Fitzhugh

Environmental Archeology and Cultural Systems in Hamilton Inlet, Labrador

A SURVEY OF THE CENTRAL LABRADOR COAST FROM 3000 B.C. TO THE PRESENT

William W. Fitzhugh

SMITHSONIAN CONTRIBUTIONS TO ANTHROPOLOGY
NUMBER 16

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SMITHSONIAN INSTITUTION PRESS
CITY OF WASHINGTON
1972

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Library of Congress Cataloging in Publication Data

Fitzhugh, William W, 1943–
Environmental archeology and cultural systems in Hamilton Inlet, Labrador.
(Smithsonian contributions to anthropology, no. 16)
Bibliography: p.
1.Indians of North America—Newfoundland—Hamilton Inlet, Labrador. 2. Eskimos—Newfoundland—Hamilton Inlet, Labrador. 3. Anthropo-geography—Newfoundland—Hamilton Inlet, Labrador. 4. Hamilton Inlet, Labrador—Antiquities. I. Title. II. Series.
GN1.S54 vol. 16 [E78.N72] 917.19'03 79–171589

Official publication date is handstamped in a limited number of initial copies and is recorded in the Institution's annual report, Smithsonian Year.

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $3.50 (paper cover)
Stock Number 4701–0112

ABSTRACT

Fitzhugh, William W. Environmental Archeology and Cultural Systems in Hamilton Inlet, Labrador. *Smithsonian Contributions to Anthropolgy,* number 16, 299 pages, 80 figures, 87 plates, 30 tables. 1972.—This monograph presents the results of a two-year investigation of the prehistoric and contemporary cultural geography of the Hamilton Inlet region of the central Labrador coast. Previously archeologically unknown, this 200-mile estuary cross-cuts the boreal-tundra ecotone and is an area in which there exists contemporary cultural diversity, including Eskimos, Indians, white trappers, and codfishermen. Until recently these cultures maintained distinctly different settlement patterns and economies and existed in basically a hunting and gathering tradition.

These cultures provide models of potential prehistoric cultural diversity for an archeological study involving regional environmental and cultural analysis, which resulted in contributions to culture history, paleoenvironmental studies, and the role of ecology and adaptive configurations in the cultural geography of the region through time. The study is divided into five parts, including methods of cultural ecology, the natural environment, the contemporary cultural environment, the prehistoric cultural environment, and configuration and adaptation patterns.

Two regional sequences for Hamilton Inlet are proposed. The sequence for the forested interior at North West River represents 3500 years of Indian occupation and includes eight cultural units. The Groswater Bay sequence contains nine units which constitute both Indian and Eskimo occupations on the coast, Two of these units—Groswater Dorset and Ivuktoke (Labrador Eskimo)—are Eskimo, while the remainder are Indian and extend back to about 2500 B.C. At least four different cultural traditions are represented in the combined sequences of the two areas. The Maritime Archaic Tradition (2500–1800 B.C.) is the first major occupation. A second Indian tradition is the Shield Archaic of the Canadian boreal forest, here dating to the early centuries A.D. In addition, two Eskimo traditions are seen—Dorset culture of the Arctic Small Tool Tradition (800–200 B.C. in Hamilton Inlet) and Thule-derived Labrador Eskimo, who arrived in central Labrador from the north about A.D. 1500. Other cultural relationships can be seen, but no clear traditions have been defined. The lack of Eskimo culture in central Labrador at the time of the Viking visits indicates that here at least the *Skraelings* were Indians of the Algonkian linguistic stock. Algonkian related cultures can be traced back archeologically to about A.D. 600 in central Labrador.

A functional analysis of nine archeological units resulted in the definition of culture-specific subsistence-settlement systems for these groups. From this emerged a typology and comparative analysis for these systems. Four basic adaptation patterns were identified, including Interior, Modified-Interior, Modified-Maritime, and Interior-Maritime types, as well as three adaptive processes. These adaptation patterns and the processes forming them have changed through time as a result of culture-historical and ecological pressures. Theoretical and descriptive ecological data is presented to explain shifts in subsistence-settlement systems and adaptation patterns. A hypothesis is developed and tested with ethnographic and archeological data which suggests that culture change in Labrador is a reflection of differences in the structures of terrestrial and marine ecology. This hypothesis explains much of the great diversity of the prehistoric Indian populations of the region and supports the contention of more stability for Eskimo cultures of the coast. Finally, it appears that climatic control, operating through changes in the prevalence of forest fires, winter icing of caribou feeding grounds, and shifts of sea-ice distribution, have had important effects on cultural development and diversity.

Preface

It is a rare archeological project that can be carried out without the assistance of a large number of individuals and institutions. The Hamilton Inlet Project was no exception. It is with considerable pleasure that I have reached a stage in the work where I can formally register my gratitude to those who participated actively or passively in any portion of the project. Unfortunately, it is impossible to include all those who deserve thanks. To those who remain unmentioned I also extend my thanks.

The Hamilton Inlet project was made possible by a dissertation grant from the National Science Foundation and two contract grants from the National Museum of Man, Ottawa, Canada. Without their support and confidence the work would not have been done. I would also like to thank those who administered the grants, particularly Miss Lucile Emond of the Harvard University Department of Anthropology and Dr. David Sanger of the National Museum of Man, Ottawa. In addition, I would like to thank Dr. A. D. Tushingham and the Royal Ontario Museum for a grant which enabled me to make a brief archeological reconnaissance in northern Labrador and Quebec in 1969.

I was aided in the field by a most able and congenial survey team. During the summer of 1968 Geoffrey W. Conrad and Peter S. Wells of Harvard University accompanied me on the initial expedition. In 1969 Conrad returned for a second season. Gary Weil of Harvard University and Steven L. Cox of Dartmouth College also joined the 1969 field crew for what turned out to be an excellent season. Besides the very capable archeological work performed by these men, it was a great personal pleasure to live and work with them. In particular, I owe a debt to Geoff Conrad for his knowledge of field techniques and a stimulating personal and intellectual association over the past three years. Conrad's honors thesis (1969) was an excellent and detailed preliminary synthesis of the 1968 collections from North West River and Groswater Bay.

In addition to the field crew, the British Newfoundland Exploration Company (BRINEX) offered us invaluable assistance through the good offices of Mr. Walter Sutton in the form of base camp lodging facilities in North West River in 1968. In 1969 BRINEX again offered logistics assistance through its camp director, Dr. Peter Grimley, and its manager, Mr. Ronald Watts. Murray Piloski kindly gave us the use of his North West River cabin for several weeks in 1969. In addition, we shall always reserve a warm spot in our hearts for Mrs. Margaret Blake, the BRINEX cook. In terms of logistics I would also like to thank Henry Blake of North West River, and John and Curtiss Oliver of Ticoralak Island and Rigolet. In Rigolet, we were greatly assisted by John Shiwak. Special thanks here also are due for the two Hudson's Bay Company factors, Mr. George MacDonald and Mr. Rich Wells. Other services and comforts were provided at various times by the R. B. Dennisons, J. H. Fitzhugh, J. E. Terrell, and Herbert Michelin.

A special note of thanks is due to those who helped with laboratory analyses and technical advice. Foremost among these is Dr. Weston Blake of the Geological Survey of Canada who processed the radiocarbon samples. Dr. Howard Savage of the Royal Ontario Museum identified the faunal material from the Groswater Bay sites. Drs. Blake and D. Hodgson of the Geological Survey of Canada (GSC) and Dr. J. Peter Johnson of Carleton University provided advice on geological matters. Drs. David Sergeant and William H. Drury were consulted concerning ecological questions. Finally, the analysis

of Ramah chert was made possible by the generous assistance of Dr. James B. Griffin, Dr. A. A. Gordus, John A. Walthall, and Thomas Meyers of the University of Michigan in performing the preliminary neutron activation experiments, by Dr. Timothy Meyer of BRINEX for geochemical assays, and by Dr. Stearns A. Morse of Franklin and Marshall College, Lancaster, Pennsylvania, for the petrographic study. Dr. E. P Wheeler, formerly of Cornell University, also lent his considerable geological experience to the Ramah chert problem.

To Dr. Elmer Harp, Jr., of Dartmouth College I owe special gratitude for many close years of association and consultation, including my initial interest and field work in the North. I owe a similar note of thanks to Professor Robert McKennan, also of Dartmouth. Dr. Stephen Williams of the Peabody Museum of Harvard served as counselor and advisor to the project during its initial planning stage and contributed helpful suggestions during the course of writing and analysis. Drs. Clifford Evans and Henry Collins of the National Museum of Natural History, Smithsonian Institution, made many helpful suggestions for the final draft.

My decision to work in Hamilton Inlet grew largely from discussions with Elmer Harp and with Dr. Junius Bird of the American Museum of Natural History. During the course of research I have benefited greatly from suggestions and discussions with a number of anthropologists familiar with the Northeast and eastern Arctic. These include Drs. David Sanger, James Wright, Jorgen Meldgaard, James Tuck, Dena Dincauze, Edward Rogers, Garth Taylor, Georg Henriksen, William E. Taylor, and Henry Collins. While expressing my thanks for these contributions I must, of course, absolve all aforementioned from the shortcomings of the final product.

A large number of individuals helped in the technical production of the report. Miss Vicki Tompkins served as cataloger and laboratory assistant during 1968–1969. Cataloging assistance was also given by Sam Schulman, Miss L. Stowell, and Misses Shaun and Maria Benet. Thanks are also extended to Gary Weil, Herbert Waite, Barbara Westman and the following scientific illustrators of the Department of Anthropology of the National Museum of Natural History: Edward Schumacher, George Robert Lewis, and Marcia Bakry. The photographic work was accomplished initially by Malcolm Musiker, and the final plates were done by Victor Krantz under the direction of Andrew Wynn, Supervisor of the NMNH Photographic Laboratory of the Smithsonian Institution. Miscellaneous assistance was given at various stages of the work by Drs. Daniel Ingersoll, Bruce Bourque, Cynthia Weber, and John Terrell. The major brunt of the typing was done beautifully by Mrs. Virginio Hixon, and editorial expertise was provided by Joan Horn of the Smithsonian Institution Press. Charles L. Shaffer, Production Supervisor of the Smithsonian Institution Press, ably advised me on publication style, format, layout, illustrations, charts, maps, and figures.

