases (Lutins 1992, but see Carlson [1988: 66] regarding the lack of salmon bones in New England sites). Nevertheless, fish remains were recorded at a minimum of 14 Meadowood sites (9 habitation and 5 mortuary components), a majority of which (n=9) are located in the Ontario/Erie and St. Lawrence/Champlain Lowlands. Identified species from these two provinces include catfish, drumfish, bullhead, sucker, bowfin, pike or pickerel, yellow perch, sunfish, bass, bluegill, shad or herring, whitefish, sturgeon, and eel (Table 5.2). It has been repeatedly observed that native people favoured fatty food species (Courtemanche 2003: 243; St-Germain 1997: 106). According to modern norms, among the fish represented in Meadowood components, the American eel, the channel catfish, and the yellow sturgeon would be considered fatty species (>10% of fat) while the freshwater drumfish would be considered a semi-fatty fish (5-10% of fat) (Courtemanche 2003: 244, 248-249). When smoked, the meat of mature eels offers as much as 27.8g of fat/100g of fish (Courtemanche 2003: 272).

In terms of presence/absence of fish as a class, similar occurrences were found in habitation and mortuary components; however, a number of species were exclusively documented in one category of site. Drumfish, whitefish and eel were only found in habitation sites, while bowfin, pike/pickerel, yellow perch, bluegill and sturgeon were only identified in mortuary contexts. Most of these observations are based on single occurrences and do not take into account the unidentified remains present at a number of sites. Nevertheless, it is interesting to note that some of the species exclusively found in mortuary components, such as pike and sturgeon, are among the largest fish present in the Great Lakes/St. Lawrence basin. The greatest diversity of fish species has been observed at the Bruce Boyd site, within a feature believed to have contained the remains of a funeral feast. Since these fish remains were often reported in terms of presence/absence, the ranking of Meadowood sites according to the relative abundance of fish bones recovered was not attempted.

Table 5.2 Fish remains recovered in Meadowood habitation (H) and mortuary (M) sites

| | PROVINCES & SUBREGIONS | | | | | | | | | | Number of occurrences | | | | |
|------------------|-----------------------------|-------------|--------------|--------------------------------|-------------------|----------------|--------------------|------------------------|-----------------|---------------------|-----------------------|------------------|-------------|---|---|
| | Lakes Ontario/Erie Lowlands | | | St-Lawrence-Champlain Lowlands | | | Appal. Uplands | Hudson-Mohawk Lowlands | Maine/maritimes | Western Great Lakes | Mortuary sites | Habitation sites | | | |
| | Niagara Peninsula | Oneida Lake | Thames River | Lake Huron | Upper St-Lawrence | Lake Champlain | Middle St-Lawrence | Allegheny Uplands | Mohawk River | South New-Brunswick | | | Saginaw Bay | | |
| SITES | | | | | | | | | | | | | | | |
| FISH | | | | | | | | | | | | | | | |
| Catfish | X | | | | | | | X | | | | | 3 | 1 | |
| Bullhead | X | | | | | | | | | | | | | 2 | 1 |
| Drumfish | X | | | | | | | | | | | | | 1 | |
| Sucker | X | | | | | | | | X | | | | | 2 | 1 |
| Bowfin | X | | | | | | | | | | | | | | 1 |
| Pike or pickerel | X | | | | | | | | | | | | | | 1 |
| Yellow perch | X | | | | | | | | | X | | | | | 2 |
| Sunfish | X | | | | | | | | | | | | | 1 | 1 |
| Bass | X | | | | | | | | | | | | | 1 | 1 |
| Bluegill | X | | | | | | | | | | | | | | 1 |
| Shad or herring | | | | | | | | | | | | | | 1 | 1 |
| Whitefish sp. | | | | | | | | | | | | | | 1 | |
| Sturgeon | | | | | | | | | | | | | | | 1 |
| Eel | | | | | | | | | | | | | | 1 | |
| Unidentified | | | | | | | | | | | | | | 3 | 3 |
| SHELLFISH | | | | | | | | | | | | | | | |
| Mussels | X | | | | | | | | | | | | | 4 | 1 |

X=Present

Ethnohistorical sources and zooarchaeological analyses can provide additional insights relative to the techniques utilized and the size of some of the fish species that were captured and processed by prehistoric groups in the Great Lakes/St. Lawrence drainage basin. The next sections summarize this information, useful to better understand the importance of fish resources in Meadowood subsistence economy.

Catfish. Erhard Rostlund, author of *Freshwater Fish and Fishing in Native North America*, observed that channel catfish and *Castomidae* have great value for people seeking resource quantity, quality, and facility of acquisition from the same species (Courtemanche 2003: 227):

However, when their high food value is taken into consideration, it must be concluded that the catfishes were the most valuable food fishes available to the Indians in the inland region south of the Great Lakes. Like the suckers, the catfishes are spring spawners and their habits do not preclude the use of any type of fishing gear (Rostlund 1952: 33).

Channel catfish (represented at four sites in the Ontario/Erie and St. Lawrence/Champlain Lowlands and the Appalachian uplands) is the most common fish species identified in Meadowood contexts. It was also the predominant species of fish present in the faunal assemblage of a Middle Woodland component at the Pointe-du-Buisson site, which was thoroughly analysed by Evelyne Cossette in her Ph.D. dissertation (Cossette 2000). While her data relate to a later time period (Middle Woodland), and given the absence of similar analysis for the Meadowood sites, some of Cossette's observations will be considered here. Pointe-du-Buisson was also occupied by Meadowood communities and it is probable that the strategies employed to capture channel catfish at this particular locale did not change significantly from the Early to Middle Woodland periods.

The Channel catfish individuals represented at Pointe-du-Buisson were about ten years old and would have weighed approximately 775-800 g each based on modern averages for male and female specimens, respectively. However, channel catfish can be over 50 cm long and weigh over 8 kg (Courtemanche 2003: 251) Based on observations from Louis Nicolas, author of *Traité des animaux à quatre pieds terrestres*, the capture of catfish can be very prolific:

C'est un plaisir quand dans une heure on en prendra des centaines de 4 à 5 livres pièces. Les Sauvages vont au pied d'un rapide dans la saison et acoups dispée les

dardent à une et deux brasses d'eau. Toute la rivière en est pavée à divers endroits. Dans moins d'une heure j'en ay veu prendre bien deux quinteaux à un seul sauvage (Nicolas, environ 1677: 223).²¹

Nicolas also reported that channel catfish can easily be captured using a set line, i.e., a line with one or more hooks left unattended in the waters (Nicolas, environ 1677: 223). Since channel catfish are mostly nocturnal feeders, the use of set lines installed in deep and clear waters before dusk to be recuperated the next morning, appears as an appropriate fishing technique. The same method can be employed to catch Lake Sturgeon, Freshwater drum, Brown bullhead and American eel, since all are deepwater fishes (Cossette 2000: 127). Various sources confirm that this was actually the case in historic times (Clermont 1991: 29; Dumont et al. 1989, cited in Cossette 2000: 128; Moussette 1979: 97).

Bullheads. Like channel catfish, Bullheads were found in Meadowood sites located in the Ontario/Erie and St. Lawrence/Champlain Lowlands and the Appalachian uplands. Ages of the Brown Bullheads recovered in a Middle Woodland component at the Pointe-du-Buisson site varied between 2 and 5 years, with weights ranging from 23 to 275 kg, which is below average (Cossette 2000: 120). Although not the only possible explanation, the small sizes of Brown bullheads may indicate the use of nets or weirs:

Pour Wing (1984: 176) qui a étudié un assemblage osseux ichtyen provenant d'un site archéologique du sud-ouest de la Floride (Big Cypress Swamp), la présence d'individus dont les poids se situent entre une et dix onces (entre 28 et 284 g) indique l'utilisation probable de seines ou de nasses puisqu'il paraît difficile d'imaginer que des poissons de cette taille aient pu être capturés de façon efficace à l'aide de lignes pourvues d'hameçons (Cossette 2000: 120).²²

Drumfish. Remains of drumfish were identified at the Riverhaven 2 site in the Niagara Peninsula. The average size and weight of Lake Erie drumfish today is of approximately 40 cm and 700 g. However, the authors of *Fishes of the Great Lakes Region* remarked that:

²¹ It is a pleasure when in an hour we will catch hundreds, of 4 to 5 pounds a piece. In season, the Savages go at the foot of a rapid and spear them at one and two fathoms of water. Various sections of the river are entirely paved with fish. In less than an hour, I have seen a single Savage catch about two hundreds (Nicolas, ca. 1677: 223).

²² According to Wing (1984: 176), who studied a fish bone assemblage from an archaeological site in Southwest Florida (Big Cypress Swamp), the presence of individuals weighting between one and ten ounces (between 28 and 284 g) indicates the probable use of seines or conical fishing baskets, as it is unlikely that fish of this size were efficiently caught using lines and fishhooks (Cossette 2000: 120).

Large pharyngeal bones and molar teeth found in campsites of Native Americans indicate that in primordial times drums of about 200 pounds existed. Native Americans apparently valued the pharyngeal bones and traded the otoliths as “lucky stones”. Large numbers of these have been found about old Indian settlements — some far from the range of the fish (Hubbs and Lagler 2004: 224).

In a Middle Woodland component at the Pointe-du-Buisson site, age and size estimation of drumfish remains indicate that adult individuals exceeding 2 kg had been caught (Cossette 2000: 120).

Sturgeon. In spring, sturgeons leave their resting and feeding territories and migrate toward a limited number of sites to reproduce. A location near Pointe-du-Buisson is the only sturgeon spawning site known to date in the St. Lawrence River, while other known spawning locales are located along tributaries of the St. Lawrence (Armelin and Mousseau 1998: 78, cited in Courtemanche 2003: 235). André-Napoléon Montpetit (1840-1898) was a lawyer, a literary man, one of the first to recognize Pointe-du-Buisson’s archaeological potential, and also a fisherman. In 1872, he wrote about “Le Buisson” in a journal entitled *Album de la Minerve*, where he described the techniques and fish harvests of fishermen exploiting the waters surrounding this point of land:

Un demi-cercle de cailloux roulants presque à fleur d’eau les protège contre le courant toujours rapide. On s’étonne qu’une barrière aussi fragile puisse servir de prison à ces éturgeons énormes longs quelquefois de plus de six pieds et pesant près de cent livres (Clermont 1991: 25).²³

Les bonnes journées sont de trente, quarante éturgeons et maillés ainsi capturés (Clermont 1991: 26).²⁴

By moving against the currents at night, Montpetit reported that fishermen could capture even more sturgeons:

Les bonnes rondes rapportent de vingt-cinq à quarante éturgeons et escargots; on ne compte ni les barbues, ni les carpes que l’on accroche en passant. Il se fait trois rondes dans la nuit (Clermont 1991: 27).²⁵

²³ Half a circle of small stones rolling at the surface of the water protects them from the currents, which are always fast. It is surprising that such a fragile barrier can act as a prison for these large sturgeons, which are sometimes over six feet-long and weigh almost one hundred pounds (Clermont 1991: 25).

²⁴ On a good day, thirty to forty sturgeons can be caught in this fashion (Clermont 1991: 26).

Hector Trudel, another expert fisherman, exploited the waters of Pointe-du-Buisson between 1910 and 1965, when a large fishing lodge constructed on the site attracted a number of families during the summer months. During this period, the Pointe began to be used for commercial fishing. The construction of a hydroelectric dam in 1965 put an end to the site's long history of providing sustenance to those who occupied its shores.

Yellow sturgeons have an average size ranging from 90 and 140 cm and weigh between 5 and 35 kg, although some fish can reach 100 kg. Gabriel Sagard ([1632]1976: 241) reports a feast at which one large sturgeon, prepared in a stew with flour, fed a party of 50 men (Courtemanche 2003: 253). At Pointe-du-Buisson, the smallest sturgeons caught by Hector Trudel were approximately two feet (60 cm) long, and weighed about ten pounds (4.5 kg). This is consistent with Évelyne Cossette's zooarchaeological analysis of a Middle Woodland component at this site, where she observed that a majority of sturgeons measured between 0.62 and 1.12 m, with a corresponding weight range of 1.4 to 9.4 kg (Cossette 2000: 123).

According to Trudel's accounts, in the nineteenth and twentieth centuries spearing was the favored method of capturing sturgeon. This was done at night, using bargepoles over five metres long. A good catch could yield as much as 30 fish, the maximum being 55 sturgeons captured in a single night. More recently, a similar technique was observed among the Nemiska Cris (Lebuis 1971, cited in Cossette 2000: 125), and a number of ethnohistorical documents suggest that spearing is also how indigenous fishermen caught sturgeons in the protohistoric period (Courtemanche 2003: 166; Rostlund 1952):

Les sauvages les dardent au pied des grands rapides ou sauts et il y a une saison dans l'année qu'ils les assoment à coup de rames (Nicolas, environ 1677: 243-244).²⁶

American Eel. The St. Lawrence River is part of the American eel's migrating route, and many ethnohistorical documents attest to the capture and storage of this fish (Charlevoix (1744)1976: 261-262; Julien et al. 1981: 199, Giguère 1973: 310, Sagard (1632)1976: 177, JR5: 6, JR6: 135, JR7: 234). Biologists estimate that before the recent

²⁵ Good rounds yield between twenty-five and forty sturgeons and snails; this is without counting catfish and carps caught by chance. Three rounds are accomplished in one night (Clermont 1991: 27)

²⁶ The savages spear them at the foot of important rapids or falls and there is one season during the year where they hit them with their paddles (Nicolas, ca. 1677: 243-244).

perturbations that affected the Great Lakes, literally millions of juvenile eels (40-50 cm long) travelled in the Upper St. Lawrence valley toward Lake Ontario between June and September. Millions of mature eels (about one metre long) also travelled in the opposite direction to reach their reproduction site in the Sargasso sea (Courtemanche 2003: 269). At Pointe-du-Buisson, Montpetit wrote in 1872 that it is easy to capture large quantities of eels and channel catfish using a fixed line (Clermont 1991: 29). Eels are easily smoked whole (without removing the bones), which could explain why this fish is poorly represented at procurement sites in archaeological contexts, although bone remains from stored surpluses could eventually be found on winter sites (Courtemanche 2003: 273). Certainly, documents indicate that American eels were stored winter food “par excellence” in historic times and it would be surprising if Meadowood communities did not exploit and store this resource as well.

Mammals

Among northeastern hunter/gatherer populations, mammals have always represented an important food source, especially in the winter when other resources were scarce. The basic subsistence needs of a community relying on hunting are substantial:

Par exemple, une famille ojibway de 10 personnes devait tuer et consommer 40 lièvres par jour (HIND, 1863, p. 108), un groupe de 30 Montagnais avait besoin d'un gros orignal à tous les deux jours en hiver pour vivre médiocrement et sans pâtir (LE JEUNE, 1635, p. 81), une famille de quatre individus dépendant du caribou a besoin d'environ 250 bêtes par an (KELSALL, 1968), un groupe de 20 personnes peut facilement manger 25 castors en moins d'une semaine, etc (Clermont 1974: 450).²⁷

Compared to fish or nuts, mammals are a much less predictable food source, and the availability of game within the provinces and subregions considered in this study may have varied considerably. Based on ethnohistorical evidence Webster (1983: 44) mentioned the low availability of game in the territory occupied by the Huron (Lake Huron/Georgian Bay) compared to that of the Five-Nations (South of Lake Ontario, between the Genesee and Hudson valleys) and the Niagara Peninsula.

²⁷ For example, an Ojibwa family of 10 had to kill and eat 40 hares each day (HIND, 1863, p. 108), a group of 30 Innu needed a large moose every two days in the winter in order to live poorly without suffering (LE JEUNE, 1635, p. 81), a family of four individuals depending on caribou needs about 250 animals each year (KELSALL, 1968), a group of 20 people can easily eat 25 beavers in less than a week, etc (Clermont 1974: 450).

Nevertheless, good hunting seasons may have allowed the accumulation of a surplus. If trustworthy, the mention of a winter when the Algonquins killed more than two thousand deer exemplifies such a situation of abundance (JR 28: 285). LeJeune also described the occasional drying of moose meat at the end of the cold season (Clermont 1980: 96):

When the heavy snows come, they eat fresh moose meat; they dry it, to live upon the rest of the time until September; and with this they have a few birds, Bears, and Beavers, which they take in the Spring and during the Summer (JR6: 136).

While the location of Meadowood sites along waterways has been used to stress the importance of fishing among these Early Woodland communities, in some cases other resources may have been the focus of Meadowood groups' subsistence strategies. At the Riverhaven 2 site, Granger suggested that:

The inland stands of oak and hickory on Grand Island provided a mast production ideal for sustaining large populations of deer and turkey in a restricted hunting area bounded by water. The Riverhaven 2 faunal sample suggests an inland rather than a riverine subsistence economy (Granger 1978: 234).

Mammals almost always compose the major category of faunal remains recovered in Meadowood archaeological sites (Table 5.3). Of course, taphonomic bias certainly explains part of this mammal over-representation. Nevertheless, one cannot deny the importance of these animals in the general Meadowood diet. This is all the more true considering the actual quantity of food that mammals represent. At the Riverhaven 2 site, for example, "mammals clearly represent the maximum proportion of useable meat at 96%, but this discrepancy is less obvious in the frequency of individuals" (Granger 1978: 232-233). Moreover, the presence of calcined and highly fragmented mammal bones is often associated with bone reduction for the manufacture of bone grease. Early historic accounts report the processing of beaver, bear, deer, and moose in this fashion (Deal 1986: 88).

The mixed and deciduous forests where Meadowood sites are found in greatest concentration are inhabited by three important cervidae species (caribou, moose, and white-tailed deer). A number of carnivorous/omnivorous species were also hunted for their meat and fur (bear and fox), and many rodents were relatively easy to catch (beaver, woodchuck, porcupine, muskrat, and squirrel) (Clermont 1974: 449). Such animals as bear, woodchuck, and beaver can be found throughout the study area, whereas other species have more limited

habitats. For example, caribou and moose are more abundant in northern regions, such as the Middle St. Lawrence valley, while in prehistoric times deer were mostly encountered in the southern portions of the study area. These different distributions are reflected in the relative importance of specific types of mammal remains between Meadowood archaeological sites located in different geographic areas. Beaver and the black bear, for example, are equally represented in the various provinces, while deer and moose concentrate in the Ontario/Erie Lowlands and St. Lawrence/Champlain Lowlands, respectively (Table 5.3).

Moose is the only species identified more frequently in mortuary contexts, while elk/caribou, rabbit/hare, raccoon, porcupine, muskrat, gray squirrel, and sea mink have only been recorded in habitation sites. In terms of occurrences, the white-tailed deer, beaver, black bear and dog are the most commonly encountered mammal species in Meadowood sites. All have been identified more frequently in habitation components, but occur also in mortuary contexts. In the following section, a brief discussion of some of the major hunted species will be presented. Dog is the only animal that northeastern prehistoric communities ever domesticated. Because it was occasionally consumed at feasts, the presence of dog remains in Meadowood archaeological sites will be discussed in the section on feasting practices included in this chapter.

Cervidae

In *Ecology of North America*, Victor E. Shelford (1963: 45-47) described the Ontario/Erie and St. Lawrence/Champlain Lowlands as an elk-deer / maple-beech forests association. The white-tailed deer, the most common cervidae species in this landscape, is an animal with important influences on its environment. The presence of predators such as wolf, bear, cougar, and lynx is one of the consequences of large deer populations (Granger 1978: 48). White-tailed deer also constituted the primary large mammal species in the subsistence economy of Meadowood communities living south of the 45th degree of latitude:

Il y a auffi des Animaux qu'on appelle Cerfs qui font de la même façon que ceux de France, à la reserve qu'ils font plus petits, & d'un poil plus blanchastre. De ceux-là il ne s'en trouue pas au deffous du Mont-Royal, mais bien au deffus; montant plus haut, il y en a fans nombre (Boucher 1664: 57).²⁸

During the spring and summer months, white-tailed deer, traveling in the woods alone or in small groups of two or three, frequently occur in open areas, forest edges, and burned areas. Deer hunting was probably undertaken opportunistically and by small groups of hunters during the warm season. In the winter, on the other hand, small herds of deer gather in closed deciduous stands, where food is abundant (Binford 1991: 60; Granger 1978: 48). To efficiently exploit this species in the cold season, it is possible that Meadowood communities organized communal hunts, a strategy that was documented ethnographically (Table 5.6):

Mass hunting tactics may be best considered as specialized methods for taking deer at specific locations during autumn when large number of deer are known to congregate for brief periods of time (Webster 1983: 75).

Elk were not only much scarcer than deer (around 1 elk per square km compared to 8 deer per square km) but according to nineteenth-century hunters, also apparently much more cautious and alert and consequently more difficult to pursue than deer (Rhodes 1903: 29-47, cited in Webster 1983: 409). Nevertheless, this species may have been successfully hunted in restricted areas "historically known for its many salt licks which attracted herds of up to 75 elks during the summer" (Rhodes 1903: 47, cited in Webster 1983: 81). North of the 45th degree of latitude, the capture of moose, a difficult and uncertain enterprise, was probably critical for the survival of prehistoric groups at a time of year when resource stress was the most pronounced (Clermont 1980: 95). After cervidae, beaver and bear were the two next most important mammal food sources among hunter/gatherer populations in northeastern North America.

²⁸ There are also animals that are called deer, similar to those from France, except smaller and with whiter-color hair. This kind cannot be found south of Mont-Royal, but moving north they are innumerable (Boucher 1664: 57).

Beaver

While densities of beaver were insufficient to represent a primary food source among indigenous populations in northeastern North America, this animal played an important role in the economic and social activities of many Algonquian groups. Regarding its capture, Clermont stated:

(...) sa prise signalait la valeur du chasseur, impliquait un partage et assurait ainsi un certain prestige communautaire. Comme l'orignal, l'ours ou le caribou, le castor devenait alors un prétexte à la cimentation du réseau social, à l'affirmation des statuts, à l'identité (Clermont 1980: 102).²⁹

Beaver are highly valued for their meat, characterized by a high fat content, and their very warm fur. As in most prehistoric periods in the Northeast, the beaver is well represented in Meadwood faunal assemblages. According to Norman Clermont, this animal was a major backup resource among hunter/gatherer communities in the Northeast. It was captured throughout the year, although the most productive chases were undertaken in October, November, February, March, and April (Clermont 1980: 98). Clermont estimated that the average hunter probably captured between 20 and 30 per year, which is equivalent in useable meat to one very large moose.

Black Bear

For several boreal hunting cultures spread across the circumpolar region, and perhaps for as much as 75,000 years, the bear has been considered a special and unique animal, embedded with symbolic meaning and associated with various rituals and ceremonies (Berres et al. 2004; Clermont 1980: 94; Hallowell 1926; Volmar 1996). Occupying a higher trophic level, bears are much less abundant than herbivorous mammals and therefore rarer and more difficult to procure. The following statement applies to native groups of northeastern North America:

The American black bear (*Ursus americanus*) formerly flourished throughout the forested portions of the Northeast (Cleland 1966:163; Craighead 2000:64, 129) and

²⁹ (...) its capture reflected the value of the hunter and involved sharing, therefore assuring a certain prestige to the community. As in the case of moose, bear, or caribou, the beaver then became a pretext for consolidating the social network, reaffirming statuses, and expressing identity (Clermont 1980: 102).

figured prominently in the religious, social, and economic life of the Algonquian, Northern Iroquoian, and Siouan-speaking peoples such as the Winnebago and Mdewakanton Dakota (Berres et al. 2004: 6).

The American black bear, which can reach 227 to 364 kg in weight and 1.5 to 1.8 m in height, can be a very intimidating animal (Berres et al. 2004: 8). Every fall, the bear's body is covered with an important layer of fat in preparation for hibernation, and the high value given to this animal by various human societies may also be related to this important characteristic. For example, Père Le Jeune (1634: 25) noted that "the Savages prefer the meat of the Bear to all other kinds of food; it seems to me that the young Beaver is in no way inferior to it, but the Bear has more fat, and therefore the Savages like it better (RJ6: 93)".

The bear feast is one of the most important feasts held by Algonquian and Iroquoian groups, and every event surrounding the animal's capture, distribution and consumption is marked by special rituals (Clermont 1980: 105; Cossette 2000: 140; Perrot 1644-1718; Speck 1935: 98-99). For example, sweat lodge rituals and fasts sometimes preceded bear hunting expeditions. The hunting of bears usually took place between October and April and was sometimes a dangerous enterprise, especially in spring when the animal wakes up from its winter lethargy. This may be why the Huron used trained dogs to hunt bear (JR14: 203). Bear is also one of the few species for which communal hunting parties were occasionally organized, under the direction of one individual, also responsible for organizing the feasts following a successful hunt.

Birds, Reptiles, and Amphibians

Wild turkey, goose, and duck remains have been identified in Meadowood components (Table 5.4). The first two species were found in both habitation and mortuary sites. Wild turkey's area of distribution did not extend much farther north than Montreal. It was available throughout most of the year, but the densest concentrations occurred in the fall, when mast production was abundant, as well as in the winter, when flocks of 20-40 birds gathered in low protected hollows (Webster 1983: 97). Ducks and geese, on the other hand, are common to the whole Lake Forest region but are seasonal migrants and as such, "could only be taken during limited periods of the year and in relatively few places" (Binford 1991: 232). The watery bogs and marshes in the Niagara Frontier, for example, are major stopping points for these aquatic birds (Granger 1978: 49). Although faunal remains are

lacking at archaeological sites, Chrétien suggested that the exploitation of waterfowl and other migratory birds may have been important in the marshy areas bordering Lac St. Pierre, close to the Camp St. Dominique and Ruisseau St. Charles sites (Chrétien 1995a: 290; Figure 3.2: 89-90). The location of the Du Verger, CgEq-25, and CgEq-22 sites is also associated with a migratory stopover of the Greater Snow Goose (Chrétien 1995a: 280; Figure 3.2: 104-106). While to the best of my knowledge, remains of the now-extinct passenger pigeon have not been positively identified on Meadowood archaeological sites, it is quite possible that these birds were hunted in areas where they were abundant for short periods of time:

During the nineteenth century Seneca hunters reported areas of up to 180 square miles holding dense flocks of nesting pigeons, each tree holding one to 50 nests depending upon its size (Webster 1983: 99).

Webster (1983: 100) suggested that passenger pigeon was probably particularly important to those communities located near natural deposits of salts, where large flocks concentrate during their migratory flights. Such a location was associated with the Meadowood cache site of Jack's Reef (Figure 3.1: 31), near Lake Onondaga and the present-day city of Syracuse (often called Salt City):

The 16th. We arrive at the entrance to a little lake in a great basin that is half dried up, and taste the water from a spring of which these people dare not drink, as they say there is an evil spirit in it that renders it foul. Upon tasting of it, I find it to be a spring of salt water; and indeed we made some salt from it, as natural as that which comes from the sea, and are carrying a sample of it to Quebec. This lake is very rich in salmon-trout and other fish (JR41: 91).

Salt Springs were also noted close to the seventeenth century Iroquois village of Goiogouen on the east shore of the Cayuga Lake (JR56: 76), in the same general area as the René Menard Bridge and Canoga Meadowood caches (Figure 3.1: 30,120). Once again, a notable relationship exists between areas where spatially restricted resources concentrate and the location of Meadowood sites, in this case caches. This possible link between salt springs and archaeological components is supported by the fact that the Finger Lake region east of the Keuka Lake is otherwise devoid of salt sources and Meadowood sites. No Meadowood component is documented north or south of this area either. To my knowledge, no evidence of prehistoric salt exploitation, production, or trade is known to date, but this question is certainly worth further consideration.

Table 5.4 Bird, reptile, and amphibian remains recovered in Meadowood habitation (H) and mortuary (M) sites

| | | PROVINCES & SUBREGIONS | | | | | | | | Number of occurrences | | | | | | | | | | | | |
|--|--|----------------------------|---------------|---------------------------------|----------------|--------------------|------------------|---------------------|-------------------|-----------------------|-------------------------|-----------------------|-------------|--------------|----------|----------|-------------|----------|---|--|---|---|
| | | Lake Erie/Ontario Lowlands | | St. Lawrence/Champlain Lowlands | | Appal. Uplands | Maine/maritimes | Western Great Lakes | Saginaw Bay | | Habitat sites | Mortuary sites | | | | | | | | | | |
| | | Niagara Peninsula | Oneida Lake | Thames River | Lake Huron | Upper St. Lawrence | Lake Champlain | Middle St. Lawrence | Allegheny Uplands | Coastal Maine | Hodges (M) | 20SA1(H) | | | | | | | | | | |
| | | Riverhaven (H) | Lakefront (H) | Boyd (M) | Bruce Boyd (M) | Vinette (H) | Oberlander 2 (M) | Pocock (H) | Ferris (H) | Muskalonge (M) | Pointe-du-Buisson 5 (M) | Pearl Street Park (H) | Boucher (M) | Batiscan (H) | Désy (H) | Wray (M) | Scaccia (H) | Knox (H) | | | | |
| | | Wild Turkey | Duck | Goose | Unidentified | REPTILES | Turtles | AMPHIBIANS | Frog/toad | | | | | | | | | | | | | |
| | | X | | | X | | | | | | | | X | | | | X | | | | 3 | 2 |
| | | X | | | | | | | | | | | X | | | | X | | | | 2 | 0 |
| | | X | | | | | | | | X | | | | | | | X | | | | 2 | 1 |
| | | | X | | | | | | | | | | | | | | | | X | | 2 | 2 |
| | | X | X | | | | | | | | | X | | X | X | X | X | X | | | 8 | 2 |
| | | | | | | | | X | | | | | | | | | | | | | | |
| | | | | | | | | X | | | | | | | | | X | | | | 3 | 0 |

X=Present

Some species of reptiles and amphibians were a major food source for waterfowl (Granger 1978: 49), and human groups also exploited those resources, as evidenced by the presence of turtle and frog/toad bones in a number of Meadowood sites. Granger (1978: 373) mentions the presence of nine different species of turtles in the Niagara region, but only wood turtle, painted turtle, and common snapping turtle are encountered in the northeastern portion of the St. Lawrence Lowlands (Redpath Museum 1999). Besides representing a subsistence resource, turtle shells may have been used as containers or rattles. For example, Ritchie and Funk (1973: 114) hypothesized that the turtle fragments found in a pit feature at the Scaccia site once formed a cup or a bowl. Fragments of unmodified turtle shell were also present at the Wray site mortuary component.

The next two sections will address questions relating to storage of food among Meadowood communities. This discussion will begin with an assessment of the environment's productivity, since storage is only feasible in contexts where resources can be accumulated beyond immediate subsistence needs (Testart 1982: 523). The necessity of storage in the context of seasonal variability, and the evolution of storage in prehistoric northeastern North America will then be addressed.

Productivity of the Environment

As Granger (1978: 49) observed, Meadowood groups lived in "an area in which food resources were plentiful and easily hunted, fished, or gathered." Similar affirmations abound in the literature, but quantitative assessments of the territory's productivity are almost nonexistent. Quantitatively evaluating modern productivity and biomass of the regions located within the study area is a challenging task, let alone trying to reconstruct such figures for Early Woodland times. Nevertheless, ethnohistorical and historical documents discussed in the next section will be used as a complement to archaeological evidence to evaluate the diversity and abundance of animal resources in the past.

Contact era and other historic accounts often mention the quantities of fish, mammals, and birds caught in some of the regions previously occupied by Meadowood communities (Bakeless 1961: 22-3, 262; Barber 1980: 107; Brumbach 1978: 20, 219, 226-234, 1986: 42-60; Cleland 1982; Cossette 2000; Courtemanche 2003; De Yoe 1961; Heath 1963: 63; James and Jameson 1913; Johnston and Cassavoy 1978: 707; J. R. 1959, 42: 73; J.R. 1708,

54: 129-130, 149-152; Snow 1980: 43; Van der Donck 1656: 54). Table 5.5 compiles a few accounts where quantitative data (number of prey, number of men involved, and duration of hunt or fishing episode) were available. These numbers clearly leave an impression of resource abundance, but cannot, of course, be directly extrapolated into the prehistoric period (Limp and Reidhead 1979: 70; Lutins 1992). Without better comparative bases, these data nevertheless contribute to quantitatively assessing the environment's productivity.

Studying Iroquois hunting strategies for his doctoral dissertation, Gary S. Webster evaluated seasonal pre-firearms return rates for various animal species based on ethnohistorical documents or, when the latter were lacking, he adjusted modern management records to take into account the different hunting strategies employed (Webster 1983: 187-188). The return rates presented in Table 5.6 are modified from Webster's calculations (Webster 1983: Appendice A), and include data from different regions, as well as different time periods. As such, this table should only be considered as an attempt to draw an approximate picture of game availability and return rates in the general territory of Meadowood communities. Interestingly, return rates from fishing are significantly higher than those obtained through hunting mammals or capturing birds. Webster reported return rates per hunter-day assuming that most Iroquois hunters were responsible for provisioning four other people with meat and fish. In a group of 50 people composed of 10 families, for example, 53,970 kg (5,397kg x 10 hunters) of meat would be available to the entire community (see Table 5.6. "Total meat" column). Among the Meadowood communities, however, the contribution of women and children to the diet in meat and fish was undoubtedly more important than in agricultural societies such as the Iroquois. Consequently, an estimate of 80,000 to 100,000 kg for the quantity of meat and fish annually captured by a community of 50 people are probably closer to the Meadowood reality.

Webster (1983: 198) also estimates the yearly meat demand of communities in which meat contributes various proportions of the diet: 15% (124kg/person); 25% (207kg/person); 50% (414kg/person) and 100% (827kg/person). Strontium content in human bones from three Late Archaic to Early Woodland cemeteries in the Midwest reveals high strontium levels, suggesting a diet consisting of more meat (80%) than vegetal resources (20%) (Price et al. 1985: 436-437, cited in Stothers and Abel 1993: 65).

Table 5.5 Ethnohistorical and modern references regarding fish, mammal, and bird productivity

| Cultural group / location | Year / century | Season of capture | Duration of hunt | Number of hunters | Methods of capture | Number of animals caught | References ¹ |
|--|----------------|----------------------------------|-----------------------------------|-------------------|-----------------------|---|--|
| River near Oneida village | 1634 | Fall | 1 day | | | 600-800 landlocked salmon | *Bogaert 1909: 149 |
| River near Oneida village | 1634 | After fishing season in November | | | | 60-70 landlocked salmon hanging in some houses | *Bogaert 1909: 149 |
| Innu | 1634 | Fall | 1 night | 2 | Weir or harpoon | 300 eels | JR6: 160 |
| | 1636 | | 1 night | 1 | | 25-30 channel catfish | JR9: 170 |
| Near Onondaga | 1655-1656 | Summer | 1 night | 1 | | 1,000 eels | *JR42: 53 |
| Lake Ganontaga near Onondaga | 1657 | Summer | 1 day | >40 | Clubs (oars) | 34 salmon | *JR43: 41 |
| Iroquois | 1659 | Fall (September & October) | 1 season | 1 | | 40,000-70,000 eels | JR45: 16: |
| Algonquian (Ottawa) / Lake Superior | 1669 | Fall | Average per night in a single net | | Netting | 800 herring, or 150 whitefish, or 20 large sturgeon | *JR54: 23-26 |
| | 1672 | | 1 hour at night | | | 200 bass; | Denys (1672)1908: 490, 598 |
| | 1672 | | One afternoon | | Hand line | 150-200 salmon & char | Denys (1672)1908 |
| 80-100 bark canoes | 1677 | | | | Various sizes of nets | Whitefish | Nicolas 1677?: f:82 |
| | 1677 | | 1 hour | | spears | (<i>Coregonus/Prosopium</i> spp) | Nicolas 1677?: 223 |
| | | | Every day | | | Hundreds of channel catfish | Nicolas 1677?: f:81 |
| Iroquois Tsonnontouans/ Mouth of the Niagara river | 1683 | | | | Scine | 3 to 4 full bags of walleye | Hennepin 1683: 23 |
| | 1691 | | 3 hours | | | More than 300 whitefish bigger than carp | LeClercq (1691)1910 |
| Rapids near Pointe-du-Buisson | | | Each time line taken out | | Fixed line | 200 char | Unpublished documents |
| | 1722 | | | | | 40-50 fish | 1614-1698, cited in Margry 1879: 121 |
| | | | | | | Enough fish to feed large villages | Bacqueville De la Potherie (1722)1997: 268 |

| Cultural group / location | Year / century | Season of capture | Duration of hunt | Number of hunters | Methods of capture | Number of animals caught | References ¹ |
|---|--------------------|-------------------|------------------------------------|-------------------|---|--|--|
| Atlantic drainage rivers (Susquehanna & Hudson) | eighteenth century | Spring | < 2 hours one day | | Weirs | >200 char, fallfish, minnow 1,000 shad | Normandin 1732: 21 *Loskeil 1794: 94; Zeisberger 1910: 37; |
| Pointe-du-Buisson | nineteenth century | | | | Weirs | White suckers, copper redhorses, pike, goldfish, channel catfish, walleye | Clermont 1991: 22-24 |
| Pointe-du-Buisson | nineteenth century | | 1 good day | | Weirs | 30 to 40 sturgeons | Clermont 1991: 26 |
| Pointe-du-Buisson | nineteenth century | | 1 night | | Fishing gaff | 75-120 sturgeons | Clermont 1991: 27 |
| Pointe-du-Buisson | | Spring | A few weeks | | | A huge quantity of suckers | Montpetit 1897 |
| Pointe-du-Buisson | | | 1 afternoon | | | 100-150 pounds of fallfish, minnow | Montpetit 1897: 522 |
| From Côteau du Lac to Pointe-du-Buisson | | Summer | 1 night | Average/ canoe | | 50 to 60 eels | Montpetit 1897: 284-285 |
| Ojibwa | twentieth century | Fall | 1 day | 1 | | 50 whitefish | *Rogers 1962: 17 |
| Mistassinni Cris | twentieth century | | | | Nets/harpoons | sturgeon | Rogers 1963: |
| Modern day Cree | twentieth century | Fall | 1 day | 1 | | 120 pounds of fish | *Winterhalter 1981 |
| Experimental study/ Mid-western rivers | twentieth century | | | | Weir | shad | *Limp and Reidhead 1979: 70-78 |
| St. François Lake | 1982 | Spring | Average for a single seine capture | | Seine (45 m long x 3 m high, 5 cm meshes) | 263 brown bullheads, 232 sunfish 79 crappies, 16 carp | Hénault 1983 |
| Québec's freshwater | 1987 & 1988 | Late spring | | | Fixed line lured with perch | 1,461 sturgeons, American eels, channel catfish, rock bass, saugers; walleye, smallmouth bass, mooneyes, northern pike | Dumont et al.1989: 22 |
| Québec's freshwater | | | | | Net, shallow waters | crapes, perchaudes, barbottes, brochets | Bélanger 1989 |
| Québec's freshwater | | | | | Net, to 12 m of depth | white sucker, copper redhorse, sturgeons, channel catfish | Bélanger 1989 |

| Cultural group / location | Year / century | Season of capture | Duration of hunt | Number of hunters | Methods of capture | Number of animals caught | References ¹ |
|---|-------------------------|-----------------------|----------------------------------|-------------------------|---|--|---|
| Huron/ Rice Lake | 1615 | Fall | 10 preparation & 14 hunting days | | Mass drive | 120 deer | Champlain 1615, cited in Biggar 1929: 84 |
| Mohawk/Around the village of Tenategehage | 1634 | Fall | 3 months season | | | 40-50 deer per longhouse | Bogaert (1634)1909 |
| Mohawk | 1634 | Winter (mid-December) | | | Stalking, pursuit with dogs | 120 beaver hanging in a big house (c.12 men) | Bogaert (1634)1909: 143 |
| Andaste (purchase by Swedish traders) | 1644 | | annual | | | 8,000 to 9,000 beaver | Phillips 1961: 152 |
| Iroquois | Mid-seventeenth century | Fall | 1 season | 1 | Musket | 50-150 deer | De Schweinitz 1870: 81 |
| From Québec to Onondaga | 1655 | Fall (October) | 17 days incidental hunt | 60 | Stalking or driving | 5 elk, 38 bears | JR42: 28-34 |
| | 1656 | Summer (June) | Incidental hunt | 40 | | 8 fawns, 100 channel catfish | JR43: 28-40 |
| Cayuga/Around the village of Oioquaen | 1671 | | 1 year | c.100 | Musket | 1000 deer | Fenton 1940: 223; JR56: 76 |
| Onondaga | eighteenth century | | 1 season | 1 | Rifle | 20 deer | Friederick and Zeisberg, cited in Beauchamp 1916: 209 |
| Ohio Mohawk & Wyandott | 1750s | Fall (November) | | 53 men & their families | Mass drive & muskets | 30 deer | Smith 1799: 25 |
| Ohio Mohawk & Wyandott | 1755 | Winter (December) | 14 days | 2 | Bows and rifles (possibly involving dogs) | 4 bears, 3 deer, 3 racoons & several turkeys | Smith 1799: 26 |
| Ohio Mohawk & Wyandott | 1755 | Winter (January) | 2 days | 8 | Bows and rifles (possibly involving dogs) | 3 bears, 1 deer, 2 turkeys | Smith 1799: 28 |
| Genesee River | 1780 | Summer | 40 days | 2 | Rifle | A few deer and elk | Gilbert 1780: 249-250 |
| Trading posts of Fort Orange (Five-Nations furs' primary outlet | | | annual | | | 8,000 to 9,000 beaver; 1,300 to 1,400 otter | Trigger 1976: 618; Phillips 1961: 752 |

| Cultural group / location | Year / century | Season of capture | Duration of hunt | Number of hunters | Methods of capture | Number of animals caught | References ¹ |
|---|--------------------|-------------------|------------------|-------------------|--|--------------------------------------|---|
| Wyandott/ Northern Ohio | nineteenth century | Spring | | 1 | traps | 300-600 raccoon | Finley 1857: 297 |
| Wyandott/ Northern Ohio | nineteenth century | | 1 week | 1 | traps | 30 raccoon | Finley 1857: 297 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Beaver | Winterhalter 1981; Rogers 1962: 36-39 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Muskrat | Winterhalter 1981; Nelson 1973: 265; Nichols and Chabreck 1973: 157 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Raccoon | Sonnenshine and Winslow 1972; Nichols and Chabreck 1973 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Otter | Nichols and Chabreck 1973; Nelson 1973: 248 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Fox | Nelson 1973: 17-18, 245 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Squirrel | Mosby 1969: 65 |
| Modern trapping records | twentieth century | | | | Steel traps, snares and other modern trapping techniques | Rabbit | Nixon 1959: 61-63 |
| Onondaga | 1656 | Spring | | | Snaring or netting | 700 passenger pigeons in one morning | JR43: 42 |
| Cayuga mission//Around the village of Oioquen | 1671 | Spring | | | Snaring or netting | 700-800 passenger pigeons | JR56: 76 |
| Modern records/ Maryland tidewater | twentieth century | | | | shotguns | Waterfowl | Webster et al. 1971: 187-190 |
| Modern records/ Erie-Ontario Lake Plains | twentieth century | | | | shotguns | Waterfowl | Foley 1955: 212-213 |

¹ References that are preceded by an asterisk are those used by Webster (1983) to calculate meat return rates for various species (see Table 5.6)

Table 5.6 Return rates for harvesting of meat and fur value for one band (50 people)/year, modified from Webster's (1983) data

| | FALL | | WINTER | | SPRING | | SUMMER | | TOTALS | |
|---------------|--------------|---------------|------------|---------------|--------------|---------------|------------|---------------|--------------|---------------|
| | Meat (kg) | Fur (styvers) | Meat (kg) | Fur (styvers) | Meat (kg) | Fur (styvers) | Meat (kg) | Fur (styvers) | Meat (kg) | Fur (styvers) |
| Fish | 1,168 | | | | 816 | | 82 | | 2,066 | 0 |
| Deer | 294 | 162 | 114 | 90 | 78 | 72 | 45 | 27 | 531 | 351 |
| Elk | 73 | 72 | 29 | 36 | 16 | 18 | 12 | 9 | 131 | 135 |
| Bear | 184 | 81 | 139 | 162 | 94 | 81 | 139 | 81 | 555 | 405 |
| Wolf | 527 | 972 | 176 | 666 | | | | | 702 | 1,638 |
| Fox | 184 | 891 | 57 | 603 | | | | | 241 | 1,494 |
| Rabbit | 131 | | | | | | | | 131 | 0 |
| Beaver | 147 | 612 | 110 | 1,224 | 41 | 342 | 61 | 342 | 359 | 2,520 |
| Raccoon | 61 | 117 | 24 | 135 | 114 | 450 | 24 | 135 | 225 | 837 |
| Muskrat | 41 | 450 | 12 | 297 | 82 | 900 | | | 135 | 1,647 |
| Squirrel | 69 | 504 | 20 | 297 | 139 | 1,008 | | | 229 | 1,809 |
| Pigeon | | | | | 53 | | | | 53 | 0 |
| Turkey | 4 | | 4 | | 4 | | 4 | | 16 | 0 |
| Waterfowl | 24 | | | | | | | | 24 | 0 |
| TOTALS | 2,907 | 3,861 | 686 | 3,510 | 1,437 | 2,871 | 367 | 594 | 5,397 | 10,836 |

Applying this 80% figure to Meadowood communities would signify an annual meat demand of about 662kg/person, which is easily met by the meat return rates (including fish, mammals, and birds) estimated earlier. In fact, such return rates could support between 120 and 150 people with a diet consisting mostly of meat (80,000-100,000kg / 662kg per person). It can be concluded, from a review of ethnohistorical and recent documents, and an approximate calculation of meat return rates, that regions where Meadowood sites concentrate are characterized by rich and diverse environments with local resource abundance and surplus accumulation. Supporting this conclusion are observations of dental wear and cavities, and stable isotope analysis of skeletal remains from the Early Woodland Boucher site, which indicate a generally adequate diet rich in protein and sufficient in carbohydrates (Krigbaum 1989, cited in Blakely 1996: 253). Similar results were obtained at the Glacial Kame Isle La Motte site (Blakely 1996).

There is one important limitation in this environment, however: the winters. In northeastern North America, a year can be divided into two main climatic episodes; a cold season and a warm season, as a Montagnais explained in the first half of the seventeenth century:

They recognize two progenitors of the seasons; one is called Nipinoukhe, it is this one that brings the Spring and Summer. This name comes from Nipin, which in their language means Springtime. The other is called Pipounoukhe, from the word Pipoun, which means winter; it therefore brings the cold season (...) When Nipounoukhe returns, he brings back with him the heat, the birds, the verdure, and restores life and beauty to the world; but Pipounoukhe lays waste everything, being accompanied by the cold winds, ice, snows, and other phenomena of winter (JR6: 46-48).

During the four- to six-month-long cold season, resource availability decreases significantly and survival of the community (aside from food stored for the winter) is dependant on the capture of mammals. While most of the fish available in the Great Lakes/St. Lawrence drainage basin are present year round, many are less active and more difficult to catch in the cold season. Because of this difficulty, accentuated by the thick ice cover on many lakes and rivers, winter fishing probably represented a minor subsistence activity among Meadowood groups.

In sum, the environments of the major Meadowood communities were luxurious and predictable in the warm season, but could also represent a survival challenge when winters came (Clermont 1974: 451). Such environments usually allowed the production of surpluses, but this accumulation was limited by seasonal and relatively frequent yearly periods of scarcity. How can this dichotomy in resource abundance, availability, and predictability be interpreted in terms of the three interaction models evaluated in this dissertation?

One of the assumptions underlying an economic explanation for the establishment of the Meadowood Interaction Sphere is that the function of exchanging is to increase the stability of the local subsistence system. In other words, trade would be a risk-reducing strategy by which alliances allow the transfer of risk or resources from one party to the other. In such a network, one would expect raw materials or food resources necessary for subsistence to circulate in the Meadowood network. However, since evidence for the exchange of subsistence goods may be hard to detect archaeologically, this model can also be supported by documenting an unequal distribution of resources. Among the !Kung, Polly Wiessner observed that “exchange ties...are often more intense with distant groups who have complementary resources than with adjacent groups who have similar ones” (Wiessner 1982: 175). She interpreted contacts and exchange of beadwork as a risk-reducing strategy for yearly resource fluctuations. When the incongruity in resource distribution is widespread

and synchronous (as generally was the case in the Northeast) or seasonal, however, one can question the efficiency of such a strategy, since in such a milieu paucity of resources would typically affect all groups at approximately the same time everywhere. For example, in 1649 Ragueneau reported a number of calamities affecting the Hurons:

What increases the public misery is, that famine has been prevalent this year in all these regions, more than it had been seen in fifty years—most of the people not having wherewith to live, and being constrained either to eat acorns, or else to go and see in the woods some wild roots...Fishing support some of them (JR34: 87).

If pooling risk to deal with resource shortages was the main reason for participating in the Meadowood Interaction Sphere, then one might expect areas most subject to fluctuations and shortages to display the most Meadowood traits. In fact, the communities inhabiting areas where the winters were more intense and resources less abundant, such as the Canadian Shield or around Lake Huron and Georgian Bay, were only marginally participating in the Meadowood Interaction Sphere. Inversely, rich resource areas with surplus-producing potentials appear to be the most active localities in the Meadowood Interaction Sphere. Also interesting is that while first explorers and missionaries in New France frequently reported alliances and exchanges between communities, rarely was this described as a way to avoid or reduce the effects of famines, which appear to have occurred quite regularly (JR7: 197).

Thus, in times of scarcity, communities in the Northeast do not appear to have counted principally on risk-pooling via connections with other groups for the survival of the general populace. This is not to say, however, that sharing of food in these circumstances did not occur (JR6: 105). However, those spontaneous and unpredictable episodes generally occurred between small, neighbouring, and related communities rather than between distant communities. As such, it can hardly account for a well established network of contacts such as the Meadowood Interaction Sphere. Exchange of valuables, on the other hand, generally occurred at the regional level. In other words, food staples and wealth items circulate in distinct exchange networks instead of being commodities involved in the same transactions. Rather than rely on inter-community risk pooling, Meadowood families appear to have relied primarily on storage as a risk reduction strategy (see next section). The existence of storage on a large scale would have obviated the need to maintain costly sharing alliances with distant communities. Finally, to interpret the Meadowood phenomenon as a way to

overcome seasonal scarcity, one would have to come up with an explanation as to why such long distance trade networks did not exist before Late Archaic times, given that seasonal incongruities in resource distribution have characterized northeastern North America since the first human occupations in Paleoindian times.

Storage

Drying and smoking perishable meat and fish for varying periods of time are techniques employed by human groups in many parts of the world to overcome extreme seasonal resource fluctuations (Courtemanche 2003: 257). Among the fish species represented in Meadowood sites, the channel catfish, yellow sturgeon, whitefish, and various Catostomidae would have been the most suitable for smoking (Courtemanche 2003: 251-253; Webster 1983: 107). Gabriel Sagard (1939: 186, cited in Webster 1983: 107) recorded that whitefish, trout and sturgeons caught by the Huron were either dried for winter use or boiled for oil and stored.

In addition, many fruits and plants could have been dried and stored for winter consumption (Wilson 1997: 52; Granger 1978: 276). Historically, edible berries (elderberry, blackberry or raspberry, partridge berry) collected in late summer and fall by the historic Micmac and Maliseet were often dried for winter used. Wild rice, abundant in the Rice Lake area and in the Western Erie Basin, is also very resistant to spoilage if properly dried and stored:

(S)uch geographically restricted places as Rice Lake and western New York State likely represent key resource and communication locales where enterprising bands could acquire surplus resources, attract followers, and establish some form of social rank in imitation of practices in the Ohio Valley (Wright 1999b: 683).

In an archaeological context, it is sometimes difficult to identify food storage pits with absolute confidence. Contents of storage pits may have been used and subsequently filled with trash, or the features may have had completely different intended functions (e.g., processing food resources, caching valuables, burying deceased members of the community). Nevertheless, a number of attributes have been proposed by Bursey (2001: 182) to recognize staple food storage pits in the archaeological record. Morphologically, such features are expected to be relatively large, deep, and cylindrically shaped. The presence of some form of

lining, a covering, and layers of cobbles and/or fire-cracked-rocks keeping stored food from direct contact with soil are other attributes of storage features commonly cited.

The ancient origin of storage practices in northeastern North America is suggested by the recovery of possible storage features at Paleoindian sites in western Maine and Southern Ontario (Gramly 1988; Woodley 1997). When the resource base is vulnerable to overexploitation, the amassing of a surplus beyond subsistence needs may represent a threat to the group's survival. The scarcity of storage features pre-dating the Late Archaic period may indicate that such a situation was prevailing in the Northeast until at least 5000-4500 BP, even though the following description should caution us not to assume that a lack of archaeologically visible storage devices is necessarily a proof of absence:

(...) comme Assihendos, Truites, Esturgeons, et autres qu'ils ventroient, et leur ouvroient le ventre comme l'on faict aux Molües, puis les estendoient sur des rateliers de perches dressez exprez, pour les faire seicher au soleil; que si le temps incommode, et les pluyes empeschent et nuisent à la seicheresse de lviande ou du poisson, on les faict boucaner à la fumée sur des dayes ou sur des perches, puis on serre le tout dans des tonneaux, de peur des chiens et des souris, et cela leur sert pour festiner, et pour donner du goust à leur potage, pincipalement en temps d'hyver (Sagard (1632)1976: 177, cited in Courtemanche 2003: 262).³⁰

The archaeological visibility of storage nevertheless increased in Late Archaic times. Within Meadowood components, large, deep features lacking evidence of *in situ* burning are typically present on fall/winter sites such as Scaccia (Ritchie and Funk 1973), Riverhaven 2 (Granger 1978), Boyd Lakefront (Spence and Fox 1986: 20-21), Dawson Creek (Jackson 1986), and Pocock (Wilson 1993: 17). The Scaccia site is a major Meadowood habitation area where over 128 pits were found (Ritchie and Funk 1973:101). Among the numerous features interpreted as storage pits (Taché 2005: 196), some were apparently used to store nuts, principally acorns, as indicated by the remains found in fill. A cluster of 9 features was found at the Riverhaven 2 site. Granger (1978: 250, 251) believes that the use of such fairly large pits to store meat in cool storage is a reasonable hypothesis in light of the high frequency of scrapers and processing tools found in and around the features. Figures 5.1 and 5.2 show the

³⁰ Like Assihendos, Trouts, Sturgeons, and other which they cleaned, opening their stomach like we do with cods, and placed them on pole-racks expressly built for that, where they dry in the sun; if the weather is inconvenient, and rains prevent the meat or the fish from drying, they smoke them on trays or poles and put them in barrels, by fear of dogs and mice, and this serves them in feasts, and to add taste to their soups, especially in winter times (Sagard (1632)1976: 177, cited in Courtemanche 2003: 262).

distribution of storage pit diameters and depths at the Riverhaven and Scaccia sites. The average diameter of storage pits is larger at the former site, while a bimodal distribution of diameters at the Scaccia site may indicate variability in the use of these features, or the presence of larger and/or wealthier households.

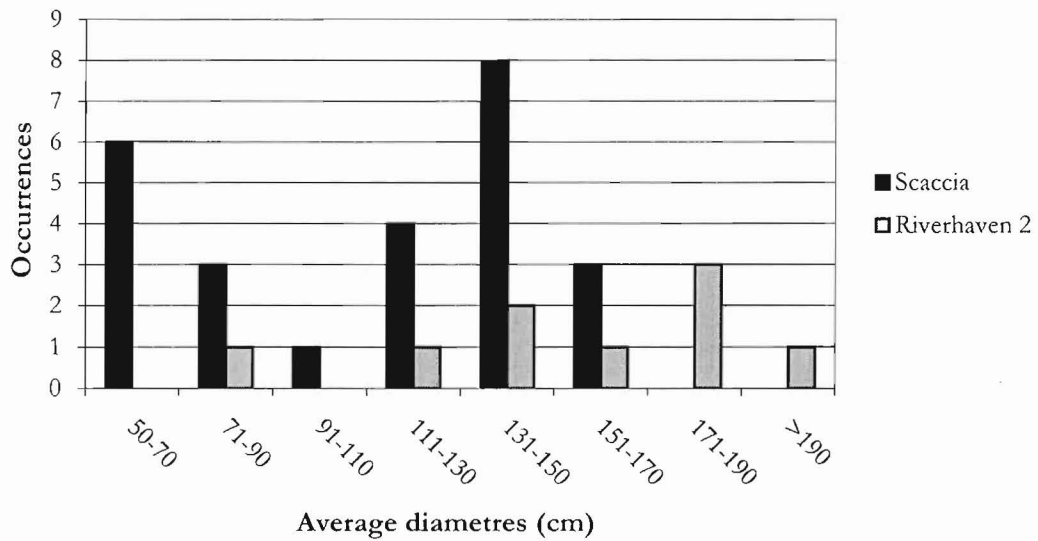


Figure 5.1 Distribution of storage pit diameters at the Scaccia and Riverhaven 2 sites.

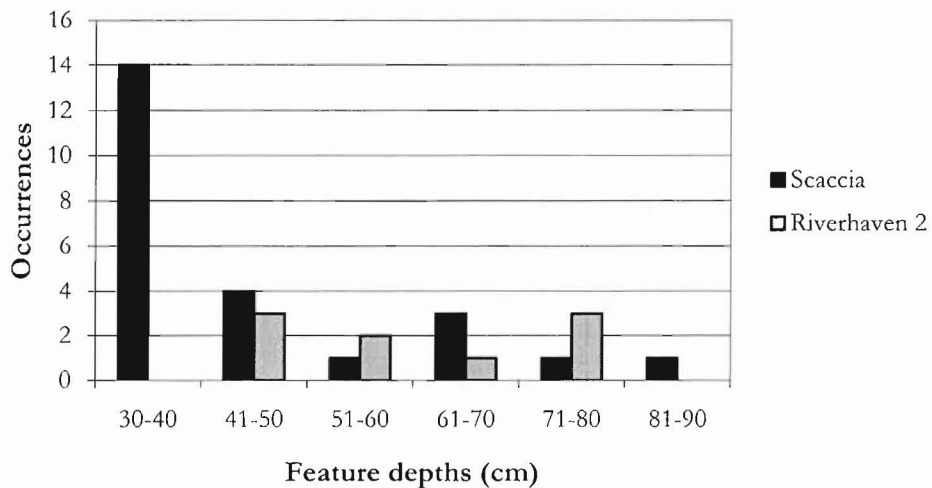


Figure 5.2 Distribution of storage pit depths at the Scaccia and Riverhaven 2 sites.

On at least three Meadowood mortuary sites (Oberlander 2, Wray and Morrow) pit features with black, humus-like soil covering the bottom have been interpreted by Ritchie (1965: 187) as burials interred in abandoned storage pits. Although this hypothesis cannot be ruled out, the possibility of the humus being the remains of funerary feasts should also be considered. Most of the time, these features are located on the periphery of the cemetery area.

The common presence of many storage pit features on archaeological sites, starting in the Late Archaic and continuing in the Early Woodland periods, may point to changes in subsistence strategies, settlement patterns and/or technologies that allowed higher levels of production and storage. For example, an accrued tendency to seasonally reoccupy the same locales could result in an increase in storage facilities. These “fixed points” along an annual circuit would have been “strategically located for the exploitation of particular resources in season” (Ingold 1982: 531). R-selected species (e.g., fish, nuts, seeds), better suited to mass harvesting and storage due to their high reproductive and growth rates, may have been increasingly favoured. The introduction of mass harvesting techniques (e.g., nets and weirs for fish; mass drives for cervidae; etc.) could also account for the increasing visibility of storage facilities by Late Archaic/Early Woodland times. Depending on the volume of food processed, storage sometimes involved significant labour and time investments. During salmon peak runs in the Interior Plateau of British Columbia, for example, one Lillooet fisherman could catch up to several hundred fish each day. However, filleting salmon for air-dry preservation is time consuming and one woman can generally process only 30 to 60 fish in a day. In consequence, it has been observed that the actual number of useable fish among these communities is often limited by the number of women available to process the salmon (Hayden 1992: 532-533; Romanoff 1992: 228).

Since evidence for an increase in population density is lacking in the Early Woodland period, intensification of resource production probably meant that food exceeded subsistence needs, and could be advantageously used as gifts in feasts or transformed into prestige goods. In this new context, efforts to amass prestige goods probably became acceptable, and maybe even encouraged (Hayden 1990; Clark and Blake 1994). Storage beyond subsistence needs is thus often associated with the development of wealth accumulation and ownership at the individual or family level. It is probably no coincidence

that increasing visibility of storage facilities is concomitant with the establishment of long-distance exchange networks across northeastern North America:

(T)he primitive hoarder can exchange his food excess for various products: stone blades, furs, shells, hammered coppers, and other rare items made by part-time specialists or imported from distant regions (Testart 1982: 526).

According to Alain Testart, this advantageous transformation of excess food is an accidental byproduct of storage, itself determined by technological and environmental factors (Testart 1982: 526). Contrary to this scenario, I believe that Meadowood communities, or ambitious individuals within them, made deliberate choices to intensify resource exploitation/production/accumulation in order to strengthen their positions as middlemen or facilitators in an already existing flow of goods and information between communities across the Northeast.

In a context of competition for spatially restricted resources, ownership is often strengthened by invoking inheritance from one's immediate ancestors. This in turn can favour the emergence of ancestor cults, corporate lineages, and/or distinct burial precincts (Goldstein 1981: 61; Hayden 2003: 186). Indeed, Goldstein found that a permanent, spatially defined burial area is representative of a corporate group that has rights over the use and/or control of crucial resources (Goldstein 1981: 61). The advent of well defined cemeteries distinct from habitation sites in Terminal and Early Woodland times in northeastern North America thus suggests increasing competition for resources. As Stothers and Abel (1993: 67) observed, limited resources do not necessarily pertain to limited subsistence resources but may also refer to high-quality chert quarries and/or strategic locales for the optimal flow of trade goods. Intensive production of highly standardized cache bifaces by Meadowood communities supports this idea.

CACHES AND THE QUESTION OF SPECIALIZATION

Instead of using a list of traits, Arnold (1996a: 78) defines cultural complexity in terms of two organizational principles. The first relates to the manipulation and/or control of labour outside of one's own kin group, and the second involves hereditary social status. The latter criteria might be best identified within mortuary contexts, although in the case of Meadowood communities the recognition of ascribed status is somewhat complicated by the

poor preservation of skeletal remains. The former principle suggested by Jeanne Arnold “might be recognized archaeologically by, for instance, the appearance of massive changes in craft production and exchange relationships on a regional scale” (Arnold 1996a: 93).

Specialization is often considered as one of the consequences, or material correlates, of increasing social complexity (Price and Brown 1985), and is even considered by some as its defining characteristic:

Burch and Ellanna (1994b: 5), who have recently discussed hunter-gatherer complexity from an organizational perspective, suggest that complexity is the degree of internal differentiation and specialization of the components of a system (see also McGuire 1983; Service 1962) (Arnold 1996a: 91).

While the advent of specialization does not necessarily result in institutionalized social differentiation, Arnold (1996a: 93) believes that regularized craft production suggests sustained control over labour, as opposed to situational production. This view is closely linked to the idea that political power derives from the alienation of prestige goods from the control of producers. In the present case, Onondaga chert cache bifaces may have been valued during the Early Woodland period in part because, being the work of specialists, their distributions could be controlled from the source (Arnold 1996a: 112). This following section reviews the evidence for the presence of craft specialization among Meadowood societies.

The caching of finished or almost finished bifaces has been documented in a variety of contexts in northeastern North America (Loring 1989: 47), but the most abundant and well known caches are those containing Onondaga chert bifaces associated with Meadowood manifestations. A few Meadowood cache features occurred in habitation contexts, but most caches are either isolated finds or were recovered within mortuary components. The term “cache” has occasionally been assigned to features containing a variety of flaked stone tools, including drills, points, scrapers, and unnotched bifaces (e.g. Spence et al. 1978: 41, 44). Typically, however, Onondaga chert bifaces are the only artefact type included within Meadowood caches. The quantity of objects present in such feature varies greatly, ranging between 7 and 1,500, with a majority of caches (53%, n=19) containing more than 50 items.

Many archaeologists have compared assemblages of Meadowood cache bifaces in an attempt to characterize and explain the variability pertaining to this category of artefact (Chrétien 1995a: 151; Fox 1981, 1984a, 1984b; Granger 1979, 1981; Williamson 1988).

Stylistic differences between groups, changes through time, functional factors, and mortuary versus secular contexts of use, as well as technological factors (e.g., one versus multiple flint knappers and/or quarries, differences in skills) have all been suggested as possible explanations for the variability in Meadowood bifaces (Fox 1981: 4; Williamson 1988: 10-11).

Ultimately, however, Meadowood cache bifaces are characterized by stylistic and technological homogeneity, and a high degree of flint-knapping skill. Joseph Granger (1979, 1981: 65) suggested that these objects were produced in a limited number of sites in western New York and Southwestern Ontario, before being traded to other regions where they sometimes served as preforms for projectile points and bifacial scrapers (Spence et al. 1990: 135). Evidence for the manufacture of large numbers of Meadowood cache bifaces, as evidenced by the sequence of production from raw material to finished products, has been exclusively documented at residential sites within the Niagara Peninsula:

The Scaccia, Riverhaven 2 and Sinking Ponds data all show that manufacture was systematic and that the “cache blade” was, in fact, being produced wherever the chert source was available, sometimes, in fact most times, in excess of need (Granger 1979: 109).

Even at great distances from the Niagara Escarpment, caches show a similar uniformity in Meadowood bifaces. As noted by Stothers and Abel (1993: 80), it is probable that this type of cache deposit, with items fashioned of raw materials from distant source locations, “is the product of inter-regional trade and exchange, possibly being used for the manufacture of highly desired “ceremonial” items for inclusion in graves.” The above observations, added to the fact that major caches or deposits were produced from primary raw materials (Emerson and Noble 1966; Spence and Fox 1986: 21; Williamson 1982: 6), have led many researchers to suggest that craft specialization and centralized production was occurring to an unparalleled degree during Early Woodland times (Chrétien 1995b: 192; Fox 1984a: 11; Granger 1979, 1981; Spence et al. 1990: 135).

As discussed in Chapter 4, it is believed that Meadowood cache bifaces were mainly produced for the purpose of trade and that they had to meet very specific criteria before being suitable to circulate within the Meadowood Interaction Sphere. Slightly higher similarity coefficients for Meadowood biface attributes recovered at funerary sites compared to those from habitation sites might indicate the use of mortuary localities as exchange centers (Granger 1979: 112). For example, Ritchie and Funk (1973: 115) observed that cache

bifaces from Scaccia and Nahrwold, two Meadowood habitation sites, tend to be slightly thicker and less skilfully chipped than the blades from mortuary features at the Morrow and Indian River sites.

In both modern and ancient trade networks, the individuals, corporate groups, or communities controlling and/or producing prestige items to be exchanged have the most advantageous position, from which a number of benefits can be derived, including wealth, protection, and power. In the Meadowood network, communities inhabiting the Niagara Peninsula held this advantage given their position close to Onondaga chert primary sources (Chrétien 1995b: 192; Granger 1978: 287). The distribution of Meadowood bifaces may have been controlled at their manufacturing source, contributing to enhancing their value as prestige items. At distant locations in the exchange network, individuals who acquired prestige goods became “sources” of them within their own communities. They gained power through their ability to give away such items and thus create debts.

Since numerous types of prestigious items can circulate in the same network, it is possible for more than one group to occupy strategic positions. Besides Onondaga chert, slate objects circulating within the Meadowood network also appear to be the work of craft specialists, although these specialists may have come from communities outside the Meadowood network. This is suggested by the presence of workshop stations for the manufacture of slate items in the southwestern Lake Erie drainage, e.g., the Riverside, Utz, Lyons 1, Bannerstone, and Missionary Island 1 sites (Stothers and Abel 1993: 43). Marine shell and native copper beads found in some Meadowood contexts may also be the work of part-time specialists in communities located along the Middle Atlantic coast and in the Western Great Lakes. Finally, we must imagine other specialist-produced items such as nets, buckskin, clothing, featherwork, and specialty foods (e.g., maple sap, nut oil, fish oil).

MEADOWOOD SETTLEMENT PATTERNS AND POPULATION DENSITY

Meadowood Settlements

Binford (1991: 66) defined a settlement as “any spatial cluster of habitational loci or habitational loci plus other functionally differentiated structures.” Besides the possible remains of houses documented at the Sinking Ponds, Pocock, Dawson Creek, Scaccia, Schultz, Knox, and Rafter Lake sites (Table 5.7), few habitation or other types of structures

have been excavated within Meadowood components. Whether this is due to preservation biases or to the temporary nature of Meadowood settlements is open to debates, but it is interesting to note that a general decrease in the number of sites and diagnostic artefacts have been said to characterize the Early Woodland period in the Northeast. According to Stuart Fiedel (cited in Versaggi 1999: 50), this reflects a concomitant decline in population size:

As triggers for this decline, he proposes climatic/environmental changes, epidemiologic factors, and sociocultural factors related to pressure from outside the Northeast and competition for critical resources (nuts and fishing territories), but concluded that this is speculation at this point.

As others have suggested (e.g., Foster et al. 1981; Versaggi 1999: 46), however, this apparent gap in the archaeological record may also be linked to our inability to recognize artefactual materials associated with the Early Woodland time period. In the Northeast, Early Woodland and Meadowood are sometimes seen and used as interchangeable concepts, but this is not the case. Early Woodland refers to a time period during which a cultural manifestation named Meadowood and best known for its commercial products has been identified in the archaeological record. That the high visibility of the Meadowood Interaction Sphere obscured contemporaneous local cultural manifestations evolving in northeastern North America 3,000 years ago is the alternative scenario I propose to account for the apparent decline in the number of sites and artefacts during the Early Woodland period:

It is becoming apparent that there are a number of typologically related but distinguishable local assemblages around the southern Great Lakes. In some cases these differences may actually reflect temporal variation, but in others the sites seem to have been contemporaneous and the variation due to geographical or social factors (Spence nd: 14).

This scenario fits best with a sociopolitical explanation for the establishment and maintenance of the Meadowood Interaction Sphere, since the latter assumes that exchanges were preferentially directed toward a limited number of communities, presumably the wealthier ones. Underlying this assumption is the prediction that there is, in northeastern North America, Early Woodland residential or burial sites that did not participate significantly in the Interaction Sphere and that did not share Meadowood material characteristics.

Table 5.7 Characteristics of habitation structures associated with Meadowood or Meadowood-related settlements

| | House shape | House size (m) | Distance between houses (m) | Associated features | Estimated # persons / house | Estimated # persons / settlement ¹ | Inferred settlement type | References |
|--|----------------------------------|----------------|-----------------------------|---|-----------------------------|---|---------------------------------------|-----------------------|
| Sinking Ponds (Niagara Peninsula): 1-3houses | oval | 4.73 x 3.97 | 6.1-7.6 | 1 rock heap, 1 storage pit, 1 manufacturing cache, 24 postmolds | 4-6 | 30 | summer fishing camp | Granger 1978: 153 |
| | oval? | 4.6 x 3.7? | | 1 rock heap, 1 storage pit, 1 manufacturing cache | | | | |
| | oval? | 4.6 x 3.7? | | 1 storage pit | | | | |
| | rectangular | 4.6 x 3.4 | | 1 pit feature, 33 postmolds | | | | |
| Pocock (Thames River): 2 houses | rectangular | 4 x 3.4 | 2 | 1 pit feature, 24 postmolds | 4-6 | 8-12 | winter base camp | Wilson 1997 |
| Dawson Creek (Trent watershed): 1 possible house | ? | ? | - | 4 postmolds | ? | ? | spring or summer fishing camp | Jackson 1982: 14 |
| Scaccia (Allegheny uplands): 1house | oblong | 5.25 x 4 | - | 3 hearths, 2 storage pits | 8-10 | 45-50 | winter base camp | Ritchie and Funk 1973 |
| Schultz (Saginaw Bay): 2 possible houses | ? | ? | ? | 5 postmolds | ? | 20-25 | fall deer hunting/nut processing camp | Ozker 1982 |
| | ? | ? | | 1 hearth, 3 postmolds | | | | |
| Knox (Coastal Maine): 2 houses, probably not contemporaneous | saucer-shaped & semisubterranean | 3-4 x 2-3 | 19-20 | ? | ? | ? | spring/fall fishing camp | Belcher 1988a |
| | saucer-shaped & semisubterranean | 3-4 x 2-3 | | ? | | | | |
| Rafter Lake (Halifax/Darmouth): 1house | oval & semisubterranean | 3.5 x 2.5 | - | 1 pit hearth | ? | ? | fishing camp | Davis 1986 |

1-Estimated numbers of persons per settlement are reported from the literature (see references column). However, it should be noted that many more people could use spring/summer/fall sites without using archaeologically visible structures/houses.

Meadowood Settlement Pattern

In the Northeast, it is generally accepted that by the Late Archaic period, and probably even earlier, nomadic bands tended to reoccupy the same sites year after year, covering the same area repeatedly (Cossette 1987: 3; Funk 1978: 320; Stothers and Abel 1993: 50; Winters 1959: 12). In certain areas, this change in settlement pattern occurred in the extensive wetland-rich, heterogeneous environments of former glacial lakes basins (Nicholas 1988: 259). The area covered by one band varied depending on resource abundance and availability. The exact timing of the transition from a scheduled nomadic subsistence cycle to a more sedentary or seasonally sedentary (semi-sedentary) way of life is debatable but some authors have seen this shift happening in Early Woodland times. The documentation of cemeteries and storage pits within the context of Meadowood archaeological sites was thought to “suggest the inception of a more stable pattern of living” (Ritchie 1965:180).

William Ritchie and Robert Funk were the first to attempt a reconstruction of the Meadowood settlement pattern. Observing a tendency for Meadowood sites to be located in riverine/lacustrine locations and a concomitant abandonment of back country sites, they concluded that there was a lack of large-scale seasonal movement and that Meadowood groups stayed within a special microenvironment all year. They postulated changes in subsistence (without specifying their nature) to explain this shift in settlement pattern and the elaboration of mortuary ceremonialism (Ritchie and Funk 1973: 348).

Granger's Reconstruction of Meadowood Settlement Pattern

In his published doctoral dissertation, Joseph Granger proposed a settlement pattern model for the Meadowood communities of the Niagara Frontier region (Granger 1978). According to him, the impression of Meadowood sedentism results from a more restricted and efficient selection and scheduling of resource production areas (Granger 1978: 269). Granger distinguished between two distinct, but complementary, types of habitation sites. One is represented by extensive sites with deep midden deposits and large pits, generally located on terraces or close to major streams. The Scaccia and Riverhaven 2 components are representatives of this settlement type, and are reminiscent of Late Archaic base camps like

the Lamoka Lake site (Ritchie and Funk 1973: 338). These sites give evidence of long-term, recurrent occupation, and would have been occupied by the local band (approximately 150 persons) in fall, winter, and early spring. Hunting of large herbivores, gathering of storable mast, and processing of hides and bone are some of the activities thought to have been carried out at these base camps (Granger 1978: 291).

Granger's second type of habitation sites corresponds to Binford's extractive type of site, and is exemplified by the Sinking Ponds component located near a shallow lake and interpreted as a small camp where people were mainly occupied with fishing and processing their catches. The manufacture of tools from locally available stones also occurred occasionally, but no evidence of storage or ceremonial activities has been documented at Sinking Ponds (Granger 1978: 265). As mentioned previously, the association of many small sites with shallow lakes and marshes is thought to reflect the efficiency of weir-net and leister fishing in such environments (Granger 1978: 295). Portions of the local band, or what Helm (1969: 214) called a task group (less than 30 persons), would have resided at locales such as Sinking Ponds from mid-spring to late summer. Besides fishing stations, other extractive camps that are postulated as part of the yearly subsistence cycle include quarry sites (e.g., Diver's Lake, Slack-Caswell, Surma) and fall hunting/nut collecting stations (e.g., Dawson Creek, Wyoming Rapids, Neeb, Boyd Lakefront, Billiard, Schultz).

Granger hypothesized the existence of a third type of site in the Meadowood settlement pattern, consisting of multi-band funerary/ritual/gathering sites. These locales could have seen the short-term congregation of local bands (approximately 500 persons) in autumn or early spring, when groups were on the move. Clear evidence for this type of site is lacking in the Niagara Frontier region. Granger thus focused his settlement model on habitation sites and only tentatively enumerates the activities that could have been going on at mortuary locales. These include trade, exchange of women, and other ritual and social activities (Granger 1978: 266). No mention of food procurement or processing activities at his hypothesized funerary ritual sites is made. This contrasts with other views of Meadowood aggregation sites as sort of "trade fairs" located at prime fishing stations, where cooperative harvesting of resources was taking place (Abel 1997).

Granger's settlement model has been tentatively applied in regions outside the Niagara Frontier region. In the Caradoc Sand Plain of southern Ontario, for example, three sites have been interpreted by Christopher Ellis and his colleagues as potential Ontarian

equivalents of the large winter base settlements identified in New York. Situated in areas of rolling topography and well-drained sandy soils, distant from major streams and lakes, these sites could have provided good yarding areas for deer in the winter (Ellis et al. 1988: 13). In contrast to New York, large winter base camps have not been documented for the preceding Late Archaic period in Ontario, a difference which could “at least partially (be) a product of the development of increased food storage capabilities in Meadowood (...)” (Ellis et al. 1988: 14).