Finally, I would like to mention two other people who have contributed to the success of the project. To my wife, Lynne Fitzhugh, I owe great appreciation for the moral support she has given during the past several years. Lastly, I would like to take this opportunity to thank Mr. Donald Charles of Toronto. Mr. Charles spent several years in North West River as the BRINEX camp director in the 1950s, during which he made important collections from several sites which provide much of the data for the North West River sequence. His interest in archeology, particularly in preserving collections and maintaining provenience data, and his willingness to donate his entire collection to the Hamilton Inlet Project, represented a great contribution to the work. It was with great remorse that I learned of his death shortly after receiving his collection. I am sorry that he did not live to see the completion of the project which he had, in fact, begun. I am, therefore, dedicating this volume to Mr. Donald Charles.

W.W.F.

Smithsonian Institution
Washington, D.C.
17 January 1971

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Environmental Archeology and Cultural Systems in Hamilton Inlet, Labrador

A Survey of the Central Labrador Coast from 3000 B.C. to the Present

Introduction

History of Archeological Research

During the late 19th century interest in Labrador grew as the offshore fishing industry expanded into northern waters. It was not long before the now-legendary "lure of the Labrador wild" began to entice travelers to visit its remote coast, peopled with hardy settlers, fishermen, Indians, and Eskimos. Early note of the archeology of the area seems to have begun with these transients, many hailing from New England, and, particularly, from Boston, who often returned south with ethnographic and archeological collections to be housed in the newly created anthropology museums.

The first published report concerning Labrador archeology is the brief note by T. G. B. Lloyd (1874; see also Cooke and Caron 1968 for a bibliography of literature on Quebec-Labrador) on collections and structural evidence from sites in southern Labrador. The first purposeful archeological survey, however, seems to have been made by A. V. Kidder in 1910. Though never publishing his results, Kidder made collections from southern Labrador and Newfoundland, and wrote an article (1927) speculating on a possible preglacial route of early man into the new world via the Labrador Pleistocene refugium postulated by Fernald (1925).

Kidder's work in Newfoundland was followed shortly by archeological explorations in Labrador. In 1927–1928 William Duncan Strong, as a member of the Rawson-Macmillan Subarctic Expedition, made collections from three sites on the central Labrador coast: Windy Tickle, Sharp Hill, and North West Corners. His report (Strong 1930a) postulated an "Old Stone Culture" for Labrador which included a variety of chipped and ground stone points, adzes, celts, semilunar knives and other tools. Strong likened this complex to pre-Algonkian (Red Paint) cultures of the Northeast and to the Beothuks, the extinct "Red Indians" of Newfoundland. Strong felt that the Old Stone Culture, which clearly antedated the recent Eskimos of Labrador, might represent an early Indian culture from which Eskimo culture evolved. Strong's thinking closely followed the ideas of Boas, Rink, Steensby, and Birket-Smith regarding an inland origin for Eskimo culture.

In the same year that Strong worked in Labrador, Junius Bird traveled there as a member of the George P Putnam Baffinland Expedition. Bird later returned to excavate Eskimo houses at Hopedale in 1933 and 1934 and published his work in 1945. His excavation gave important clarification to the antiquity of the Labrador Eskimo occupation in central and southern Labrador. He recognized a succession of house types and concluded that none of the sites was more than 400 years old. Beneath one of the Eskimo houses he found an Indian stone lodge site which yielded corner-notched projectile points at an elevation of 15 feet above sea level. Writing after Dorset culture had become better known, Bird offered an erroneous reinterpretation of Strong's data by viewing the old stone culture as predominantly Dorset. Wintemberg (1930) had earlier proposed that some, but not all, of Strong's collections was Dorset. In addition, Bird (1945:180) felt that Dorset Eskimos, not Indians, had been encountered by the Viking voyagers in Vinland and Markland.

The third archeological investigation in Labrador was Douglas Leechman's 1935 work on Dorset sites in northern Labrador on the McLelan Strait, published in 1943. Leechman may have chosen this area partially as a result of Bernhard Hantzsch's investigations in the area (1931–1932) and his reporting on Eskimo graves which he had excavated in 1906 (1930). Before Leechman's work, which concerned primarily Dorset culture, W. J. Wintemberg (1939, 1940) had recognized Dorset culture in Newfoundland. The major evidence of Dorset culture here, however, comes from Elmer Harp's excavations at Port au Choix, Newfoundland, in the 1950s and early 1960s (1951, 1964, nd).

The last descriptive paper (Harp 1963) on Labrador archeology is based on surveys conducted by Harp

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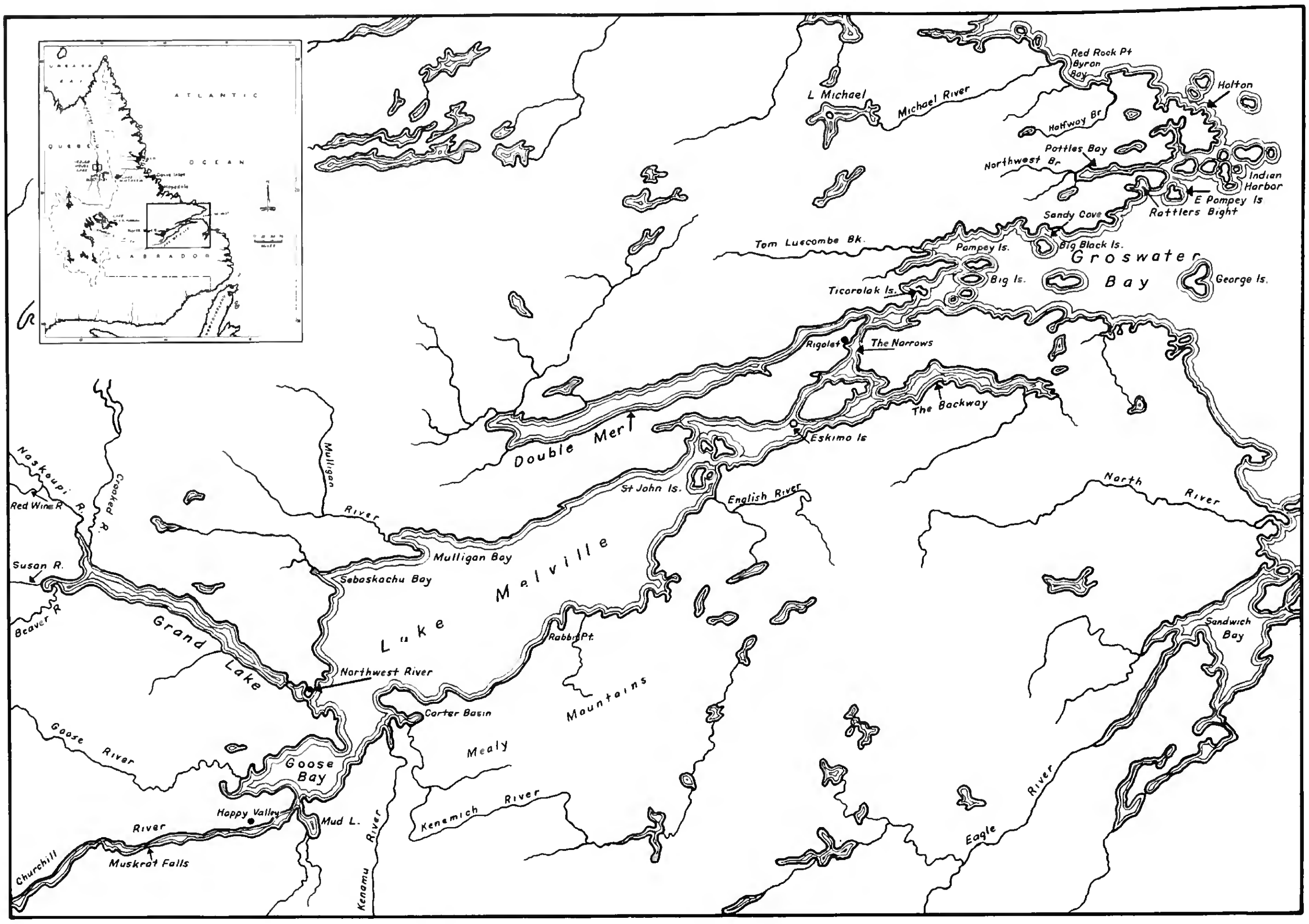


FIGURE 1.—Hamilton Inlet, Labrador.

along the Labrador side of the Strait of Belle Isle in 1949, 1950, and 1961. This report and several radiocarbon dates, published later (Harp and Hughes 1968:44), provide a large amount of new data on Indian cultures in Labrador. Harp (1963:252) classified this material in the Boreal Archaic framework proposed by Byers (1959), and tentatively recognized three potential chronological groupings within the Archaic materials. The early group included several sites with large stemmed points, simple tool inventories, and an absence of ground slate or stone tools. The middle group included a great number of projectile point types and a well-developed series of ground stone tools. The final group was considered late by the absence of ground stone and presence of triangular points of non-Dorset origin. Harp's sequence suffered from the usual problems of mixed components in surface collected materials. While his 1963 paper was a great step forward from the *mélange* of Strong's old stone age culture there was a great need to clarify and further subdivide the Indian sequence. Finally W. E. Taylor, Jr. (1964) has given us a wide-ranging synthesis of the current state of archeology in the Quebec-Labrador peninsula as seen darkly through a haze of blackflies.