Critiques to Extrapolating Granger’s Model outside the Niagara Frontier Region

The application of Granger’s model to Southern Ontario has been criticized by a number of authors (Dodd et al. 1989, cited in Wilson 1993: 14; Timmins 1992: 16). Nina Versaggi, for example, challenged Granger’s settlement pattern reconstruction and observed that the “use of macro-band models tend to skew our perception of primary habitation sites towards the unique, and patterns in smaller but equally diverse residential sites are often overlooked” (Versaggi 1999: 46). For example, Versaggi suggests that instead of an extractive camp, Sinking Ponds was a primary habitation site, like Riverhaven 2 albeit smaller. Neighbouring sites, such as Buffalo Terrace, could have been smaller seasonal camps, auxiliary to this main residential component. This view is supported by the fact that, besides a handful of larger settlements, most Meadowood habitation sites are small, bearing “testimony to a diminutive population, probably no larger than the little bands of some thirty to fifty people which we have postulated for their Archaic predecessors” (Ritchie 1965: 189).

In Chapter 3, the Niagara Frontier region was described as an area within the Ontario/Erie Lowlands characterized by a unique combination of resources. Most importantly, the Onondaga Escarpment (primary source of Onondaga chert) is part of the Niagara Frontier. Therefore, the application of Granger’s model to other regions tends to conceal the diversity that characterizes Early Woodland economies and organization in the Northeast (Versaggi 1999: 46). To make up for this deficiency, Nina Versaggi reviewed and compared existing settlement data from six different regions yielding evidence of Meadowood occupation. She concluded that “(w)hile macro-band models have served us well in defining some systems of organization, particularly within the Meadowood heartland in western New York, these models offer a poor fit to the data in other regions” (Versaggi

1999: 54; see also Wilson 1993: 14). This interpretive issue may in part be due to a sampling bias, but Versaggi believes it mostly comes from a tendency of archaeologists to explain their data according to familiar models, elaborated from the point of view of a specific region. She proposed that using concepts of horizontal organization such as *heterarchy* may help us better understand Early Woodland dynamics. A heterarchy is a network of elements sharing common goals in which each element shares the same "horizontal" position of power and authority. In the context of the Meadowood Interaction Sphere, heterarchy assumes various roles and degrees of participation for each community, in response to shifts in social, political and economic factors (Crumley 1979, 1995, cited in Versaggi 1999: 54).

The spatial distribution, value, and seasonal availability of Meadowood traded items may indeed have resulted in various levels of organizational complexity among Meadowood communities. For example, Meadowood groups inhabiting the Niagara Frontier region were favourably located (along the Great Lakes corridor and close to Onondaga chert sources) to be active partners in the Meadowood Interaction Sphere. The fact that chert constituted a year-round necessity accessible during all seasons probably created pressures for greater sedentism on the part of the groups exploiting this resource, which in turn would explain why we observe, in the Niagara Frontier region, larger base camps such as the Riverhaven 2 site (Versaggi 1999: 54). Early Woodland groups living in the Upper Susquehanna valley, on the other hand, may not have occupied such a central role within the Meadowood Interaction Sphere, although their participation in the network is unquestionable. Hypothetically, they could have been seasonally well positioned to secure and process deer hides (Versaggi 1999: 53).

Groups inhabiting highly productive fishing grounds could have exploited and controlled access to this resource. Such a focus on aquatic resources would have, once again, influenced settlement patterns. Instead of winter base camps as predicted by Granger's settlement model, a focus on aquatic resources may have encouraged local bands to coalesce during the warm season, such as was observed in some areas of Southern Ontario (Spence and Fox 1986: 30; Spence et al. 1978: 42).

More so than other food sources, fishing conditions and harvest rates varied widely from one location to another. The Oneida, for instance, were historically noted for their abundant eels in the summer and fall seasons (Zeisberger and Frey 1902, cited in Webster

1983: 426). In other parts of the world, such as southwest Victoria in Australia (e.g., Builth 2006), the exploitation of eel was an occasion for multiband gatherings and feasting:

In southwest Victoria (Australia), eel-harvesting feasts (Lourandos 1985) provided opportunities for competitive intergroup meetings and ceremonial gatherings. Gatherings estimated to include as many as 1,000 individuals are recorded during eel migrations (Lourandos 1980, 1985: 407, cited in Jackson 1991: 275).

On the other hand, fall fishing return rates were much lower among the Andaste and Mohawk than among groups living close to Great Lakes waterways since the former did not have easy access to major fall runs (Webster 1983: 423). Interestingly, seventeenth century documents report Oneida fishermen selling surplus salmon to the Mohawk at the beginning of the winter (Bogaert (1634)1909: 143, cited in Webster 1983: 424—but see footnote 6 [p.30]). The concentration of Meadowood occupations at Pointe-du-Buisson, a site located near rapids downstream from Lake St. Louis, supports the idea that highly productive fishing stations were central locations for large aggregations in the Meadowood's annual round. Moreover, it could have conferred a strategic role within the Meadowood Interaction Sphere to the local group exploiting the plain of Montreal (Clermont and Chapdelaine 1982: 20). Finally, it is also possible that some groups were excluded (or opted out) from participation in regional exchange relationships, or only participated to a nominal extent.

Granger's settlement model may be well suited for the Niagara Frontier region, but caution should be used when applying his model to other areas of northeastern North America. In the case at hand, the Riverhaven 2 and Scaccia sites correspond to Granger's extensive settlements showing evidence of long-term and recurrent occupations. In fact, these two sites are commonly cited as examples of large Meadowood base camps, together with the Vinette and Nahrwold 2 components (Granger 1978: 264).

However, few comparable Early Woodland sites were identified across northeastern North America, suggesting that these components are rather unique. Pressure for greater sedentism deriving from a necessity to obtain and control Onondaga chert sources is an interesting hypothesis that may explain these unique types of sites. In this particular situation, year-round occupation may have been the norm. The wide range of activities documented at the Scaccia site (i.e., hunting, fishing, collecting vegetal foods, flint-knapping, cooking and fire-making [Ritchie and Funk 1973: 347]) support this view. If such was the case, Granger's interpretation of large, deer-hunting winter base camps could be reconciled

with that of large Meadowood sites occupied during spring and summer for the exploitation of fish resources (Granger 1978: 265; Spence et al. 1978: 42-43).

This interpretation, however, cannot be extended to Batiscan, the other Meadowood habitation site analyzed in this dissertation. There, as at other Meadowood sites in the upper and Middle St. Lawrence valley (e.g., Pointe-du-Buisson and Lambert sites), both habitation and ritual/mortuary activities were documented. The distinction between these sites and other Meadowood mortuary sites (e.g., Hunter, Muskalonge, Oberlander 2, and Bruce Boyd) may be comparable to the distinction that David Stothers and Timothy Abel proposed between regional and local band cemeteries (Stothers and Abel 1993: 67-79). Both regional and local cemeteries are associated with environmentally rich riverine/lacustrine habitats or wetlands, suggesting that the exploitation of fish resources was important at these locales. The location of regional cemeteries near sites where the cooperative harvesting of fish by multiple local bands was taking place is a compelling hypothesis. Interestingly, rock heaps from the Muskalonge Lake and Hunter sites are similar to heat ovens found at fishing stations (Granger 1978: 283). The participation of Batiscan communities in the Meadowood Interaction Sphere, on the other hand, may derive from their strategic position in securing and processing deer hides. In sum, I believe, with Nina Versaggi, that a better understanding of the Meadowood network can only be gained by addressing interregional variability and by using concepts of horizontal organization such as heterarchy.

BURIAL PRACTICES AND FUNERARY RITUALS

William Ritchie's reconstruction of Meadowood's communities involved the emergence of social inequalities. He believed that cremation and grave good inclusions represented social stratification, personal prestige, and cultic concepts:

With the appearance of an Early Woodland burial cult, however, there occur the first tangible inklings of social differentiation ... Broadly conceived, ceremonial centers made their appearance at first as small cemeteries on sacred burial precincts, set apart from habitation quarters ... Because these cemeteries contain a variable proportion of more carefully prepared graves with richer offerings it seems logical to assume some sort of social hierarchy. The use of symbolic ritualistic objects and substances, like red ochre, suggests religio-ceremonialism under the shamanistic or priestly control, a primitive church operating as an integrative social force (Ritchie 1955: 76).

The last 30 years, however, have been marked by a tendency to classify Meadowood communities within the “egalitarian” category. In so-called egalitarian societies, status is achieved and determined by factors such as age, sex, and personal achievement. Higher status individuals are expected to have very little power over the population, and control or differential access to resources is generally denied (Granger 1978: 287; Parker 1997: 138; Spence and Fox 1986: 24). It is argued here, however, that a number of patterns relating to burial practices point to the emergence of social inequalities and differential access to resources during the Early Woodland period in the Northeast. Indisputable proofs may be hard to establish, but the possibility of inegalitarian (but probably not stratified) Meadowood communities cannot be dismissed.

The general theoretical framework associated with the notion that prehistoric social organizations can be inferred through the various aspects of mortuary practices is largely based on the work of Saxe (1970), Binford (1971) and Tainter (1975, 1978), who examined ethnographically documented behaviours. The recognition of social differentiation and inequalities is a major focus of this processual approach to mortuary practices. Burial modes, the spatial orientation or distribution of burials, and grave goods are just a few aspects of human burials that can be used to infer social organization. When funerary rituals can be inferred from the archaeological record, these data also have great potential in highlighting past social dynamics. Namely, high status individuals are presumed to be differentiated from individuals of other social standing by a greater investment of energy put into the construction of special tombs, the special treatment of the corpse, the interment of lavish grave goods and/or by burial locations that differ according to social standing. These topics will be addressed in this section.

Meadowood Cemeteries

The Meadowood concept was proposed by William Ritchie in 1955 following the discovery and excavation of two cemeteries on sand ridges bordering the Indian River, approximately 13 km southeast of the St. Lawrence River in a hilly and partly wooded region (Ritchie 1955: 9). As discussed in the first chapter of this dissertation, the Meadowood concept was later modified to include both residential and funerary components, but the existence of burial precincts distinct from habitation sites still remains one of the defining characteristics of Meadowood communities.

Excavated Meadowood cemeteries are usually small, containing from 10 to 35 closely spaced, intersecting or intrusively overlying graves (Ritchie 1965: 197). As will be discussed later, these numbers suggest that only a select part of the community was interred in Meadowood burial precincts. Moreover, William A. Ritchie observed that Meadowood burials were generally located on natural, mound-like knolls which in some cases are high and prominent in the landscape. He also noted that occasionally, graves were mainly or wholly situated on the east-facing portion of the upper slope (Ritchie 1965: 197). Unlike habitation sites, which are sometimes located near marshes or marginal streams, Meadowood burial sites are almost always located on the terraces of major streams or near large lakes, usually not in close association with any single base settlement. Assuming adequate survey coverage of other locales to ensure that this trend actually reflects past settlement patterns, such central locations are expected if, as many archaeologists suggested, Meadowood mortuary practices and rituals represented occasions for local or regional bands to gather, mourn, exchange and make alliances (Abel 1997; Granger 1978: 296, Haviland and Power 1994: 110; Spence et al. 1978: 42).

The Significance of Cemeteries

In northeastern North America, the emergence of well-defined cemeteries is roughly contemporaneous with the establishment of long distance trade networks in Late Archaic times, and likely reflects ongoing changes in social organizations and dynamics. Since the advent of Lewis Binford's (1971) and Arthur Saxe's (1970) processual approach to mortuary analyses, it has become common to view formal disposal areas for the dead as a means "by which corporate groups utilized lineal ties to the ancestors to control access to crucial but restricted resources" (Chapman 1995: 32; see also Goldstein 1981)³¹.

Where resources enable surplus production, appropriation of this surplus is likely to be attempted by the most ambitious individuals. Ownership over resources is strengthened by invoking inheritance from one's immediate ancestors. As Hayden (2003: 186) states, "under cultural ecological conditions where inherited resource ownership could bring wealth

³¹ While Binford and Saxe also define cemeteries as territorial claims, I do not think that Meadowood communities can be defined as territorial. Territoriality progressively develops to defend and regularize rights to scarce and valued resources (Earle 2000: 43). While I argue that corporate rights to restricted resources are emerging among Meadowood communities, clear indicators of territoriality (e.g., fenced settlements, indicators of warfare, monumental burials) are lacking.

or subsistence security, ancestor cults and lineages tended to thrive.” A close relationship between corporate groups, productive resources, and the formal disposal of the dead has been observed on a consistent basis (Goldstein 1981; Saxe 1971; Saxe and Gall 1977). More specifically, Goldstein surveyed 30 societies and found that a permanent, spatially defined burial area is always representative of a corporate group that has rights over the use and/or control of crucial resources. She further discovered that this control is maintained by means of lineal descent from the dead, either in terms of actual lineage ownership or in the form of a strong, established tradition of critical resource passing from parent to offspring (Goldstein 1981: 61; Henry 1989: 207).

Productive fishing grounds are a good example of such resources. In historic times, for example, all members of an Iroquoian tribe, regardless of clan affiliation, could hunt within the limits of the tribal lands, but there are indications that fishing sites and their associated weirs and camps were affiliated in terms of ownership and use-rights with certain kin groups (Webster 1983: 163). Similarly, among British Columbia Plateau communities, fishing sites were sometimes owned and inherited. These sites consisted of rocks beside small, swift flowing eddies, where platforms were built to facilitate net fishing (Romanoff 1992: 242).

As mentioned earlier, researchers have proposed that a sort of annual trade fair, held during the spring fish spawns, was the organizing focus for Meadowood mortuary ritual. Such a pattern was also proposed for Late Archaic and Early Woodland sites in the Midwest, where strontium content in human bones from three cemeteries revealed slightly different strontium levels at the Williams site. The latter was interpreted as a regional center where high status individuals and corporate groups gathered annually (Stothers and Abel 1993: 53), and the variations in strontium levels could be accounted for by varying consumption of fish (Price et al. 1985, cited in Stothers and Abel 1993: 65).

Access to Meadowood Burial Grounds

The spatial placement of burials has been considered by some authors to be a better indicator of social standing than the presence or absence of elaborate grave goods. Wealthy or high-status individuals' graves are often located in different settings than those of lower status individuals. Spatial separation within a single burial can also denote status differences. For example, among the Merina of Madagascar, low status individuals were buried at the

entrance of tombs, while people of higher status were buried inside the tomb (McHugh 1999: 55).

Were all members of Meadowood communities buried within cemeteries, or was this treatment reserved to certain individuals only? To address this issue, one can ask how many cemeteries would be required if all the members of the Meadowood communities were buried within these burial precincts. At first glance, the 59 Meadowood mortuary/ritual sites documented in this dissertation appear to be enough. Indeed, dividing this number between the 27 regions defined in this study, one gets a total of about 2 Meadowood cemeteries per region. However, looking more closely at the distribution of mortuary sites between regions, this reconstruction does not hold up and one rather gets the impression that not every member of a community was buried in a cemetery. Meadowood mortuary sites are well represented in the Niagara Peninsula (n=7), lakes Ontario and Oneida (n=6), Upper St. Lawrence valley (n=5), Lake Champlain (n=4), Glaciated Allegheny Uplands (n=5), Connecticut valley (n=5), Merrimack valley (n=6), and Saginaw Bay (n=4). On the other hand, no mortuary site are known to date from nine of the regions defined in this study (i.e., Trent waterway, Middle St. Lawrence valley, Ottawa valley, Susquehanna valley, Coastal Maine, Halifax area, Lake Michigan, Abitibi-Témiscamingue, Lac St. Jean, and Lower St. Lawrence valley).

Sampling biases, however, may be responsible for this distribution of Meadowood mortuary sites across northeastern North America. An alternative approach to determine whether everybody was buried in Meadowood cemeteries is to look at the number of individuals present within known sites. This exercise, however, is not without pitfalls. The graves excavated at a Meadowood site often represent limited portions of past burial precincts and evaluating how many people were buried in Meadowood cemeteries is generally a challenging task. This difficulty is accentuated when archaeological site boundaries, as well as site duration and frequency of use, are unknown.

At the Bruce Boyd component, Michael Spence and William Fox assumed that all members of the community were buried in the cemetery:

If each pit was indeed the burial place for most or all the band members who had died over the year, it would indicate one or two deaths per year. Given the mortality rates for hunter-gatherers, the size of the contributing band should have been roughly 30-60 people (Spence and Fox 1986).

In this case, only 20 individuals were identified, implying an unusually short use life of cemetery (10-20 years). The single radiocarbon date of 2470 ± 65 BP obtained from Meadowood material is insufficient to estimate the duration of use of this burial precinct. It is thus impossible to support or refute Spence and Fox's interpretation, but the possibility that only a portion of the population was buried at Bruce Boyd should not be ruled out.

The Boucher Cemetery. The Boucher site is one of the few complete Early Woodland cemeteries excavated in the Northeast. As such, it provides valuable data regarding the use of Early Woodland cemeteries and will be briefly discussed here, keeping in mind however that the figures estimated from that single example cannot simply be extrapolated to all Meadowood cemeteries.

Eighty-four burial features were identified at the Boucher cemetery, 63 of which included preserved human skeletal remains. Based on the occasional presence of multiple individuals in one grave, and the excavation of empty pits that were likely burials, Michael Heckenberger and his colleagues estimated that over 100 burials may have been present at the site (Heckenberger et al. 1990: 115). Death rates ranging between 2.1 and 6.7 percent per year have been documented ethnographically among American Indian groups from the Plains (Wissler 1936, cited in Buikstra 1976: 25). Applying a conservative annual death rate of 2% to the Boucher assemblage would put the number of deaths at 1 person/year for a population of 50. Within 900 years, the time span covered by the radiocarbon sequence obtained at Boucher, the total number of deceased from such a group would comprise a minimum of 900 individuals, meaning that the estimated 100 individuals present at the site maximally represent slightly over 10% of the deceased population.

If the death rate or community size had actually been higher (which seems likely) the burials at Boucher would represent a smaller proportion of the population. If Meadowood cemeteries were used by more than one local band, the proportion of the deceased population interred at the Boucher site would be even smaller. Under any of these scenarios, it is possible to conclude that not all dead members of the community were buried at the Boucher cemetery. Heckenberger and colleagues (1990: 140) concluded in a similar manner that the Boucher site could not "reflect the exclusive burial ground of large groups of 50 or more people" and that "it is clear that multiple precincts were being used by related social groups and, consequently, the available sample of such sites as known across the region is likely very incomplete." While this hypothetical reconstruction may be plausible, the

incomplete representation of the population at the Boucher site could also reflect the fact that not every member of the community was buried within the context of well defined cemeteries.

If both the estimated number of burials and the radiocarbon sequence obtained at the Boucher site are accurate, one could also conclude that the burial precinct “was used quite infrequently over a long period” (Heckenberger et al. 1990: 40). It is also possible, however, that communities, or segments of communities, gathered periodically at these locales to participate in various activities, including ancestral rituals, without each time burying a deceased member of the community. In Stothers’ and Abel’s (1993: 67) view, “the manifest function of cemetery and/or ritual areas was probably for social interaction and provided a focal point for ritualization, commodity exchange, and intergroup alliance formation.”

Repeated use of the same burial precinct over some time is not unique to the Boucher site. It was also noted at the Bruce Boyd component based on overlapping features and intrusion of some burials into others (Spence et al. 1978: 42). Similarly, in the Western Lake Erie basin, the Williams Mortuary Complex, composed of the Williams Cemetery and the Sidecut Crematory sites, was interpreted as the major ritual and exchange center between 3075 and 2310 BP, where “members of ‘elite’ corporate bodies, controlling the flow of information and commodities, accessed the center, perhaps annually, to engage in ritual ceremony, mortuary rites, and trade and exchange” (Stothers and Abel 1993: 53).

Child Burials

Another way to determine whether or not the entire population was buried in a given cemetery is to look at the age/sex distribution of the individuals recovered from the burial component in question. At the Bruce Boyd site, for example, the under representation of sub-adults—3 sub-adults versus 14 adults—led Spence to propose distinct procedures for adults and sub-adults in the Bruce Boyd band (Spence nd: 23). This scenario, however, leaves unanswered the question as to why some sub-adults were still present in the cemetery. Alternatively, social status could be responsible for the different burial programmes. In this case, one would have to admit that sub-adults, even infants, sometimes had high social status in Meadowood communities. In this regard, Lewis Binford (1963a: 190) noted that all

identified human remains from the Pomranky site are adolescent, indicating that some status accrued to individuals of this age group.

Determinations of ascribed (hereditary) status as opposed to achieved status have been made based on the presence of child burials in a burial precinct (in cases where only a portion of the population was privileged enough to be buried there), or the presence of elaborate grave goods or status markers with child burials (O'Shea and Zvelebil 1984, cited in Parker Pearson 1999). The logic behind this position is that if status in a society is achieved, there should not be evidence of status differentiation in child burials as they would not have had the opportunity to achieve status (Binford 1962: 222).

It is also possible, however, that in a society where status is achieved, parents will utilize children as a means of investing surpluses as well as using occasions of the death of an infant for "advertising behaviour." Once the possibilities of ownership and wealth accumulation are established in a society, labour often becomes critical, since the ability to procure more resources depends on how many people are available to accomplish a given subsistence task such as building weirs or catching fish, for how much time, and how hard they are willing to work (Hayden 2003: 155). The need for labour can lead to unprecedented values attributed to, and investment in wives and children.

Burial Modes

A variety of burial modes have been documented in Meadowood contexts (Table 5.8). Cremation of unweathered bones is common and probably involved keeping the body above the ground (in trees, on scaffolds, or in a charnel house of some kind) for a period sufficient to allow for the decay of most of the flesh (Ritchie 1965: 196). Bundle, flexed burials, multiple primary, and multiple secondary burials have all been documented in Meadowood contexts. Combinations of these burial modes also occur. Multiple burials suggest to Ritchie the performance of periodic burial services with individuals of the same social unit being interred in a common grave (Ritchie 1965: 196). For their final interment, corpses were typically placed in bark-lined pit features with large quantities of powdered red ochre, although unburied cremations are documented at the Hunter site. Preserved leather shrouds enclosing bone bundles were found at the Oberlander 2 and Hunter sites. The placing and orientation of skeletal remains within Meadowood burials is highly variable and either random or conditioned by factors not readily apparent (Spence n.d.: 23).

Table 5.8 Sizes, number of burials/individuals, and burial treatments characterizing a sample of Meadowood burial sites

| Sites | Regions | Excavated area (m ²) | Estimated site size (m ²) | Total number of burials | Number of individuals | Number of crematories | Burial treatment | | Références |
|---------------------|------------------------------|----------------------------------|---------------------------------------|-------------------------|-----------------------|-----------------------|------------------|-------------|---|
| | | | | | | | Cremations | Inhumations | |
| Cranberry Creek | Niagara Peninsula | | | 1 | | | | | Spence and Fox 1986: 22 |
| Bruce Boyd | Niagara Peninsula | 225 | <6,500 | 15 | 19-21 | | 5 | 15 | Spence n.d., Spence and Fox 1986: 23-28; Spence and al. 1978, 1981, 1990: 132-133 |
| Oberlander 2 | Oneida Lake | | | 22 | | | 22 | | Ritchie 1944, 1965:180 |
| Liahn 2 | St-Clair Lake & Thames River | 250 | | 6-13 | 7-16 | | 1 | 6-15 | Spence and Fox 1986: 22-23; Spence et al. 1990: 131; Williamson 1980 |
| Rickley | St-Clair Lake & Thames River | | | 2 | 6 | | 5 | 1 | Spence and Fox 1986: 22 |
| Hunter | Upper St. Lawrence | | | 3 | | 14 | 3 | | Ritchie 1955 |
| Muskalonge | Upper St. Lawrence | | | 7 | | 8 | 7 | | Ritchie 1955 |
| Rockway Point | Upper St. Lawrence | | | 1 | 1 | 1 | 1 | 1 | Ritchie 1955: 69,76 |
| Pointe-du-Buisson 5 | Upper St. Lawrence | 42 | 2,000 | 4 | 6-10 | | 4 | | Clermont 1978 |
| Boucher | Champlain Lake | 730 | 730 | 84 | >100 | | 17 | 43 | Haviland and Power 1981; Loring 1985; Heckenberger 1989, 1996; Heckenberger et al. 1990 |
| Swanton | Champlain Lake | | | 25 | | | P | | Haviland and Power 1981; Loring 1985 |
| East Creek | Champlain Lake | | | 45 | | 1 | P | P | Loring 1985: 98 |
| Bennett | Champlain Lake | | | | | | | P | Ritchie 1944: 199; Loring 1985: 102 |
| Cuylerville | Allegheny Uplands | | | 21 | | | P | P | Ritchie and Drago 1960:29-34 |
| Wray | Allegheny Uplands | | | 10 | 15 | | | 10 | Ritchie 1944: 125, 1965 |
| Morrow | Allegheny Uplands | | 225 | 35-40 | | | 4 | 7 | Ritchie n.d.; Granger 1981: 67 |
| Bristol (6FA117) | Lower Hudson | | | 1 | | 1 | 1 | | Cassedy 1992 |
| Fairfield | Lower Hudson | 0.5 | | 1 | 1 | | | 1 | Kraft 1989 |
| Ferguson | Connecticut valley | | | 1 | | | 1 | | Ferguson 1947 |
| Call | Merrimack River | | | 1 | | | 1 | | Burt 1960: 5 |
| Titicut | Merrimack River | | | 1 | | | 1 | | Robbins 1967 |
| Hawes | Merrimack River | | | 2 | | | 1 | 1 | Robbins 1963: 30-33 |
| Mansion Inn | Merrimack River | | | 1 | | 1 | 1 | | Dincauze 1968: 87-88 |

Table 5.8 (continued) Sizes, number of burials/individuals, and burial treatments characterizing a sample of Meadowood burial sites

| Sites | Regions | Excavated area (m ²) | Estimated site size (m ²) | Total number of burials | Number of individuals | Number of crematories | Burial treatment | | References |
|-----------|-------------------------------|----------------------------------|---------------------------------------|-------------------------|-----------------------|-----------------------|------------------|-------------|----------------------------|
| | | | | | | | Cremations | Inhumations | |
| Fort Hill | Merrimack River | | | 1 | | | 1 | | Fowler and Wiet 1955: 9-12 |
| Potter | Merrimack River | | | 2 | | 1 | 2 | | Fowler 1965: 39-43 |
| BaDd-4 | Lakes Kejimikujik & Rossignol | | | 1 | | | | | McEachen 1996: 120 |
| Tozer | Tobique & Miramichi Rivers | | | | | | 2 | | McEachen 1996: 46 |
| Pomrancky | Saginaw Bay | 1.6 | | 4 | 4 | P | 4 | | Binford 1963: 157-191 |
| Hodges | Saginaw Bay | 2.1 | | 1 | | | 1 | | Binford 1963: 125-147 |

Most Meadowood burials are secondary inhumations or cremations, although primary interments are not unknown from Meadowood contexts (Binford 1963a: 190; Heckenberger et al. 1990: 114; Ritchie 1965: 196). Secondary burials are sometimes attributed to seasonally mobile groups, who would temporarily stored the bodies of individuals who died during their seasonal round until they can be transferred to the band cemetery for final burial (Byrd and Monahan 1995: 279; Bar-Yosef 2001: 17). At Bruce Boyd, however, the absence of cutting or scraping marks on the bones suggests disarticulation by natural decay in the primary burial area. Moreover, secondary burials have been ethnographically reported among highly sedentary groups, such as the Thompson Indians of British Columbia (Teit 1900: 330). In these cases, delaying burials was necessary to give communities or corporate groups enough time to accumulate resources for funeral feasts (Hayden 2004: 279). In the Northeast, Perrot (1644-1718: 39) observed a three-day-long funeral feast among Ottawa communities, where hosts gave away practically all that they accumulated in the preceding year.

Roughly circular aggregates of fire-cracked igneous rocks partially embedded in charcoal-stained sand were recorded at a number of Meadowood cemeteries. Such features range from 2.5 to 10.5 m in diameter and reach up to 60 cm in height (Ritchie 1955: 25, Pl. 1, 2, 4, 18-20). Among the stones lie bits of calcined bones, some unequivocally human, together with bits of locally unavailable hematite. Interpreted as crematories, these rock heaps indicate that skeletal remains were sometimes burned in the vicinity of cemeteries. However, evidence of fleshed cremations from other mortuary contexts suggests the burning of the body soon after death, maybe when the group was still away from the band cemetery (Spence n.d.). Remains transferred from the crematory to the final burial location ranged from a small proportion of the skeleton to a fairly wide representation of the body (Binford 1963a: 190; Spence n.d.: 24). Meadowood burial program may have begun with the primary disposal of the dead in a charnel house of some kind or on a platform. In some instances, this appears to have been followed by the cremation of unweathered or dry bones, bundled in a leather bag or shroud, on stone crematories. Following incineration, calcined bones and fire-shattered goods were either allowed to remain on the crematory or gathered up for the final interment in a pit grave (Ritchie 1955:62). As will be discussed in the next section, however, it is likely that only certain individuals had their remains stored, cremated, transported, and buried secondarily in a cemetery.

At Muskalonge and Red Lake sites, the discovery of cremated and bundled remains in the same grave pits, as well as the presence of stone crematories, indicate secondary burials and point to a mortuary program that included several distinct stages. Secondary burials, or the removal of bones from decayed bodies and their reburial, can be associated with ancestor worship and competitive feasting with status displays (Adams 2007; Hayden 2004). Skulls are sometimes selected for secondary burial, which is also often associated with ancestor worship (Hayden 2004: 277). At the Liahn 2 site, there is evidence that a quantity of red ochre, a large number of native copper beads, and an articulated adult male skull were placed within a bark object (Williamson 1982: 6). This discovery indicates that special treatment of heads was part of Meadowood funerary practices. Bruce Boyd is the site where this phenomenon was the most frequently observed (Spence and Fox 1986: 23), but it was also documented at the Muskalonge Lake (Ritchie 1955: 30), Liahn 2 (Spence n.d.: 25), Peterkin (Spence n.d.: 25), Hind (Pfeiffer 1977: 37), and Rickley sites (Pfeiffer 1978: 138, cited in Spence and Fox 1986: 23). At the Bruce Boyd site, the absence of cut marks on the lowest surviving cervicals suggests that decapitation had not occurred, although in most cases the remains were too badly deteriorated to allow much confidence in the determination (Spence n.d.: 22).

Interpreting Variability in Meadowood Burial Modes

Variability in the burial modes can shed light on past social organization. Cremation burials generally require higher expenditure of energy than inhumations and in some ethnographic contexts, cremation has been observed to be reserved for high-status individuals. During the European Mesolithic, the first known cremations occurred together with other changes in burial practices, including boat burials, specialized structures in cemeteries, and the circulation and modification of selected skeletal elements. According to Rick J. Schulting, these new practices reflect profound cultural changes:

Increasing population and social inequality at this time may have provided an arena in which establishing and maintaining rights to land and resources became important, and use of the ancestral dead was one means of achieving this end (Schulting 1998: 217-218).

In communities where all individuals are cremated, other differentiations based on status are sometimes noted. For example, once site preservation and post-depositional

variables have been accounted for, full as opposed to partial cremations can be interpreted as a sign of higher status. Similarly, wealthier individuals or families are sometimes cremated in a central location or a special structure, while cremation occurred in remote locales for the remainder of the population (McHugh 1999: 54). Alternatively, many people, especially the poor, may not be interred or cremated at all, but simply left on the ground, in trees, or on scaffolds (e.g., in Tibet [David-Neel 1932]).

According to comparative studies, the position of inhumations (e.g., flexed versus extended) can be status-related but in this case it is harder to explain differential treatments in terms of energy expenditure (Sahlins 1958: 22). Removal of certain body parts and/or skull burials, a practice that has been documented archaeologically and ethnographically in a number of regions (McHugh 1999: 54), has been viewed as indicative of high status individuals (Wall and Kuschel 1975: 59-62), criminals (e.g., among the Ashanti, see Saxe 1970), or war victims (O'Shea 1984).

Unfortunately, because of the small number of burials at most Meadowood sites and/or the poor preservation of the remains, it is often impossible to correlate mortuary variability with factors such as age and sex, or any other variables (Ritchie 1965: 195; Spence and Fox 1986: 23). A few exceptions do exist, however, and where patterning could be distinguished, adult males were generally favoured (Ritchie 1965: 195). A similar trend was noted in the contexts of Glacial Kame (Terminal Archaic) cemeteries, where cremation was generally reserved for males, more specifically post-pubertal males (Blakely 1996: 244, see also Ritchie 1949).

The comparison of burial modes with the type and quantity of grave inclusions in Meadowood mortuary contexts has sometimes produced interesting results. At the Liahn 2 site, "the only cases of flexed adults were accompanied by the only cases of grave goods and three out of five red ochre inclusions" (Williamson 1982: 8). At the Boucher site, it was observed that items of personal adornment made from copper and shell were limited (with one exception) to primary inhumations, while nonadornment artefacts—tools, weapons, and ceremonial objects of stone, bone, and ceramics—were usually associated with cremated individuals (Heckenberger et al. 1990: 134-137). These distinctions are generally used to indirectly infer a link between treatment of corpses and age or sex, assuming a relationship between these variables and certain classes of artefacts.

A correlation between the age and sex of the deceased and mortuary treatment is generally interpreted as evidence that status in the society is achieved. This position is based on Goodenough's role theory. He argued that age, sex, achievement, personality, circumstances of the death, and social deviances are the dimensions of the social persona likely to be expressed in the burial practices of simple societies. These dimensions lose their importance in more complex societies, being affected by the power of emerging elite whose status is supplanting other statuses and dominating funerary symbolism (Goodenough 1965).

In some Meadowood cases, no correlation was recognized between the treatment of the corpse and the age or sex of the deceased (Clermont 1978; Pfeiffer 1977: 143; Spence et al. 1978: 43). Similarly, in the Western Lake Erie Basin, Stothers and Abel observed that:

Contrary to suggestions by Binford (1963) for other Late Archaic to Early Woodland cremation cemeteries, age and/or sex differentiations within specific modes of burial do not seem apparent at Williams (Stothers and Abel 1993: 68).

A number of practical explanations have been offered to account for this absence of patterning between the mode of burial and age/sex. It has been suggested, for example, that the practice of cremation reflects the time and/or distance between death and burial (Pfeiffer 1977: 143; Clermont 1978). However, at the Bruce Boyd site, Michael Spence observed that the uncremated bodies "ranged from largely disarticulated to virtually intact so that the amount of time between death and final burial (or, to put it another way, the anticipated degree of decomposition by the time of final burial) could not have been the determining factor" (Spence n.d.). Similarly, the presence of crematories in close proximity to graves at a number of Meadowood burial sites contradicts, at least at those specific locales, the idea that the practice of cremation is a function of the distance from the burial ground. Other authors proposed that only those who died beyond the band's home territory were cremated, during extended trips associated with activities such as warfare or trade (Pfeiffer 1977: 143, 151).

The absence of a clear relationship between age/sex of the deceased and the burial mode may also mean that other criteria, such as social status, are involved. As mentioned earlier, cremations require much more energy than inhumations. A fire at a temperature of about 650°C for one or two days would have been required to reduce the skeletal remains to the extent observed at the Isle La Motte site, a state comparable to that of Meadowood

cremations (Blakely 1996: 245). It is thus possible that higher status individuals were the ones being cremated within Meadowood communities. At the Bruce Boyd site, the higher proportion of non-cremated burials supports this hypothesis. The differential distribution of grave goods, however, does not always seem to support the hypothesis that cremation was reserved for higher-status individuals (Spence and Fox 1986: 23). A number of factors could explain this contradiction. Since Meadowood cremations are often secondary burials, it is possible that all or part of the grave goods originally associated with the cremated remains were left behind, within crematory features or primary burials for example. This is supported by the association of cache bifaces and crematories at the Muskalonge site (New York), Sidecut Crematory (Ohio), and East Creek site (Vermont), as well as by the recovery of a birdstone in a crematory feature at the East Creek site. Alternatively, it is also possible that grave inclusions were not the primary mean of displaying status (Stothers and Abel 1993: 87).

On the other hand, the exclusive presence of cremations at Meadowood components such as Muskalonge and Hunter, and Oberlander 2 is intriguing. In the Western Lake Erie Basin, David M. Stothers and Timothy J. Abel hypothesized a division of Late Archaic to Early Woodland cemeteries into various levels of social integration, e.g. regional, local, sub-local. Local cemeteries are expected to reflect a more egalitarian structure than regional graveyards, which saw the expression and interplay of corporate groups:

Thus, we are suggesting that reciprocal ties within the local band were for the most part egalitarian, much similar to the political organization described for the !Kung (Lee 1979). In situations where reciprocal ties might be sought or maintained with neighboring local or regional bands, some larger corporate authority body or “elite” was responsible for negotiations. Successful negotiations were accomplished through the giving of ceremonies, feasts, trade and exchange of foodstuffs and exotic goods, intermarriage, etc. (Stothers and Abel 1993: 67).

This scenario, tentatively applied to Meadowood burial sites, could explain the exclusive presence of cremated remains at sites such as Hunter and Muskalonge Lake, presumably regional burial precincts where “larger corporate authority bodies” interacted. Two of the four stone crematories discovered at Hunter contained the partial remains of multiple cremations. The existence of competing lineages or corporate groups, each using its own crematory, could explain this pattern.

Multiple Burials

Status can be individual or associated with corporate groups such as lineages and descent groups. Although not common, Meadowood multiple burials do occur and may suggest periodical family burials. At the Bruce Boyd and Liahn 2 sites, multiple graves generally contain sub-adult individuals (Spence n.d.; Williamson 1982: 8). However, other sub-adults were apparently buried alone:

It is not clear what factors conditioned the decision of whether to bury a sub-adult alone or with an adult, but it may simply have depended on who died in the year since the last band interment and what their relationship had been with one another (Spence n.d.: 23).

Burial clusters have been documented at the Morrow site, and tentatively interpreted as evidence for distinct lineage groups or other corporate groups using different locations within a single burial site. The different loci identified at the Hunter and Muskalonge Lake sites support this argument (Granger 1979: 105; Ritchie 1965: 197). Possible separation of corporate groups was also observed at the Williams Cemetery, a burial site associated with a cultural manifestation contemporaneous with the Meadowood Interaction Sphere in the Western Lake Erie Basin (Stothers and Abel 1993: 68).