To this body of published data can be added the unpublished field research of the following individuals: Jorgen Meldgaard of the Danish National Museum surveyed the Labrador coast for Viking sites in 1956. Shortly after, Helge Ingstad made a similar survey. Both men entered Hamilton Inlet. More recently, Donald MacLeod visited North West River and conducted surveys in the Michikamau area in 1967, 1968, and 1969, while James A. Tuck of Memorial University, Newfoundland, carried on investigations in the Saglek area of northern Labrador in 1969, and 1970. Finally, Father René Levèsque has excavated sites in southern Labrador and Quebec for the Archeological Society of Sherbrooke.

Besides institutional projects, scattered work has been done over the years by amateurs or scientists from disciplines outside of anthropology. These collections are useful for comparative purposes. The most important of all these collections was that of Mr.

Donald Charles from North West River. These, and all other collections known for Labrador, are listed in Appendix 5.

When the Lake Melville Project began, the status of archeological research in Labrador consisted of three broad cultural units of which two of the three —Dorset and Labrador Eskimo—concerned Eskimo inhabitants of the area and seemed to represent relatively short periods of time (Figure 2). Although chronological distinctions were recognized within these units no formal subdivisions of the periods had been made. The third basic unit encompassed the entire span of Indian prehistory of the far Northeast and was termed the Boreal Archaic. Harp had received radiocarbon dates as early as 4200 B.C. (Harp and Hughes 1968:44) from sites in southern Labrador which were associated with cultural material but no diagnostic tool types. Of the three subdivisions of the presumed 4000–5000 year span of the Boreal Archaic only the middle and late groups stood on reasonably secure evidence. Of the two, the late unit characterized by triangular points was probably protohistoric. The Boreal Archaic therefore represented a large span of time and included a variety of cultural materials that could not be sorted into discrete cultural groupings from the data then extant. The unifying principle to the concept of the Boreal Archaic was that it seemed to represent a relatively simple, basic Indian adaptation to life in the subarctic forest, similar to that known from the ethnographic literature.

For many reasons it now seems wise to drop the descriptive unit, Boreal Archaic, from use in Northeastern archeology. Many of the distinctions first proposed by Byers (1959) still remain valid today; however, the use of the term has been extended so broadly as to cover virtually the entire Archaic of the Northeast and it has thus lost much of its integrative value. Recent work in northeastern North America suggests that other, new concepts may be more useful in the future. Among these is the concept of a Maritime Archaic tradition. This idea was first proposed by Byers (1959:255, see also Byers 1962:148–149) in the form of a Boreal Maritime Archaic that, with the interior oriented Laurentian Boreal Archaic, encompassed the major subdivisions of the Boreal Archaic. Unfortunately, this suggestion went unheard in the vacuum of Northeastern archeology. The idea was dropped until it re-emerged in its Maritime Archaic form, suggested by James Tuck (1970) as a result of excavations in a large Indian cemetery at Port au Choix, Newfoundland, in 1968. The strong seasonal marine adaptation of these people and their cultural distribution into the Far Northeast, as well as their affinities to the Moorehead complex of Maine, distinguished this flamboyant, magico-religious culture from the related Laurentian Tradition cultures documented from William A. Ritchie's extensive work in New York State. Although the concept and pertinent data on the Maritime Archaic Tradition are not yet fully defined it appears that it will be a chronologically and spatially distinct cultural unit within the former Boreal Archaic continuum and as such is likely to be a most useful designation.

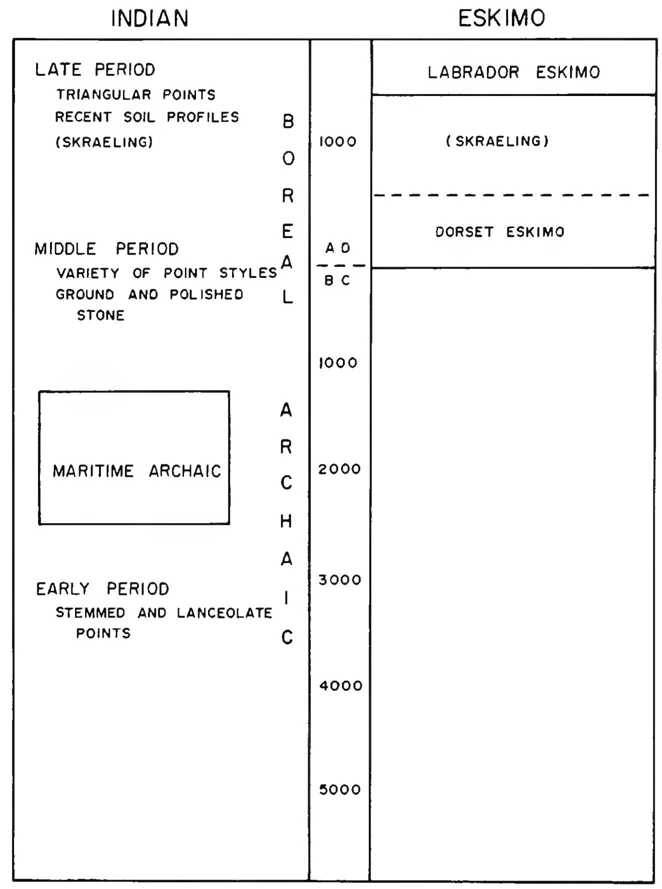


FIGURE 2.—Cultural sequence before the Hamilton Inlet Project. (Compiled from Harp 1963, 1964; Bird 1945; Tuck 1970)

Beside the problem of cultural chronology, there was the nagging problem of the "forest smell" of Dorset culture (Meldgaard 1960). The lingering aroma of this idea is proving remarkably persistent. The history of the "Dorset problem" has been discussed by Harp (1964:7–12), William E. Taylor, Jr. (1959a, 1968), and Douglas Byers (1962) and will not be taken up again here. Suffice it to say that for a long time there has been a feeling, if not a smell, that Dorset culture might have a trace of Indian in its ancestry. This idea grew in the early part of the 20th century after Jenness' (1925) discovery and definition of the Cape Dorset culture and the recognition of its distinctiveness from Thule and modern Eskimo culture in the Eastern Arctic. In addition, the strength of the ethnographic theories of the derivation of Eskimo culture from Indian cultures of the North American subarctic forest, and the influence of early archeology in the northeastern United States which demonstrated some similarities between these pre-Algonkian cultures and Eskimo culture, suggested that Dorset culture may have evolved from an early Indian culture of the Northeast. Strong (1930a:142) put forth this hypothesis in interpreting the Labrador materials as Indian progenitors of Eskimo culture. Later, initial hypothetical relationships between Dorset and Laurentian (Hoffman 1952) were dispelled by radiocarbon dates (Byers 1962:151). Meldgaard's data from Igloolik, however, have caused renewed caution in disclaiming complete independence in Dorset origins. Recent work on the east coast of Hudson Bay by Elmer Harp has not turned up any suggestion of Dorset-Indian contact or diffusion, nor is there any suggestive data in northern Labrador-Quebec at the proper time period. It seems logical, therefore, to investigate the remaining unknown frontier on the eastern side of the peninsula.

Finally, there was a series of problems which has concerned ethnologists in the Far Northeast for many years. Some of these problems, such as the disputed claim for inherited family hunting grounds among the prehistoric Montagnais would be difficult to deal with archeologically. Others, like Beothuck origins and the Algonkian problem (Howley 1915, Jenness 1929) would be more susceptible to treatment with the direct historical approach. After Strong's paper (1930a) interest in the ethnographic theories of Eskimo origins waned and archeological data shifted the focus of this problem into the Western Arctic.

Research Objectives

Despite the work of Strong, Bird, Leechman, and Harp the culture history of Labrador is still largely unknown. Perhaps the most pressing problem was the definition of units within the Indian prehistory. Other problems included the possibility of a pre-Dorset occupation of the Labrador coast, the appearance and terminal dates of Dorset culture and its relationship with contemporary Indian culture, and the nature of early Labrador Eskimo settlement of the central coast. An investigation of these, and other questions by the Hamilton Inlet Project will fill a conspicuous gap in the prehistory of eastern Canada at a time when increasing anthropological interest in the Northeast demands links between arctic, boreal, and temperate zones (Campbell 1962).

Geographic and environmental considerations were also important. Labrador is a "bridging zone" between the southern temperate forests and the arctic barrens. Boreal and arctic environments are juxtaposed here along the coast of Labrador for a distance of nearly 800 miles. Owing to a strip of coastal tundra which is backed a few miles inland by boreal forest, these different environments are easily accessible one from the other, constituting a lengthy contact zone in which cultures might adapt to a variety of habitats. Thus, forest-adapted peoples could utilize coastal resources which are essentially arctic in nature without the specialized adaptations required for true arctic life; conversely, arctic-adapted peoples could subsist in the tundra coastal zone as far south as the Gulf of St. Lawrence, utilizing arctic marine resources while also taking advantage of the interior forest environment. In such an environment there are increased possibilities of the evolution of new cultural adaptations, in addition to interesting possibilities resulting from cultural exchange across an ecological and cultural "tension zone."

Hamilton Inlet was chosen as the area of study because it represents, in microcosm, many of these contrasts within an inlet barely 150 miles in length. The inlet delimits the northern boundary of the continuous close-crown boreal forest and contains a wide variety of microenvironments of potential usefulness to man. Its geographic position suggests it would have been an important transportation route between the coast and the interior during prehistoric times, just as it is today. Besides this, it presented a unified geographic area, ideal for limited regional study, and was accessible to a mobile field party. Logistic problems were simplified by regular air service to Goose Bay from Montreal. In addition, there were four settlements—Happy Valley, North West River, Rigolet, and Smokey—to provide supplies, medical assistance, and local information, and a distribution of contemporary fishing and trapping camps along the shores of the inlet to facilitate local arrangements.

From another point of view, Hamilton Inlet was an interesting area in which to investigate the relationship between prehistoric cultures and their environment. The ecological peculiarities of the area provide a wide range of possible adaptations susceptible to analysis by the method of cultural ecology. The presence of different cultural traditions adapted to the interior and the coastal environment in ethnographic times promised to be a useful point of departure for studies of prehistoric cultural ecology.