In multiple burials, grave goods are either associated with a single individual (personal belongings), or with a group of individuals. The latter situation was observed at the Pomramky and Hodges sites, where contributions from several persons or groups were also recognized through the spatial distribution of offerings and the differential representation of raw materials between clusters of goods (Binford 1963a: 184, 1963b: 141). Similarly, contributions from more than one flint knapper is thought to explain the observed variability among the bifaces recovered from two caches at the Bruce Boyd site (Spence n.d.).

Meadowood Grave Offerings

A variety of stone, copper, bone, ceramic and shell items have been documented within the contexts of Meadowood burials, some more commonly encountered than others. One of the most consistent elements of the Meadowood interaction sphere is the presence of Onondaga chert bifaces placed in varying quantities in graves. Within the mortuary sites

analyzed for this dissertation, Meadowood cache bifaces, projectile points, bifacial scrapers, fire-making sets rolled in bark or enclosed in a bag (Ritchie 1965: 198), ground stone adzes or celts, stone gorgets, and abrading stones were recovered at all four sites (Table 5.9).

Some grave goods, which could have been part of the personal equipment of the deceased, show traces of use while others appear to have been made specifically for the burial (Spence et al. 1978: 43). The ritual killing of artefacts before their interment has also been documented. Granger (1979: 114) interprets the destruction of traded goods through their ritual killing and/or placement with the dead as supporting evidence for the idea that maintaining reciprocal relationships underlay the movement of goods within the Meadowood Interaction Sphere. It is unclear why, according to Granger, these reciprocal relationships were important, except to “knit Meadowood regional bands into a cohesive whole” (1979: 114), and presumably therein provide access to necessary subsistence resources. While I agree that maintaining the exchange network probably was an important preoccupation among Meadowood communities, the reciprocal nature of these relationships has not been convincingly demonstrated.

Interpreting the Distribution of Grave Goods

The presence of special or lavish grave offerings in burials is perhaps the most common way by which prehistoric inequalities have been inferred from mortuary remains (e.g. Chapman 1977, 1981). The concern here is not only with the mere quantity of grave goods, but with the type of goods associated with a burial. Using the direct historical approach can contribute to identifying status or wealth symbols. For example, Lynn Gamble and her colleagues (2001) identified high status Chumash burials at Malibu dated to about AD 950-1150, in part by the presence of abundant *Olivella* shell beads interred with the deceased. Ethnographically, *Olivella* shell beads were considered by the Chumash to be symbols of status and wealth (King 1990, cited in Gamble et al. 2001). Grave goods are unequally distributed between Meadowood burials (Figures 5.3-5.6).

Table 5.9 Type and quantity of grave offerings at the Hunter, Muskalonge, Oberlander, and Bruce Boyd sites

| | CHIPPED STONE | | | | | | POLISHED STONE | | | ROUGH STONE | | | MINERALS AND UNMODIFIED LITHICS | | | | | | | | | |
|------------|----------------|-------------------|----------------|------------------|---------------------------|----------------------------------|-----------------|--------|---------------|--------------------|---------------------|-----------------------|---------------------------------|------------------------|----------------|-----------------|-------------------|----------|---------------------|--------------------------|--------------------|---|
| | Cache blades * | Projectile points | Scrapers | Bifaces & knives | Drills | Strike-a-lights & iron pyrites * | Utilized flakes | Flakes | Miscellaneous | Adzes/celts * | Gorgetts/pendants * | Birdstones * | Miscellaneous | Hammerstones | Anvilstones | Abrading stones | Steatite sherds * | Galena * | Hematite/limonite * | Quartz crystals * | Unmodified pebbles | |
| Hunter | 243 | 2 | 8 | 0 | 0 | 3 | 0 | 0 | 12 | 1 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | |
| Muskalonge | 1,711 | 11 | 2 | 1 | 1 | 5 | 0 | 0 | 1 | 4 | 3 | 0 | 0 | 2 | 1 | 2 | 0 | 4 | 1 | 0 | 0 | |
| Oberlander | 110 | 39 | 17 | 9 | 13 | 2 | 1 | P | 0 | 6 | 12 | 2 | 1 | 3 | 2 | 3 | 2 | 0 | 0 | 0 | 1 | |
| Bruce Boyd | 13 | 11 | 2 | 1 | 1 | 4 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | |
| | NATIVE COPPER | | | | | | BONE / ANTLER | | | | | | SHELL | | CERAMIC | | VEGETAL & HIDE | | | | | |
| | Adzes * | Awls * | Flaking tool * | Beads * | Fragment of native copper | Awls | Needles | Points | Tube * | Worked bone/antler | Beaver incisors | Unworked animal bones | Beads * | Mussel shell pendant * | pottery sherds | tubular pipes * | Bowl section * | Shroud | Cordage | Charred bark and leather | Miscellaneous | |
| Hunter | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| Muskalonge | 3 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 23 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 |
| Oberlander | 0 | 2 | 0 | 0 | 1 | 6 | 2 | 2 | 0 | 2 | 0 | P | 0 | 0 | P | 1 | 1 | 0 | 0 | P | 0 | 0 |
| Bruce Boyd | 0 | 1 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | P | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* Prestige/wealth item

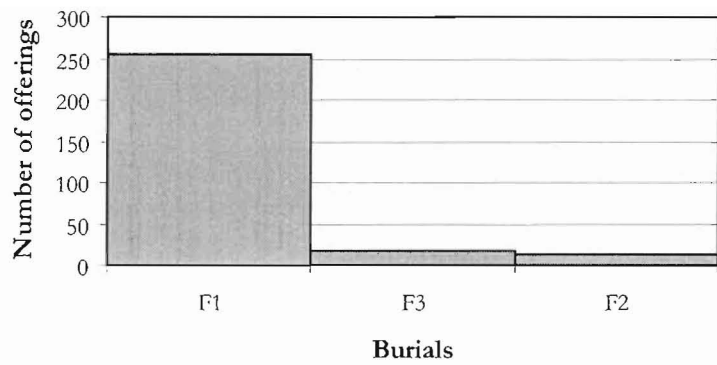


Figure 5.3 Rank order graph showing the distribution of offerings in burials at the Hunter site.

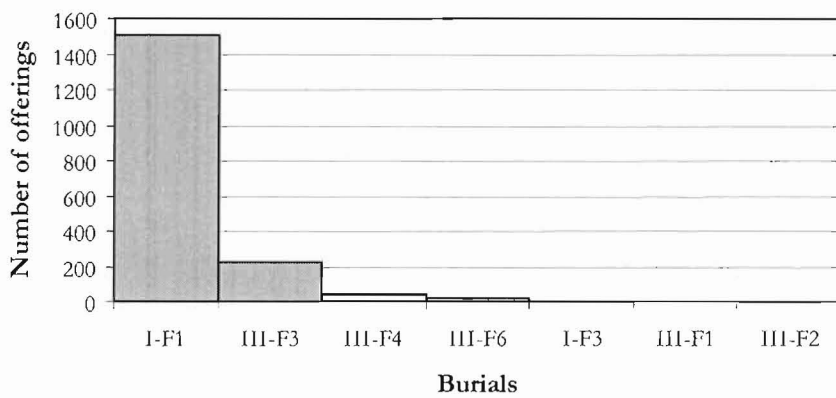


Figure 5.4 Rank order graph showing the distribution of offerings in burials at the Muskalonge Lake site.

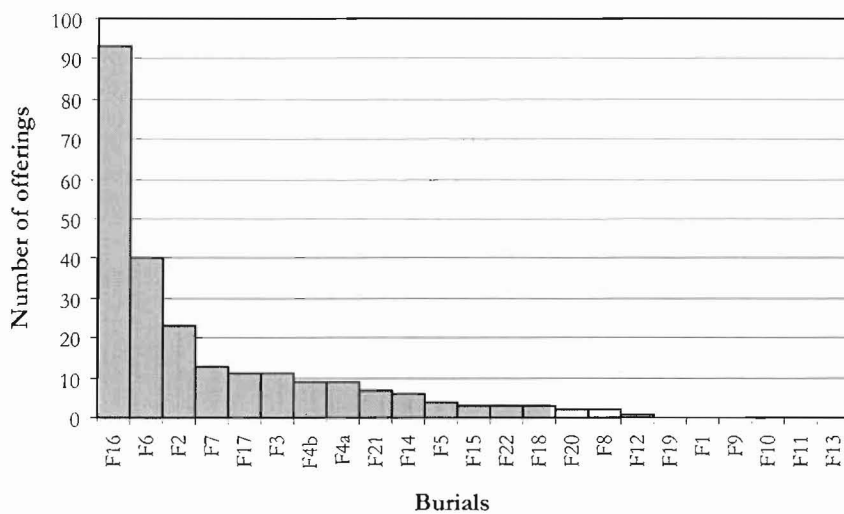


Figure 5.5 Rank order graph showing the distribution of offerings in burials at the Oberlander 2 site.

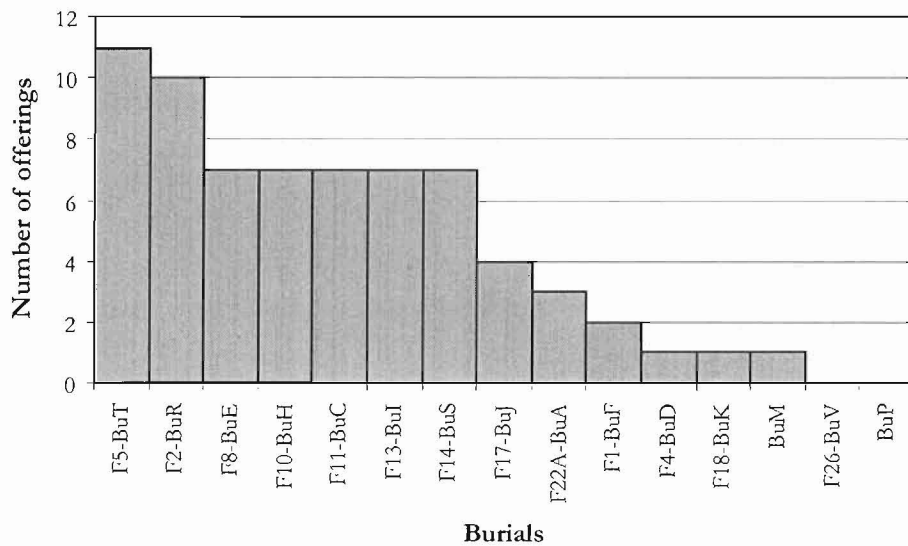


Figure 5.6 Rank order graph showing the distribution of offerings in burials at the Bruce Boyd site.

Ritchie (1955: 65) mentioned that the number, specialized character and distribution of cache blades in burials at Muskalonge, Red Lake, Pickens and other Meadowood sites raise the suspicion that they functioned as a type of “wealth to maintain or enhance the prestige of the departed in his new abode.” I would argue that offerings served the living more than the dead, notably by increasing the socio-economic standing and influence of a group via the display of success and prestige of the givers, qualities that partially extended to the deceased’s lineage, corporate group, and community.

While differences in the nature and quantity of grave goods have occasionally been associated with the sex of the deceased (Heckenberger et al. 1990: 134), variability based on age is more common. At the Boucher site, lithic, ceramic, and bone artefacts are nearly absent from the graves of pre-pubescent individuals (neonatal to 10 years), which may reflect the existence of an age-grade distinction where certain objects are first used as burial offerings only after a certain age (Heckenberger et al. 1990: 134). Similarly, At the Bruce Boyd site, grave goods are exclusively associated with adults, more often males than females. Not all adults, however, were buried with offerings:

Perhaps then, as Ritchie has suggested for Meadowood, status in the society may have been attained with adulthood, although not all adults achieve status (Williamson 1982: 8).

Any interpretation relying on these data, however, is seriously impeded by the poor preservation state of most Meadowood burials and the uncertain assumption of a simple and direct relationship between grave goods and status.

In many instances, the graves with the highest number of offerings are also characterized by a diversity of goods, including some relatively rare items assumed to have had special value among Meadowood communities, e.g., birdstones or native copper objects. This is not always the case, however. At the Oberlander 2 site, for example, the burial with the most offerings contained 93 items, all Meadowood cache bifaces. It is the second and third richest burials which yielded the highest diversity of offerings. Whether the quantity or the diversity of offerings better reflect status within Meadowood communities is impossible to say with certitude.

Grave goods are also unequally distributed between Meadowood burial sites, as shown by the discrepancies in the number of offerings present at the four components analyzed in this study (Table 5.9). Also illustrative of that is the proportion of the total number of Meadowood cache bifaces recovered at a single site. Approximately eight thousand Meadowood cache bifaces have been reported to date from 96 different components, and among these 22% came from the single site of Muskalonge Lake, where 1,726 Meadowood bifaces were recovered. Unequal distributions of grave offerings may indicate differential access to traded items between Meadowood communities. Alternatively, if Meadowood cemeteries reflect distinct levels of social integration; that is, regional and local, this hierarchy may account for the abundance of offerings at Muskalonge, Hunter, and to some degree Oberlander 2, just as it was thought to explain the exclusive presence of cremations at these sites.

Funerary Feasts

Despite ambiguities, the idea that the formal aspects of mortuary practices can provide information on past social structures remains widely accepted today. It has been noted, however, that other funerary rituals, besides the disposal of bodies and grave goods, can contribute to build a more complete picture of social structure (Brown 1995; Goldstein 1976; Trinkaus 1984). While some of these rituals leave no material record, others, like funerary feasts, are susceptible to be recognized in archaeological sites. Material correlates of feasting behaviour include the relative abundance and occasional destruction of prestige

items, the association of rare or highly valued food items with unusual/ritual features or structures, paraphernalia for public rituals, food preparation features, and special preparation and/or serving vessels (Hayden 2001a: 40-41). These correlates, in relation to evidence from Meadowood contexts, are discussed below.

Feasting with Exotics

As discussed in Chapter 2, Meadowood prestige items are often associated with mortuary components and burial features: 80% (n=6,433) of the Meadowood cache bifaces were recovered from mortuary sites or caches, native copper was found in 4 habitation and 14 mortuary sites, while marine shells were documented in a single habitation versus 8 mortuary contexts. The carefully crafted Meadowood polished stone objects are more equitably distributed. Birdstones were documented in 13 mortuary versus 10 habitation sites, while gorgets were present in 16 habitation and 20 mortuary components.

Given that feasts are ideal contexts for the display of prestige objects, the distribution of Meadowood traded items could indicate that communal meals and lavish displays of success were held at funerals. However, other evidence is needed to support this hypothesis. Moreover, the fact that prestige objects also occurred on habitation sites should not be neglected and will be addressed later.

Food in Graves

Nicolas Perrot's description of funerals held among the Ottawa people sometime between 1644 and 1718 helps to understand the presence of food in graves:

Les parents du mort font quelques jours après un festin de viande et de grain (...) On y convie, s'il s'en trouve, les estrangers qui sont venus des autres villages, et font connoitre à tous les conviez que celui qui est mort leur donne ce festin. S'il est de viande; ils en prendront un morceau qu'ils doivent porter sur la fosse, ainsy de quelque autre sorte de vivres (Perrot 1644-1718: 35).³²

³² The parents of the deceased host, a few days later, a feast of meat and grains (...) They invite strangers from other villages, if there are any, and inform them that the one who died is offering this feast. In the case of a meat feast, guests will have to take a portion and place it in the grave, together with other types of victual (Perrot 1644-1718: 35).

At the Oberlander 2 and Wray sites, unburned mammal, bird, and fish bones representing probable food remains were recovered from some of the graves (Ritchie 1965: 197). Similarly, thirteen burials from the Boucher site contained unmodified animal bones, including “fragments of fish, including possibly perch and shad, large mammal long bone fragments, and in one case, male turkey tarsometatarsus bones (Heckenberger et al. 1990: 125).

At the Bruce Boyd site, the incomplete remains of an elderly male and the skull of a six- to nine-month-old child were found in one of the burial pits. Of interest here is the mass of unburned faunal bones lying directly on the human remains, interspersed with charcoal and chert flakes. The vast majority of identified bone in the feature is deer, with at least six animals represented. Non-deer mammal, birds and fish bones were also present, suggesting some diversity in the animals utilized. At least one beaver, one woodchuck, one dog, and three wild turkeys were identified. Species of fish include bowfin, bullhead, channel catfish, pike, yellow perch, sunfish, bass, bluegill, and the sucker. While mammal and bird bones point to a fall kill, the fish were probably taken in the spring.

Michael Spence (n.d.) proposed an interesting scenario to account for this association of animal and human bones in the burial at Bruce Boyd. In the first place, we can think of the mammalian assemblage as resulting from a large procurement effort initiated by the death of an important member of the community and intended for a funeral feast held at the time of the primary funeral, probably sometime in fall. The high fragmentation of deer limb bones suggests that marrow was extracted. According to Spence, the debris left from the feasts was then deposited with human remains in a primary burial, maybe of a scaffold type. Indeed, carnivore chewing on the animal bones suggests that they were left unburied, possibly on display with the corpses, before their final interment in Feature 1. The faunal assemblage was transferred to a final resting place with partially disarticulated bodies in a spring interment, where another feast of more recently procured fish would have taken place. This scenario fits nicely with Timothy Abel’s proposition that a kind of Meadowood trade fair, held during the spring fish spawns, was the organizing focus for large-scale mortuary rituals (Abel 1997).

At the Mud Lake Stream site, Michael Deal observed Vinette I sherds in the vicinity of a burial feature containing canid, non-salmonid fish and beaver remains. The fish and beaver, Deal proposed, probably represent food offerings in what could have been a dog

burial. He draws a parallel between this feature and the one from the Bruce Boyd site that contained animal remains (Deal 1985: 147-149, cited in McEachen 1996: 55). Whether the dog was eaten or only buried is uncertain. Morris Brizinski and Howard Savage documented the case of a dog sacrifice at the Frank Bay site, dated around AD 1000, where the animal does not appear to have been eaten. Associated with the dog burial were the remains of a feast represented by an abundance of charred mammalian bones such as beaver and muskrat. Such ritual sacrifices of dog have been documented archaeologically (Kenyon 1980: 19), ethnographically, and ethnohistorically (Brizinski and Savage 1983: 39) among the Great Lakes Algonquians and many other societies around the globe, which Brian Hayden qualifies as transegalitarians:

In at least some respects, dogs functioned like slaves to display individual power and wealth through sacrifice (Hayden and Schulting 1997: 74).

Evidence of dogs used as food also exists from Meadowood sites. In the Champlain valley, the burial of a dog previously eaten by the inhabitants of the Ewing habitation site yielded a date of 2765 ± 135 BP (Haviland and Power 1994:108). At the Oberlander 2 site, burned deer and dog bones accompanied human cremations (Ritchie 1965: 197).

In general, faunal assemblages containing food items that are rare, labor intensive, fatty, or in any way special constitute good indicators of feasting. Large quantities of food are also indicative of feasting, and the six deer recovered from a burial at the Bruce Boyd site certainly constitute a large quantity of meat. While the animals represented in the feature at Bruce Boyd are by no means exclusively found in ritual or funerary contexts, most of them were probably highly valued by Early Woodland groups.

The large size of deer and the predictability and periodical abundance of fish make these food sources very attractive to many hunting and gathering societies. It was argued at the beginning of this chapter that fishing and deer hunting in northeastern North America likely enabled the accumulation of surpluses. Where deer meat is available, it is often a delicacy that is eaten and shared in feasting events. Ethnographic accounts from the Northeast also describe communal meals involving the serving of fish (Bougainville 1828: 60; Gravier 1827-1904: 193; Perrot 1644-1718: 262; RJ 49: 178; RJ 59: 59), especially sturgeon, trout, and eel. Among the Montagnais of Godbout, Nicolas A. Comeau also documented feasts where birds such as geese and loons were served (Speck 1935: 106).

Dog is the only animal that prehistoric communities living in the Northeast ever domesticated, a characteristic that undoubtedly confers on dogs a very special status. Almost all hunting and gathering groups who have domesticated dogs confer special status on them:

In the famine which we endured, our savages would not eat their dogs, because they say that, if the dog was killed to be eaten, a man would be killed by blows from an axe (JR6: 95).

Nevertheless, missionaries and explorers reported several *special events* among the Cree, Illinois, Iroquois, and other groups that involved the preparation and consumption of dogs at feasts. In his travels in Acadia, Sieur de Diéreville observed:

On ne croira peut-être pas que le chien est leur met le plus délicat. S'ils veulent traiter un sagamo de l'honneur qu'il leur fait, ce pauvre animal est la triste victime, et c'est le plus honorable morceau qu'ils puissent lui présenter, et qui marque la considération qu'ils ont pour lui. Il ne peut encore éviter la mort quand ils régaler un de leur intimes amis, et ce n'est pas le plus méchant qu'ils tuent, c'est celui dont ils font plus de cas pour la chasse. Quand il est du festin, tout y va, et ils ne se réjouissent jamais mieux (Diéreville and Fontaine 1885: 88).³³

It is interesting to note that taboos associated with dog consumption were applied only in specific contexts, and that feasting is determined by factors other than survival.

Ritual Paraphernalia

Ritual faunal elements placed in preserved hide garments were found in two burial features at the Boucher site. These findings suggest the remains of “medicine bags,” hypothetically associated with ritual specialists (Heckenberger et al. 1990: 134). A partial black rat snake (*Elaphe obsoleta*) was the only animal identified in the first bag. The second hide garment included remains of a timber rattlesnake (*Crotalus horridus*), a black rat snake (*Elaphe obsoleta*), a pine marten (*Martes americana*), an American mink (*Mustela vison*), a red fox (*Vulpes vulpes*), a raccoon baculum (*Procyon lotor*), and unidentified cervid and duck. A bone

³³ It may be hard to believe that the dog is their finest meal. If they want to pay honour to a sagamo, this poor animal is the victim, and it is the most honourable piece of meat that they can give, and which emphasize the consideration they have for him. A dog will also have to die if they want to treat close friends to a good meal, and it is not the most villain that they kill, but the one that they value the most for hunting. When dog is served at a feast, everyone goes and rejoice more than in any other occasion (Diéreville and Fontaine 1885: 88).

fishhook and two unmodified pebbles were also found in this bag (Heckenberger et al. 1990: 130).

A “medicine bundle” consisting of clustered faunal elements was also recovered at the Williams Cemetery, a Terminal Archaic site likely related to the Meadowood complex. Among the exotic faunal items documented were bald eagle talon cores, polished bobcat femur, and polished mountain lion ulna awls (Abel et al. 2001: 314). At the Hodges site in Michigan, a cremation was excavated that contained bones of raccoons, turtles, and small birds. These elements may represent part of a headdress, a medicine bag, and/or items of personal adornment (Binford 1963b: 145).

At least one black bear (*Ursus americanus*) mandible, ground and decorated with incisions, was recovered at the Boucher site. According to Michael Heckenberger and his colleagues, these could have been part of a mask. Similar objects were documented in Middle Woodland contexts in midwestern United States:

Cut halves of bear mandibles, and sometimes maxillas, also occur in Hopewell contexts. Some were polished, partially ground, and bored for suspension as a pendant or necklace, or possibly attached to a breechcloth. Uncut mandibles may have been simply laid near or upon the bodies of deceased humans (Deuel 1952:169-170) (Berres et al. 2004: 20-21).

Ritual paraphernalia may also have involved black bear skulls as suggested by the recovery of skull masks at the Williams Cemetery and Hind sites, two Terminal Archaic components (Berres et al. 2004: 14; Donaldson and Wortner 1995:15, 24; Stothers and Abel 1993: 68). As mentioned earlier in this chapter, bears were perceived as connections to power among many traditional societies. Archaeological and ethnographical evidence indicates that at least since the late Archaic period, bear imagery and ritual (including bear feasts) were important and endured across much of the Northeast:

There was a complex of customs common to past cultures that stem from a respectful attitude to the bear including the ceremonial display of the skulls in elevated positions and ritual disposal of post-cranial remains (Hallowell 1926: 154, cited in Berres et al. 2004: 29).

Like the medicine bags mentioned above, bear masks could also be part of a shaman’s paraphernalia. Ethnographically, shamanic costumes are known to include items that assist the shaman in making connections or controlling sacred forces. Typically, these

“assistants” take the form of animal spirit helpers that are thought to have supernatural powers. Besides bear masks, antlers and bird anatomical parts are widely used to make prestige items, ornaments, and various elements of costumes displayed in ritual contexts (Hayden 2003). Antler tines manufactured from various species of cervidae, including moose (*Alces alces*) and deer (*Odocoileus virginianus*), were found in burials at the Boucher site (Heckenberger et al. 1990: 122). Ritual offerings of bear skulls, caribou antlers, or goose feathers have been ethnographically documented among northeastern Indian groups, a phenomenon that may be mirrored by the presence of bear masks and other rare or symbolically charged faunal elements in Meadowood burial and features (Volmar 1996).

Food Preparation Features

The feasting evidence associated with a burial feature at the Bruce Boyd site points to cooking techniques and food preparation features that do not burn the bones. This observation fits well with the two features filled with fire cracked rocks documented at the mortuary component of Muskalonge Lake, which could be baking pits used for cooking with hot stones (Ritchie 1955: 18-21; 1965: 188). The largest of these pits measured 1.8 m in diameter and 1.3 m in depth. The concentration of broken igneous rocks was about 75 cm in maximum length and 40 to 50 cm in thickness. These features are interesting considering that large size and unusual locations for food-preparation facilities are two indicators that Hayden (2001: 40) proposed to recognize feasting in archaeological contexts.

Special Food Serving and Preparation Vessels

Cord-marked Vinette 1 pottery dates to the Early Woodland period and represents the first evidence of ceramics in northeastern North America. Sherds occur typically in small concentrations on Meadowood sites, indicating a limited use of the new ceramic technology. While pottery is very rarely found in burials, its use in the preparation of mortuary feasts should not be ruled out (Taché, in prep). Indeed, Vinette 1 sherds have been found near graves in a number of sites:

- At the Muskalonge Lake site, Ritchie reported areas of dark sand, the largest measuring almost two metres across and 25 cm deep, filled with charcoal particles. Vinette 1 sherds were scattered within most of these features;

- At the Bruce Boyd burial site, four Meadowood features were interpreted as refuse pits on the basis of either animal bones or Vinette 1 pottery sherds found in their fill; and

- The Muskalonge and Red Lake sites (located five kilometres apart as the crow flies) contained respectively eight and fourteen stone features suspected to have served as crematories. Vinette 1 pottery was found in the vicinity of crematory features at both sites. A close association between sherds and three unburied cremations was interpreted by Ritchie as possible food offerings in pots made at the time and place of the burning of the dead. Alternatively, such associations may represent the remains of funerary feasts.

The Significance of Funerary Feasts

Prestige items can be used to acquire status through competitive feasting (Schulting 1995). The ethnographic literature for the Northeast contains many references to, and descriptions of feasts held at various occasions and at different moments of the year among a range of Algonquian and Iroquoian groups (e.g., JR10: 122-128). The most extravagant ones are those that took place at funerals, which represented occasions for gathering together a number of potentially allied communities. Moreover, the death of an important member of the community could be commemorated over long periods of time by holding repetitive rituals and feasts.

Hayden (2003: 191, n.d.) noted that in transegalitarian societies, funerals are one of the most common events for competitive displays of family and lineage wealth. Typically, families and lineages use their entire available surplus to host funeral feasts. They send invitations to important members of allied lineages and make prestige gifts to those people, who find themselves in debt toward the hosting lineage or village since these invitations must be reciprocated (Hayden 2003: 192). Such is the case among the Ottawa people, where, as mentioned earlier, Perrot observed an annual funeral feast lasting three days and during which hosts gave away practically all that they accumulated in the preceding year (Perrot 1644-1718: 39).

Because of their high emotional content, funerary rituals have strong potentials to create, reinforce, and manipulate cultural values and social relations within the living community. Indeed, in such a vulnerable state of mind, people are more likely to be receptive to particular values that the leaders of the community wish to promulgate, such as

the worship of ancestors, identification with lineages, and mutually supporting relationships (Hayden 2001a, 2001b; 2003: 192; Schulting 1998).

Feasts are a strategy used by elite members of a community to acquire prestige and wealth by creating debt relationships within and between communities. Thus, feasting evidence found in some Meadowood funerary contexts tends to confirm the hypothesis that exotic and finely crafted objects circulating in the Meadowood interaction sphere reflects increasing social inequalities and constitutes evidence of ownership and competitive displays of success.

DISCUSSION

To better understand the benefits that accrued from participating in the Meadowood Interaction Sphere, this chapter addressed various aspects of Meadowood subsistence strategies and social organization. Productivity of the environment was described and discussed in terms of resource uncertainties and/or potential for accumulating and storing surpluses. I also examined evidence for Meadowood craft specialization, corporate kinship groups and labour, as well as social differentiation reflected in funerary practices. These data are needed to address the last set of expectations of the three exchange models evaluated in this dissertation (Table 3.1).

In terms of subsistence strategies, a good case can be made for an increasing dependence on fish and the development of fishing technologies among Meadowood communities. Several regions exploited by Meadowood groups contain exceptionally rich fishing grounds and the spatial distribution of Meadowood sites confirms that summer and spring fishing was a major subsistence activity. Moreover, contact era and other historic documents from various regions in northeastern North America demonstrate the exceptionally high return rates that can be obtained from fish. Compared to fish, mammals are a much less predictable food source. Nevertheless, species like the white-tailed deer, black bear, and beaver undoubtedly played an important role in Meadowood subsistence economy. Nuts and nut oil appear to have been one of the most important plant resources, and wild rice of some local importance. Other plants assumed minor subsistence roles, although some domesticates (as well as nut oils) may have been important as prestige foods.

I emphasized in chapters 3 and 4 the fact that subsistence and wealth resources are not equally distributed across the Northeast. Concurrently, it was demonstrated in this chapter that northeastern North America is a rich and diverse environment with local resource abundance and surplus accumulation, albeit limited by seasonal and yearly periods of scarcity. These conditions in turn account for the regional diversity in Meadowood settlement patterns and organizational complexity. With Nina Versaggi (1999: 54), I believe that the concept of heterarchy has great potential in unravelling Early Woodland dynamics and the various roles of communities within the multidimensional Meadowood Interaction Sphere. For example, Meadowood groups inhabiting the Niagara Frontier region were favourably located (along the Great Lakes corridor and close to Onondaga chert sources) to be active partners in the Meadowood Interaction Sphere. The fact that chert constituted a year-round necessity accessible during most seasons probably created pressures for greater sedentism on the part of the groups exploiting this resource, which in turn would explain why we observe, in the Niagara Frontier region, larger base camps such as the Riverhaven 2 site. It was also suggested that Meadowood communities in the Middle St. Lawrence valley and perhaps the Susquehanna valley were strategically located to secure and process deer hides, which were in turn exchanged as prestige items in the Meadowood Interaction Sphere.

Meadowood cemeteries, on the other hand, are often associated with environmentally rich riverine and lacustrine habitats, suggesting that the exploitation of fish resources was important at these locales. Reinstating Timothy Abel's (1997) hypothesis, I suggest that Meadowood regional cemeteries represent "trade fairs" where the cooperative harvesting of fish by multiple local bands was taking place. Mortuary practices and rituals taking place at these sites also represented occasions for local or regional bands to gather, mourn, exchange and make alliances.

The sociopolitical exchange model assumes that exchanges were preferentially directed toward a limited number of communities, presumably the wealthier ones. Underlying this assumption is the prediction that there is, in northeastern North America, Early Woodland residential or burial sites that did not participate significantly in the Interaction Sphere and that did not share Meadowood material characteristics. In this chapter, an apparent decrease in the number of sites and diagnostic artefacts in Early Woodland times was described. In line with the sociopolitical scenario, I suggest that the

high visibility of the Meadowood manifestations in fact obscured contemporaneous local cultural manifestations evolving in northeastern North America three thousand years ago.

The common presence of many storage pit features on Meadowood archaeological sites points to an accrued tendency to seasonally reoccupy locales characterized by abundant R-selected species (e.g., fish, nuts, seeds). The exploitation of such food sources may in turn have developed following the introduction of mass harvesting techniques (e.g. nets and weirs for fish; mass drives for cervidae; etc.). Among the food resources exploited by Meadowood groups, nuts and fish are particularly well suited for storage. Fatty fish species (e.g., American eel, channel catfish, and yellow sturgeon) as well as nut species could have been processed to make oil. Competition for spatially restricted resources is likely to result from an increasing dependence on R-selected species and storage, and this is where the concept of ownership becomes important. Ethnographically, fishing sites and their associated weirs were affiliated, in terms of ownership and use-rights, with certain kin groups, and it is likely that it was also the case among Meadowood communities.

In traditional societies, the best way to claim ownership is to invoke inheritance from one's immediate ancestors, which in turn favour the emergence of ancestor cults, corporate lineages, and/or distinct burial precincts. Multiple burials and burial clusters documented in a number of Meadowood contexts could support the existence of distinct lineage groups or other corporate groups using different locations within a single burial site. Secondary burials, or the removal of bones from decayed bodies and their reburial, can also be associated with ancestor worship and competitive feasting with status displays. Finally, skulls were sometimes selected for secondary burial by Meadowood groups, and this practice is also often associated with ancestor worship. Once the possibilities of ownership and wealth accumulation are established in a society, labour often becomes critical, since the ability to procure more resources depends on how many people are available to accomplish a given subsistence task such as building weirs or catching fish, for how much time, and how hard they are willing to work. The need for labour can lead to unprecedented values attributed to, and investment in wives and children. This is potentially reflected by the occasional rich child burials included within Meadowood cemeteries.

Craft specialization also relates to manipulation and/or control of labour. Meadowood cache bifaces are finely made and highly standardized objects that appear to have been produced in a limited number of sites in western New York and Southwestern

Ontario before being traded to other regions. These characteristics strongly suggest the existence of craft specialization among Meadowood communities. In the Meadowood network, individual/corporate groups/communities inhabiting the Niagara Peninsula probably controlled Onondaga chert primary sources, therefore contributing to enhancing the value of Meadowood cache bifaces as prestige items. At more distant locations in the exchange network, other individuals/corporate groups gained power in their own community through their ability to give away such items and thus create debts. Marine shell, slate, and native copper objects may also be the work of part-time specialists in communities located along the Middle Atlantic coast and in the Western Great Lakes. Finally, we must imagine other specialist-produced items such as nets, buckskin, clothing, featherwork, and specialty foods (e.g., maple sap, nut oil, fish oil).

The Meadowood communities are well-known for their elaboration of mortuary ceremonialism. The existence of burial precincts distinct from habitation sites is another characteristic of Meadowood communities supporting the existence of resource ownership and control. In this chapter, I argue that only a select part of the community was actually interred in such precincts. In terms of grave goods, the inclusion of socio-ceremonial objects and items of personal adornment in Meadowood graves contrasts with preceding periods (when grave goods consisted largely of utilitarian artefacts) and could reflect the development of a degree of status differentiation seldom seen in earlier times. Grave goods probably served the living more than the dead, notably by increasing the socio-economic standing and influence of a group via the display of success and prestige of the givers, qualities that partially extended to the deceased's lineage, corporate group, and community. Offerings are not only unequally distributed between Meadowood burials, but also between burial sites, which support the idea that Meadowood cemeteries reflect distinct levels of social integration, e.g., regional and local. This hierarchy could account for the abundance of offerings at Muskalonge, Hunter, and Oberlander 2, just as it is thought to explain the exclusive presence of cremations at these sites.

The abundance and occasional destruction of prestige items associated with cemeteries, the association of rare or highly valued food items with unusual/ritual features or structures, paraphernalia for public rituals, food preparation features, and special preparation and/or serving vessels are material correlates of feasting behaviour that have been documented in Meadowood contexts. Also, Meadowood secondary inhumations or

cremations may reflect the necessity of delaying burials to give communities or corporate groups enough time to accumulate resources for funeral feasts. Feasts are a strategy used by elite members of a community to acquire prestige and wealth by creating debt relationships within and between communities. Thus, feasting evidence found in some Meadowood funerary contexts tend to confirm the hypothesis that exotic and finely crafted objects circulating in the Meadowood interaction sphere reflects increasing social inequalities and constitutes evidence of ownership and competitive displays of success.

How can such evidence relating to environmental productivity and various aspects of Meadowood communities be interpreted in terms of the benefits that accrued from participating in the Meadowood Interaction Sphere? If pooling risk to deal with resource shortages was the main reason for participating in the Meadowood Interaction Sphere, as the economic model predicts, one might expect areas most subject to resource fluctuations and shortages to display the most Meadowood traits. In fact, the communities inhabiting areas where the winters were more intense and resources less abundant, such as the Canadian Shield or around Lake Huron and Georgian Bay, were only marginally participating in the Meadowood Interaction Sphere. Inversely, rich resource areas with surplus-producing potentials appear to be the most active localities in the Meadowood Interaction Sphere. Rather than rely on inter-community risk pooling, Meadowood families appear to have relied primarily on storage as a risk reduction strategy.

The environmental productivity and social organization described in this chapter could be intelligible in terms of both the ritual and the sociopolitical interaction models. In the mortuary cult scenario, the prediction that ritual objects were circulating in the Meadowood Interaction Sphere implied that resources were abundant and predictable enough to allow time and energy to be invested in the production of items that are not strictly utilitarian. However, when evaluating the ritual model, one is still left with the problem of why mortuary cults would “require” costly and difficult to acquire grave goods as part of their funerary rituals.

On the other hand, the social inequalities implied by the socio-political model depend upon subsistence intensification and the relative amount of surplus that could be produced on a consistent basis by families or larger economic groups. The recognition of corporate labour subsistence practices, storage practices are therefore in line with the sociopolitical scenario. The socio-political model also implies the existence of archaeological

indicators of social differentiation and inequalities. Consequently, the presence of skilled specialists and the numerous burial practices and patterns pointing to the emergence of social inequalities and differential access to resources among Meadowood groups are mostly comprehensible within the socio-political interaction model.

CHAPTER 6 – DISCUSSION AND CONCLUSIONS

My dissertation explored the dynamics of past human interactions. This is a central question in archaeology, given the potential for culture contact situations to stimulate social development and complexity. In northeastern North America, the Early Woodland period is a period of transition characterized by important cultural transformations and an overall increase in social complexity. Intensification in the exploitation of certain food sources, the emergence of distinct burial precincts and an elaboration of mortuary ceremonialism, as well as the development of socio-economic inequalities are some of the changes that occurred in Early Woodland times. This time frame also concurs with increased patterns of interaction, materialized in both the quantity and spatial distribution of trade items. The Early Woodland period in northeastern North America is therefore an ideal context to explore the role that intersocietal interactions have in sociocultural changes.