Culture history.—The first objective of the Hamilton Inlet Project was to formulate a cultural sequence for the area. At the time research began it was known that the ancestors of the Labrador Eskimo and Montagnais-Naskapi Indians must have inhabited the coast and interior. Bird (1945) had demonstrated the recent arrival of the Labrador Eskimo. Furthermore, it could be assumed that Dorset peoples must have inhabited Labrador since they were present in Newfoundland. The presence of chipped and ground stone tools in Strong's and Harp's collections indicated the presence of Laurentian Archaic peoples. Beyond this, all was conjecture.

The Hamilton Inlet research aimed first to construct an archeological sequence for the central coast of Labrador, which would serve as a general cultural framework for future studies here and elsewhere in Labrador. Chronological periods and cultural phases would be defined, and cultural traditions would be isolated and described in terms of culture and ecological areas and core features.

Within the area of culture history a particular problem was singled out for special attention: Eskimo and Indian contacts across the forest-tundra zone. Particular emphasis was to be given to the relationship between Dorset and its contemporary Indian cultures, and between Labrador or Thule Eskimo and recent Indians.

PALEOETHNOGRAPHY.—The second objective was to make a synchronic cultural analysis of specific sites with the aim of extracting from the archeological remains evidence of former social and behavioral patterns. These would then be integrated into an ethnographic framework to portray the culture as it existed in the past. Important features of this analysis would be settlement patterns, activity functions, technological processes, tool typology and function, economic adaptations, seasonal rounds, social groupings, and trade. It is felt that this type of cultural analysis, as well as typological analysis for chronology, should be a concurrent aspect of archeological work even though the field operation would be primarily a regional survey. Attempts to learn how societies function should not remain until all chronological problems have been solved. This aspect of the analysis would be important for an understanding of cultural systems and adaptations in Hamilton Inlet.

CULTURAL ECOLOGY.—Finally, the environmental diversity of Hamilton Inlet lends itself to ecological studies aimed at understanding cultural adaptations in a wide variety of habitats. This aspect of the project would investigate cultural variability as it relates to environment in both synchronic and diachronic terms. Thus, the effects of seasonality and scheduling of resources by man would enable better understanding of settlement patterns at a given time; while long term environmental change or ecological fluctuation might help explain culture change. The basic query is the nature of the relationship between man and his environment, and how this relationship changes in time and space as it relates to cultural adaptation or environmental change. The method of cultural ecology used in this study is described in detail on pages 9–11.

Data Categories

FIELD SURVEYS.—The basic data of the project was gathered over two field seasons (Fitzhugh 1969a) during which much of Hamilton Inlet was surveyed for archeological, environmental, and ethnographic information. An attempt was made to investigate as many different environmental and geographic areas as possible to achieve a reasonable sample of the total range of cultures and ecological zones. While it was not possible to survey the entire inlet, many representative regions were inspected: the lower Naskapi River, Grand Lake, North West River, western Lake Melville (excepting Goose Bay), the southern shore of Lake Melville, the Narrows, and the north shore and islands of Groswater Bay (Figure 3).

In general, surveys were conducted by coastal reconnaissance. Transportation was provided by an outboard motor boat small enough to be hauled up on the beach during stormy weather. Usually a camp was set up at a strategic location near a river mouth or cove, and the surrounding region was surveyed by boat or on foot. In the forest it is nearly impossible to travel except along waterways; on the coast overland travel is also feasible. In both environments desirable site locations could be located by analysis of air photos or maps, or by visual inspection from the water. In general, these locales were near river mouths, on bluffs overlooking the water, on exposed marine terraces, portage routes, or islands. On the coast, protected harbors and coves with sandy beaches or tombolo terrace formations were the most promising locations. An unfortunate element of coastal survey is the skewing of the sample away from interior sites. Interpretation of the resulting data must take this into account, especially in the loss of winter sites. On the other hand, interior surveys are often frustrating and unrewarding.

Since the survey nature of the project required gathering data on as many environments as possible it was necessary to strike a balance between the sometimes conflicting requirements of remaining to investigate extensively a good site and the equally pressing urge to move on to a new area to extend the chronological and spatial coverage of the survey. Often, interesting problems had to be abandoned for lack of time.

During the two field seasons, travel within Hamil-

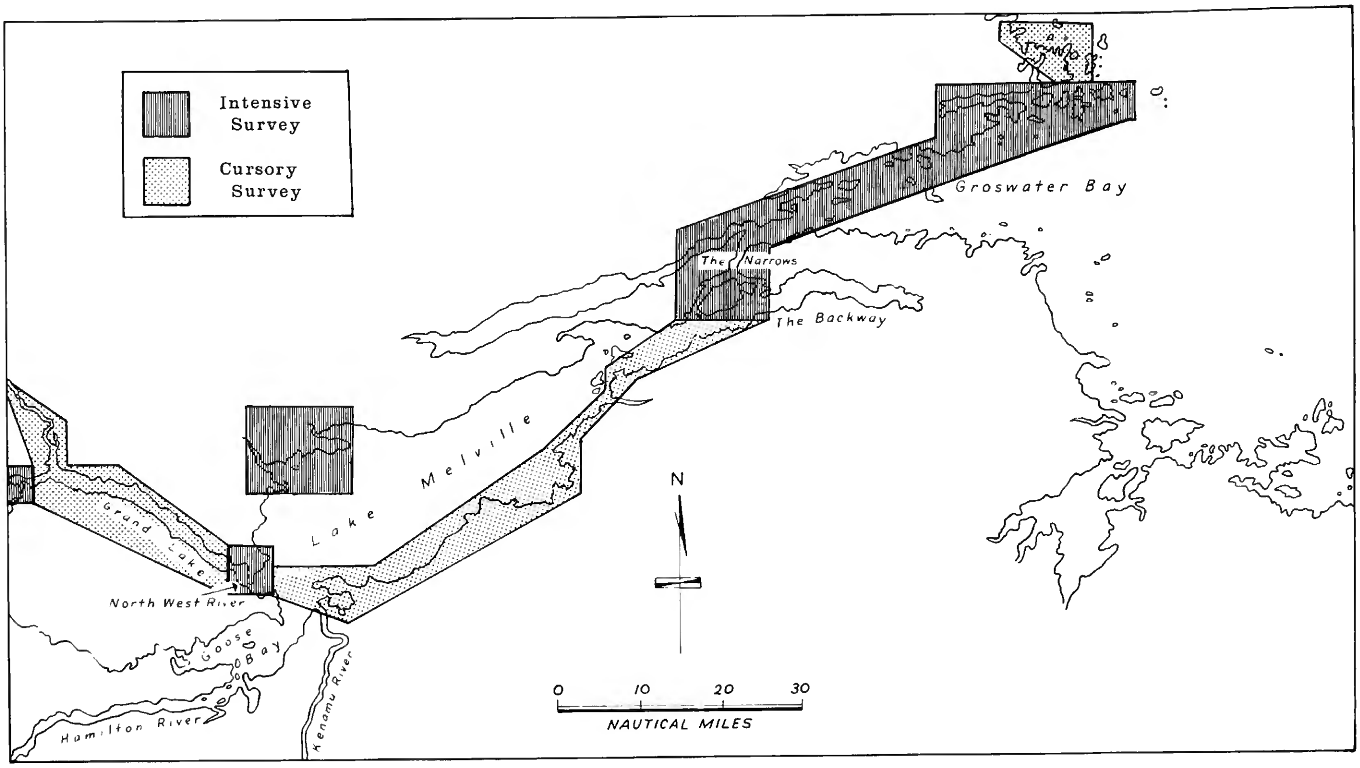


FIGURE 3.—Areas surveyed by Hamilton Inlet Project in 1968 and 1969.

ton Inlet amounted to some 2000 miles, of which 1500 were by outboard and the remainder by steamer or trapboat. Of the 157 days in the field, 103 were spent in survey or excavation, while 54 were lost to stormy weather or logistics. Weather is always a force to be reckoned with, especially when small boat travel is required. It is particularly annoying to be landlocked on an archeologically unrewarding area by windstorm, when the weather is otherwise beautiful.

ARCHEOLOGICAL DATA.—Archeological information was gathered from three sources. The first was surface collections. These data can be useful for indicating the presence of nearby sites, extending the geographic range of materials of a culture or period, and for typological comparisons. Unfortunately, natural exposures rarely occur in the forest zone, and our surface collections come mainly from the coastal tundra regions. In some cases these collections are mixed, making cultural complexes difficult to perceive. By mapping the precise locations of the artifacts and chipping debris, however, it is often possible to discover spatially distinct components by typological or technological comparisons, or in different patterns of raw material usage. In general, surface collections at a site appeared to represent single components.

Excavated materials provide the bulk of information for cultural complexes and chronology. Sites were excavated to the extent that time and circumstances allowed, but in many cases broad excavation could not be undertaken. In all cases, all cultural material was mapped and retained, and particular attention was given to the collection of datable carbon samples.

A final category of archeological data included settlement data. This information was generally less available for prehistoric sites, but the historic periods have considerable evidence of this type. Historic Eskimo evidence included winter sod houses, burial cairns, and summer tent ring camps. From these data functional and seasonal use of sites could be determined. Indian sites were similarly studied, though with more difficulty due to forest regeneration.

ENVIRONMENTAL DATA.—A second source of data was geographic and ecological information. Local geology was observed, especially data regarding postglacial uplift and marine limits; shell samples were collected to date raised beaches; and the effects of uplift on geography were investigated. Local inhabitants were questioned about available resources, seasonality, and hunting and fishing techniques; information on winter ice conditions was elicited.

A study of the contemporary environment was made to determine contemporary resource areas. Distributions of animal, plant, and fish species were noted as well as their seasonal availability and abundance. Finally, data bearing on climatic or environmental change were collected. These more random observations could be tied into the local pollen sequence and related to data from archeological sites.