The main objective of my thesis was to identify the factors responsible for the establishment of the Meadowood Interaction Sphere in Northeastern North America during the Early Woodland period. First thought to have resulted from the spread of a burial cult across northeastern North America (Ritchie 1955), Meadowood manifestations were subsequently interpreted as the result of an exchange network established to ensure more stability to local subsistence systems (Granger 1978; Haviland and Power 1994). Socio-political factors have also been proposed to account for interactions contemporaneous and very similar in kind to the Meadowood Interaction Sphere (Bourque 1994; Pleger 1998, 2000; Stothers and Abel 1993). In this study, I assessed the relative importance of ritual, economic, and socio-political factors in the development of the Meadowood Interaction Sphere. To evaluate these three alternative scenarios, I examined the material characteristics of the Meadowood Interaction Sphere, the distribution of sites across the landscape, the environmental and cultural contexts of traded artefacts and raw materials, and the characteristics of Meadowood subsistence strategies and social organization (Table 6.1).

Table 6.1 Theoretical models accounting for the structure of the Meadowood interaction sphere

| Archaeological correlates | | Factors underlying interaction sphere | | |
|------------------------------------|--|---------------------------------------|-----------------------------------|---|
| | | Ritual | Economical | Socio-political |
| 1. CIRCULATING OBJECTS / MATERIALS | Utilitarian/subsistence related items | | ✓ | |
| | Non-utilitarian prestige items | Cult items | Wealth items (exchanged for food) | Status items |
| 2. CONTEXTS | Type of sites | Mortuary | Domestic | Gathering, mortuary |
| | Associated features | Burials, caches | Middens, houses | Burials, caches |
| | Differential distribution in features | | | ✓ |
| 3. DISTRIBUTION OF SITES | Homogenous distribution | ✓ | | |
| | Function of distance from material sources | | ✓ | |
| | Concentration in certain areas | Core | | Rich areas |
| 4. COMMUNITIES | Subsistence strategies | ? | Resource uncertainties | Corporate labour |
| | Social inequalities | Possible | Limited | Reflected in burial practices, feasting, etc. |
| | Storage | Possible | Possible | ✓ |
| | Specialization | Possible | | ✓ |

The material characteristics of the Meadowood Interaction Sphere were described through a comparative analysis of seven major sites. The objective of this research component was to identify the objects and raw materials circulating within the Meadowood network and classify them as prestige objects, cult paraphernalia, or subsistence goods. These issues are related to the first set of expectations proposed to evaluate the interaction models included in my theoretical framework.

The second set of expectations implies that the distribution of Meadowood components/diagnostics across the landscape can inform us on the motivations underlying interactions. Therefore, a comprehensive inventory of Meadowood archaeological sites within eight provinces and 27 regions in northeastern North America was undertaken. Within each geographical division, variables such as the total number of sites/diagnostics, the number of habitation versus mortuary components, and the existence of site

concentrations were discussed in relation to resource availability and predictability, transportation routes, and access to raw materials.

The different theoretical models accounting for the establishment of interaction spheres also include predictions about the contexts in which of traded items should be found. In this dissertation, distribution patterns and contextual data (e.g., mortuary vs. habitation sites, presence in features) were described for each of the major Meadowood diagnostic artefacts and raw materials. Variability was sought and patterns explained in terms of the object/raw material's role within Meadowood Interaction Sphere (e.g., prestige objects, cult paraphernalia, or subsistence goods).

Finally, reconstructing the economical and socio-political organization of Meadowood communities may ultimately allow us to broach the question of what benefits accrued from participating in the Meadowood Interaction Sphere. I described the subsistence resources available to Meadowood groups and examined environmental productivity in terms of resource uncertainties and/or potential for accumulating and storing surpluses. The consequences of these ecological conditions on Meadowood settlement patterns were also discussed. Finally, I examined evidence for Meadowood craft specialization, corporate labour, as well as social differentiation reflected in funerary practices.

In this final chapter, I review the major components of my research by reassessing, for each one, the predictions ensuing from the three alternative exchange models (i.e., ritual, economical, and socio-political [Table 6.1]) and summarizing my results. I conclude by arguing that the attempt by certain individuals or corporate groups to enhance their status through privileged access to rare goods was central in maintaining cross-cultural contacts. This is a novel interpretation of northeastern archaeological contexts which promises to enhance our understanding of the origins of social complexity.

MATERIAL MANIFESTATIONS

In Chapter 2, the assemblages from three habitation sites (Scaccia, Riverhaven 2, and Batiscan) and four mortuary sites (Mukslalonge Lake, Hunter, Oberlander 2, and Bruce Boyd) were described in order to identify the material characteristics of the Meadowood Interaction Sphere. To distinguish trade items from objects that did not circulate in the

Meadowood network, assemblages were described in their entirety. I analyzed and compared the stone, bone, antler, shell, native copper, and ceramic artefacts represented in the seven collections. Chapter 2 ended with a discussion about the nature of Meadowood trade goods. More specifically, I wanted to know whether they are best classified as prestige objects, cult paraphernalia, and/or subsistence goods. This question is related to the first set of expectations that I propose to evaluate the three interaction models included in my theoretical framework.

Predictions of Material Patterning

Expectations deriving from a ritual framework include non-utilitarian, ritual objects as traded items. Moreover, if the Meadowood Interaction Sphere was mainly ritual in nature, traded items should be found predominantly in mortuary or ritual sites, associated with graves or caches.

In contrast, one would expect raw materials or food resources necessary for subsistence, as well as wealth items to be exchanged for food, to circulate in a network established primarily for economic/practical reasons. According to the economic model, a majority of traded items should be found in domestic sites, in contexts such as midden or houses. There is no reason for them to occur in ritual or mortuary contexts except perhaps as personal possessions of the deceased.

Finally, trade in prestige items is one of the material correlates associated with a socio-political framework, and exchanged goods should occur in greatest quantities at large gathering and feasting sites or cemeteries associated with special structures, graves, or caches. Because smaller feasts or other public displays of status also occur at residences, some prestige items are expected to occur at habitation sites as well (in contrast to the purely funerary cult model).

Results

Onondaga chert, exotic to most Meadowood sites, is the main currency of the Meadowood Interaction Sphere and was used to manufacture finely crafted cache bifaces, projectile points, scrapers, drills, and possibly other less diagnostic artefacts. The high quality and standardization of these objects not only suggests high labour investment but also points

to the presence of skilled specialists among Meadowood communities. A majority of Meadowood cache bifaces were found in mortuary sites, mostly in the context of burial features, or in caches. Even though Onondaga chert might have had a strictly utilitarian role in earlier periods, it apparently became a highly valued raw material in the Early Woodland period, perhaps as a result of increasing control over its distribution (see Hayden 1997: 58 for a similar argument regarding obsidian on the North West Coast). Onondaga chert bifaces not only circulated within the Meadowood Interaction Sphere, but also between regional networks of exchange. These bifaces were probably exchanged for exotic raw materials or goods such as native copper, marine shells, Ohio and Indiana cherts, banded slate, Mistassini quartzite, furs, hides, nets, nut oil, fish oil, and other prestige items:

Inter-regional networks then were also in operation, participating in the circulation of these exotic and often “ceremonial” goods among neighbouring regional bands, who then distributed these goods through their respective band hinterlands (Stothers and Abel 1993: 83).

Native copper and marine shells, as well as stone gorgets and birdstones, although fewer in numbers, can also be confidently associated with long-distance trade and were likely prestige objects. The elaborated shapes and craftsmanship of stone gorgets and birdstones, as well as their non-utilitarian nature, are the main arguments for their classification within the category of prestige items. Native copper and shell items, on the other hand, are among the raw materials displaying “qualities (that) appear to elicit pan-human aesthetic responses or engender positive reactions when used as displays of success and status” (Hayden 1998:12). Among historically known groups in the Northeast,

(s)hell, crystal, and copper are believed to be otherworldly substances obtained by humans through reciprocal exchange with Under (water) World Grandfathers. These bright, reflective substances from beneath the water or the earth, and artefacts made from them, are associated with myths and rituals involving both physical and spiritual well-being in this world and the next (Haviland and Power 1994: 81-82 in Blakely 1996: 255).

In the context of Meadowood sites, copper and shells were often used to produce items of personal adornment and are predominantly recovered from mortuary components.

Occasionally present in Meadowood contexts, steatite potsherds, as well as stone and ceramic tubular pipes are other exchanged goods likely to be related with rituals and/or the

expression of status. In many different contexts, stone bowls have been related to emerging social inequalities and the display of power on formal occasions (Hayden and Schulting 1997: 68-69). The same can be said of the finely crafted smoking pipes and of the behaviours they imply. The act of smoking, which probably marked special occasions, was likely performed by individuals who “shared the same set of cultural values and were approximately of equal status, capable of performing as elites” (Hayden and Schulting 1997: 71).

Besides the recognizable traded items, a number of idiosyncratic objects documented in Meadowood assemblages undoubtedly also represent non-utilitarian objects, which primary function may have been to convey status. A majority of these are bone implements, two of which bear some of the few stylistic designs documented within Meadowood artefactual assemblages.

Because they are very rarely preserved in the archaeological record, perishable trade commodities are always underrepresented in archaeological deposits. However, there is little doubt that such items were circulating in eastern North American prehistoric trade networks, just as they were in historical times (Baugh and Ericson 1994; Brose 1994; Smith 1996; Trigger 1987; Wright 1967; Wright 1995, cited in Martin 1999: 195). Ethnographic research has documented the exchange of ritual/wealth items for food. Polly Wiessner (1982: 175), for example, interpreted the circulation of beadworks among the !Kung as a risk-reducing strategy for resource fluctuations (Wiessner 1982: 175). Based on such ethnographically documented cases, Steven Simms (1979) postulate the dual exchange of subsistence-related products and ritual/wealth items during the Early Woodland period in the Northeast, despite the absence of archaeological evidence for the former.

Accounts of seventeenth-century trade networks in northeastern North America attest to the importance of food and other perishables, together with exotic items, as exchanged products (Smith 1996, cited in Martin 1999: 195-196; Trigger 1987, Wright 1994):

An accounting from one area, that of northern Lake Huron, suggested the following perishable trade goods handled during the seventeenth century by the Odawa of Manitoulin Island: reed mats, fish, berries, meat, furs, and antler. In addition, they acted as middlemen handlers or importers of nets, hemp, oils, tobacco, maize, wampum, marine shell, and medicine (Martin 1999: 195).

Animal skins and hide garments appear to have been a particularly important traded commodity, even prior to the European fur trade (Springer 1981: 225-226). According to Richard Gramly, deer was the only large animal in the Northeast occurring in sufficient numbers to provide enough hides for clothing (Gramly 1977: 601). He suggested that increasing conflicts and competition over deer hunting territories in the Late Woodland period reflected a desire to acquire deer skins for clothing, which became a scarce resource with increasing population. Moreover, Gary Webster (1979: 819) rightly noted that “in order to continue to produce an adequate number of deer skins, mass hunts would have required increasingly greater energy subsidies from other “cheaper” sources, such as corn and fish.”

I also consider that skins and hide garments to have been important and highly valued items among prehistoric populations of northeastern North America. However, rather than global population increase, demand from a minority of high-status individuals may alternatively be responsible for increasing competition over deer skins. As Brian Hayden and Rick Schulting suggested, it is probable that only the wealthiest and most prestigious individuals of a community possessed tailored clothes of high quality, which usually are the ones illustrated in ethnographies (Hayden and Schulting 1997: 62; Hayden 2002). The remainder of the population may have been wearing less elaborate hide garments or even bark capes, as observed among the Thompson Indians of British Columbia (1900: Teit 186ff; 1906: 218-220, in Hayden and Schulting 1997: 62). Interestingly, ethnohistorical sources suggest that among the Huron, the motivations behind deer hunting, an important male social activity, were largely nonutilitarian (Webster 1979: 819).

Animal skins and hide garments may have been circulating within the Meadowood Interaction Sphere. It was speculated that Meadowood groups in the Upper and Middle St. Lawrence valley were well positioned to secure and process deer and other species hides during seasons when they aggregated. A similar hypothesis was proposed for the Meadowood groups in the Upper Susquehanna valley (Versaggi 1999: 53). Hides could have then been traded with populations in the midwestern United States. The manufacture of hide garments and bags is evidenced at the Boucher site (Heckenberger et al. 1990).

In sum, it is argued that all the objects archaeologically documented as exchanged within the Meadowood network meet at least one (generally all) the criteria of prestige items (Brumfield 1987: 8; Hayden 1998). Indeed, products circulating in the Meadowood network were primarily non-utilitarian items involving high labour and skill investments and/or

manufactured from raw materials with sources fixed in space rather than uniformly distributed across the landscape. These objects were recovered in various quantities at the seven sites analyzed in this dissertation, pointing to different degree of participation of Early Woodland communities in the Meadowood Interaction Sphere. All three models outlined in the introductory chapter involve the circulation of non-utilitarian items. While the primary function of prestige objects may be said to differ from that of cult items, this is not always the case. For example, ritual paraphernalia are often used to convey status. Therefore, it may be impossible to evaluate the validity of one explanation over the other based without a clear context of use.

The predominance of Meadowood prestige items in the four mortuary sites analyzed in this study contradicts the economical model. On the other hand, their common occurrence in the three studied habitation sites is inconsistent with the mortuary cult scenario. The association of significant numbers of prestige items with gathering and mortuary sites, but also occasionally with habitation sites, best fit a sociopolitical model in which feasts at gathering locales, funerals, and residences represent prestige items' main context of use.

SPATIAL DISTRIBUTION OF SITES AND EXOTIC ITEMS

In this dissertation, a regional scale of analysis was adopted in order to obtain as complete a picture as possible of the network that apparently involved the movement of goods across long distances, and to “highlight diversity as well as homogeneity, and give meaning to models derived from local scales” (Versaggi 1999: 55). Northeastern North America was divided into 9 physiographic provinces and 27 sub-regions, and an inventory of 226 Meadowood archaeological sites was generated and mapped. My analysis also included a study of the distribution and relative frequency of exotic raw materials and trade items at Meadowood residential and burial sites.

Predictions of Regional Patterning

The ritual scenario for the establishment and maintenance of the Meadowood Interaction Sphere implies the existence of a core and peripheral areas, where the developments in the periphery are dependent upon what happens in the core. Diffusion of

ideas would most likely result in a relatively homogenous distribution of sites across the landscape, although the most typical and elaborate expressions are expected to occur in the core area.

Among the corollary assumptions of an adaptationist economic framework is that inequalities in resources are randomly distributed and that all communities are equally affected by resource fluctuations in a region. In such environments, no specific locality can be identified as most reliable or abundant, i.e., as the ideal place to go to get food or cash in prestige items for food. Therefore, the degree and frequency of contacts between communities (typically identified archaeologically through similarities and differences in artefactual types and proportions) should be a function of the distance separating them. We should also observe declining frequencies of exotic materials as distance from their source areas increases.

On the other hand, the socio-political model assumes that exchange is preferentially directed toward wealthy communities. Concentrations of prestige items and exotic materials therefore should occur at a few loci where resources are relatively abundant, spatially restricted, and not susceptible to overexploitation. These conditions would be met, for example, in coastal environments and other locations characterized by high fishing productivity, in areas characterized by a combination of terrestrial and wetland resources, in prolific nut collecting areas, and at sites suitable for growing plants like squash. Underlying this assumption is the prediction that there will likely be, in northeastern North America, Early Woodland residential or burial sites that could not produce surpluses necessary to participate in the Meadowood Interaction Sphere and which therefore do not share Meadowood characteristics.

Results

Meadowood sites are common in what, in later Woodland times, was Iroquois country, except for the Middle Atlantic Region, historically inhabited by Algonquian-speaking people (Haviland and Power 1981: 117; Haviland and Power 1994). While Early and Late Woodland communities appears to have inhabited the same territory, site locations and subsistence economies differ, with Late Woodland components being more often inland and less directly associated with waterways. Ritchie captured this distinction when he wrote about Meadowood exchange network:

(t)his intercommunication, possibly through a system of trading partners, which probably took place by canoe travel, as in earlier times, rather than by overland forest trails, as among the Iroquois and other Late Woodland tribes (Ritchie 1965: 195).

Indeed, the most striking pattern in the distribution of both habitation and funerary/ritual Meadowood sites is their association with propitious fishing grounds on sizeable streams and small lakes (Ritchie 1969: 181). Such a choice of locations can be interpreted in terms of subsistence strategies, interaction patterns, or more likely both these aspects:

Explicit in all examinations of Meadowood phase site distributions is the relationship of such sites with water features, whether streams, lakes, or marshes. This leads to one general conclusion, that fish and their procurement were a dominant form of subsistence. Furthermore, the impression of social interactions on a wider and more intensive scale is reinforced by postulation of water routes as major communication channels (Granger 1978: 294).

Several of the Meadowood sites coincide with possible trade routes for the movement of Onondaga Chert outside the Niagara Peninsula, as well as routes along which other types of exotic goods probably entered the latter area (Granger 1979: figs. 5-6). Moreover, results of my spatial analysis show no direct relationship between the number of Meadowood diagnostics and the distance from the core area of the interaction sphere. Instead, concentrations of diagnostics occur in the Ontario/Erie Lowlands, St. Lawrence/Champlain Lowlands, Atlantic Coastal Plain and around Saginaw Bay in Michigan. This is at variance with expectations of the mortuary cult and economic exchange models. Interestingly, concentrations of Meadowood traits do not occur beyond 1,000-1,100 km from the Niagara Peninsula. Between these concentration areas, a number of regions yielded smaller amounts of Meadowood diagnostics. Moreover, in areas such as the Hudson and Upper Delaware valleys, evidence suggests that diagnostics other than Meadowood could define Early Woodland habitation sites (Versaggi 1999: 54). This also is at variance with predictions from the ritual and economic models.

In comparison to other provinces, Meadowood material is distributed more evenly in the Ontario/Erie Lowlands, especially around the Niagara Peninsula, where sources of Onondaga chert are found. Communities living around the Niagara Escarpment may have taken advantage of their strategic position in a pan-eastern network to establish contacts with neighbouring and more distant communities.

Beyond the Niagara Escarpment, the presence of local centres of redistribution, or areas of local band interaction, probably account for the differential distribution of Meadowood diagnostics within Ontario/Erie and St. Lawrence/Champlain Lowlands. Once again, these areas of concentrated Meadowood materials are generally situated in environmentally rich riverine and lacustrine habitats (Stothers and Abel 1993: 73), such as the upper and Middle St. Lawrence valleys, Lake Oneida, and Lake Champlain.

Thus, results from my spatial analysis do not show a core-periphery pattern as was implied by the ritual model, nor do they fit an economical/functional explanation, where distribution of diagnostics was expected to be a function of distance between sites. Instead, the distribution of Meadowood sites across northeastern North America supports a socio-political model, where traded items concentrate in communities that have the greatest potential to produce surplus and to develop socioeconomic inequalities. Moreover, it suggests a superposition of regional networks, in which Meadowood communities were strategically located between the Middle Atlantic region and midwestern United States. The benefits ensuing from middlemen positions may have stimulated pressures to intensify the production of tradable items (in this case Onondaga chert bifaces) and to obtain exotic items. Through these means, individual and kin group prestige and power could be enhanced. According to this scenario, changes in social organization and interaction occurring in the Midwest and in the Middle Atlantic Region in Late Archaic times engendered similar changes in the Ontario/Erie and St. Lawrence/Champlain Lowlands. Marine shells, primarily from the Middle Atlantic Region, and Lake Superior native copper were the two main raw materials circulating in Terminal Archaic exchange networks across northeastern North America. In this context, the benefits ensuing from middlemen positions in the Ontario/Erie and St. Lawrence/Champlain Lowlands can not be overemphasized.

MEADOWOOD SUBSISTENCE AND SOCIAL ORGANIZATION

The seasonality, abundance, and predictability of floral and faunal resources available in the Meadowood landscape and recovered from archaeological sites were topics addressed in Chapter 5. The main motivation behind this discussion was to highlight the possible consequences of subsistence constraints and choices on Meadowood technology, settlement patterns, social organization, and trading strategies.

Predictions of Subsistence and Social Organization

Unless they require very little labour investment, the production of cult-related items expected in the ritual model implies a certain stability of the resource base. This in turn is not inconsistent with the existence of storage, social inequalities, and craft specialization. When evaluating the ritual model, however, one is still left with the problem of why such mortuary cults would “require” costly and difficult to acquire grave goods as part of their funerary rituals. Was this simply a random belief that emerged and drove people to exert themselves to an unusual degree?

Predictions associated with an economic scenario, on the other hand, include the presence of complementary ecological niches and/or some form of resource uncertainties. Under such conditions, storage, like inter-group exchanges, may have represented one of many risk-buffering strategies. Social organization, in this case, is generally assumed to be egalitarian.

In contrast, the social inequalities implied by the socio-political framework depended upon subsistence intensification and the relative amount of surplus that could be produced on a consistent basis by families or larger economic groups (Pleger 1998: 20; Price and Brown 1985). The recognition of corporate labour subsistence practices (Hayden 1995: 17-20) or storage facilities are thus indicators that favour the socio-political model. This model also implies the existence of archaeological indicators of social differentiation and inequalities, such as the presence of skilled specialists or the differential distribution of Meadowood items in graves.

Results

In northeastern North America, the Early Woodland period seems to represent a gradual transition between generalized hunter/gatherers communities and transegalitarian communities.

In terms of subsistence strategies, a good case can be made for the development of fishing technologies and an increasing dependence on fish among Meadowood communities. This trend, noted among a number of contemporaneous populations within northeastern North America, is sometimes linked to environmental changes:

During Archaic stages, surface levels of the Great Lakes fluctuated drastically. Stabilization by Early Woodland period may have enhanced the productivity of aquatic food resources along lake and river-mouth shorelines (Pleger 1998: 56).

The Archaic/Woodland transition may have been marked by a change from a subsistence economy with mixed hunted and gathered resources to a subsistence economy more heavily dependent upon fish. Chemistry analyses on human bones from the Riverside Red Ocher and Oconto Old Copper sites yielded results supporting the hypothesis that fish played a more important role in the diet of people from the former site (Pleger 1998: 264).

The specialized, bounded, and exclusive burial precincts used by Meadowood communities suggest some form of resource ownership and control. It has been said that population densities during the Late Archaic and Early Woodland periods were too small to have caused a competition for resources. However, as Stothers and Abel (1993: 67) noted, “limited resources does not necessarily pertain to limited subsistence resources”. In the case of the Early Woodland period, and more specifically the Meadowood Interaction Sphere, high-quality chert quarries, strategic locales to secure and process animal hides, or sites allowing the optimal flow of trade goods come to mind as important and limited, non-subsistence resources. The well known caches of bifaces found across the Northeast in Early Woodland times tend to support this idea.

Moreover, by the Terminal Archaic period in northeastern North America, socio-ceremonial objects and items of personal adornment are included in graves and distributed according to age, sex, and other unknown criteria. This situation contrasts with preceding periods (when grave goods consisted largely of utilitarian artefacts) and could reflect the development of a degree of status differentiation seldom seen in earlier times (Blakely 1996: 253; Fitting 1970; see also Winters 1968). Thomas Pleger compared the Oconto (6000-5000 BP) and Riverside (3000-2500 BP) cemeteries in midwestern United-States to demonstrate that by 2500 BP, “[i]ncreased trade and the production of prestige goods accompanied the emergence of high-status individuals or aggrandizers (presumably adult males) within the community, conveying their leadership status” (Pleger 2000: 172).

Marital exchange is often tied to processes governing the movements of material wealth and status values. Among the Shawnee, for instance, chiefly families tended to intermarry, and such intermarriages cut across tribal boundaries (Callender 1979). Andrew Shryock proposed that bracelets and beads served as media for bride price payments among

more recent Adena communities. Meadowood marital patterns, however, probably remained very flexible, as suggested by a comparative analysis of skeletons from three distinct cemeteries dating between the Terminal Archaic and the Middle Woodland:

[m]obility and high gene flow, combined with the absence of a preferred postmarital residential practice, make such groups difficult to distinguish biologically, even given larger samples (Spence and Fox 1986: 24).

While the lack of a fixed, unilocal postmarital residential practice may preclude the development of an identifiable trans-generational biological and genetic unit, it does not necessarily prevent the formation of trans-generational corporate groups. As suggested by Versaggi (1999: 54), regional diversity within the Early Woodland of the Northeast may be best understood using concepts of horizontal organization, such as heterarchy. Access to specific resources (e.g., chert quarries, fishing grounds, nuts, hides) could have been controlled by a number of corporate groups of comparable status who participated in trading relationships spanning hundreds of miles. Within Meadowood's yearly subsistence cycle, these corporate groups probably supported trade activities as their communities exploited seasonal surpluses (e.g., nuts, fish) in their home territories (Parker 1997: 137).

Ethnographic records offer many examples of exchange systems managed by lineage leaders, who were accorded special burial treatment (Brose 1979). The emergence of corporate lineage-focused social organization (versus family-focused ones) could have fostered competition between lineage heads for labour and control of resources or trade routes. This in turn would have favoured a number of social changes, including "the development of sumptuary rules restricting consumption of higher-order goods to elders, new mechanisms of labour control for the manufacture and transportation of prestige goods, and perhaps new forms of political structure or alliance for solidifying the control of trade routes" (Peregrine 1996b: 41). Eventually, centres may have developed at nodal locations where the flow of valuables could be readily controlled (Stothers and Abel 1993: 87). The emergence of formal local and regional cemeteries seems to support this reconstruction of Meadowood social organization in terms of corporate kinship groups.

CONCLUSION

The evidence presented in my dissertation and summarized in this final chapter all converge on socio-political as best fit and major underlying factors for the establishment and maintenance of the Meadowood Interaction Sphere. The prestige nature of exchanged items and their occurrence in both residential and mortuary/feasting contexts are inconsistent with the ritual and economical exchange models, but expected in the socio-political model. Moreover, major concentrations of sites and artefacts occur in regions where communities have the greatest potential to produce surpluses and develop socioeconomic inequalities. Spatial analyses also suggest the presence of distinct regional networks in which Meadowood communities are strategically located between the Middle Atlantic Region and midwestern United States. The benefits derived from middlemen positions likely produced pressures to intensify the production of tradable items for exchange and, through this ability, enhanced individual and kin group prestige and power.

The Early Woodland period in northeastern North America is described in terms of a gradual transition between generalized hunter/gatherer communities and transegalitarian communities. Regarding subsistence strategies, a good case is made for an increasing dependence on abundant and predictable fish resources, partially subject to accumulation and manipulation by emerging elites. Furthermore, burial precincts used by Meadowood communities suggest some form of resource ownership and control. Variability in mortuary treatments, differential distribution of prestige items in graves, and evidence of funerary feasts also indicate increasing social inequalities, ownership, and competitive displays of success.

Unicausal explanations, however, can rarely satisfactorily explain a reality as complex as the one studied in this dissertation. Hence, if social and political factors were prominent in the establishment and maintenance of the Meadowood Interaction Sphere, this is not to say that economical or ritual considerations never came into play. For example, if territoriality resulted from the control of spatially restricted resources, interactions likely became increasingly necessary to facilitate the flow of information, materials, and mating partners (Pleger 1998: 262). Nevertheless, my review of Meadowood data across northeastern North America suggests that, contrary to previous interpretations, long-distance trade networks in Early Woodland times may best be explained by both the development of socioeconomic

inequalities and an attempt by a few individuals or corporate groups to enhance their personal status through privileged access to rare goods.

In this study, I have combined ecological and socio-political considerations to understand the processes of cultural development. More specifically, I have argued that particular ecological and technological conditions are required to enable the organized and long-distance exchange of prestige items that characterizes the Meadowood Interaction Sphere (Table 6.1). For example, the environment must permit the acquisition and transformation of surpluses and the emergence of corporate groups and labour strategies. In such a context, the creation of vast interaction spheres is closely linked with the development of prestige technologies and the emergence of socio-economic inequalities. I contend that controlling the access and the distribution of prestige items is one strategy used by a few individuals or corporate groups to enhance their status. I have demonstrated the applicability of these theoretical ideas in contexts such as northeastern North America, where the emergence of social complexity is often denied, ignored, or only superficially understood. In sum, by documenting a case of transition between egalitarian and transegalitarian societies, this research contributes to better understanding the conditions for the emergence of social complexity. Most importantly, I proposed a novel approach to study exchange networks and address questions of shifts in subsistence and prestige economies in northeastern North America. It can only be hoped that the socio-political exchange model favoured in this study will be tested and adapted to other archaeological contexts, where it can reveal its full potential in understanding the dynamics of past human interactions.

APPENDIX A: INVENTORY OF MEADOWOOD
COMPONENTS/DIAGNOSTICS

| 17 | Moerschfelder | Ont | M | - | 1 | 1 | All features (N) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | |
|----|--------------------------------|-----|---|---------|-------|---|------------------|---------------------------------------|-----------------------------------|-------------------------------|----------------------|------------|----------------|-----------------------------------|----------------------|----------------------|---------------------|-----------------------|-----------------------|-------------------|------------------------|--|----------------------|
| | | | | | | | | Estimated site size (M ²) | Exacavated area (M ²) | Habitation (H) / Mortuary (M) | Other Structures (N) | Houses (N) | Post molds (N) | Burial features (individuals) (N) | Caches (N) | Storage features (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | | | Gorgets/pendants (N) |
| 1 | Riverhaven 2 | NY | H | | | | 18 | | | | | | | | | 956 | 52 | 196 | 705 | 1 | 2 | | Granger 1978 |
| 2 | Orchid, area B | Ont | H | 35 | - | | | | | | | | | | 41 | 10 | 1 | 29 | | 1 | | White 1966; Granger 1976; Williamson and MacDonald 1998 | |
| 3 | Surma | Ont | H | - | - | | | | | | | | | | 3 | 2 | | 1 | | | | Spence and Fox 1986: 21 | |
| 4 | Buffalo G. | NY | M | | | | | 1 | | | | | | | 27 | 4 | 1 | 22 | | | | Granger 1978; Granger 1981: 67 | |
| 5 | Winters | NY | H | | | | P | | | | | | | | 1 | | | | | | | Granger 1978 | |
| 6 | Petrie | NY | H | surf | | | | | | | | | | | 1 | | | | | | | Granger 1978 | |
| 7 | Spicer Creek, Riverhaven IV | NY | H | 2,130 | | | 20 | | | | | | | | 106 | 1 | 6 | 99 | | | | Granger 1978 | |
| 8 | Sinking Ponds | NY | H | 163 | 3,800 | | 39 | 7 | | | | | | | 153 | 30 | 15 | 105 | 2 | 1 | | Granger 1978 | |
| 9 | Allen | NY | H | | 1,500 | | | | | | | | | | 1 | | | | 1 | | | Granger 1978 | |
| 10 | Larkin | NY | H | surf | 5,000 | | | | | | | | | | 3 | 1 | 1 | | | 1 | | Granger 1978 | |
| 11 | Divers Lake | NY | H | surf | | | P | | | | | | | | 24 | 9 | | 15 | | | | Prisch 1976 | |
| 12 | South Waterport | NY | H | | | | | | | | | | | | 61 | 56 | | 5 | | | | Vanderlaan 1966; Granger 1981: 67 | |
| 13 | Forrestel | NY | H | | | | | | | | | | | | 21 | 5 | | 16 | | | | Vanderlaan 1967; Granger 1981: 67 | |
| 14 | Frank | NY | H | 28 surf | - | | 1 | 2 | | | | | | | 24 | 23 | P | | | | | Wick 1973 | |
| 15 | Haldimand country | Ont | M | | | | | | 1 | | | | | | 11 | | | 11 | | | | Fox 1984b | |
| 16 | Cranberry Creek | Ont | M | - | - | | 1 | | | | | | | | 1 | | | P | | | | Spence and Fox 1986: 22 | |
| 17 | Moerschfelder | Ont | M | | | | | | 1 | | | | | | 34 | | | 34 | | | | Fox 1981, 1984b | |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTIFACTS | | | | | | Radiocarbon Dates (BP) | References |
|----|---------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|--|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | |
| 18 | Hoover | M | | | | | | | | | | | | | | | | | Fox 1981, 1984b |
| 19 | Townsend area (Nanticoke) | M | | | | | | | | | | | | | | | | | Fox 1981; Williamson 1988 |
| 20 | Slack-Caswell | H | - | - | | | | | | | | | | | | | | | Spence and Fox 1986: 21; Fox 1981, 1984b |
| 21 | Billiard | H | 49 | 750 | | | | | | | | | | | | | | | Timmins 1992 |
| 22 | Cashbrown | H | 50 | 225 | | | | 3 | | | | | | | | | | | Williamson 1988 |
| 23 | Bruce Boyd | M | 225 | <6,500 | | 38 | | | 13 (20) | | | | | | | | | | Spence and Fox 1986: 23; Spence and al. 1978, 1990: 132 |
| 24 | Boyd Lakefront | H | 4 | - | | 2 | | | | | | | | | | | | | Spence and Fox 1986: 20-21; Spence and al. 1990: 133; Fox 1983 |
| 25 | Point Pleasant | M | acc | | | 1 | | | | | | | | | | | | | Ritchie 1944: 175; Granger 1981: 67 |
| 26 | Irondequoit Creek | M | acc | | | 1 | | | | | | | | | | | | | Ritchie 1955: 68 |
| 27 | Vinette | H | | 1,010 | | | | | | | | | | | | | | | Ritchie 1944, 1965; Granger 1981: 66 |
| 28 | Wickham | H | | | | | | | | | | | | | | | | | Ritchie 1946 |
| 29 | Oberlander 2 | M | | | | 22 | | | | | | | | | | | | | Ritchie 1944, 1965: 180 |
| 30 | Rene Menard Bridge 2 | M | | | | | | | | | | | | | | | | | Ritchie 1965; Granger 1981: 66 |
| 31 | Jack's Reef | M | acc | | | 1 | | | | | | | | | | | | | Ritchie 1955: 68; Granger 1981: 66 |
| 32 | Pickens | M | | | | 2 | | | | | | | | | | | | | Ritchie 1944, 1965; Granger 1981: 66 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | | |
|----|---|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|------------|--|---|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | | | |
| 33 | Liahn 1 | Ont | H | - | - | - | - | - | - | - | - | - | - | 7 | P | 3 | - | - | - | 3 | Williamson 1978 |
| 34 | Liahn 2 | Ont | M | 250 | - | 6-13 (7-16) | 1 | - | - | - | - | - | 57 | 1 | 55 | 1 | - | - | - | Spence and Fox 1986: 22-23; Spence et al. 1990: 131; Williamson 1980 | |
| 35 | Rickley | Ont | M | - | - | 2 (6) | - | - | - | - | - | 1 | - | - | - | 1 | - | - | - | 2410±85 | Spence and Fox 1986: 22 |
| 36 | Morpeth South | Ont | H | 3F, surf | - | - | 6 | - | - | - | - | 1 | P | - | - | - | - | - | - | 2520±50; 2650±50 | Spence and Fox 1986: 19; Spence and al. 1990: 131; Fecteau 1979; Granger 1978 |
| 37 | 2 sites, Thames river, near Kent Bridge | Ont | H | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | Spence et al. 1990: 134 |
| 38 | Welke-Tonkonoh | Ont | H | surf | 5,000 | - | 10 | - | - | - | - | - | 57 | 48 | 6 | 3 | - | - | - | - | Ellis 1999; Ellis et al. 1988 |
| 39 | Glen Oak | Ont | H | surf | 2,500 | - | - | - | - | - | - | - | 14 | 12 | 1 | - | 1 | - | - | - | Ellis et al. 1988 |
| 40 | Lambert | Ont | H | surf | 9,375 | - | - | - | - | - | - | - | 7 | 3 | 4 | - | - | - | - | - | Ellis et al. 1988 |
| 41 | Willow | Ont | H | salv | 5,000 | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | Wilson 1993: 14; Wilson 1997: 57 |
| 42 | Hamet | Ont | H | salv | 2,500 | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | Wilson 1993: 14; Wilson 1997: 57 |
| 43 | Cushman | Ont | H | salv | 2,500 | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | Wilson 1993: 14; Wilson 1997: 57 |
| 44 | Neeb | Ont | H | salv | - | - | 4-6 | - | - | - | - | - | 2 | P | - | P | - | - | - | - | Spence and Fox 1986: 19-20; Spence and al. 1990: 132 |
| 45 | Brodie | Ont | H | surf | 200,000 | - | - | - | - | - | - | - | 20 | 7 | 3 | 4 | 3 | 3 | - | - | Ellis et al. 1988: 5 |
| 46 | Pocock | Ont | H | 153 | 4,250 | - | 6 | 2 | - | - | - | - | 10 | 7 | 2 | 1 | - | - | - | - | Wilson 1993; 1997 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References |
|----|--------------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|-----------------------|----------------|------------------------|---|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgetts/pendants (N) | Birdstones (N) | | |
| 47 | Belvoir | H | 12 | 4,000 | | | | | | | | | 4 | 4 | | | | | Wilson 1993: 14; Wilson 1997 |
| 48 | Old Channel | H | - | 4,000 | | | | | | | | | 2 | 1 | 1 | | | | Wilson 1993: 15 |
| 49 | Paddock | H | - | 5,000 | | | | | | | | | 1 | 1 | | | | | Wilson 1993: 15; Wilson 1997: 67 |
| 50 | Speedway | H | - | 2,000 | | | | | | | | | 1 | 1 | | | | | Wilson 1993: 15; Wilson 1997: 68 |
| 51 | Scott Wales | H | surf | 25,000 | | | | | | | | | 9 | 3 | 1 | | | | Wilson 1993: 18; Wilson 1997: 66 |
| 52 | Wishing Well | H | surf | - | | | | | | | | | 7 | | | | | | Wilson 1993: 18 |
| 53 | Parker | H | | | | | | | | | | | 1 | | | | | | Mitchell 1963; Lee 1958:50 |
| 54 | Wyoming Rapis | H | 4 | 4(?) | 1 | | | | | | | | 1 | | | | | | Spence and Fox 1986: 18; Spence and al. 1990: 132; Wilson 1997: Appendix 3:21, 23 |
| 55 | Parkhill | H | 26 | - | | | | | | | | | 1 | 1 | | | | | Spence et al. 1990: 135; Ellis 1994 |
| 56 | 3 sites Pinery provincial park | H | | | | | | | | | | | 1 | | | | | | Spence et al. 1990: 135 |
| 57 | Theford | M | | | | | | | | | | | 166 | | | 166 | | | Deller et al. 1986: 9; Spence et al. 1990: 135 |
| 58 | Ben Miller-Williams | H | | | | | | | | | | | 1 | | | | | | Spence et al. 1990: 135 |
| 59 | Ferris | H | 12 | | 2 | | | | | | | | 1 | | | | | | Spence and Fox 1986: 18; Spence and al. 1990; Fox 1984a |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | | | | |
|----|-------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|------------|--|-------------------|--|---|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | | | | | |
| 60 | Donaldson | M | 437 | - | P | | | | | | | | | | | | | | | | 2535±150; 2480±60 | Wright and Anderson 1963; Finlayson 1977: 234; Spence et al. 1990: 135 | |
| 61 | Siller collection | H | | | | | | | | | | | | | | | | | | | | McEachen and Williamson 1995 | |
| 62 | Scott O'Brien | H | - | 4,000 | | | | | | | | | | | | | | | | | | Archaeological Services Inc. 1994, cited in McEachen and Williamson 1995 | |
| 63 | Dawson Creek | H | - | 20 | 6 | | | | 5 (?) | 1(?) | | | | | | | | | | | | 2940±70; 2675±70; 2550±90; 2540±70; 2430±85; 2420±90; 2320±70 | Jackson 1982, 1986, 1988 |
| 64 | McIntyre | H | | | | | | | | | | | | | | | | | | | | | Johnston 1984: 26, 49; Spence et al. 1990: 135 |
| 65 | Hunter | M | 18,500 | | | | | | 1 | 3 | | | | | | | | | | | | | Ritchie 1955 |
| 66 | Muskalonge Lake | M | 500 | | | | | | 1 | 7 | | | | | | | | | | | | | Ritchie 1955 |
| 67 | Rockway Point | M | | | 2 | | | | 1 (L) | | | | | | | | | | | | | | Ritchie 1955: 69, 76 |
| 68 | Ault Park | M | >14,000 | | | | | | | | | | | | | | | | | | | | Spence and Fox 1986; Spence et al. 1990; Wright 1967: 114 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | |
|----|-------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|-------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|---|--|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | | |
| 81 | Boucher | VT | M | 730 | 730 | 102 | 84-102 (72) | | | | | | | | | | | | 2835±35; 2665±20; 2620±95; 2620±45; 2550±195; 2520±70; 2415±35; 2355±50; 2325±55; 2300±50; 2265±40; 2250±60; 2185±70; 2180±130; 2075±70; 2065±115 | Haviland and Power 1981; Loring 1985; Heckenberger et al. 1990, 1996 |
| 82 | Swanton | VT | M | | | | 25 | | | | | | | | | | | | | Haviland and Power 1981; Loring 1985 |
| 83 | Pearl Street Park | Vt | H | | | 2 | | | | | | | | | | | | | | Haviland and Power 1994 |
| 84 | Ewing | Vt | H | | | 1 | | | | | | | | | | | | | | Haviland and Power 1994 |
| 85 | Lemon Fair | Vt | H | | | | | | | | | | | | | | | | | Loring 1985; 113 |
| 86 | East Creek | VT | M | | | | 45 | | | | | | | | | | | | | Loring 1985: 98 |
| 87 | Bennett | VT | M | | | | P | | | | | | | | | | | | | Ritchie 1944: 199; Loring 1985: 102 |
| 88 | Ferme Boucher | Qc | H | | | | | | | | | | | | | | | | | Marois and Ribes 1975: 67 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | | | | | | |
|-----|-------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|------------|--|--|--|--|---------------------|--------------------------------|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | | | | | | | |
| 105 | CgEq-25 | H | | | | | | | | | | | | | | | | | | | | | | Chrétien 1995a: 280 | |
| 106 | CgEq-22 | H | | | | | | | | | | | | | | | | | | | | | | | Chrétien 1995a: 280 |
| 107 | Ile aux Cornelles | H | | | | | | | | | | | | | | | | | | | | | | | Tremblay, comm pers 2005 |
| 108 | Rivière Petite Nation | ? | | | | | | | | | | | | | | | | | | | | | | | Tremblay 2003 |
| 109 | Wabasse | ? | | | | | | | | | | | | | | | | | | | | | | | Tremblay, comm pers 2005 |
| 110 | Lac Trente et Un Milles | ? | | | | | | | | | | | | | | | | | | | | | | | Tremblay 2003: 13 |
| 111 | Deep River | H | - | 2,400 | | | | | | | | | | | | | | | | | | | | | Mitchell 1963, 1966 |
| 112 | CcGk-19 (riv. Dumoine) | H | | | | | | | | | | | | | | | | | | | | | | | Côté, comm. pers. 2003 |
| 113 | Rosebary | H | - | - | | | | | | | | | | | | | | | | | | | | | Spence and Fox 1986: 29 |
| 114 | Scaccia | H | 492 | 4,000 | 128 | 58 | 5 | 1 | | | | | | | | | | | | | | | | | Ritchie and Funk 1973 |
| 115 | Cuylerville | M | - | - | 21 | | 21 | | | | | | | | | | | | | | | | | | Ritchie and Drago 1960:29-34 |
| 116 | Macaulay | H | | | | | 1 | | | | | | | | | | | | | | | | | | Granger 1981: 67 |
| 117 | Wray | M | | | 10 | | 10 (15) | | | | | | | | | | | | | | | | | | Ritchie 1944: 125, 1965 |
| 118 | Morrow | M | salv | 225 | 35-40 | | 35-40 | | | | | | | | | | | | | | | | | | Ritchie n.d.; Granger 1981: 67 |
| 119 | Yates County | M | acc | | 1 | | 1 | | | | | | | | | | | | | | | | | | Ritchie 1955: 68 |
| 120 | Canoga | M | acc | | 1 | | 1 | | | | | | | | | | | | | | | | | | Ritchie 1955: 68 |
| 121 | Pointe Merry | M | | | | | | | | | | | | | | | | | | | | | | | Clermont 1990: 7 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References |
|-----|----------------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|------------------|------------------------|---------------------------|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | |
| 138 | Johnsen 1 | H | 117 | 7,000 | P | | | | | | | | 1 | P | | | | | Funk 1993 vol.2: 503 |
| 139 | Gardepe | H | 310 | | | | | | | | | | 3 | 3 | | | | | Funk 1993 vol.2: 393 |
| 140 | Camelot 1 | H | 155 | 300 | 8 | | | | | | | | 7 | 3 | 4 | | | | Funk 1993 vol.2:187 |
| 141 | Camelot 2 | H | 113 | | P | | | | | | | | 2 | 2 | | | | | Funk 1993 vol.2:207 |
| 142 | Enck 2 | H | 53 | <100 | | | | | | | | | 2 | 2 | | | | | Funk 1993 vol.2:271 |
| 143 | Jamba | H | | | | | | | | | | | 1 | 1 | | | | | Klein 1985: 892 |
| 144 | Fortin | H | 255 | 12,000 | P | | | | | | | | 6 | 3 | 3 | | 3180±95 | | Funk 1993 vol.2 39 |
| 145 | Cottage | H | 36 | 1,500 | 4 | | | | | | | | 1 | | | | | | Funk 1993 vo.2 579 |
| 146 | Oscar Leibhart | H | | | | | | | | | | | 12 | | 12 | | | | Granger 1981 |
| 147 | Memorial Park | H | | | c.10 | | | | | | | | 4 | | P | | 2830±50; 2625±45 | | Hart and Asch Sidell 1997 |
| 148 | Zimmerman | H | 3,700 | 6,700 | 3 | | | | | | | | 18 | 16 | 2 | | | | Kinsey et al. 1972: 90 |
| 149 | Faucett | H | 418.5 | 1,115 | 2 | | | | | | | | 26 | 24 | | 1 | 1 | 2700±100 | Kinsey 1975: 40 |
| 150 | Harry's Farm | H | | | | | | | | | | | 6 | 5 | 1 | | | | Kraft 1975 |
| 151 | Tocks Island Reservoir (5 sites) | H | | | | | | | | | | | 8 | 8 | | | | | Kinsey 1975: 88 |
| 152 | Bushkill area | H | surf | surf | | | | | | | | | 12 | 7 | | 5 | | | Kinsey et al. 1972: 433 |
| 153 | Gray* | M | | | 1 | | | | | | | | 246 | | | 246 | | | Staats 1984 |
| 154 | Byram | H | 25.6 | - | | | | | | | | | 1 | 1 | | | | | Kinsey 1975: 72 |
| 155 | Abbott Farm | M | | | | | | | | | | | 10 | | | 10 | | | Granger 1981: 68 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | |
|-----|--------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|------------|--|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | | |
| 156 | Rancocas Creek drainage* | M | - | - | 1 | | 1 | | | | | 180 | | | | | 180 | | | Bello et al. 1997 |
| 157 | Hopkins | H | 16 | - | | | | | | | | 1 | | | | | | | | Thompson 1973 |
| 158 | Bristol (6FA117) | M | | | 1 | | 1 | | | | | 160 | | | | | 160 | | | Cassedy 1992 |
| 159 | Tamarack | H | 120 | 800 | 3 | | | | | | | 3 | | | | | 3 | | | Vargo and Vargo 1986 |
| 160 | Dogan Point | H | | | | | | | | | | 1 | | | | | 1 | | | Brennan 1974, 1977 |
| 161 | Fairfield | M | 0.5 | - | 1 | | 1(1) | | | | | 18 | 14 | | | | 2 | 2 | | Kraft 1989 |
| 162 | Fresh Pond | M | acc | | 1 | | 1 | | | | | 263 | | | | | 263 | | | Ritchie 1955: 68 |
| 163 | Fishers island | H | | | | | | | | | | 1 | P | | | | 1 | | | Funk and Pfeiffer 1988: 102 |
| 164 | Seward* | M | | | 1 | | 1 | | | | | 31 | | | | | 31 | | | Granger 1981 |
| 165 | Wethersfield* | M | | | 1 | | 1 | | | | | 201 | | | | | 201 | | | Willoughby 1935, cited in Bourn 2002: 18 |
| 166 | Smith Brook* | M | | | 1 | | 1 | | | | | 499 | | | | | 499 | | | Bourn 2002 |
| 167 | South Windsor* | M | | | 1 | | 1 | | | | | 125 | | | | | 125 | | | Ritchie 1969b: 223 |
| 168 | Springfield | H | | | | | | | | | | 18 | 6 | 2 | 10 | | 18 | 2 | 10 | Bourn 2002: 20 |
| 169 | Ferguson | M | | | 1 | | 1 | | | | | P | | | | | P | | | Ferguson 1947 |
| 170 | Skitchewang | H | | | | | | | | | | 1 | | | | | | | | Haviland and Power 1994 |

| Site ID | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | | |
|---------|-----------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|---------------------|-----------------------|-----------------------|-------------------|----------------------|------------------------|------------|------------------------------|----------------------------|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | | | Birdstones (N) | |
| 171 | Beaver Meadow Brook | H | 64 | | 6 | | | | | | | | 3 | 2 | | | 1 | | 3150±125; 2560±105; 2495±185 | Howe 1988 |
| 172 | Smyth | H | 470 | | | | | | | | | | 2 | P | | | | | | Kenyon and Foster 1980: 49 |
| 173 | Neville | H | 80 | | | | | | | | | | 4 | 1 | 3 | | | | | Dincauze 1976:131 |
| 174 | Call | M | | | 1 | | | | | | | | 3 | P | | | 1 | | | Burt 1960: 5 |
| 175 | Tinicut | M | | | 1 | | | | | | | | 1 | P | | | | | | Robbins 1967 |
| 176 | Hawes | M | | | 2 | | | | | | | | 3 | 3 | | | | | | Robbins 1963: 30-33 |
| 177 | Mansion Inn | M | | | 1 | | | | | | | | 8 | 1 | 7 | | | | | Dincauze 1968: 87-88 |
| 178 | Fort Hill | M | | | 1 | | | | | | | | 3 | P | 1 | | 1 | | | Fowler and Wett 1955: 9-12 |
| 179 | Potter | M | | | 2 | | | | | | | | 8 | 6 | | | 1 | 1 | | Fowler 1965: 39-43 |
| 180 | Knox | H | 23 | 350 | 2 | | | | 3 | | | | 2 | 2 | | | | | | Belcher 1988, 1989 |
| 181 | Portland Point (BhDm-7) | H | | | | | | | | | | | 2 | 2 | | | | | | McEachen 1996: 52 |
| 182 | Grand Lake area | H | | | | | | | | | | | 2 | 2 | | | | | | McEachen 1996: 52 |
| 183 | Upper Jemseg | H | | | | | | | | | | | 1 | 1 | | | | | | McEachen 1996: 52 |
| 184 | Maquapit Lake, Indian Point | H | | | | | | | | | | | 1 | 1 | | | | | | McEachen 1996: 52 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | |
|-----|-----------------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|-----------------------|----------------|------------------------|-------------------|---|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgetts/pendants (N) | Birdstones (N) | | | |
| 185 | Mud Lake Stream | M | >57 | | 4 | 1 | | | | | | | 23 | 11 | | 11 | 1 | | 2470±110; 2750±80 | Deal 1986; McEachen 1996: 54 |
| 186 | O'dell | H | | | | | | | | | | | 1 | 1 | | | | | | McEachen 1996: 52 |
| 187 | Wilson | H | | | | | | | | | | | 12 | 7 | 1 | 4 | | | | McEachen 1996: 48 |
| 188 | Howe | H | | | | | | | | | | | 1 | | | | | | | McEachen 1996: 48 |
| 189 | Hogan-Mullin | H | | | | | | | | | | | 4 | 4 | | | | | | McEachen 1996: 49 |
| 190 | Tozer | M | | | 2 | | | | | | | | 18 | | | 17 | 1 | | | McEachen 1996: 46 |
| 191 | McEachern's Point, Tabusintac Bay | H | | | | | | | | | | | 1 | 1 | | | | | | McEachen 1996: 52 |
| 192 | Tracadie region | H | | | | | | | | | | | 2 | 2 | | | | | | McEachen 1996: 52 |
| 193 | St. Croix (BfDa-1) | H | 33 | 30,000 | | | | | | | | | 1 | 1 | | | | 2500±120 | | Godfrey-Smith et al 1997; Deal et al. 1995, cited in McEachen 1996:59 |
| 194 | Rafter Lake | H | 111 | - | 1 | | | | 1 | | | | 1 | 1 | | | | | | Davis 1986: 119; McEachen 1996: 58 |
| 195 | Halifax | H | | | | | | | | | | | 4 | 4 | | | | | | Davis 1986: 119; McEachen 1996: 58 |
| 196 | Merrymakedge | H | | | | | | | | | | | 1 | 1 | | | | | | McEachen 1996: 63 |
| 197 | Ell Island | H | | | | | | | | | | | 1 | 1 | | | | | | McEachen 1996: 64 |
| 198 | Eel Weir 6, 10, 12 | H | | | | | | | | | | | 5 | 5 | | | | | | McEachen 1996: 61 |
| 199 | BaDd-4 | M | | | 2 | 1 | | | | | | | 15 | P | | 11 | 2 | 1 | | McEachen 1996: 120 |
| 200 | Naugle | H | 307 | 18,200 | 2 | | | | | | | | 14 | 14 | | | | | 2850±100 | Ozker 1976 |
| 201 | Pomranky | M | 1.6 | - | 1 | | | | | | | | 516 | | | | | | | Binford 1963a: 157-191 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References |
|-----|----------------------------|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|---|--|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | |
| 202 | Hodges | M | 2.1 | - | 1 | | | | | | | | 18 | 7 | 1 | 8 | 2 | | Binford 1963b: 125-147 |
| 203 | Green Point (20SA1) | H | - | 263 | 5 | | | | | | | | 1 | 1 | | | | 2480±120 | Wright 1964 |
| 204 | Schultz | H | 5,000 | 40,470 | 41 | | | | 13 | 2-4 | | | 9 | 6 | 1 | 1 | 1 | 2480±120; 2490±130; 2480±150 | Ozker 1982 |
| 205 | Stroebel (20SA14) | M | | | | | | | | | | | 1 | P | | | | | Papworth 1967; Lovis and Robertson 1989 |
| 206 | Andrews | M | | | | | | | | | | | 1 | P | | | | 3170±150 | Papworth 1967; Lovis and Robertson 1989; 236 |
| 207 | Frazer-Tyra | H | 1,858 | | 1 | | | | | | | | 9 | 2 | 7 | | | | Andrews 1995 |
| 208 | Butterfield | H | | | | | | | | | | | 1 | P | | | | | Fitting et al. 1968: 173-275 |
| 209 | 20BY79 | H | | | | | | | | | | | 4 | 4 | | | | | Lovis and Robertson 1989; 236 |
| 210 | Conservation Park (20GR33) | H | 441.8 | 6,000 | 43 | | | | | | | | 47 | 34 | 8 | 1 | 4 | 2760±90; 2750±150; 2560±60; 2530±60; 2515±145; 2490±90; 2400±90 | Beld 1991 |
| 211 | 20GR176 | Mi | 100 | 330 | 3 | | | | | | | | 2 | 1 | | | | 2330±80 BP | Beld 1991 |
| 212 | Strover | Mi | 13,240 | 662 | | | | | | | | | 4 | 4 | | | | | Garland 1990: 155 |

| | Location | Habitation (H) / Mortuary (M) | Excavated area (M ²) | Estimated site size (M ²) | STRUCTURAL DATA | | | | | | | DIAGNOSTIC ARTEFACTS | | | | | | Radiocarbon Dates (BP) | References | |
|-----|--|-------------------------------|----------------------------------|---------------------------------------|------------------|----------------------|------------|-----------------------------------|----------------|------------|----------------------|----------------------|-----------------------|-----------------------|-------------------|----------------------|----------------|------------------------|-----------------------------|---|
| | | | | | All features (N) | Storage features (N) | Caches (N) | Burial features (individuals) (N) | Post molds (N) | Houses (N) | Other Structures (N) | All diagnostics (N) | Projectile points (N) | Bifacial Scrapers (N) | Cache bifaces (N) | Gorgets/pendants (N) | Birdstones (N) | | | |
| 213 | Eidson | H | 2,108 | >100,000 | | | | | | | | | | | | | | | 2850±100; 2940±80; 2730±100 | Garland 1990: 345 |
| 214 | Eastport | H | | | | | | | | | | | | | | | | | | Binford and Papworth 1963: 71 |
| 215 | Frank Bay | H | | | | | | | | | | | | | | | | | 2920±300 | Ridley 1954 |
| 216 | Fort Témiscamingue | H | | | | | | | | | | | | | | | | | 2130±280 | Côté, comm. pers. 2003; Côté and Inksetter 2001 |
| 217 | CjGt-2 (Lac des Quinze) | H | | | | | | | | | | | | | | | | | | Côté, comm. pers. 2003 |
| 218 | DaGt-1 | H | | | | | | | | | | | | | | | | | | Côté 1993: 14 |
| 219 | Pearl Beach | H | | | | | | | | | | | | | | | | | | Noble 1982: 42 |
| 220 | DcGt-29 | H | | | | | | | | | | | | | | | | | | Côté, comm. pers. 2003 |
| 221 | Lac Abitibi (collection Bérubé et Laliberté) | H | | | | | | | | | | | | | | | | | | Côté 1993: 14 |
| 222 | DdGt-5 | H | | | | | | | | | | | | | | | | | | Côté, comm. pers. 2003 |
| 223 | DbGk-1 (lac de Montigny) | H | surf. | | | | | | | | | | | | | | | | | Côté, comm. pers. 2003 |
| 224 | DdEw-12 | H | | | | | | | | | | | | | | | | | | Langevin 1990 |
| 225 | St. Gédéon | ? | | | | | | | | | | | | | | | | | | Langevin, pers comm 2005 |
| 226 | Rivière aux Outardes | H | | | | | | | | | | | | | | | | | | Archéotec 1983, cited in Clermont 1990: 7 |

REFERENCES CITED

- Abel, T. J.
1997 The Meadowood Mortuary Complex: Social Complexity in Northeast Early Woodland Culture. Paper presented at the Annual meeting of the New York State Archaeological Association, Lake George, New York.
- Abel, T. J., D. M. Stothers, and J. M. Koralewski
2001 The Williams Mortuary Complex: A Transitional Archaic Regional Interaction Center in Northwestern Ohio. In *Archaic Transitions in Ohio and Kentucky Prehistory*, edited by O. H. Prufer, S. E. Pedde and R. S. Meindl, pp. 290-327. Kent State University Press, Kent.
- Adams, R. I.
2001 *Ethnoarchaeology of Torajan Feasts*. M.A. thesis, Department of Archaeology, Simon Fraser University, Burnaby.
- 2007 *The Megalithic Tradition of West Sumba, Indonesia: An Ethnoarchaeological Investigation of Megalith Construction*. Ph.D., Simon Fraser University.
- Aikens, C. M.
1970 Hogup Cave: Chapters on Textiles and Wooden Artefacts, edited by J. M. Adovasio and G. F. Dalley. University of Utah Anthropological Papers, No. 93. University of Utah Press, Salt Lake City.
- Allan, P.
1990 *Red Bank Historic Park Concept*. Red Bank Indian Band, Fredericton.
- 1991 *Metepenagiag: New Brunswick's Oldest Village*. Red Bank Indian Band and Communications Canada, Fredericton.
- Andrews, J. P.
1995 A Lithic Analysis of the Frazer-Tyra Site (20SA9): A Multicomponent Site in the Saginaw Valley. *Michigan Archaeologist* 41(4):139-200.
- Arnold, J. E.
1996a The Archaeology of Complex Hunter-Gatherers. *Journal of Archaeological Method and Theory* 3(2):77-126.
- Bacqueville De la Potherie, M.
(1722) 1997 *Histoire de l'Amérique septentrionale: relation d'un séjour en Nouvelle-France*. Éditions du Rocher, Monaco.

- Bakeless, J. E.
1961 *The Eyes of Discovery: The Pageant of North America as Seen by the First Explorers*. Dover Publications, New York.
- Barber, R. J.
1980 Post-Pleistocene Anadromous Fish Exploitation at the Buswell Site, Northeastern Massachusetts. In *Early and Middle Archaic Cultures in the Northeast*, edited by D. R. Starbuck and C. E. Bolian. Occasional Publications in Northeastern Anthropology 7. Franklin Pierce College, Rindge.
- Bar-Yosef, O.
2001 From Sedentary Foragers to Village Hierarchies: The Emergence of Social Institutions. In *The Origin of Human Social Institutions*, edited by W. G. Runciman, pp. 1-38. Proceedings of the British Academy. Oxford University Press, Oxford.
- Battle, H. B.
1922 The Domestic Use of Oil among the Southern Aborigines. *American Anthropologist* 24(2):171-182.
- Baugh, T. G., and J. E. Ericson (editors)
1994 *Prehistoric Exchange Systems in North America*. Plenum Press, New York.
- Beauchamp, W. M.
1916 *Moravian Journals Relating to Central New York, 1745-1766*. Dehler Press, Syracuse.
- Bélanger, B.
1989 *Habitat, âge et croissance de la Barbue de rivière (Ictalurus punctatus, Rafinesque) du lac Saint-Louis au sud-ouest de l'île Perrot*. M.Sc., Biological Sciences, Université de Montréal.
- Belcher, W. R.
1988 *Archaeological Investigations at the Knox Site (30-21), East Penobscot Bay, Maine*. M.Sc. thesis, Institute for Quaternary Studies, University of Maine, Orono.
- 1989 Prehistoric Fish Exploitation in East Penobscot Bay, Maine: The Knox Site and Sea-Level Rise. *Archaeology of Eastern North America* 17:175-191.
- Beld, S. G.
1991 *Two Terminal Archaic/Early Woodland Sites in Central Michigan*. University of Michigan Museum of Anthropology, Technical Report 22, Ann Arbor.
- Bello, C. A., J. H. Cresson and R. Veit
1997 A Meadowood Cache from the Rancocas Creek Drainage, Burlington County. *Bulletin of the Archaeological Society of New Jersey* 52:63-67.

- Berres, T. E., D. M. Stothers, and D. Mather
 2004 Bear Imagery and Ritual in Northeast North America: An Update and Assessment of A. Irving Hallowell's Work. *Midcontinental Journal of Archaeology* 29(1):5-42.
- Bettinger, R. L., and T. F. King
 1973 Interaction and Political Organization: A Theoretical Framework for Archaeology in Owens Valley, California. In *Archaeological Survey, Annual Report 1971*, pp. 139-150. Department of Anthropology, University of California, Los Angeles.
- Biggar, H. P. (editor)
 1922-1936 *The Works of Samuel de Champlain*. The Champlain Society, Toronto.
- Binford, L. R.
 1962 Archaeology as Anthropology. *American Antiquity* 28(2):217-225.
- 1963a The Pomranki Site: A Late Archaic Burial Station. In *Miscellaneous Studies in Typology and Classification*, edited by A. M. White, L. R. Binford, and M. L. Papworth, pp. 149-192. Anthropological Papers, No.19. Museum of Anthropology, University of Michigan, Ann Arbor.
- 1963b The Hodges Site: A Late Archaic Burial Station. In *Miscellaneous Studies in Typology and Classification*, edited by A. M. White, L. R. Binford and M. L. Papworth, pp. 124-148. Anthropological Papers, No.19. Museum of Anthropology, University of Michigan, Ann Arbor.
- 1971 Mortuary Practices: Their Study and their Potential. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by J. A. Brown, pp. 6-29. Memoirs of the Society for American Archaeology, New York.
- 1980 Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.
- 1991 *Cultural Diversity Among Aboriginal Cultures of Coastal Virginia and North Carolina*. Evolution of North American Indians. Garland, New York.
- Binford, L. R., and M. L. Papworth
 1963 The East Port Site, Antrim County, Michigan. In *Miscellaneous Studies in Typology and Classification*, edited by A. M. White, L. R. Binford, and M. L. Papworth, pp. 71-123. Anthropological Papers, No.19. Museum of Anthropology, University of Michigan, Ann Arbor.
- Birket-Smith, K.
 1930 Folk Wanderings and Culture Drifts in Northern North America. *Journal de la Société des Américanistes* 22:1-32.

- Blakely, R. L.
1996 Biocultural Implications of Mortuary Treatment and Paleopathology at the Isle La Motte Site. *North American Archaeologist* 17(3):239-262.
- Bleed, P.
1969 *The Archaeology of Petaga Point: The Preceramic Component*. Minnesota Prehistoric Archaeology Series No. 2. Minnesota Historical Society Press, St. Paul.
- Bogaert, H. S.
1909 Narrative of a Journey into the Mohawk and Oneida Country, 1634-1635. In *Narratives of New Netherlands*, edited by J. Jameson. Charles Scribner's Sons, New York.
- Boucher, P., sieur de Boucherville
1664 *Histoire véritable et naturelle des moeurs & productions du pays de la Nouvelle France, vulgairement dite le Canada*. Chez Florentin Lambert, Paris.
- Bourn, R. Q., Jr.
2002 The Smith Brook Site (6-HT-23). *Bulletin of the Archaeological Society of Connecticut* 64:3-22.
- Bourque, B. J.
1994 Evidence for Prehistoric Exchange on the Maritime Peninsula. In *Prehistoric Exchange Systems in North America*, edited by T. G. Baugh and J. E. Ericson, pp. 23-46. Plenum Press, New York.
1995 *Diversity and Complexity in Prehistoric Maritime Societies: A Gulf of Maine Perspective*. Interdisciplinary Contributions to Archaeology. Plenum Press, New York.
- Bourque, B. J., S. L. Cox, and R. H. Whitehead
2001 *Twelve Thousand Years: American Indians in Maine*. University of Nebraska Press, Lincoln.
- Bradbury, A. P.
1997 The Bow and Arrow in the Eastern Woodlands: Evidence for an Archaic Origin. *North American Archaeologist* 18:207-233.
- Braun, D. P.
1986 Midwestern Hopewellian Exchange and Supralocal Interaction. In *Peer-Polity Interaction and Socio-Political Change*, edited by C. Renfrew and J. F. Cherry, pp. 117-126. New Directions in Archaeology. Cambridge University Press, Cambridge.
- Brennan, L. A.
1974 The Lower Hudson: A Decade of Shell Middens. *Archaeology of Eastern North America* 2(1):81-93.

- 1977 The Lower Hudson: The Archaic. In *Amerinds and Their Paleoenvironments in Northeastern North America*, pp. 411-430. New York Academy of Sciences, New York.
- Brizinski, M., and H. Savage
 1983 Dog Sacrifices among the Algonkian Indians: An Example from the Frank Bay Site. *Ontario Archaeology* 39:33-40.
- Brose, D. S.
 1994 Trade and Exchange in the Midwestern United States. In *Prehistoric Exchange Systems in North America*, edited by T. G. Baugh and J. E. Ericson, pp. 215-240. Plenum Press, New York.
- Browman, D. L.
 1975 Trade Patterns in the Central Highlands of Peru in the First Millennium B.C. *World Archaeology* 6(3):322-329.
- Brown, J. A.
 1986 Early Ceramics and Culture : A Review of Interpretations. In *Early Woodland Archaeology*, edited by K. B. Farnsworth, and T. E. Emerson, pp. 598-608. Kampsville Seminars in Archaeology Volume 2. Center for American Archaeology, Illinois.
- 1995 On Mortuary Analysis. With Special Reference to the Saxe-Binford Research Program. In *Regional Approaches to Mortuary Analysis*, edited by L. A. Beck, pp. 3-26. Plenum Press, New-York.
- Brumbach, H. J.
 1978 *Middle Woodland Fishing Economies: The Upper Hudson River Drainage*. Ph.D. dissertation, State University of New York.
- 1979 Early Ceramics and Ceramic Technology in the Upper Hudson Valley. *New York State Archaeological Association Bulletin* 76:21-26.
- 1986 Anadromous Fish and Fishing: A synthesis of Data from the Hudson River Drainage. *Man in the Northeast* 32:35-66.
- Brumfield, E. M., and T. K. Earle
 1987 Specialization, Exchange, and Complex Societies: An Introduction. In *Specialization, Exchange, and Archaeology*, edited by E. M. Brumfield and T. K. Earle, pp. 1-9. New Directions in Archaeology. Cambridge University Press, Cambridge.
- Builth, H.
 2006 Gunditjmarra Environmental Management: The Development of a Fisher-Gatherer-Hunter Society in Temperate Australia. In *Beyond Affluent Foragers: Rethinking Hunter-Gatherer Complexity. Rethinking Hunter-Gatherer Complexity*, edited by C. Grier, J. Kim, and J. Uchiyama. Oxford: Oxbow Books.

- Burger, R. L.
1988 Unity and Heterogeneity within the Chavín Horizon. In *Peruvian Archaeology: An Overview of Pre-Inca and Inca Society*, edited by R. W. Keatinge, pp. 99-144. Cambridge University Press, Cambridge.
- Burger, R. L., and R. Matos Mendieta
2002 Atalla: A Center on the Periphery of the Chavín Horizon. *Latin American Antiquity* 13(2):153-177.
- Bursey, J. A.
2001 Storage Behavior in the Northeast: A Review of the Evidence. *North American Archaeologist* 22(3):179-199.
- Burt, F.
1960 Editor's Note. *The New Hampshire Archaeologist* 10:5.
- Byrd, B. F., and C. M. Monahan
1995 Death, Mortuary Ritual, and Natufian Social Structure. *Journal of Anthropological Archaeology* 14(3):251-287.
- Caldwell, J. R.
1964 Interaction Spheres in Prehistory. In *Hopewellian Studies*, edited by J. R. Caldwell and R. L. Hall, pp. 1-34. Illinois State Museum Scientific Papers, Vol. XII, Springfield.
- Cann, J. R., and C. Renfrew
1964 The Characterization of Obsidian and Its Application to the Mediterranean Region. *Proceedings of the Prehistoric Society* 30:111-131.
- Carlson, C. C.
1988 Where's the Salmon? A Reevaluation of the Role of Anadromous Fisheries in Aboriginal New England. In *Holocene Human Ecology in Northeastern North America*, edited by G. P. Nicholas, pp. 47-80. Plenum Press, New York.
- Carr, C.
2004 Rethinking Interregional Hopewellian "Interaction". In *Gathering Hopewell. Society, Ritual, and Ritual Interaction*, edited by C. Carr and D. T. Case, pp. 575-623. Kluwer Academic/Plenum Publishers, New York.
- Cassedy, D. F.
1992 *Native American Interaction Patterns and Lithic Acquisition Strategies in Eastern New York and Southern New England*. Ph.D. dissertation, Department of Anthropology, State University of New York at Binghamton.
- Cauvin, J.
2000 *The Birth of the Gods and the Origins of Agriculture*. New York: Cambridge University Press.

- Ceci, L.
1986 *The Origins of Wampum among the Seneca Iroquois*. Technical Report, Rochester Museum & Science Center.
- Chapdelaine, C.
1989 *Le Site Mandeville à Tracy: Variabilité Culturelle des Iroquoiens du Saint-Laurent*. Signes des Amériques No.7. *Recherches amérindiennes au Québec*, Montréal.
- 1990 Un site du Sylvicole moyen ancien sur la plage d'Oka (BiFm-1). *Recherches Amérindiennes au Québec* 20(1):19-35.
- Chapman, L. J. and D. R. Putnam
1966. 2d. ed. *The Physiography of Southern Ontario*. University of Toronto Press.
- Chapman, R.
1981 The Emergence of Formal Disposal Areas and the 'Problem' of Megalithic Tombs in Prehistoric Europe. In *The Archaeology of Death*, edited by R. Chapman, I. Kinnes, and K. Randsborg, pp. 71-81. Cambridge University Press, Cambridge.
- 1995 Ten Years After -Megaliths, Mortuary Practices, and the Territorial Model. In *Regional Approaches to Mortuary Analyses*, edited by L. A. Beck, pp. 29-51. Plenum Press, New York.
- Chapman, R. W.
1977 Burial Practices: An Area of Mutual Interest. In *Archaeology and Anthropology: Areas of Mutual Interest*, edited by M. Spriggs, pp. 19-33. BAR Supplementary Series 19. British Archaeological Reports, Oxford.
- Charlevoix, P. de
(1744) 1966 *Journal of a Voyage to North-America*. Great Americana. Readex Microprint.
- Chicoine, D.
2006 *Architecture and Society at Huambacho (800-200 B.C.), Nepeña Valley, Peru*. Ph.D. dissertation, School of World Art Studies and Museology, University of East Anglia.
- Chrétien, Y.
1995a *Le Sylvicole inférieur dans la région de Québec et le dynamisme culturel en périphérie de la sphère d'interaction Meadowood*. Ph.D. Dissertation, Anthropology Department, Université de Montréal.
- 1995b Les lames de cache du site Lambert et l'influence de la culture Meadowood dans la région de Québec. In *Archéologies Québécoises*, edited by A.-M. Balac, C. Chapdelaine, N. Clermont and F. Duguay, pp. 185-201. Paléo-Québec 23. Recherches Amérindiennes au Québec, Montréal.

- Clark, J. E., and M. Blake
 1994 The Power of Prestige: Competitive Generosity and the Emergence of Rank Societies in Lowland Mesoamerica. In *Factional Competition and Political Development in the New World*, edited by E. M. Brumfiel and J. W. Fox, pp. 17-30. New Directions in Archaeology. Cambridge University Press, Cambridge.
- Clarke, M. J.
 2001 Akha Feasting: An Ethnoarchaeological Perspective. In *Feasts. Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by M. Dietler and B. Hayden, pp. 144-167. Smithsonian Institution Press, Washington, D.C.
- Cleland, C. E.
 1982 The Inland Shore Fishery of the Northern Great Lakes: Its Development and Importance in Prehistory. *American Antiquity* 47(4):761-784.
- Clermont, N.
 1974 L'hiver et les indiens nomades du Québec à la fin de la préhistoire. *La Revue de Géographie de Montréal* 28(4):447-452.
- 1978 Les crémations de Pointe-du-Buisson. *Recherches Amérindiennes au Québec* 8(1):3-20.
- 1980 Le contrat avec les animaux. Bestiaire sélectif des Indiens nomades du Québec au moment du contact. *Recherches Amérindiennes au Québec* 10(1-2):91-109.
- 1987 Les énigmatiques objets piriformes de l'Archaïque. *Recherches Amérindiennes au Québec* 17(1-2):37-46.
- 1990 Le Sylvicole inférieur au Québec. *Recherches Amérindiennes au Québec* 20(1):5-17.
- 1991 *Des figures historiques : Jane Ellice et André-Napoléon Montpetit*. À Fleur de Siècles.
- 2003 Chapitre quatre: L'outillage osseux. In *Île aux Allumettes: l'Archaïque supérieur dans l'Outaouais*, edited by C. Chapdelaine, N. Clermont and J. Cinq-Mars. Collection Paléo-Québec, No. 30, Recherches amérindiennes au Québec, Musée canadien des civilisations, Montréal.
- n.d. La présence Meadowood (1000-400 BC). In *Sous les Caryers du Buisson: Le Site Hector Trudel*, edited by N. Clermont, manuscript in the author's possession.
- Clermont, N., and C. Chapdelaine
 1982 *Pointe-du-Buisson 4 : Quarante Siècles d'Archives Oubliées*. Recherches Amérindiennes au Québec, Montréal.
- 1990 Le plateau des portageurs, une halte au pied des courants. *Recherches Amérindiennes au Québec* 20(3-4):43-72.

1998 *Île Morrison : lieu sacré et atelier de l'Archaïque dans l'Outaouais*. Recherches amérindiennes au Québec, Montréal.

Clermont, N., C. Chapdelaine and G. Kennedy

1999 D'où vient la poterie Vinette 1 trouvée au Québec méridional? In *L'Archéologie sous la Loupe. Contribution à l'Archéométrie*, edited by J.-F. Moreau, pp. 67-72. Recherches Amérindienne au Québec, Montréal.

Corbett, R.

2004 Chumash Bone Whistles. The Development of Ceremonial Integration in Chumash Society. In *Foundations of Chumash Complexity*, edited by J. E. Arnold, pp. 65-73. Perspectives in California Archaeology, Volume 7. Cotsen Institute of Archaeology, University of California, Los Angeles.

Cossette, E.

1987 Quand on nommait lacs et rivières. *Recherches Amérindiennes au Québec* 17(1-2):3-6.

2000 *Prélude à l'agriculture dans le Nord-Est américain. Le site Hector Trudel et les stratégies de subsistance entre 500 et 1000 de notre ère dans la vallée du Saint-Laurent, Québec, Canada*. Bar International Series 884, Oxford.

Côté, M.

1987 Les manifestations archaïques de la station 1 du site Hamel. *Recherches Amérindiennes au Québec* 17(1-2):133-138.

1993 Préhistoire de l'Abitibi-Témiscamingue. *Recherches Amérindiennes au Québec* 23(2-3):5-24.

Côté, M., and L. Inksetter

2001 Ceramics and Chronology of the Late Prehistoric Period: The Abitibi-Témiscamingue case. In *A Collection of Papers Presented at the 33rd Annual Meeting of the Canadian Archaeological Association*, edited by J.-L. Pilon, M. W. Kirby and C. Thériault, pp. 111-127. The Ontario Archaeological Society Inc.

Courtemanche, M.

2003 *Pratiques halieutiques à la station 4 de la Pointe-du-Buisson (BhFl-1) au Sylvicole Moyen tardif (920-940 AD)*. M.Sc., Département d'anthropologie, Université de Montréal.