ETHNOGRAPHY.—The final category of field data is the ethnographic evidence collected from local Indians, Eskimos, and settlers. This includes information on contemporary and recent settlement patterns, seasonal rounds, and economic resource areas. Specific adaptations were noted, as well as political or social factors operating to shift contemporary patterns of exploitation away from those more typical before 1945. From these data it is possible to establish current ethnographic patterns of exploitation which can be compared with natural environmental areas. A combination of the two provides an ecological model useful for interpretation of prehistoric cultures.

PRE-EXISTING DATA.—The remaining data used in this thesis comes from existing archeological collections from Labrador, the extant literature, and from personal knowledge of individuals with experience in the area. Although pertinent archeological collections from Hamilton Inlet are scarce, there is a fairly large body of literature dealing with the physical environment. Unfortunately, the ethnographic literature on Hamilton Inlet is sparse, and chiefly concerns Indian culture of the present day; there is almost no data on the Hamilton Inlet Eskimo.

RESEARCH DESIGN

Subsistence-Settlement Systems

One of the fundamental assumptions in the study relating man to his environment is that man is part of an ecosystem, that he cannot live without it, and that he is in part limited by the environment or by the extent of his ability to alter it. A second assumption is that culture can be analyzed as a superorganic system and that it is man's chief means of survival, resulting in successful adaptations in almost every conceivable portion of the globe. Culture is, therefore, an adaptive system which articulates with the environment through a complex set of patterned relationships. Following Stuart Struever (1968:136), this occurs within two environmental milieus, one of which is biophysical, the other social. Anthropological investigation of culture must therefore concern itself with both aspects of the environment.

For archeologists, the bulk of evidence from prehistoric societies concerns the biophysical realm. The most accessible and direct relationship between a culture and its environment is expressed in its technological and economic adaptations, and those cultural forms most closely related with these pursuits. This primary level is clearly portrayed in a culture's *subsistence-settlement system* (Struever 1968: 135). The core of this system consists of a set of techniques used to extract biological energy from the environment, combined with a settlement system adapted to maximize the harvest of this energy as it shifts seasonally or geographically within the environment. Although primarily determined by technology, economy, and resource potential, other factors contribute to the formation of a distinctive seasonal pattern, or "round," in an annual cycle. Weather and geography are important determinants of settlement locations, as is also the need for social interaction with a larger group.

The basic unit of the subsistence-settlement system is the settlement, which can be defined as an occupation of a particular geographic locus by one or more individuals for any amount of time that alteration of the natural environment results. Campbell (1968: 15) would add that the occupation should fall within the "ordinary, expected and predictable round of activities of the society in question." A settlement may be any locus of human activity resulting in archeological remains, and for practical purposes this usually means a dwelling area or a functionally specific activity area, such as a manufacturing workshop, a kill site, or a quarry.

These activities often result in the deposition of physical residues patterned such that similar activities produce a similar structure of material remains. From these remains one should be able to infer the function and possibly the season of occupation of the settlement. In other words, the patterned structure of material remains should correspond with a similarly patterned configuration of exploitative and maintenance activities. It is thus predictive and indicative of that activity. Such a specific activity identifies a functional settlement type, for instance, a salmon fishing site located on a river during early summer, and occupied by a small group of people.

The annual cycle of a society results in a series of different settlement types, each identifiable by functional or formal variation in archeological remains. The spatial distribution of these sites is the settlement pattern, or the way in which a society is segmented and partitioned to exploit the environment. Together, different settlement types and exploitative technology compose the subsistence-settlement system that characterizes a society's adaptation. This system provides the anthropologist with a corpus of data with which to investigate cultural-ecological relationships for a single society at one time or over a period of time.

Continuing, the subsistence-settlement system is unique to the society and can be considered area-bound within the territory utilized by the group during the course of the year. The corresponding social unit at this level would be the largest social group that normally has face-to-face contact for at least some period of the year. This unit is generally taken to be the "band" in northern studies (Helm 1969). The subsistence-settlement system, therefore, links a particular territory to a social group and a subsistence system. This association is usually relatively stable for that group through time.

A particular subsistence-settlement system cannot, however, be generalized beyond the limits of the social unit and the regional environment to which it is adapted. Other neighboring groups may have a similar basic adaptation, but their subsistence-settlement systems will differ slightly due to environmental and social variation, even though the groups in question may share similar genetic, linguistic, and historic traditions. Environmental differences and related differences in ecological adaptations may result through time in specialization, cultural variability, and diversification. Eventually this process may result in the formation of distinct and separate cultural entities. The differences between the Caribou Eskimo culture and the coastal Eskimos of the central Arctic seem to have arisen through the intensification of inland hunting and a corresponding reduction of the marine economy in the annual cycle, until the two groups became culturally distinct (Harp 1961:68).

It is in this sense that Vayda and Rappaport (1968: 494) caution that ecological studies in anthropology should deal with human populations, not cultures, within particular ecosystems and biotic communities. "Human populations as units are commensurable with the other units with which they interact to form food webs, biotic communities and ecosystems." This perspective is lost if "cultures" are made the units, "for cultures, unlike human populations, are not fed upon by predators, limited by food supplies, or debilitated by disease."

Analytical Units

Since archeologists deal with culture, or the material remains of culture, and not with human populations, it is necessary to infer these population units from the data. This means that the regional subsistence-settlement system, based on an ethnographic view of culture, must be the focal point of analysis since it alone enables the archeologist to focus on specific adaptations of a particular society in a given environment, and to contrast this with cultural systems which may be spatially of chronologically distinct. This endeavor was a major objective of the archeological program in Hamilton Inlet. Only this type of study will achieve an understanding of cultures as they existed in the past and the adaptations and specializations that gave rise to cultural change.

Such a study of prehistoric cultural ecology necessitates a critical examination of the archeological concept of culture which is generally based on material culture and broad formal similarities in artifact assemblages (Willey and Phillips 1958). This concept is too restrictive for detailed studies of culture in ethnographic and ecological contexts. To understand cultural variation and the processes of culture change, a more refined concept, or series of concepts, must be applied to prehistoric remains. Such a concept would emphasize specific cultural adaptations, or adaptation complexes, would specify particular and limited geographic areas corresponding to those used by distinct social units, and would bring ethnographic categories to bear on the interpretation of materials and the structure of physical remains. Instead of being viewed in a typological sense, material culture and structures would be interpreted functionally as part of the total cultural system according to ethnographic function, group size, social unit, and other factors (see pages 136–138).

An ethnographically derived cultural ecology also entails a re-direction of spatial concepts of interpretation so that they too would correspond more closely with environmental and ethnographic realities. In this case, "microenvironment" would signify an area with a certain range of economic opportunities, in which certain settlement types would occur; "region" would signify the territory utilized by a group within its annual cycle, corresponding to the area encompassed by the subsistence-settlement system; and "culture area" would signify the sum total of regions inhabited by societies with closely related cultures. Within this structure it is not necessary to assume cultural homogeneity within a microenvironment, region, or culture area. In the past, the inability to cope with cultural variability has been the major weakness of the culture area concepts. Indeed, within the framework suggested here environmental and cultural variation would characterize such spatial units, and, as in a gene pool, would serve as a major source of cultural innovation.

Recently several new concepts useful in ecological theory in anthropology have been proposed by Rappaport (1969). He suggests a dual distinction between spatial and population concepts. In the population field he views the primary genetic and cultural unit occupying a specific geographic area, usually equivalent to the tribe or band, as the "local population," while the larger population unit of which it is a part and which constitutes the gene pool of closely related cultures is the "regional population." On the other hand he makes the spatial distinction between the "immediate environment" which corresponds to the local population area, and the "non-immediate environment," which corresponds to the regional population area which is also utilized to some extent by the local population during the course of trade, acquisition of special raw materials, long distance social contacts, and other activities.

Archeological Strategies

From the several archeological strategies of cultural ecology now being developed, a combination of three was used in the Hamilton Inlet study.

ENVIRONMENTAL ANALYSIS.—Karl Butzer (1964:337–341) has formulated a method to help elucidate the land-man relationship in prehistory. He stresses the need for a broad understanding of the geographic environment by utilizing data from interdisciplinary studies in physical, biological, and anthropological sciences. His method proceeds through three levels: regional analysis of climate, physiography, vegetation, and geology; regional resource studies; and local setting studies of the site area itself.

Butzer's method has some similarities to a method of aerial photographic interpretation being developed by Elmer Harp of Dartmouth College and scientists of the U.S. Army Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire (Harp 1966, 1968a, 1968b; Fitzhugh 1967). This technique, based on the identification of culturally anomalous features in the natural landscape as revealed in air photo images, also proceeds through regional and local analysis to increasingly fine grained studies of the biophysical realm.

MICROENVIRONMENTAL STUDIES.—Several other projects utilize different approaches to regional surveys, such as the work of Flannery, M. D. Coe, MacNeish, and Struever. These studies have been directed mainly at incipient food production or agricultural societies, and none deals extensively with hunting and gathering peoples.

Coe and Flannery (1964:651, 1967) employed a three-stage method for studying cultural ecology from the standpoint of microenvironments. Predicating their work on the assumption that the environment has been constant in their area, they analyzed the present microecology, conducted a quantitative study of food remains from archeological sites and the associated exploitative technology, and then correlated the environmental and cultural aspects of the research. The importance of scheduling seasonally available resources was stressed in determining adaptation patterns. Their method has been more fully explicated on coastal Guatemala (Coe and Flannery 1967).

SUBSISTENCE-SETTLEMENT SYSTEMS.—According to Struever's method discussed above, environmental reconstruction is an essential part of the study. Struever, however, does not utilize ethnographic information to a large extent. His emphasis is on regional surveys involving intensive surface collections and excavation aimed at discovering site distributions within microenvironments, and defining functional variation within and between subsistent-settlement systems.

Cultural Ecology in Hamilton Inlet

The following research design for the Hamilton Inlet Project was derived and modified from the foregoing environmental and ecological strategies in anthropology. The seven major phases of research (Figure 4) presented below illustrate a rather eclectic process of investigation based on a variety of information, including the preexisting literature and field data. In part also, these steps document the evolution of the research design as the project progressed through the planning, data collection, analysis, and interpretation phases. Prior to field work, only the strategy of environmental analysis and a general approach to settlement pattern and historical data existed in the plan. The scope of the project was broadened as the nature of the data became clear and new problems and hypotheses came to the fore.

PHASE I REGIONAL ANALYSIS.—Hamilton Inlet was taken as the basic unit of study, and the first phase of the research consisted of a regional analysis of its climate, topography, geology, vegetation, and hydrography to identify broad patterns in the natural environment, and to understand their interrelationships. The data came from both field observations and the published literature. An important aspect of regional analysis involved the use of aerial photography which permitted the identification of environmental zones, areas of contemporary cultural activity, prospective

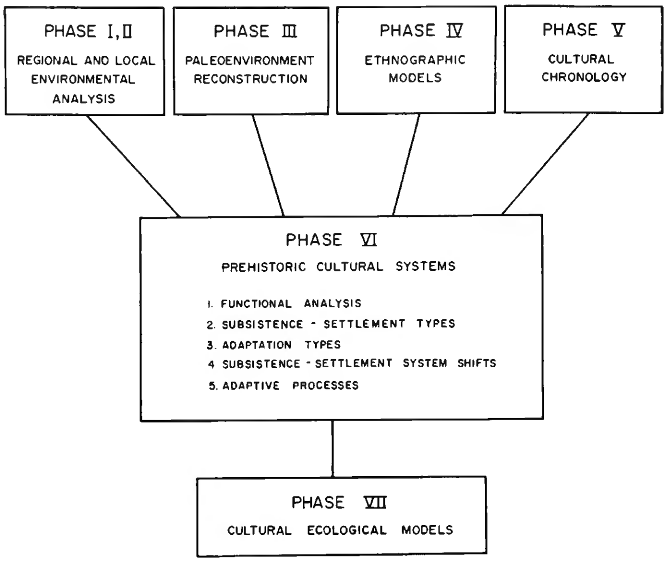


FIGURE 4.—Hamilton Inlet research strategy.

site locations, and the establishment of a field schedule. The photos also served as field maps and were invaluable for purposes of navigation.

PHASE II LOCAL ANALYSIS.—After achieving a basic understanding of the general environmental conditions, an intensive study was undertaken to identify at the microenvironmental level natural resource areas, faunal distributions, patterns of biological seasonality and resource scheduling, geographical details, and specific environmental conditions. Most of this type of information had to be gathered from informants and from personal observations.

PHASE III CONTEMPORARY PATTERNS OF EXPLOITATION.—Five cultures are presently represented at Hamilton Inlet. These are Eskimo, Indian, white trappers, "liveyere" fishermen, and Euro-Canadians. The latter group includes medical and armed forces personnel, government officials, and immigrants from the south. Unlike the indigenous groups, their culture is largely imported and is of little use in analyzing local patterns of exploitation. The other groups, however, exploit much of the total range of the environment, and with the exception of the outboard motor, the rifle, and the iron trap, do so at what is essentially an aboriginal hunting and gathering level. Information on technology, economic adaptations, seasonal movements, resource areas, and culture areas was extracted from the literature, field observations, and informants to develop models of ethnographic subsistence-settlement systems. The systems were then compared with the results of regional and local environmental analysis and the archeological data.

PHASE IV PALEOENVIRONMENT AND GEOGRAPHY.—Reconstruction of the paleoenvironment of Hamilton Inlet was an important aspect of the research due to the considerable environmental change that has taken place here since postglacial times. Pollen studies were available for vegetation and climatic history. Paleogeographic reconstructions were made by tracing topographic and geographic changes at various stages of isostacy, and from these it was possible to suggest hydrographic and ecological changes through time. Unfortunately, the best means of reconstructing the faunal environment, that of paleontology and the study of faunal remains in archeological sites, was of little use due to the paucity of animal remains preserved in the subarctic podsols. The use of ecological models from other regions in Labrador provided some insight into the past history of the inlet.

PHASE V CULTURE HISTORY.—Reconstruction of a working cultural sequence was developed in the form of two regional sequences, one for western Lake Melville and the other for Groswater Bay and the Narrows. Four separate lines of evidence were used in developing the chronology: typology and external relations, lithic patterns within the sites, relative elevation, and absolute dates. This chronology was not considered an end in itself but a means of exploring other problems of cultural development and process and evaluating the influence of climate on environment and culture.

PHASE VI PREHISTORIC CULTURAL SYSTEMS.—The aim of this phase of the research plan was to reconstruct prehistoric cultural systems for the various archeological units defined within the sequence and also to abstract from these systems general developmental trends and relationships between culture and environment. This aspect of the research is almost exclusively interpretive and rests on the combined results of the previous phases. It focused on cultural adaptations and subsistence-settlement systems and was based on a functional analysis of each archeological unit. The study proceeded in the following steps.

Functional Analysis: Each of the units was studied in terms of the percentage composition of various tool types within the assemblage from each site. Technological and economic characteristics were defined, along with the settlement pattern and the subsistence-settlement system. The ethnographic data from the Phase II study filled out the picture by providing models of various cultural systems used in this environment.

Subsistence-Settlement Types: Subsistence-settlement systems for the archeological units were examined and recurrent patterns were grouped into subsistence-settlement types, of which four varieties were defined. Within these types, subtypes were created for more detailed description of a culture's adaptation.

Adaptation Types: Further abstraction from the data revealed basic adaptation types, which have governed the orientation of subsistence-settlement systems in Hamilton Inlet. These types were described in terms of their central focus and the manner in which the environment was utilized.

Subsistence-Settlement Shifts: Changing adaptations through time have resulted in the emergence of different subsistence-settlement systems. Identification of these changes and the sequence they followed suggested possibilities of interpreting cultural continuity or discontinuity, developmental trends, and the role of environmental change or external cultural factors. Shifts in system types were compared with culture-historical evidence of change.

Adaptive Processes: The final step in the investigation of prehistoric cultural systems was the abstraction of adaptive processes from the characteristics of the subsistence-settlement systems and their shifts through time.

PHASE VII CULTURAL-ECOLOGICAL MODELS.—The last aspect of the research design was evaluation of the relationships between culture and environment through time in order to explain some aspects of the culture history of the northern portion of the Labrador-Quebec peninsula. Various historical models were applied to the archeological data to determine which, if any, explained particular cultural events or general patterns or trends seen in the foregoing analysis. The most accessible models included developmental, migration, diffusion, and extinction models. Ethnographic analogy was also projected onto the archeological panorama. Finally, these models were examined with respect to environmental data relating to stability or instability of terrestrial and marine ecosystems under the influence of climatic and cultural pressure. From this, hypotheses emerged which elucidated prehistoric events and known ethnographic conditions.

Physical Environment

ENVIRONMENT

Labrador Panorama

As an introduction to the environment of Labrador it may be helpful to present a glimpse of the principal ecological zones as seen by an airborne observer flying from the Gulf of St. Lawrence to northern Labrador. Approaching the southern coast of the peninsula from the south one remains unaware of a most important feature of the environment, its rich marine resources. At the time of Cartier's exploration the abundance of cod, seal, whale, and walrus was immense, and aboriginal use of these resources is well documented (Hoffman 1961). Once over land, however, the environment is more readable. The southern coast of the peninsula rises slowly from the Gulf of St. Lawrence mantled with a thick forest of spruce mixed occasionally in burned areas with patches of alder, aspen, birch, and white pine. Numerous youthful rivers dissect the southern slope, rising in narrow channels north to the rolling plateau. The plateau itself is studded with amoeboid lakes and is often crisscrossed by boulder trains and eskers meandering like mole runs under the forest floor. The relief is low, and in general the land rolls away beneath the flight path in a featureless maze of water, trees, swamp and bog. An occasional granite knob rises a few hundred feet from the sea of spruce. This is the land of the woodland caribou, of beaver, fox, mink, and marten and has for many years been the home of the Montagnais Indians.

West of Lake Melville, trees begin to thin on the peneplained surface, and the yellow-beige forest carpet of moss and lichens winks through the thinning blackness of spruce. Bogs are fewer, exposed ridges more common, while the thick forest hugs the river bottom and lake shores. Increasingly, caribou trails are seen beaten into the moss around lake margins and at fording spots. Eskers proliferate, dividing shallow lakes, climbing over hillsides and diving into valleys. Besides caribou one finds in the lichen woodlands black bear, lynx, snowshoe hare, fox, partridge, and many species of fish.

Proceeding north of Lake Michikamau, spruce begin to disappear from the glaciated plateau surface and are found only on southern hill slopes, in protected river valleys, and around lake shores. Soil is scarce and the effects of glaciation and thermal erosion on the barren rock result in jumbled scree and boulder fields. Caribou trails are plentiful on sandbanks along the rivers and lineate the lichen-encrusted rock barrens. Still farther north, east of Indian House Lake, the plateau is devoid of all growth except lichens. Even on a July flight one is impressed by the desolation of black rock, frozen ponds, and still-extensive snowfields attempting, often unsuccessfully, to melt before the winter, which begins in September at this altitude. It is indeed a desolate land, unused even by the Barren Ground People—the Naskapi Indians—who fear life without fire in this timberless wasteland. Caribou are still plentiful, however, and occasionally Eskimo forays penetrate the northern barrens from the coast in search of antler, meat, and fur.

As one approaches the plateau edge, long U-shaped valleys appear running east and west. Once carrying the glacial ice to the sea, they now hold lakes and rivers in which salmon spawn. In the valleys, glacial sand deposits permit the growth of stunted spruce and willows. To the northward above the plateau rim can be seen the snow-covered peaks of the Kiglapait and Kaumajet mountains; farther on still, the towering Torngat Mountains rise 5500 feet from the sea's edge.