Crawford, G. W., and D. G. Smith

2003 Paleoethnobotany in the Northeast. In *People and Plants in Ancient North America*, edited by P. Minnis, pp. 172-257. Smithsonian Books, Washington, D.C.

Crucefix, L.

2001 *Copper Use in the Old Copper Complex: A Comparative Analysis of Witley VI-C Copper Axes and Three-Quarter Grooved Stone Axes*. M.A., Department of Archaeology, Simon Fraser University, Burnaby.

- Cunningham, W. M.
1948 *A Study of the Glacial Kame Culture in Michigan, Ohio, and Indiana*. Occasional Contributions from the Museum of Anthropology of the University of Michigan, No.12. University of Michigan Press, Ann Arbor.
- Cusick, J. G.
1998 Introduction. In *Studies in Culture Contact. Interaction, Culture Change, and Archaeology*, edited by J. G. Cusick, pp. 1-20. Occasional Papers No. 25. Center for Archaeological Investigations, Southern Illinois University, Carbondale.
- Custer, J. F.
1987 Problems and Prospects in Northeastern Prehistoric Ceramic Studies. *North American Anthropologist* 8(2):97-123.
- 1989 *Prehistoric Cultures of the Delmarva Peninsula: An Archaeological Study*. University of Delaware Press, Newark.
- 1994 Current Archaeological Research in the Middle Atlantic Region of the Eastern United States. *Journal of Archaeological Research* 2(4):329-360.
- Dalton, G.
1975 Karl Polyani's Analysis of Long-Distance Trade and his Wider Paradigm. In *Ancient Civilization and Trade*, edited by J. A. Sabloff, and C. C. Lamberg-Karlovsky, pp. 63-132. University of New Mexico Press, Albuquerque.
- 1977 Aboriginal Economies in Stateless Societies. In *Exchange Systems in Prehistory*, edited by T. K. Earle and J. E. Ericson. Studies in Archaeology. Academic Press, New York.
- Damas, D.
1969 Characteristics of Central Eskimo Band Structure. In *Contribution to Anthropology: Band Societies*, edited by D. Damas, pp. 116-141. National Museums of Canada Bulletin 228. National Museums of Canada, Ottawa.
- David-Neel, A.
1932 *Magic and Mystery in Tibet*. New York: Dover.
- Davis, S. A.
1986 *Man, Mollusks and Mammals: A Study of Land Use and Resources in the Late Holocene of the Maritime Provinces of Canada*. Ph.D. Dissertation, Wolfson College, Oxford.
- De Atley, S. P., and F. J. Findlow (editors)
1984 *Exploring the Limits: Frontiers and Boundaries in Prehistory*. BAR International Series 223, Oxford, England.
- De Schweinitz, E.
1870 *The Life and Times of David Zeisberger*, edited by E. Schwenitz, Philadelphia.

Deal, M.

1986 Late Archaic and Ceramic Period Utilization on the Mud Lake Stream Site, Southwestern New Brunswick. *Man in the Northeast* 32:67-94.

2002 Aboriginal Land and Resource Use in New Brunswick during the Late Prehistoric and Early Historic Period. In *Northeast Subsistence-Settlement Change A.D. 700-1300*, edited by J. P. Hart, and C. B. Rieth, pp. 321-344. New York State Museum Bulletin 496, Albany.

in press Paleoethnobotanical Research in the Maritime Provinces. *North Atlantic Prehistory* 1(1).

Deller, D. B., C. J. Ellis, and I. Kenyon

1986 The Archaeology of Southeastern Huron Basin. In *Studies in Southwestern Ontario Archaeology*, edited by W. A. Fox. Occasional Publications, No.1. London Chapter of the Ontario Archaeological Society, London.

Denton, D.

1998 From the Source, to the Margins and Back. Notes on Mistassini Quartzite and Archaeology in the Area of the Colline Blanche. In *L'Éveilleur et l'ambassadeur: Essais archéologiques et ethnohistoriques en hommage à Charles Martijn*, edited by R. Tremblay, pp. 17-32. Collection Paléo-Québec No.27. Recherches Amérindiennes au Québec, Montréal.

Denton, D., and M. T. McCaffrey

1988 A Preliminary Statement on the Prehistoric Utilization of Chert Deposits near Schefferville, Nouveau-Quebec. *Canadian Journal of Archaeology* 12:137-152.

Denys, N.

(1672)1908 *The Description and Natural History of the Coasts of North America (Acadia)*. The Champlain Society, Toronto.

Dice, L. R.

1943 *The Biotic Provinces of North America*. University of Michigan Press, Ann Arbor.

Diéreville, M., and L. U. Fontaine

1885 *Voyage du sieur de Diéreville en Acadie*. Imprimerie A. Côté, Québec.

Dincauze, D. F.

1968 *Cremation Cemeteries in Eastern Massachusetts*. Peabody Museum, Cambridge, Massachusetts.

1975 Ceramic Sherds from the Charles River Basin. *Bulletin of the Archaeological Society of Connecticut* 39:5-17.

1976 *The Neville Site: 8,000 Years at Amoskeag, Manchester, New Hampshire*. Peabody Museum Monographs, No. 4. Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge, Mass.

- Dincauze, D. F., and R. J. Hasenstab
 1989 Explaining the Iroquois: Tribalization on a Prehistoric Periphery. In *Centre and Periphery. Comparative Studies in Archaeology*, edited by T. C. Champion, pp. 67-84. London: Unwin Hyman.
- Donaldson, W. S., and S. Wortner
 1995 The Hind Site and the Glacial Kame Burial Complex in Ontario. *Ontario Archaeology* 59:5-95.
- Dragoo, D. W.
 1963 *Mounds for the Dead: An Analysis of the Adena Culture*. Carnegie Museum, Pittsburgh.
- 1976 Adena and the Eastern Burial Cult. *Archaeology of Eastern North America* 4:1-9.
- Druc, I.
 2004 Ceramic diversity in Chavin de Huantar, Peru. *Latin American Antiquity* 15(3): 344-363.
- Dumont, P., P. Lamoureux, G. Laforce, M. La Haye and N. Fournier
 1989 *Influence de la dimension de l'hameçon sur la sélectivité et le rendement de la ligne dormante pour la capture de l'Esturegon jaune (Acipenser fulvescens)*. Avis scientifique 89/1. Ministère de la Pêche, de l'Agriculture, des Pêcheries et de l'Alimentation et Ministère du Loisir, de la Chasse, et de la Pêche, Québec.
- Duval, I.
 2008 Identification visuelle et géochimique du quartzite sur les sites du Saguenay–Lac-Saint-Jean. *Archéologiques* 21:44-57.
- Earle, T. K.
 1982 Prehistoric Economics and the Archaeology of Exchange. In *Contexts for Prehistoric Exchange*, edited by J. E. Ericson, and T. K. Earle, pp. 1-12. Academic Press, New York.
 2000 Archaeology, Property, and Prehistory. *Annual Review of Anthropology* 29:39-60.
- Earle, T. K., and J. E. Ericson (editors)
 1982 *Contexts for Prehistoric Exchange*. Academic Press, New York.
- Eley, B. E., and P. H. von Bitter
 1989 *Cherts of Southern Ontario*. Royal Ontario Museum, Toronto.
- Ellis, C. J.
 1994 The Pits (Part II): A Radiocarbon-Dated Early Woodland, Meadowood Phase Feature from the Parkhill Site. *Kewa* 94(5):2-6.
- 1999 Some sites and Artefacts I Have Known: The Welke-Tonkonoh Site Revisited or What is a Meadowood Point? *Kewa* 99(3-4):9-26.

- Ellis, C. J., J. A. Fisher, and D. B. Deller
 1988 Four Meadowood Phase Lithic Artefact Assemblages from Caradoc and Delaware Townships, Southwestern Ontario. *Kewa* 88(8):3-20.
- Ellis, C. J., and M. W. Spence
 1997 Raw Material Variation and the Organization of Small Point Archaic Lithic Technologies in Southwestern Ontario. In *Pre-ceramic Southern Ontario*, edited by P. J. W. a. P. Ramsden, pp. 119-140. vol. Occasional Papers in Northeastern Archaeology, No.9. Copetown Press.
- Emerson, J. N., and W. C. Noble
 1966 The Surma Site, Fort Erie, Ontario. *Ontario Archaeologist* 9:68-88.
- Fagan, B.
 2003 *Before California. An Archaeologist Looks at our Earliest Inhabitants*. Rowman & Littlefield Publishers/AltaMira Press, Lanham.
- Fecteau, R. D.
 1979 Archaeobotanical Remains from the Morpeth South Site (AcHk-3), a Late Archaic Site in Kent County, Ontario. *Kewa* 79(6):3-6.
- 1997 Appendix 3: Floral Analysis of the Pocock and Racher Sites. In *The Middle Thames River Settlement/ Subsistence Project, Middlesex County, Ontario*, edited by J. Wilson. Report submitted to the Ontario Heritage Foundation and Ontario Ministry of Citizenship, Culture and Recreation.
- Feinman, G. M.
 1996 Conclusions. In *Pre-Columbian World Systems*, edited by P. N. Peregrine and G. M. Feinman, pp. 115-121. Monographs in World Archaeology No.26. Prehistory Press, Madison, Wisconsin.
- Fenton, W. N.
 1940 Problems Arising from the Historic Northeastern Position of the Iroquois. *Smithsonian Miscellaneous Collections* 100:159-251.
- Ferguson, C. C.
 1947 West Brookfield Indian Burial. *Bulletin of the Massachusetts Archaeological Society* 9(1):16.
- Fiedel, S. J.
 1987 Algonquian Origins: A Problem in Archaeological-Linguistic Correlation. *Archaeology of Eastern North America* 15:1-11.
- Finlayson, W. D.
 1977 *The Saugeen Culture: A Middle Woodland Manifestation in Southwestern Ontario*. Mercury Series, Archaeological Survey of Canada no. 61. National Museums of Canada, Ottawa.

- Finley, J. B.
1857 *Autobiography of Rev. James B. Finley; or, Pioneer Life in the West*. Methodist Book Concern, Cincinnati.
- Fitting, J. E.
1970 *The Archaeology of Michigan: A Guide to the Prehistory of the Great Lakes Region*. Natural History Press, Garden City, N.Y.
- Fitting, J. E., and D. Brose
1971 The Northern Periphery of Adena. In *Adena: The Seeking of an Identity*, edited by B. K. Swartz, pp. 29-55. Ball State University Press, Muncie.
- Fitting, J. E., J. R. Halsey, and H. M. Wobst
1968 *Contributions to Michigan Archaeology*. Anthropological Papers 32. Museum of Anthropology, University of Michigan, Ann Arbor.
- Fitzhugh, W. W.
1975 A Maritime Archaic Sequence from Hamilton Inlet, Labrador. *Arctic Anthropology* 12(2):117-138.
- Flannery, K. V.
1968 The Olmec and the Valley of Oaxaca: A Model for Inter-Regional Interaction in Formative Times. In *Dumbarton Oaks Conference on the Olmec*, edited by E. P. Benson, pp. 79-110. Dumbarton Oaks Research Library and Collection, Trustees for Harvard University, Washington, D.C.
- Fogel, I. L.
1963 The Dispersal of Copper Artefacts in the Late Archaic Period of Prehistoric North America. *The Wisconsin Archaeologist* 44(3):129-179.
- Foley, D.
1955 Certain Aspects of Waterfowl Hunting in New York as Indicated by Bag - Check Data for 1953 and 1954. *New York Fish and Game Journal* 2:205-219.
- Ford, R. I.
1979 Gathering and Gardening: Trends and Consequences of Hopewell Subsistence Strategies. In *Hopewell Archaeology. The Chillicothe Conference*, edited by D. S. Brose, and N. Greber, pp. 234-238. Kent State University Press, Ohio.
- Forget, J.-M.
1996 Le Sylvicole inférieur et la culture Meadowood. In *En remontant la rivière aux Brochets. Cinq mille ans d'histoire amérindienne dans Brome-Missisquoi*, edited by J.-M. Forget and D. St-Arnaud, pp. 51-65. Paléo-Québec vol. 25. Recherches Amérindiennes au Québec, Montréal.
- Foster, D. W., V. B. Kenyon, and G. P. Nicholas
1981 Ancient Lifeways at the Smyth Site NH38-4. *The New Hampshire Archaeologist* 22(2).

- Fowler, M. L.
1974 *Cabokia: Ancient Capital of the Midwest*. Cummings, Menlo Park.
- Fowler, W. S.
1965 A Birdstone Recovery in Rhode Island. *Bulletin of the Massachusetts Archaeological Society* 26(3):39-43.

1966 The Horne Hill Soapstone Quarry. *Bulletin of the Massachusetts Archaeological Society* 27(2):17-28.
- Fowler, W. S., and J. W. Welt
1955 A Significant Find. *Bulletin of the Massachusetts Archaeological Society* 17(1):9-12.
- Fox, W. A.
1981 Meadowood Caches in Southwestern Ontario. *Kewa* 81(2):3-5.

1983 Four Square Metres of Ontario Prehistory. *Arch Notes* 2:17-26.

1984a An Early Woodland Camp on Inverhuron Bay. *Kewa* 84(6).

1984b Meadowood Biface Caches from Southwestern Ontario. *Kewa* 84(2):7-12.
- Fritz, G. J.
1990 Multiple Pathways to Farming in Precontact Eastern North America. *Journal of World Prehistory* 4:387-435.
- Funk, R. E.
1976 *Recent Contributions to Hudson Valley Prehistory*. New York State Museum Memoir 22.

1978 The Northeastern United States. In *Ancient North America*, edited by J. D. Jennings, pp. 303-371. W.H. Freeman and Company, San Francisco.
- Funk, R. E., and R. J. Dineen
1993 *Archaeological Investigations in the Upper Susquehanna Valley, New York State, Vol. 1 and 2*. Persimmon Press, Buffalo, N.Y.
- Funk, R. E., and J. E. Pfeiffer
1988 Archaeological and Paleoenvironmental Investigations on Fishers Island, New York: A Preliminary Report. *Bulletin of the Archaeological Society of Connecticut* 51:69-110.
- Gamble, L. H., P. L. Walker, and G. S. Russel
2001 An Integrative Approach to Mortuary Analysis: Social and Symbolic Dimensions of Chumash Burial Practices. *American Antiquity* 66(2):185-212.

Garland, E. B.

1986 Early Woodland Occupations in Michigan: A Lower St. Joseph Valley Perspective. In *Early Woodland Archaeology*, edited by K. B. F. a. T. E. Emerson, pp. 47-83. vol. Seminars in Archaeology No.2. Center for American Archaeology Press, Kampsville.

1990 *Late Archaic and Early Woodland Adaptation in the Lower St. Joseph River Valley, Berrien County, Michigan: The US-31 Berrien County Freeway Project*. Michigan Department of Transportation, Michigan Department of State, and the Federal Highway Administration.

Gerard, W. R.

1907 Virginia's Indian Contributions to English. *American Anthropologist* 9(1):87-112.

Giguère, G.-É.

1973 *Oeuvres de Champlain*. Éditions du Jour, 3 volumes, Montréal.

Gilbert, B.

1780 A Narrative of the Captivity and Sufferings of Benjamin Gilbert and his Family. *Garland Library* 57:220-252.

Godfrey-Smith, D. I., M. Deal, and I. Kunelius

1997 Thermoluminescence Dating of St. Croix Ceramics: Chronology Building in Southwestern Nova Scotia. *Geoarchaeology* 12(3):251-273.

Goldstein, L.

1976 *Spatial Structure and Social Organization: Regional Manifestations of Mississippian Society*.

1981 One-Dimensional Archaeology and Multi-Dimensional People: Spatial Organization and Mortuary Analysis. In *The Archaeology of Death*, edited by R. Chapman, I. Kinnes and K. Randsborg, pp. 71-82. Cambridge University Press, Cambridge.

Goodenough, W. H.

1965 Rethinking Status and Role: Toward a General Model of the Cultural Organization of Social Relationships. In *The Relevance of Models for Social Anthropology*, edited by M. Banton, pp. 1-24. A.S.A. Monographs no. 1. Praeger, New-York.

Gramly, R. M.

1988 *The Adkins Site: A Paleo-Indian Habitation and Associated Stone Structure*. Persimmon Press, Buffalo.

Granger, J. E.

1976 The Orchid site Area B, Fort Erie, Ontario. *New York State Archaeological Association Bulletin* 67:1-39.

1978 *Meadowood Phase Settlement Pattern in the Niagara Frontier Region of Western New York State*. Anthropological Papers, No. 65. Museum of Anthropology, University of Michigan, Ann Arbor.

1979 Cache Blades, Chert and Communication: A Reappraisal of Certain Aspects of Meadowood Phase and the Concept of a Burial Cult in the Northeast. In *Essays in Northeastern Anthropology in Memory of Marian E. White*, edited by W. E. Engelbrecht, and D. K. Grayson, pp. 96-122. Occasional Publications in Northeastern Anthropology No.5.

1981 The Seward Site Cache and a Study of the Meadowood Phase 'Cache Blade' in the Northeast. *Archaeology of Northeastern North America* 9:63-103.

Gravier, G.

1827-1904 *Vie de Samuel Champlain: fondateur de la Nouvelle France: 1567-1635*. J. Maisonneuve, 1900, Paris.

Green, S. W., and S. M. Perlman (editors)

1985 *The Archaeology of Frontiers and Boundaries*. Academic Press, Orlando.

Greenfield, H. J.

1991 A Kula Ring in Prehistoric Europe? A Consideration of Local and Interregional Exchange during the Late Neolithic of the Central Balkans. In *Between Bands and States*, edited by S. A. Gregg, pp. 287-308. Center for Archaeological Investigations, Occasional Paper No.9. Southern Illinois University at Carbondale.

Griffin, J. B.

1961 Review of the Eastern Dispersal of the Adena by Ritchie and Dragoo. *American Antiquity* 26:572-573.

Hall, M. E.

2004 Pottery Production during the Late Jomon Period: Insights from the Chemical Analyses of Kasori B pottery. *Journal of Archaeological Science* 31(10):1439-1450.

Hallowell, A. I.

1926 Bear Ceremonialism in the Northern Hemisphere. *American Anthropologist* 28:1-175.

Halstead, P., and J. O'Shea

1982 A Friend in Need is a Friend Indeed: Social Storage and the Origins of Social Ranking. In *Ranking, Resource, and Exchange: Aspects of the Archaeology of Early European Society*, edited by C. Renfrew and S. Shennan. Cambridge University Press, New York.

Hammer, J.

1976 Identification and Distribution of Some Lithic Raw Materials from New York State. *Man in the Northeast* 11:39-62.

Hampton, O. W.

1999 *Culture of Stone: Sacred and Profane Uses of Stone among the Dani*. College Station: Texas A&M University Press.

- Hart, J. P., H. J. Brumbach, and R. Lusteck
 2007 Extending the Phytolith Evidence for Early Maize (*Zea mays ssp. mays*) and Squash (*Cucurbita sp.*) in Central New York. *American Antiquity* 72(3):563-583.
- Hart, J. P., and N. A. Sidell
 1997 Additional Evidence for Early Cucurbit Use in the Northern Eastern Woodlands East of the Allegheny Front. *American Antiquity* 62(3):523-537.
- Haviland, W. A., and M. W. Power
 1981 *The Original Vermonters: Native Inhabitants, Past and Present*. University Press of New England, Hanover, N.H.
- 1994 *The Original Vermonters: Native Inhabitants Past and Present. Revised and expanded edition*. University Press of New England, Hanover, N.H.
- Hayden, B.
 1980 Confusion in the Bipolar World: Bashed Pebbles and Splintered Pieces. *Lithic Technology* 9(1):2-7.
- 1990 Nimrods, Piscators, Pluckers and Planters: The Emergence of Food Production. *Journal of Anthropological Archaeology* 9:31-69.
- 1992 Conclusions: Ecology and Complex Hunter/Gatherers. In *A Complex Culture of the British Columbia Plateau. Traditional St'át'imx Resource Use*, edited by B. Hayden, pp. 525-563. UBC Press, Vancouver.
- 1995 Pathways to Power: Principles for Creating Socioeconomic Inequalities. In *Foundations of Social Inequality*, edited by T. D. Price and G. M. Feinman. Plenum Press, New York.
- 1998 Practical and Prestige Technologies: The Evolution of Material Systems. *Journal of Archaeological Method and Theory* 5:1-55.
- 2000 *The Ancient Past of Keatley Creek. Volume I: Taphonomy*. Archaeology Press, Archaeology Department, Simon Fraser University, Burnaby, B.C.
- 2001a Fabulous Feasts. A Prolegomenon to the Importance of Feasting. In *Feasts. Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by M. Dietler and B. Hayden, pp. 23-64. Smithsonian Institution Press, Washington, D.C.
- 2001b *Funeral Feasts: Why are they so Important?* Paper presented at the Society for American Archaeology Meeting, April 18-22, Louisiana, New Orleans.
- 2002 L'évolution des premiers vêtements en cuir. In *Le travail du cuir de la préhistoire à nos jours*, edited by F. Audoin-Rouzeau and S. Beyries. XXIIe rencontres internationales d'archéologie et d'histoire d'Antibes. Éditions APDCA, Antibes.

- 2003 *Shamans, Sorcerers, and Saints*. Smithsonian Books, Washington, D.C.
- 2004 Sociopolitical Organization in the Natufian: A View from the Northwest. In *The Last Hunter-Gatherer Societies in the Near East*, edited by C. Delage. Bar International Series. John and Erica Hedges, Oxford.
- Hayden, B., and R. Schulting
 1997 The Plateau Interaction Sphere and Late Prehistoric Cultural Complexity. *American Antiquity* 62(1):51-85.
- Heath, D. B. (editor)
 1963 *A Journal of the Pilgrims at Plymouth: Mourt's Relation*. Corinth Books, New York.
- Heckenberger, M. J., J. B. Petersen, L. A. Basa, E. R. Cowie, A. E. Spiess, and R. E. Stuckenrath
 1990 Early Woodland Period Ceremonialism in the Far Northeast: A View from the Boucher Cemetery. *Archaeology of Eastern North America* 18:109-144.
- Heckenberger, M. J., J. B. Petersen, F. B. King, and L. A. Basa
 1996 Fiber Industries from the Boucher Site: An Early Woodland Cemetery in Northeastern Vermont. In *A Most Indispensable Art: Native Fiber Industries from Eastern North America*, edited by J. B. Petersen, pp. 50-72. University of Tennessee Press, Knoxville.
- Heidenreich, C. E.
 1971 *Huronian: A History and Geography of the Huron Indians, 1600-1650*. McClelland and Stewart Limited, Toronto.
- Helm, J.
 1969 A Method of Statistical Analysis of Primary Relative Bonds in Community Composition. In *Contributions to Anthropology: Band Societies*, pp. 218-239. National Museums of Canada Bulletin 228. National Museums of Canada, Ottawa.
- Helms, M. W.
 1979 *Ancient Panama: Chiefs in Search of Power*. University of Texas Press, Austin.
- 1988 *Ulysses' Sail: An Ethnographic Odyssey of Power, Knowledge, and Geographic Distance*. Princeton University Press, Princeton, NJ.
- 1993 *Craft and the Kingly Ideal: Art, Trade, and Power*. University of Texas Press, Austin.
- Hénault, M.
 1983 *Essai de pêche commerciale à la seine au lac Saint-François au printemps 1982*. Ministère du Loisir, de la Chasse et de la Pêche, Direction régionale de Montréal, Service de l'aménagement et de l'exploitation de la faune.

Hennepin, L.

1683 *Description de la Louisiane, nouvellement découverte au Sud'Oüest de la Nouvelle-France, par ordre du Roy. Avec la Carte du Pays: les Moeurs & la Maniere de vivre des Sauvages, Dédiée à sa Majesté, À Paris, Chez la veuve Sebastien Huré, ruë Saint Jacques, à l'Image S. Jérôme, près S. Séverin.*

Henry, D. O.

1989 *From Foraging to Agriculture. The Levant at the End of the Ice Age.* University of Pennsylvania Press, Philadelphia.

Hoffman, C.

1998 Pottery and Steatite in the Northeast: A Reconsideration of Origins. *Northeast Anthropology* 56:43-68.

Howe, D. E.

1988 The Beaver Meadow Brook Site: Prehistory on the West Bank at Sewall's Falls, Concord, New Hampshire. *The New Hampshire Archaeologist* 29(1):49-107.

Hubbs, C. L., and K. F. Lagler

2004 *Fishes of the Great Lakes Region. Revised Edition.* The University of Michigan Press, Ann Arbor.

Huber, J. K.

2000 Archaeological Implications of Pollen Evidence for Wild Rice (*Zizania aquatica*) during the Paleoindian, Archaic, and Woodland Periods in Northeast Minnesota. In *Proceedings of the Wild Rice Research and Management Conference. Carlton, Minnesota. July 7-8, 1999*, edited by L. F. Williamson, L. A. Dlutkowski and A. P. McCammon Soltis, pp. 40-52. Great Lakes Indian Fish and Wildlife Commission, Odanah.

Ingold, T.

1982 Comment on Testart 1982. *Current Anthropology* 23(5):531.

Isbell, W.

1978 Environmental Perturbations and the Origin of the Andean State. In *Social Archeology: Beyond Subsistence and Dating*, edited by C. L. Redman, M. Berman, E. Curtin, W. Langhorne, Jr., N. Versaggi, and J. Wanser, pp. 303-313. Academic Press, New York.

Jackson, H. E.

1991 The Trade Fair in Hunter-Gatherer Interactions: The Role of Intersocietal Trade in the Evolution of Poverty Point Culture. In *Between Bands and States*, edited by S. A. Gregg, pp. 265-286. Center for Archaeological Investigations, Occasional Paper No.9. Southern Illinois University, Carbondale.

Jackson, L. J.

1982 Dawson Creek: An Early Woodland Site in South-Central Ontario. *Ontario Archaeology* 33:13-32.

- 1986 New Evidence for Early Woodland Seasonal Adaptation from Southern Ontario, Canada. *American Antiquity* 51(2):389-401.
- 1988 *Dawson Creek Site Feature Analysis: 4000 Years of Ontario Prehistory*. Occasional Papers in Anthropology, No. 5. Trent University, Peterborough.
James, B. B., and J. F. Jameson (editors)
- 1913 *The Journal of Jasper Danckaerts, 1679-80*. Scribner's, New York.
- Jarvis, H.
1988 *INAA Characterization of Onondaga Chert: A Preliminary Study in Western New York*. Master's thesis, Department of Anthropology, State University of New York, Buffalo.
- Jilek, W., and L. Jilek-Aall
2000 Shamanic Symbolism in the Revived Ceremonials of the Salish Indian Nation of the Pacific Northwest Coast. *Shaman* 8: 1-16.
- Johnston, R. B.
1984 Archaeology of the McIntyre Site. In *The McIntyre Site: Archaeology, Subsistence and Environment*, edited by R. B. Johnston, pp. 7-85. National Museum of Man, Archaeological Survey of Canada, Mercury Series, Paper 126, Ottawa.
- Johnston, R. B., and K. Cassavoy
1978 The Fishweirs at Atherley Narrows, Ontario. *American Antiquity* 43(4):697-709.
- Jopling, C. F.
1989 *The Coppers of the Northwest Coast Indians: Their Origin, Development, and Possible Antecedents*. The American Philosophical Society, Philadelphia.
- JR (Jesuit Relations) Thwaites, R. G. (editor)
1896-1901 *The Jesuit Relations and Allied Documents: Travels and Explorations of the Jesuit missionaries in New France, 1610-1791. The original French, Latin, and Italian texts, with English translations and notes*. 73 vols. Burrows Bros. Co., Cleveland.
- Julien, C.-A., R. Herval, and T. Beauchesne (editors)
1981 *Jacques Cartier: Voyages au Canada, avec les relations des voyages en Amérique de Gonneville, Verrazano et Roberval*. Maspero-La Découverte, Paris.
- Jury, W. W.
1965 Copper Artefacts from Western Ontario. *Wisconsin Archeologist* 46(4):223-246.
- 1973 Copper Cache at Penetanguishene, Ontario, Canada. *Wisconsin Archeologist* 54(2):84-106.
- 1978 *A Red Ochre Burial from Port Franks, Ontario*. Museum of Indian Archaeology, University of Western Ontario, Museum Notes 1, London, Ontario.

- Karrow, P. F., and B. G. Warner
 1990 The Geological and Biological Environment for Human Occupation in Southern Ontario. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by C. J. Ellis, and N. Ferris, pp. 5-35. Occasional Publication of the London Chapter, No. 5. Ontario Archaeological Association.
- Keatinge, R. W.
 1981 The Nature and Role of Religious Diffusion in the Early Stages of State Formation: An Example from Peruvian Prehistory. In *The Transition to Statehood in the New World*, edited by G. D. Jones, and R. R. Kautz, pp. 172-187. Cambridge University Press, Cambridge.
- Keeley, L. H.
 1996 *War before Civilization. The Myth of the Peaceful Savage*. New York: Oxford University Press.
- Kenyon, V. B., and D. W. Foster
 1980 The Smyth Site (NH 38-4): Research in Progress. *The New Hampshire Archaeologist* 21:44-54.
- Kinsey, W. F., III
 1975 Faucett and Byram Sites: Chronology and Settlement in the Delaware Valley. *Pennsylvania Archaeologist* 45:1-103.
- Kinsey, W. F., III, H. C. Kraft, D. J. Werner, and P. Marchiando
 1972 *Archeology in the Upper Delaware Valley: A Study of the Cultural Chronology of the Tocks Island Reservoir*. Pennsylvania Historical and Museum Commission, Harrisburg.
- Klein, J. I.
 1985 Current Reserach, Northeast. *American Antiquity* 50(4):887-897.
- Klein, M. J.
 1997 The Transition from Soapstone Bowls to Marcey Creek Ceramics in the Middle Atlantic Region: Vessel Technology, Ethnographic Data, and Regional Exchange. *Archaeology of Eastern North America* 25:143-158.
- Kowalewski, S. A.
 1996 Clout, Corn, Copper, Core-Periphery, Culture Area. In *Pre-Columbian World Systems*, edited by P. N. Peregrine, and G. M. Feinman, pp. 27-37. Monographs in World Archaeology No.26. Prehistory Press, Madison, Wisconsin.
- Kowalewski, S. A., R. E. Blanton, G. M. Feinman, and L. Finsten
 1984 Boundaries, Scale, and Internal Organization. *Journal of Anthropological Archaeology* 2:32-56.

Kraft, H. C.

1975 *The Archaeology of the Tocks Island Area*. Archaeological Research Center. Seton Hall University Museum, South Orange, New Jersey.

1989 A Dated Meadowood Component from Fairfield, Essex County, New Jersey. *Bulletin of the Archaeological Society of New Jersey* 44:51-54.

Kroeber, A. L.

1939 *Cultural and Natural Areas of Native North America*. University of California Publications in American Archaeology and Ethnology, Vol. 38, Berkeley, California.

Langevin, É.

1990 *DdEw-12: 4000 ans d'occupation sur la grande décharge du lac Saint-Jean*. M.Sc., Université de Montréal.

Le Clercq, C.

(1691)1910 *Nouvelle Relation de la Gaspésie, qui contient Les Moeurs & la Religion des Sauvages Gaspésiens Porte-Croix, adorateurs du Soleil & d'autres peuples de l'Amérique Septentrionale, dite le Canada*. The Champlain Society, Toronto.

Lee, G.-A., A. M. Davis, D. G. Smith, and J. H. McAndrews

2004 Identifying Fossil Wild Rice (*Zizania*) Pollen from Cootes Paradise, Ontario: A New Approach Using Scanning Electron Microscopy. *Journal of Archaeological Science* 31:411-421.

Lee, T. E.

1958 The Parker Earthwork, Corunna, Ontario. *Pennsylvania Archaeologist* 29(1):3-30.

Leonard, K.

1996 *Mi'kmaq Culture during the Late Woodland and Early Historic Period*. Ph.D. dissertation, Department of Anthropology, University of Toronto, Toronto.

Lévesque, R., F. F. Osborne, and J. V. Wright

1964 *Le Gisement de Batiscan: Notes sur des Vestiges Laissés par une Peuplade de Culture Sylvicole Inférieure dans la Vallée du Saint-Laurent*. Musée national du Canada, Études Anthropologiques, No.6, Ottawa.

Levine, M. A.

1993 New Perspectives on Old Copper : The Procurement, Distribution, and Exchange of Native Copper in Northeastern North America, 6000-1000 BP

1999 Native Copper in the Northeast: An Overview of Potential Sources Available to Indigenous Peoples. In *The Archaeological Northeast*, edited by M. A. Levine, K. E. Sassaman, and M. S. Nassaney, pp. 183-199. Bergin & Garvey, Westport.

- Lewis Williams, J. D., and T. A. Dowson
 1993 On Vision and Power in the Neolithic: Evidence from the Decorated Monuments. *Current Anthropology* 34(1):55-65.
- Limp, W. F., and V. A. Reidhead
 1979 An Economic Evaluation of the Potential of Fish Utilization in Riverine Environments. *American Antiquity* 44(1):70-78.
- Loring, S.
 1985 Boundary Maintenance, Mortuary Ceremonialism and Resource Control in the Early Woodland: Three Cemetery Sites in Vermont. *Archaeology of Eastern North America* 13:93-127.
- 1989 Une réserve d'outils de la période intermédiaire sur la côte du Labrador. *Recherches Amérindiennes au Québec* 19(2-3):45-57.
- Loskiel, G. H.
 1794 *History of the Mission of the United Brethren among Indians in North America*. 3 parts in 1 vol. Brethren's Society & John Stockdale, London.
- Lovis, W., and J. Robertson
 1989 Rethinking the Archaic Chronology of the Saginaw Valley, Michigan. *Midcontinental Journal of Archaeology* 14:226-260.
- Lutins, A.
 1992 *Prehistoric Fishweirs in Eastern North America*. M.A., Department of Anthropology, State University of New York at Binghamton.
- MacDonald, R. I., and R. H. Pihl
 1994 Prehistoric Landscapes and Land Uses: The Role of Predicting Modelling in Cultural Resource Management. In *Great Lakes Archaeology and Paleoecology: Exploring Interdisciplinary Initiatives for the Nineties*, edited by R. I. MacDonald, pp. 25-60. Quaternary Sciences Institute, University of Waterloo, Ontario.
- Margry, P. (editor)
 1879 *Découvertes et établissements des Français dans l'Ouest et dans le Sud de l'Amérique septentrionale, 1614-1698, Mémoires et documents inédits. Première partie. Voyages des Français sur les Grands Lacs et découverte de l'Ohio et du Mississipi (1614-1684)*. Maisonneuve et Cie., Libraires-Éditeurs, Paris.
- Marois, R., and R. Ribes
 1975 *Indices de manifestations culturelles de l'Archaique: la région de Trois-Rivières*. Collection Mercure No.41. Musée national de l'Homme, Ottawa.
- Martin, S. R.
 1999 *Title Wonderful Power: The Story of Ancient Copper Working in the Lake Superior Basin*. Wayne State University Press, Detroit.

- Mason, C. I.
1986 Prehistoric Maple Sugaring: A Sticky Subject. *North American Archaeologist* 7(4):305-311.
- Mason, R. J.
1981 *Great Lakes Archaeology*. Academic Press, New-York.
- Mather, D., and R. G. Thompson
2000 Archaeological Perspectives on Wild Rice. In *Proceedings of the Wild Rice Research and Management Conference. Carlton, Minnesota. July 7-8, 1999*, edited by L. F. Williamson, L. A. Dlutkowski, and A. P. McCammon Soltis, pp. 15-26. Great Lakes Indian Fish and Wildlife Commission, Odanah.
- McEachen, P. J.
1996 *The Meadowood Early Woodland Manifestations in the Maritimes: A Preliminary Interpretation*. M.A. thesis, Department of Anthropology, Memorial University of Newfoundland, St. John's.
- McEachen, P. J., and R. F. Williamson
1995 The Siller Site: A Meadowood Component on the Credit River. *Kewa* 95(2):2-19.
- McHugh, F.
1999 *Theoretical and Quantitative Approaches to the Study of Mortuary Practice*. BAR international series 785. Archaeopress, Oxford.
- McKern, W. C.
1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. *American Antiquity* 4(4):310-313.
- Milner, G. R.
1999 Warfare in Prehistoric and Early Historic Eastern North America. *Journal of Archaeological Research* 7(2):105-151.
- Mitchell, B.M.
1966 Preliminary Report on a Woodland Site near Deep River, Ontario. *Anthropological Papers* 11:1-25.
- 1963 Occurrence of Overall Corded Pottery in the Upper Ottawa Valley, Canada. *American Antiquity* 29(1):114-115.
- Moffat, C. R.
2000 New Data on the Late Woodland Use of Wild Rice in Northern Wisconsin. *Midcontinental Journal of Archaeology* 25(1):49-81.

- Monaghan, W. G., W. A. Lovis, and K. C. Egan-Bruhy
 2006 Earliest *Cucurbita* from the Great Lakes, Northern USA. *Quaternary Research* 65(2):216-222.
- Monahan, V.
 1990 *Copper Technology in the Maritimes: An Examination of Indigenous Copper-Working in the Maritime Provinces during the Protohistoric Period*. B.A. Honours Thesis, Department of Anthropology, Saint Mary's University, Halifax.
- Montpetit, A.-N.
 1897 *Les poissons d'eau douce du Canada*. C.-O. Beauchemin et Fils, Montréal.
- Mosby, H.
 1969 The Influence of Hunting on the Population Dynamics of Woodlot Gray Squirrel Population. *Journal of Wildlife Management* 33:59-72.
- Mouer, D. D.
 1991 The Formative Transition in Virginia. In *Late Archaic and Early Woodland Research in Virginia: A Synthesis*, edited by T. R. Reinhart, and M. Hodges, pp. 1-88. Archaeological Society of Virginia, Richmond.
- Moussette, M.
 1973 La pêche au filet maillant chez les indiens de l'est du Canada. *Recherches Amérindiennes au Québec* 3(3-4):41-67.
 1979 *La pêche sur le Saint-Laurent. Répertoire des méthodes et des engins de capture*. Les Éditions du Boréal Express, Montréal.
- Mulholland, M. T.
 1988 Territoriality and Horticulture. A Perspective for Prehistoric Southern New England. In *Aboriginal New England. In Holocene Human Ecology in Northeastern North America*, edited by G. P. Nicholas, pp. 137-166. Plenum Press, New York.
- Muller, J.
 1987 Salt, Chert, and Shell: Mississippian Exchange and Economy. In *Specialization, Exchange, and Archaeology*, edited by E. M. Brumfield, and T. K. Earle, pp. 10-21. New Directions in Archaeology. Cambridge University Press, Cambridge.
- Nash, R. J. and V. P. Miller
 1987 Model Building and the Case of the Micmac Economy. *Man* 34:41-56.
- Nassaney, M. S., and K. Pyle
 1999 The Adoption of the Bow and Arrow in Eastern North America: A View from Central Arkansas. *American Antiquity* 64(2):243-263.