Flying east through a valley, one sees in the distance long narrow bays reaching from the coast. Soon the sea itself is reached, with its bold, indented coast, craggy peaks, and island skerries. North of Mount Thoresby the islands cease and the only trace of vegetation are lichens and scrub. Here, and to the north along the Torngat coast, only a maritime-adapted culture can survive, though caribou are present seasonally. This coast, more than any other in North America, resembles the fjorded coast of Greenland and Scandinavia.

These few glimpses of Labrador-Quebec present views of several life zones and habitats which are important to man. They also document a variety of environments of which the Hamilton Inlet region represents a microcosm.

Labrador-Quebec

Labrador lies at the northeastern extremity of the North American continent. It is the eastern drainage of a 700,000 square mile land mass called Labrador-Ungava, or New Quebec, or Labrador-Quebec. Four of its five sides are geographically bounded by water: the James and Hudson bays, Hudson Strait, the Labrador Sea and Atlantic Ocean, and the Gulf of St. Lawrence. Its connection to greater Canada is by way of a boreal corridor to the southwest. Here the boundary of the peninsula is generally placed at the fiftieth parallel.

The political boundary of Labrador does not reflect geographic or environmental divisions. It is set at the eastern divide, beginning at Cape Chidley and running south until it reaches the fifty-second parallel, at which point it turns east to the Straits of Belle Isle. In this paper the term "Labrador" will refer to this political unit, which is now under the jurisdiction of the province of Newfoundland and Labrador. The entire peninsula will be referred to as "Labrador-Quebec."

Although Labrador is isolated from the rest of North America by large marine water bodies and can be considered a peripheral region it nevertheless stands as the geographic heartland of the far northeastern quadrant of North America. To the north lie the arctic islands; to the northeast, the continent of Greenland; to the southeast, the island of Newfoundland; and to the south, Gaspe, Novia Scotia, and New England. To the southwest there is obvious geographic and ecological continuity with the lands south of Hudson and James bays, and with the St. Lawrence region. This perspective is different from that traditionally taken by anthropologists whose research interests have usually stressed the peripheral or marginal nature of Labrador-Quebec as viewed from culture centers to the north or south.

Labrador-Quebec is at the eastern periphery of the Canadian Shield, and its physiography is characteristic of much of that province. Most of the peninsula is essentially a flat or gently rolling peneplain with plateau elevations ranging between 1000–2000 feet. Mountain ranges are infrequent and low—the Otish Mountains of central Quebec being 3700 feet; the Mealy Mountains south of Lake Melville, about 4000 feet; the Kiglapait and Kaumajets north of Nain, about the same elevation; and, finally, the Torngats of northeastern Labrador, 5500 feet. The presence of this rugged range rising directly from the sea qualifies northern Labrador as one of the most majestic coasts of North America. From Cape Chidley to Nain the coast is heavily indented with fjords and glacial valleys. The coastal physiography between Nain and Hopedale is characterized by drowned valleys, long deep bays, and island skerries. South of Hopedale the coast is more regular with fewer islands and bays, Hamilton Inlet and Sandwich Bay being the major exceptions. Here the coast is backed by rocky lowlands that rise gradually to the plateau and from there roll gently across to Hudson Bay.

The drainage of the peninsula is relatively youthful, and has undergone successive periods of stagnation and rejuvenation during the Pleistocene. Some of the larger rivers, such as the Saguenay and Churchill have preglacial histories (Tanner 1944:131, Stevenson 1967:1). On the interior, lakes rather than rivers predominate, and bogs and fens are common. A glance at the physiographic map gives the impression of a vast lake-studded wilderness linked to the sea by a radial array of narrow rivers running off the plateau perpendicular to the coast. Without this network of waterways it is doubtful that man could have inhabited the interior.

As noted above, the geology of the peninsula is characteristic of the Canadian Shield and can be described as an uplifted peneplain of pre-Cambrian granites and gneisses. Isolated stratigraphic series are present around the Strait of Belle Isle, Seal Lake, Aillik, and in northeastern Labrador (A. P. Coleman 1921, Odell 1938, Daly 1902). The southern beds are limestone while those to the north are shales, quartzites, and slates. One such series between Saglek and Hebron contains a bed of Ramah chert (see pages 40–43; Appendix 4), which has been used as raw material by many prehistoric cultures.

The Pleistocene geology of Labrador is of considerable importance in archeological interpretation and will be discussed later in detail. At this point, however, it might be noted that geologists have located a large ice dispersal center west of Lake Michikamau and that ice build-up in this region may have reached a maximum thickness of one mile, thus comparable to the present Greenland icecap. From here it dispersed and covered the entire peninsula, extending out over the continental shelf to the east and in the west merging with the Laurentide ice sheet (Ives 1960). At various stages during the glacial period *nunataks* (unglaciated mountain peaks within a glaciated area) existed in the Torngats and Mealies, but it is no longer feasible to postulate a long-term Pleistocene refuge for plants (Fernald 1925) or indeed for early man (Kidder 1927) in northern Labrador. As the ice sheet withdrew from the coast large proglacial lakes were formed, resulting in relic shorelines far in the interior. Isostatic rebound followed ice retreat and resulted in formation of raised beaches and marine terraces with elevations between 200–900 feet (Tanner 1944:243, Wenner 1947:167). Eventually the ice retreated from the coast and river valleys and stagnated on the central plateau. Final wastage occurred as recently as 6500–6000 years ago in the Schefferville-Kaniapiskau area (Grayson 1956) and about 5700 years ago in the Churchill River area (Morrison 1963:274, 1970:1967).

This view of an extremely late persistence of the Wisconsin Laurentide ice in central Labrador-Quebec is supported by recent climatological research. Hare (1966:10), for instance, describes the present climate in rather frigid terms:

> The peninsula has still, for its latitude, the harshest climate on earth, and the regional snowline lies not far above the summits; small glacierettes survive in the cirques of the Torngats. It offers, in fact, the nearest thing we have today to a midlatitude glacial climate, accessible to study and inviting conclusions as to the past.

Recent studies of the Labrador climate have been made by Hare (1966), Barry (1959, 1960, 1966), Manley (1955), and Derbyshire (1960). These studies have been directed primarily to the problem of the onset of glaciation, its build-up, and wastage; for the Labrador climatic and meteorological regime, more than any other region in the world, serves as a laboratory in which to study conditions leading up to glaciation. Its high elevation, peninsular geography, and precipitation are suited to early glacial onset and late wastage. Of crucial importance seems to be summer temperature, which if it dropped a few degrees today would be insufficient to melt the winter snow. The fact that summer temperatures may drop here as a result of increased cloud cover over the peninsula and not necessarily as a result of general world-wide climate cooling accentuates the borderline conditions of the area (Barry 1966). Barry has suggested that the presumed ice thickness on the Labrador Plateau during the last major glaciation would require a period of build-up of about 20,000 years.

One does not have to look far afield for climatic determinants in Labrador-Quebec. The southerly extension of arctic climate is the result of a peninsular environment influenced by the temperature of its surrounding water bodies, the persistence and distribution of winter pack ice, and by unstable atmospheric conditions (Dunbar 1966, Biays 1964, Beverton and Lee 1965; Hare and Montgomery 1949). Hudson Bay and Strait are essentially arctic water bodies, and the Labrador Current which sweeps continuously down the east coast has its constituent waters derived from the Irminger Current of West Greenland, the Baffin Island Current, and Hudson Strait (Figure 5). The Labrador Current flows over the continental shelf at an average rate of 10 miles per day (Nutt 1963) and provides a continuous source of cold water with pack ice six to seven months a year. Resultant refrigeration has produced a strip of arctic environment along the east and southern coast as far west as Anticosti Island (Hare 1959:33) and the extension of marine arctic conditions far south into the subarctic. Heavy pack and shore ice forms in the winter on all three northern perimeters of the land, and these do not melt until early summer. Winters are, therefore, cold and long; summers cool and short.

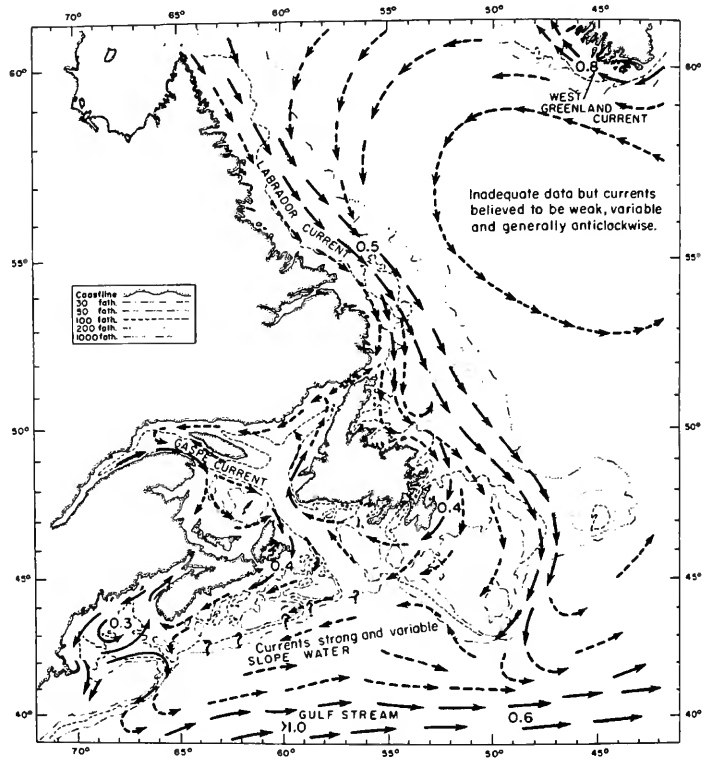


FIGURE 5.—Typical circulation of surface waters in the northwestern Atlantic Ocean during spring and summer. Solid arrows indicate relatively persistent current directions; broken arrows indicate less persistent current directions; numbers indicate approximate speed of currents in knots. (After Templeman 1966: fig. 9)

The vegetation and life zones of the peninsula reflect these climatic conditions. Phytogeographers have made extensive studies, of which Hare's (1950, 1959) are the most comprehensive. Rousseau (1952), Hustich (1949), and Harper (1964) have also contributed.