- Nelson, R.
1973 *Hunters of the Northern Forest*. University of Chicago Press, Chicago.
- Nichols, J., and D. Chabreck
1973 A Survey of Furbearer Resources of the Atchafalaya River Flood Plain in Louisiana. *Proceedings of the Annual Conference of the Southeastern Association of Game and Fish Commissioners* 27:152-168.
- Nicholas, G. P.
1988 Ecological Leveling: The Archaeology and Environmental Dynamics of Early Postglacial Land Use. In *Holocene Human Ecology in Northeastern North America*, edited by G. P. Nicholas, pp. 257-296. New York: Plenum Press.
- 1991a Putting Wetlands into Perspectives. In *The Role of Wetlands in Northeastern Prehistory*, pt. I, edited by G. P. Nicholas, pp. 29-38. *Man in the Northeast* 43.
- 1991b Places and Spaces: Changing Patterns of Wetland Use in Southern New England. In *The Role of Wetlands in Northeastern Prehistory*, pt. I, edited by G. P. Nicholas, pp. 75-98. *Man in the Northeast* 43.
- 1992 Directions in Wetlands Research. In *The Role of Wetlands in Northeastern Prehistory*, pt. 2, edited by G. P. Nicholas, pp. 1-9. *Man in the Northeast* 43.
- 1993 Current Research, Northeast. *American Antiquity* 58(3):579-580.
- 1998a Wetlands and Hunter-Gatherers: A Global Perspective. *Current Anthropology* 39(5):720-731.
- 1998b Wetlands and Hunter-Gatherer Land Use in North America. In *Hidden Dimensions: The Cultural Significance of Wetland Archaeology*, edited by K. Bernick, pp. 31-46. UBC Press, Vancouver.
- Nicolas, L.
(environ 1677)1996 Traité des animaux a quatre pieds terrestres et amphibies, qui se trouvent dans les Indes occidentales, ou Amérique septentrionale (extraits). *Recherches Amérindiennes au Québec* 26(2):11-26.
- Nixon, C. M.
1959 *Warm Blooded Vertebrates on a Woodlot in Centre County, Pennsylvania*. M.A., Pennsylvania State University.
- Noble, W. C.
1982 Algonkian Archaeology in Northeastern Ontario. In *Approaches to Algonkian Archaeology*, edited by M. C. Hanna, and B. Kooyman, pp. 35-56. Archaeological Association of the University of Calgary, Calgary.

- Normandin, J. L.
1732 Journal de Joseph Laurent Normandin en 1732. Unpublished manuscript, Archives publiques du Canada et Société historique du Saguenay.
- Odell, G. H.
1988 Addressing Prehistoric Hunting Practices through Stone Tool Analysis. *American Anthropologist* 90(2):335-336.
- O'Shea, J. M.
1984 *Mortuary Variability: An Archaeological Investigation*. Academic Press, Toronto.
- Ozker, D.
1976 The Naugle Site 20MD30, Midland County, Michigan. *The Michigan Archaeologist* 22(4):315-355.

1982 *An Early Woodland Community at the Schultz Site 20SA2 in the Saginaw Valley and the Nature of the Early Woodland Adaptation in the Great Lakes Region*. Anthropological papers, No. 70. Museum of Anthropology, Ann Arbor.
- Pagoulatos, P.
2002 Early Woodland Settlement Patterns: A View from the State of New Jersey. *Bulletin of the Archaeological Society of Connecticut* 64:23-42.
- Papworth, M. L.
1967 *Cultural Traditions in the Lake Forest Region during the Late High-water Stages of the Post-glacial Great Lakes*. Doctoral dissertation, Anthropology, University of Michigan.
- Parker, L. R. B.
1997 The Fitzgerald Site: A Non-Meadowood Early Woodland Site in Southwestern Ontario. *Canadian Journal of Archaeology* 21 21:121-148.
- Parker Pearson, M.
1999 *The Archaeology of Death and Burial*. Stroud, Sutton.
- Parkins, W.
1977 *Onondaga Chert: Geological and Palynological Studies as Applied to Archaeology*. M.Sc. Thesis, Brock University.
- Patterson, T. C.
1971 Chavin: An Interpretation of its Spread and Influence. In *Dumbarton Oaks Conference on Chavin*, edited by E. P. Benson, pp. 29-48, Washington, D.C.
- Penman, J. T.
1977 The Old Copper Culture: An Analysis of Old Copper Artefacts. *The Wisconsin Archaeologist* 58(1):3-23.

Peregrine, P. N.

1996a Introduction: World-Systems Theory and Archaeology. In *Pre-Columbian World Systems*, edited by P. N. Peregrine, and G. M. Feinman, pp. 1-25. Monographs in World Archaeology No.26. Prehistory Press, Madison.

1996b Hyperopia or Hyperbole? The Mississippian World-System. In *Pre-Columbian World Systems*, edited by P. N. Peregrine, and G. M. Feinman, pp. 39-49. Monographs in World Archaeology No.26. Prehistory Press, Madison.

Perrot, N.

1644-1718 *Mémoire sur les moeurs, coutumes et religion des sauvages de l'Amérique Septentrionale*. Bibliotheca americana. A. Franck, 1864, Leipzig ; & Paris.

Petersen, J. B., B. S. Robinson, D. F. Belknap, J. Stark, and L. K. Kaplan

1994 An Archaic and Woodland Period Fish Weir Complex in Central Maine. *Archaeology of Eastern North America* 22:197-222.

Pfeiffer, S.

1977 *The Skeletal Biology of Archaic Populations of the Great Lakes Region*. Archaeological Survey of Canada Mercury Series, Paper 64. National Museums of Canada, Ottawa.

Pétrequin, P., and A.-M. Pétrequin

1992 De l'espace actuel au temps archéologique ou les mythes d'un préhistorien. In *Ethnoarchéologie: Justification, Problèmes, Limites, XIIe Rencontres internationales d'archéologie et d'histoire d'Antibes*, pp. 211-238. Juan-les-Pins: APDCA Editions.

1993 *Écologie d'un Outil: La Hache de Pierre en Irian Jaya (Indonésie)*. Monographies du CRA 12. Paris: CNRS Éditions.

Phillips, P. C.

1961 *The Fur Trade*. 2 vols. University of Oklahoma Press, Norman.

Phillips, P., and G. Willey

1953 Method and Theory in American Archaeology : An Operational Basis for Culture-Historical Integration. *American Anthropologist* 55(5):615-633.

Pleger, T. C.

1998 *Social Complexity, Trade, and Subsistence During the Archaic/Woodland Transition in the Western Great Lakes (4000-400 B.C.): A Diachronic Study of Copper Using Cultures at the Oconto and Riverside Cemeteries*. Ph.D. dissertation, Department of Anthropology, University of Wisconsin, Madison.

2000 Old Copper and Red Ocher Social Complexity. *Midcontinental Journal of Archaeology* 25(2):169-190.

- Plog, S.
1980 Village Autonomy in the American Southwest: An Evaluation of the Evidence. In *Models and Methods in Regional Exchange*, edited by R. E. Fry, pp. 135-146. SAA Papers No.1. Society for American Archaeology, Washington.
- Polyani, K.
1963 Ports of Trade in Early Societies. *The Journal of Economic History* 23(1):30-45.
- Potzger, J. E.
1946 Phytosociology of the Primeval Forest in Central-Northern Wisconsin and Upper Michigan, and a Brief Post-Glacial History of the Lake Forest Formation. *Ecological Monographs* 16:211-250.
- Powell, B. W.
1981 Carbonized Seed Remains from Prehistoric Sites in Connecticut. *Man in the Northeast* 21:75-85.
- Price, T. D. and J. A. Brown
1985 *Prehistoric Hunter-Gatherers : The Emergence of Cultural Complexity*. Studies in archaeology. Academic Press, Orlando.
- Prisch, B. C.
1976 The Divers Lake quarry site - Genesee county, New York. *New York State Archaeological Association Bulletin* 66:8-18.
- Prufer, O. H.
1964 The Hopewell Cult. *Scientific American* 211(6):90-102.
- Quimby, G. I.
1960 The Changing World of the Old Copper Indians. In *Indian Life in the Upper Great Lakes: 11 000 BC to AD 1800*, pp. 52-63. The University of Chicago Press, Chicago.
- Rafferty, S. M.
2002 Identification of Nicotine by Gas Chromatography/Mass Spectroscopy Analysis of Smoking Pipe Residue. *Journal of Archaeological Science* 29:897-907.
- Rappaport, R. A.
1967 *Pigs for the Ancestors: Ritual in the Ecology of a New Guinea People*. Yale University Press, New Haven.
- Rataul, R. C.
2004 *New York State's Garnetiferous Gneiss Bannerstones: The Form and Function of Flight*. M.A. thesis, Department of Anthropology, State University of New York, Albany.

Rathje, W. L.

1971 The Origin and Development of Lowland Classic Maya Civilization. *American Antiquity* 36(3):275-285.

1972 Praise the Gods and Pass the Metates: A Hypothesis of the Development of Lowland Rainforest Civilization in Middle America. In *Contemporary Archaeology: A Guide to Theory and Contributions*, edited by M. P. Leone, pp. 365-392. Illinois University Press, Carbondale.

Redpath Museum

1999 Québec Biodiversity Website. Electronic document, <http://redpath-museum.mcgill.ca/Qbp/introe.html>.

Renfrew, C.

1977 Alternative Models for Exchange and Spatial Distribution. In *Exchange Systems in Prehistory*, edited by T. K. Earle, and J. E. Ericson, pp. 71-91. Academic Press, New York.

1986 Introduction: Peer Polity Interaction and Socio-Political Change. In *Peer Polity Interaction and Socio-Political Change*, edited by C. Renfrew, and J. F. Cherry, pp. 1-18. Cambridge University Press, Cambridge.

Renfrew, C., and P. Bahn

1996 (2nd edition) What Contact Did They Have? Trade and Exchange. In *Archaeology: Theories, Methods, and Practice*, pp. 335-368. Thames and Hudson, London.

Rice, P. M.

1999 On the Origins of Pottery. *Journal of Archaeological Method and Theory* 6(1):1-54.

Ridley, F.

1954 The Frank Bay Site, Lake Nipissing, Ontario. *American Antiquity* 20(1):40-50.

Ritchie, W. A.

1944 *The Pre-Iroquoian Occupations of New York State*. Rochester Museum of Arts and Sciences, Memoir No. 1, Rochester.

1945 *An Early Site in Cayuga County, New York: Type Component of the Frontenac Focus, Archaic Pattern*. Researches and Transactions of the New York State Archaeological Association. Lewis H. Morgan Chapter 10, Rochester.

1946 *A Stratified Prehistoric Site at Brewerton, New York*. Research Records 8. Rochester Museum of Arts and Sciences, Rochester

1949 *An Archaeological Survey of the Trent Waterway in Ontario, Canada and its Significance for New York State Prehistory*. Research Records of the Rochester Museum of Arts and Sciences No. 9, Rochester

- 1955 *Recent Discoveries Suggesting an Early Woodland Burial Cult in the Northeast*. New York State Museum and Science Service Circular 40. The University of the State of New York, Albany.
- 1959 *The Stony Brook Site and its Relation to Archaic and Transitional Cultures on Long Island*. New York State Museum Bulletin 372. University of the State of New York, Albany.
- 1961 *A Typology and Nomenclature for New York Projectile Points*. New York State Museum and Science Service. Bulletin No. 384. University of the State of New York State Education Dept., Albany.
- 1962 The Antiquity of Pottery in the Northeast. *American Antiquity* 27(4):583-584.
- 1965 *The Archaeology of New York State*. American Museum of Natural History, Natural History Press, Garden City.
- 1969a *The Archaeology of New York State*. 2nd ed. Natural History Press, Garden City.
- 1969b *Archaeology of Martha's Vineyard. A Framework for the Prehistory of Southern New England*. Natural History Press, Garden City.
- n.d. The Morrow Site. In *New York State Museum Accession A1956.15*.
- Ritchie, W. A., and D. W. Dragoo
1960 *The Eastern Dispersal of Adena*. Bulletin / State Museum and Science Service ; no. 379. New York (State) University, Albany.
- Ritchie, W. A., and R. E. Funk
1973 *Aboriginal Settlement Patterns in the Northeast*. New York State Museum and Science Service Memoir 20. University of the State of New York State Education Dept., Albany.
- Ritchie, W. A., and R. S. MacNeish
1949 The Pre-Iroquoian Pottery of New York State. *American Antiquity* 15(2):97-124.
- Robbins, M.
1963 Secondary Cremation Burial No. 2, the Hawes Site. *Bulletin of the Massachusetts Archaeological Society* 24(2):30-33.
- 1967 The Titicut Site. *Bulletin of the Massachusetts Archaeological Society* 28:33-76.
- Robertson, J. A., W. A. Lovis, and J. R. Halsey
1999 The Late Archaic: Hunter-Gatherers in an Uncertain Environment. In *Retrieving Michigan's Past: The Archaeology of the Great Lakes State*, edited by J. R. Halsey, and M. D. Stafford, pp. 95-122. Cranbrook Institute of Science. Bulletin 64, Bloomfield Hills, Michigan.

- Robinson, B. S.
1996 A Regional Analysis of the Moorehead Burial Tradition: 8500-3700 BP *Archaeology of Eastern North America* 24:95-147.
- Rogers, E. S.
1962 *The Round Lake Ojibwa*. Occasional Paper 5. Royal Ontario Museum, Division of Art and Archaeology.

1963 *The Hunting Group-Hunting Territory Complex among the Mistassini Indians*. Bulletin 195. National Museum of Man, Ottawa.
- Romanoff, S.
1992 Fraser Lillooet Salmon Fishing. In *A Complex Culture of the British Columbia Plateau. Traditional St'l'áil'imx Resource Use*, edited by B. Hayden, pp. 222-265. UBC Press, Vancouver.
- Rostlund, E.
1952 *Freshwater Fish and Fishing in Native North America*. University of California Press, Berkeley.
- Rouse, I.
1958 The Inference of Migrations from Anthropological Evidence. In *Migrations in New World Culture History*, edited by R. Thompson, pp. 63-68. University of Arizona Bulletin 29. University of Arizona Press, Tucson.
- Sabina, A. P.
1965 *Rock and Mineral Collecting in Canada, Volume III: New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland*. Geological Survey of Canada, Miscellaneous Report No. 8. Department of Mines and Technical Surveys, Ottawa.
- Sagard, G.
(1632) 1976 *Le grand voyage du pays des Hurons*. Éditions Hurtubises HMH (édition originale 1865, Librairie Tross), Montréal.
- Sahlins, M. D.
1958 *Social stratification in Polynesia*. University of Washington Press, Seattle.
- Saint-Germain, C.
1997 *Le Bouillon d'Os*. M.Sc., Anthropology Department, Université de Montréal.
- Salls, R. A.
1989 To Catch a Fish: Some Limitations on Prehistoric Fishing in Southern California with Special Reference to Native Plant Fiber Fishing Line. *Ethnobiology* 9(2):173-199.

- Sanders, W. T.
 1956 The Central Mexican Symbiotic Region. In *Prehistoric Settlement Patterns in the New World*, edited by G. R. Willey, pp. 115-127. Viking Fund Publications in Anthropology 23. Wenner-Gren Foundation for Anthropological Research, New York.
- 1984 Formative Exchange Systems: Comments. In *Trade and Exchange in Early Mesoamerica*, edited by K. G. Hirth, pp. 275-279. University of New Mexico Press, Albuquerque.
- Sanders, W. T., and B. J. Price
 1968 *Mesoamerica: The Evolution of a Civilization*. Random House, New York.
- Sanger, D. and M. A. P. Renouf (editors)
 2006 *The Archaic of the Far Northeast*. University of Maine, Orono.
- Sassaman, K. E.
 1993 *Early Pottery in the Southeast: Tradition and Innovation in Cooking Technology*. University of Alabama Press, Tuscaloosa.
- 1995 The Social Contradictions of Traditional and Cooking Technologies in the Prehistoric American Southeast. In *The Emergence of Pottery: Technology and Innovation in Ancient Societies*, edited by W. K. Barnett, and J. W. Hoopes, pp. 223-240. Smithsonian Series in Archaeological Inquiry. Smithsonian Institution Press, Washington, D.C.
- 1997 Refining Soapstone Vessel Chronology in the Southeast. *Early Georgia* 25(1):1-20.
- 1999 Southeastern Perspective on Soapstone Vessel Technology in the Northeast. In *The Archaeological Northeast*, edited by M. A. Levine, K. E. Sassaman, and M. S. Nassaney, pp. 75-95. Bergin and Garvey, Westport.
- 2002 Woodland Ceramic Beginnings. In *The Woodland Southeast*, edited by D. G. Anderson, and R. C. Mainfort, pp. 398-420. University of Alabama Press, Tuscaloosa.
- Saxe, A. A.
 1970 *Social Dimensions of Mortuary Practices*. Unpublished Doctoral Dissertation, University of Michigan.
- 1971 Social Dimensions of Mortuary Practices in a Mesolithic Population from Wadi Halfa, Sudan. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by B. James A, pp. 42-72. Memoirs of the Society for American Archaeology No. 25.
- Saxe, A. A., and P. L. Gall
 1977 Ecological Determinants of Mortuary Practices: The Temuah of Malaysia. In *Cultural-Ecological Perspectives on Southeast Asia*, edited by W. Wood. Ohio University Center for International Studies, Athens.

- Schortman, E. M.
1989 Interregional Interaction in Prehistory: The Need for a New Perspective. *American Antiquity* 54(1):52-65.
- Schortman, E. M., and P. A. Urban
1987 Modeling Interregional Interaction in Prehistory. *Advances in Archaeological Method and Theory* 11:37-95.
- 1992 The Place of Interaction Studies in Archaeological Thought. In *Resources, Power, and Interregional Interaction*, edited by E. M. Schortman, and P. A. Urban, pp. 3-15. Plenum Press, New York.
- 1996 Actions at Distance, Impacts at Home: Prestige Good Theory and a Pre-Columbian Polity in Southeastern Mesoamerica. In *Pre-Columbian World Systems*, edited by P. N. Peregrine, and G. M. Feinman, pp. 97-114. Monographs in World Archaeology No. 26. Prehistory Press, Madison, Wisconsin.
- Schulting, R. J.
1995 *Mortuary Variability and Status Differentiation on the Columbia-Fraser Plateau*. Simon Fraser University Archaeology Press, Burnaby.
- 1998 Creativity's Coffin. Innovation in the Burial Record of Mesolithic Europe. In *Creativity in Human Evolution and Prehistory*, edited by S. Mithen, pp. 203-226, Routledge, London.
- Scott, W. B., and E. J. Crossman
1973 *Freshwater Fishes of Canada*. Bulletin 184. Fisheries Research Board of Canada, Ottawa.
- Service, E. R.
1962 *Primitive Social Organization: An Evolutionary Perspective*. Random House, New York.
- 1975 *Origins of the State and Civilization*. Norton, New York.
- Shelford, V. E.
1963 *The Ecology of North America*. University of Illinois Press, Urbana.
- Sherratt, A.
1990 The Genesis of Megaliths: Monumentality, Ethnicity and Social Complexity in Neolithic North-West Europe. *World Archaeology* 22(2):147-167.
- Shott, M. J.
1997 Stones and Shaft Redux: The Metric Discrimination of Chipped-Stone Dart and Arrow Points. *American Antiquity* 62(1):86-101.

- Simms, S. R.
1979 Changing Patterns of Information and Material Flow at the Archaic-Woodland Transition in the Northeastern U.S. *Pennsylvania Archeologist* 49(4):30-44.
- Smith, I. F.
1979 Early Smoking Pipes in the Susquehanna River Valley. *Pennsylvania Archeologist* 49(4):8-23.
- Smith, J., Col.
1799 *An Account of the Remarkable Occurances in the Life and Travels of Colonal James Smith, During his Captivity with the Indians in the Years 1755-1759*. J. Bradford, Lexington.
- Snarey, K.
2000 *The Adoption of the Bow and Arrow in Southwestern Ontario: A View from the Smallpoint Archaic*. M.A. Thesis, Department of Anthropology, University of Western Ontario, London.
- Snow, D. R.
1980 *The archaeology of New England*. Academic Press, New York.
- Sonenshine, D., and E. Winslow
1972 Contrasts in Distribution of Raccoons in Two Virginia Localities. *Journal of Wildlife Management* 36:838-847.
- Speck, F. G.
1935 *Naskapi. The Savage Hunters of the Labrador Peninsula*. University of Oklahoma Press, Norman.
- Spence, M. W.
n.d. Untitled manuscript, in the author's possession.
- Spence, M. W., W. D. Finlayson, and R. H. Phil
1979 Hopewellian Influences on Middle Woodland Cultures in Southern Ontario. In *Hopewell Archaeology. The Chillicothe Conference*, edited by D. S. Brose, and N. Greber, pp. 115-121. Kent State University Press, Ohio.
- Spence, M. W., and W. A. Fox
1986 The Early Woodland Occupations of Southern Ontario. In *Early Woodland Archaeology*, edited by K. B. Farnsworth, and T. E. Emerson, pp. 4-46. Center for American Archaeology Press, Seminars in Archaeology, No. 2, Kampsville.
- Spence, M. W., and B. J. Fryer
2004 Hopewellian Silver and Silver Artefacts from Eastern North America: Their Sources, Procurement, Distribution, and Meaning, In *Gathering Hopewell. Society, Ritual, and Ritual Interaction*, edited by C. Carr and D. T. Case, pp. 714-733. New York: Kluwer Academic/Plenum Publishers.

- Spence, M. W., R. H. Phil, and C. R. Murphy
 1990 Cultural Complexes of the Early and Middle Woodland Periods. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by C. J. Ellis, and N. Ferris, pp. 125-169. Occasional Publication of the London Chapter, No. 5. Ontario Archaeological Association.
- Spence, M. W., S. G. Wall, and R. H. King
 1981 Fluorine Dating in an Ontario Burial Site. *Canadian Journal of Archaeology* 5:61-77.
- Spence, M. W., R. F. Williamson, and J. H. Dawkins
 1978 The Bruce Boyd Site: An Early Woodland Component in Southwestern Ontario. *Ontario Archaeology* 29:33-46.
- Springer, J. W.
 1981 Ethnohistoric Study of the Smoking Complex in Eastern North America. *Ethnohistory* 28(3):217-235.
- Staats, F. D.
 1984 Gray Cache. *Pennsylvania archaeologist* 54(3):57-59.
- Starna, W. A.
 1979 A Comment on Curren's "Potential Interpretations of 'Stone Gorget' Function. *American Antiquity* 44(2):337-341.
- Steinbring, J.
 1968 A Copper Blade of Possible Paleo-Indian Type. *Manitoba Archaeological Newsletter* 5(1-2):3-12.
- Steward, J. H.
 1955 *Theory of Culture Change*. University of Illinois, Urbana.
- Stewart, M. C.
 1977 Pits in the Northeast: A Typological Analysis. In *Current Perspectives in Northeastern Archaeology. Essays in Honor of William A. Ritchie*, edited by R. E. Funk, and C. F. I. Hayes, pp. 149-164. Researches and Transactions of New York State Archaeological Association, Vol. 17. New York State Archaeological Association, Rochester & Albany, New York.
- Stewart, R. M.
 1989 Trade and Exchange in Middle Atlantic Region Prehistory. *Archaeology of Eastern North America* 17:47-78.
- Stothers, D. M., and T. J. Abel
 1993 Archaeological Reflections of the Late Archaic and Early Woodland Time Periods in the Western Lake Erie Region. *Archaeology of Eastern North America* 21:25-109.

- Strathern, A.
1971 *The Rope of Moka: Big Men and Ceremonial Exchange in Mount Hagen, New Guinea*. Cambridge University Press, Cambridge.
- Struever, S.
1964 The Hopewell Interaction Sphere in Riverine-Western Great Lakes Culture History. In *Hopewellian Studies*, edited by J. R. Caldwell, and R. L. Hall, pp. 86-106. Scientific Papers 12. Illinois State Museum, Springfield.
- Suttles, W.
1960 Affinal Ties, Subsistence, and Prestige among the Coast Salish. *American Anthropologist* 62(2):296-305.
- Taché, K.
2005 Explaining Vinette I Pottery Variability: The View from the Batiscan Site, Québec. *Canadian Journal of Archaeology* 29(2):165-233.
- Taché, K., D. White, and S. Seelen
in press Potential Functions of Vinette I Pottery. Complementary Use of Archaeological and Py-GC/MC Data. *Archaeology of Eastern North America*
- Taggart, D. W.
1967 Seasonal Patterns in Settlement, Subsistence, and Industries in the Saginaw Late Archaic. *Michigan Archaeologist* 13(4):153-170.
- Tainter, J. A.
1975 Social Inference and Mortuary Practices: An Experiment in Numerical Archaeology. *World Archaeology* 7(1):1-15.

1978 Mortuary Practices and the Study of Prehistoric Social Systems. *Advances in Archaeological Method and Theory* 1:106-141.
- Teit, J. A.
1900 The Thompson Indians of British Columbia. In *American Museum of Natural History Memoirs*, vol. 1(2), edited by F. Boas, pp. 163-390. New York: AMS Press.

1906 The Lillooet Indian. In *American Museum of Natural History Memoirs*, vol. 2(5), edited by F. Boas, pp. 193-300. New York: AMS Press.

1909 The Shuswap. In *American Museum of Natural History Memoirs*, vol. 2(7), edited by F. Boas, pp. 447-789. New York: AMS Press.
- Testart, A.
1982 The Significance of Food Storage Among Hunter-Gatherers: Residence Patterns, Population Densities, and Social Inequalities. *Current Anthropology* 23(5):523-537.

- Thomas, D. H.
1978 Arrowheads and Atlatl Darts: How the Stones got the Shaft. *American Antiquity* 43(3):461-472.
- Thompson, D. H.
1973 Preliminary Excavations at the Hopkins Site (6-LF-1), Warren, Connecticut. *Bulletin of the Archaeological Society of Connecticut* 38:5-24.
- Thompson, R. G., R. A. Kluth, and D. W. Kluth
1994 Tracing the Use of Brainerd Ware through Opal Phytolith Analysis of Food Residues. *The Minnesota Archaeologist* 53:86-95.
- Timmins, P.
1992 The Billiard Site (AhHa-76): A Small Meadowood Component in the Region of Hamilton-Wentworth, Ontario. *Kewa* 92(1):2-19.
- Toll, H. W., T. C. Windes, and P. J. McKenna
1980 Late Ceramic Patterns in Chaco Canyon: The Pragmatics of Modeling Ceramic Exchange. In *Models and Methods in Regional Exchange*, edited by R. E. Fry, pp. 95-118. SAA Papers No. 1. Society for American Archaeology, Washington.
- Tooker, E.
1967 *An ethnography of the Huron Indians, 1615-1649*. Bureau of American Ethnology Bulletin 190. Huronia Historical Development Council and the Ontario Department of Education through the cooperation of the Smithsonian Institution, Washington, D.C.
- Tourtellot, G., and J. A. Sabloff
1972 Exchange Systems among the Ancient Maya. *American Antiquity* 37(1):126-135.
- Tremblay, R.
2003 *Découverte fortuite d'une pierre aviforme, rivière Petite Nation, été 2003. Constat et analyse descriptive*. Report submitted to the Ministère de la Culture et des Communications du Québec, Direction régionale de l'Outaouais.
- Trigger, B. G.
1976 *The Children of Aataentsic: A History of the Huron People to 1660*. McGill-Queen's University Press, Montréal.
- Trigger, B. G. (editor)
1978 *Northeast*. 15. Smithsonian Institution, Washington D.C.
- Trinkaus, K. M.
1984 Mortuary Ritual and Mortuary Remains. *Current Anthropology* 25(5):674-679.

- Tuck, J. A.
 1978 Regional Cultural Developments. In *Northeast*, edited by B. Trigger, pp. 28-43. Handbook of North American Indians. Vol. 15, W. C. Sturtevant, general editor. Smithsonian Institution, Washington.
- 1984 *Maritime Provinces Prehistory*. Canada's Prehistory Series, National Museum of Man. National Museums of Canada, Ottawa.
- Turnbull, C. S.
 1976 The Augustine Site: A Mound from the Maritimes. *Archaeology of Eastern North America* 4:50-62.
- Underhill, J. C.
 1986 The Fish Fauna of the Laurentian Great Lakes, the St. Lawrence Lowlands, Newfoundland and Labrador. In *The Zoogeography of North American Freshwater Fishes*, edited by C. H. Hocutt, and E. O. Wiley, pp. 105-136. John Wiley and Sons Inc., New York.
- Turner, N. J., and D. C. Loewen
 1998 The Original "Free Trade": Exchange of Botanical Products and Associated Plant Knowledge in Northwestern North America. *Anthropologica* 15:49-70.
- Van der Donck, A.
 (1656)1968 *A Description of New Netherlands*. Syracuse University Press, Syracuse.
- Vanderlaan, S.
 1966 The Waterport South Site Ood 3-3. *Morgan Chapter Newsletter (N.Y.S.A.A)* 6:8-12.
- 1967 The Forrestel Site Mda 5-1. *Morgan Chapter Newsletter (N.Y.S.A.A)* 7:1-4.
- Vargo, J., and D. Vargo
 1986 Preliminary Results of Archaeological Investigations Conducted at the Multi-Component Tamarack Site. *Bulletin of the Archaeological Society of Connecticut* 49:1-18.
- Vennum, T.
 1988 *Wild Rice and the Ojibway People*. Minnesota Historical Society Press, St. Paul.
- 2000 Traditional and Social Context of Ricing. In *Proceedings of the Wild Rice Research and Management Conference. Carlton, Minnesota. July 7-8, 1999*, edited by L. F. Williamson, L. A. Dlutkowski, and A. P. McCammon Soltis, pp. 1-7. Great Lakes Indian Fish and Wildlife Commission, Odanah.
- Vernon, W. W.
 1984 New Perspectives on the Archaeometallurgy of the Old Copper Industry. *Masca Journal* 3(5):154-163.

- Versaggi, N. M.
1999 Regional Diversity within the Early Woodland of the Northeast. *Northeast Anthropology* 57:45-56.
- Volmar, M. A.
1996 Maugua the Bear in Northeastern Indian Mythology and Archaeology. *Bulletin of the Massachusetts Archaeological Society* 57(2):37-45.
- Von Gernet, A.
2000 North American Indigenous *Nicotiana* Use and Tobacco Shamanism. In *Tobacco Use by Native North Americans. Sacred Smoke and Silent Killer*, edited by J. C. Winter, pp. 59-80. The Civilization of the American Indian Series. University of Oklahoma Press, Norman.
- Wagner, G. E.
2000 Tobacco in Prehistoric Eastern North America. In *Tobacco Use by Native North Americans. Sacred Smoke and Silent Killer*, edited by J. C. Winter, pp. 185-201. The Civilization of the American Indian Series. University of Oklahoma Press, Norman.
- Wall, L., and R. Kuschel
1975 Burial Customs and Grave Sites on Pre-Christian Nggatokae, Western Solomon Islands. *Archaeology and Physical Anthropology in Oceania* 10(1):55-66.
- Walthall, J. A.
1981 *Galena and Aboriginal Trade in Eastern North America*. Illinois State Museum Scientific Papers, No. 17, Springfield.
- Walthall, J. A., C. H. Webb, S. H. Stow, and S. I. Goad
1982 Galena Analysis and Poverty Point Trade. *Midcontinental Journal of Archaeology* 7(1):137-148.
- Webster, C., E. H. Galbreath, and A. E. L. Drierker
1971 Propagation, Release and Harvest of Mallards at Remington Farms. *Proceedings of the Annual Conference of the Southeastern Association of Game and Fish Commissioners* 25:1-6.
- Webster, G. S.
1980 Recent Data Bearing on the Question of the Origin of the Bow and Arrow in the Great Basin. *American Antiquity* 45(1):63-66.
- 1983 *Northern Iroquoian Hunting: An Optimization Approach*. Ph.D., Department of Anthropology, Pennsylvania State University, State College.
- White, M. E.
1966 The Orchid Site. Ossuary, Fort Erie, Ontario. *New York State Archaeological Association Bulletin* 38:1-35.

Whitney, T.

1967 A Small Blade Cache (Sfg-1). *Chenango Chapter Newsletter (N.Y.S.A.A.)* 9(1):1-10.

1970 Nine Mile Swamp Site (Sgf-2-N). *Chenango Chapter Newsletter (N.Y.S.A.A.)* 11(2):1-12.

Wicks, N. J.

1973 A Preliminary Report on a Late Archaic-Early Woodland Site in Genesee County. *New York State Archaeological Association Bulletin* 59:6-13.

Wiegand, E. A.

1978 The Athena Site (Sfd 1-2). *New York State Archaeological Association Bulletin* 74:10-25.

Wiessner, P.

1982 Beyond Willow Smoke and Dogs' Tails: A Comment on Binford's Analysis of Hunter-Gatherer Settlement Systems. *American Antiquity* 47(1):171-179.

Willey, G. R.

1945 Horizon Styles and Pottery Traditions in Peruvian Archaeology. In *American Antiquity*, pp. 49-56.

1966 *An Introduction to American Archaeology. Volume I: North and Middle America*. Prentice-Hall, Inc., Englewood Cliffs, N.J.

Williamson, R. F.

1978 *Report on Excavations of the Early Woodland Liahn II site (AcHo-2) and Test Excavations at the Peterkin (AcHo-9), Mitchell's Bay, Ontario*. Research Report, No. 8. Museum of Indian Archaeology at the University of Western Ontario, London.

1980 The Liahn II Site and Early Woodland Mortuary Ceremonialism. *Ontario Archaeology* 33:3-11.

1982 The Liahn II Site and Early Woodland Mortuary Ceremonialism. *Ontario Archaeology* 33:3-11.

1988 Report on Archaeological Investigations of the Cashbrown Site (AiHd-42), Lincoln Village Subdivision, Waterloo. *Kewa* 88(3):4-13.

Williamson, R. F., and R. I. MacDonald

1998 *Legacy of Stone. Ancient Life on the Niagara Frontier*. Eastendbooks, Toronto.

Wilson, J.

1993 The Preliminary Investigations at the Pocock Site and the Meadowood Phase Along the Middle Thames Drainage. *Kewa* 93(3):2-22.

1997 *The Middle Thames River Settlement/Subsistence Project, Middlesex County, Ontario*. Submitted to Ontario Heritage Foundation and Ontario Ministry of Citizenship, Culture and Recreation.

Winter, J. C. (editor)

2000a *Tobacco Use by Native North Americans: Sacred Smoke and Silent Killer*. University of Oklahoma Press, Norman.

2000b Traditional Uses of Tobacco by Native Americans. In *Tobacco Use by Native North Americans. Sacred Smoke and Silent Killer*, edited by J. C. Winter, pp. 9-58. The Civilization of the American Indian Series. University of Oklahoma Press, Norman.

Winterhalder, B.

1981 Foraging Strategies in the Boreal Environment: An Analysis of Cree Hunting and Gathering. In *Hunter-Gatherer Foraging Strategies: Ethnographic and Archaeological Analyses*, edited by B. Winterhalder, and E. Smith. Prehistoric Archaeology and Ecology Series. University of Chicago Press.

Winters, H. C.

1959 The Archaic Period. In *Illinois Archaeology*, edited by E. Bluhm. Illinois Archaeological Survey, Urbana.

1968 Value Systems and Trade Cycles of the Late Archaic in the Midwest. In *New Perspectives in Archaeology*, edited by S. R. Binford, and L. R. Binford, pp. 175-222. Aldine, Chicago.

Woodley, P. J.

1997 The Witz and Koeppe II Sites, Ancaster, and the Hi-Lo Occupation of Southern Ontario. In *Pre-ceramic Southern Ontario*, edited by P. J. Woodley, and P. Ramsden, pp. 149-171. Occasional Papers in Northeastern Archaeology No. 9. Copetown Press, Dundas.

Wray, C. F.

1948 Varieties and Sources of Flint Found in New York State. *Pennsylvania Archaeologist* 18:25-43.

1965 Scaccia Site, Cda-17-3: An Early Woodland Site near Cuylerville, New York. *Morgan Chapter (N.Y.S.A.A) Newsletter* 5:3-8.

Wright, H. T.

1964 A Transitional Archaic Campsite at Green Point (20SA 1). *Michigan Archaeologist* 10(1):17-22.

Wright, J. V.

1967 *The Laurel Tradition and the Middle Woodland Period*. National Museum of Canada Bulletin, No. 217, Anthropological series, No. 79, Ottawa.

- 1972 *Ontario Prehistory: An Eleven-Thousand-Year Archaeological Outline*. Canada's Prehistory Series, National Museum of Man. National Museums of Canada, Ottawa.
- 1979 *Quebec Prehistory*. Canada's Prehistory Series, National Museum of Man. National Museums of Canada, Ottawa.
- 1981 Prehistory of the Canadian Shield. *Handbook of North American Indians* 6:86-96.
- 1982 La circulation de biens archéologiques dans le bassin du St. Laurent au cours de la préhistoire. *Recherches Amérindiennes au Québec* 12(3):193-205.
- 1990 Archaeology of Southern Ontario to A.D. 1650: A Critique. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by C. J. Ellis, and N. Ferris, pp. 493-503. Occasional Publication of the London Chapter No.5. Ontario Archaeological Association, Ontario.
- 1994 The Prehistoric Transportation of Goods in the St. Lawrence River Basin. In *Prehistoric Exchange Systems in North America. Interdisciplinary Contributions to Archaeology*, edited by T. G. Baugh, and J. E. Ericson, pp. 47-71. Plenum Press, New York.
- 1999a In the Eye of the Beholder, or What is a Meadowood Point. *Kewa* 99(5-6):20-27.
- 1999b *A History of Native people of Canada. Volume II (1000 B.C.-A.D.500)*. Archaeological Survey of Canada, Paper 152. 3 vols. Canadian Museum of Civilization, Hull, Québec.
- Wright, J. V., and J. E. Anderson
 1963 *The Donaldson site*. National Museum of Canada Bulletin, No. 184, Anthropological series, No. 58. Dept of Northern Affairs and National Resources, Ottawa.
- Yesner, D. R.
 1980 Maritime Hunter-Gatherers: Ecology and Prehistory. *Current Anthropology* 21:727-750.
- Zeisberger, D.
 1910 David Zeisberger's History of the Northern American Indians. In *Ohio State Archaeological and Historical Society* 19, edited by A. B. Hulbert, and W. N. Schwarz, pp. 1-189.