Hare (1950) described five major zonal divisions, conforming broadly to evapotranspiration and thermal conditions. Other contributory factors include altitude and proximity to the coast.

The five main zones can be briefly described. The mixed boreal forest zone is dominated by white and black spruce but contains elements of birch, alder, aspen, red pine, and white pine. The main boreal forest zone is predominantly black and white spruce, tamarack, and balsam. The open boreal woodland zone is one of open-crown forest where the spruce and tamarack are widely spaced and the forest floor of lichens and mosses is exposed. The forest-tundra ectone is a transition area between forest and tundra in which the forest is stunted and sparsely distributed in sheltered regions. Fingers of forest therefore penetrate the tundra environment until conditions become too severe for survival. More recently, Hare (1959) in a comprehensive air-photo survey has lumped the traditional and main boreal forests into a single boreal forest zone.

Hamilton Inlet

Hamilton Inlet, like Labrador, has its own toponymical problems, and present terminology reveals contradications between local usage, historical precedent, and official terminology. In this paper the official use will be followed. Accordingly, Hamilton Inlet refers to the entire waterway from Indian Harbor to the head of Goose Bay. In the past this term frequently referred only to the outer marine portion of the inlet, or what shall be called here Groswater Bay. Earlier names, principally Ivuktoke Bay or Esquimaux Bay, were used with characteristic imprecision to denote either Groswater Bay or Hamilton Inlet.

Hamilton Inlet is a unique environmental unit when compared with other areas in Labrador. From a geographic standpoint it is the largest single body of water in Labrador and its direct link with the sea provides a continuous navigable waterway by canoe between the coast and the lake plateau of the interior. This was of great importance to the migrant hunters, for overland travel in the Labrador forests is difficult in the extreme. Furthermore, the inlet itself, lying athwart the central coast transects a series of environmental zones from coastal tundra to mixed boreal forest. It therefore contains a wide variety of habitats that, for unique climatic and geographic reasons, have been compressed into a small geographic area barely 150 miles in length and 30 miles in width. These environments are accessible to man, lying along the shores and rivers of Hamilton Inlet and can be reached with relative ease. In an area where seasonal and annual fluctuations in climate and wildlife are extensive, and which undoubtedly had potentially disasterous consequences for prehistoric man, Hamilton Inlet offers a microcosm of varied food resources with flexible schedules of availability. To achieve comparable economic flexibility in other areas of Laborador would require long-distance travel between widely separated ecological zones. Considerations of transportation, ecological compression, and environmental variability therefore make the Hamilton Inlet region an admirable area in which to undertake a regional study of Labrador's prehistory and cultural ecology.

Geography

Hamilton Inlet can best be described as a *ria*, a drowned river valley which has been substantially altered by glacial scouring (Kindle 1924:71). The funnel-shaped opening of the inlet between Indian Harbor and Pottles Cove Head is twenty miles across and from here extends some forty miles westward to the Narrows. Groswater Bay has depths between 120–240 feet, and numerous islands. The shores tend to be rocky, with mud flats in the coves. Low hills back the coast. Tundra vegetation dominates the outer portions of the inlet, but as one proceeds toward the Narrows the spruce forests creep to the shore and become taller and more densely wooded.

Entering the Narrows, the hills rise to several hundred feet, compressing the channel connecting Groswater Bay and Lake Melville into a tidal sluiceway approximately sixteen miles long and barely a mile wide. The settlement of Rigolet lies on the north shore of this channel above Henrietta Island. Tidal currents in the Narrows are strong, especially on the falling tide, and open water is maintained here throughout the winter except during short periods of severe cold.

Southwest of the Narrows lies Lake Melville. This estuary, whose waters are derived from both marine and terrestrial sources, is a tidal lake approximately 100 miles long. In its widest portion it is 20 miles across. The southeastern shore of the lake is rugged. The Mealy Mountains rise directly from the water to attain heights of 4300 feet. Its peaks are snowcapped throughout most of the summer and provide a dramatic backdrop to the lovely scenery of the lake. West of Rabbit Point the Mealies (named for their snow-mottled appearance in early summer) recede from the shore and rise in a dramatic scarp over the low timbered coastal plain of uplifted Pleistocene sediments. On the plain grows a mature boreal forest which has long been noted for its accessible timber resources (Davies 1843). The north shore of the lake is flanked by rocky hills and has no extensive coastal plain. Here, forest cover does not achieve the magnitude of the southeastern shores, and there are extensive patches of tundra on the hilltops and lichen woodlands where there are well-drained sand deposits.

The western end of the lake is heavily forested with spruce and minor components of birch, ash, and aspen. Here the lake margins are shallow, lined with boulder-strewn mud flats, and there are numerous islands scattered along the northwestern shore. The land deposits consist of marine-worked glacial sands which support bogs and spruce forests. The effects of postglacial uplift can be clearly seen in elevated beach ridges, recorded on aerial photographs as regular variations in the forest growth. Into northwestern Lake Melville flow the Mulligan and Sebaskachu rivers. Mokami Hill, a monadnock 1590 feet high, is the dominant topographic feature of this area. Further south lies North West River.

North West River is the shortest and largest river of its kind in Labrador. Formerly a term designating the present Naskapi River, it is now restricted to the one-half mile stretch of water at the debouchement of Grand and Little Lakes into Lake Melville. Here the combined flow of the Naskapi, Crooked, Beaver, Susan, and Caribou rivers have breached two large recessional moraines blocking the path to Lake Melville. The water flows with such a swiftness and volume that, like the Narrows, North West River is often unfrozen in winter. The Naskapi and Grand Lake route is a major transportation link to the interior and is navigable by motorboat for more than 50 miles, to slightly above the junction with the Red Wine River. Beyond this a long series of rapids stretches to Seal Lake.

South of North West River lies Goose Bay, a shallow body of water at whose mouth there once existed a second major moraine system at the terminus of the Churchill Valley glacial flow. Goose Bay is 15 miles long and, like much of the land around it, seems soon destined to become a large flat sandy plain through which the Churchill River will eventually flow (Kindle 124:68). The Churchill now enters Goose Bay just below Mud Lake and is navigable twenty-seven miles upstream to Muskrat Falls where the river makes two drops totaling 70 feet. Above, it is navigable by canoe nearly to Churchill Falls, over 200 miles upstream (Cary 1892). Other rivers flowing into the lower Churchill River or Goose Bay include the Goose, Traverspine, Kenemich, and Kenamu. The only river of consequence draining into eastern Lake Melville is the English River, which flows eastward out of the Eastern Mealy Mountains and enters the lake's south shore opposite St. John's Island. In sum, western Lake Melville receives the drainage of nearly half of the Labrador Plateau (Backus 1957:280). This huge influx of relatively warm fresh water, as well as the generally low elevations of the surrounding country, make the area one of the most unique environments in Labrador.

Geology

The geology of Hamilton Inlet is reasonably well understood, but has not been studied in great detail as in the Makkovik or Seal Lake areas, where extensive geological mapping has been conducted by the British-Newfoundland Exploration Company. Central Labrador has been surveyed and mapped for bedrock geology by Christie, Roscoe, and Fahrig (1953), Kranck (1953), Brummer and Mann (1961), and Emslie (1968). Pleistocene deposits and general topographic features of Hamilton Inlet have been mapped by Blake (1956) and Stevenson (1967). Kindle's (1924) geographic study is the most extensive report on the area and concentrates on the Quaternary deposits. The other major reports are those of Low (1896) and Tanner (1944). For the archeologist, these studies are of interest in three general ways: (1) Structural and mineralogical surveys help locate the source locations of prehistoric raw materials; (2) studies of post-Pleistocene land emergence facilitates the dating of archeological sites; and (3) knowledge of the uplift curve, makes it possible to reconstruct the topographic and hydrographic environment at any point during the postglacial period. This enables the archeologist to make predictive statements about prehistoric settlement patterns and ecology.

There are five principal bedrock provinces in the Hamilton Inlet region and its environs. The most extensive of these is the granite-gneiss complex which dominates the geology of this portion of the Canadian Shield. A second complex, equally uninteresting in terms of archeology, is the massive gabbro-anorthosite pluton of resistant intrusive rocks on the south side of Lake Melville. These rocks have been peneplained and uplifted along a fault-*graben*, which coincides with the northern scarp of,the Mealy Mountains. The fault extends westward, controlling the course of the Churchill River as far as Gull Island Lake. To the north of the scarp lies the down-faulted Lake Melville basin; to the south, the uplifted portion of this *graben* and *horst* formation rises quickly to elevations between 3000–4000 feet. The summits have concordant elevations, and glacial erosion has only slightly modified its peneplained surface. This formation is essentially an alpine plateau and supports an arctic tundra environment which during the winter is an important feeding ground for caribou.

North and west of Lake Melville are several areas that contain stratigraphic deposits. These are remnant deposits of beds which formerly occupied extensive areas in central Labrador but which now largely have been eroded away. The youngest of these is the Double Mer Formation. These beds, which Tanner (1944:113) dates to the Paleozoic, may once have been 1000 feet thick. They outcrop along the north shores of Lake Melville and Double Mer and also appear at Ticoralak Island and on the north side of the Churchill River (Christie et al. 1953:1). The formation consists of red arkosic sandstone, maroon shales, and on the Churchill contains conglomerate beds (Stevenson 1967:10). The Double Mer Formation is well-bedded and unmetamorphosed; it rests unconformably on older gneisses and granites.

To the northwest around Seal Lake is a remnant volcanic and sedimentary series which includes beds ranging from boulder conglomerates to fine red (continental) and green (marine) shales and slates associated with quartzites and dolomites. The Letita Lake group southwest of Seal Lake includes banded volcanics, rhyolites, tuffaceous rhyolites, and banded tuffs. North of Seal, the Wuchusk Lake Formation on the Naskapi River has shales, slates, quartzites and limestone with interbedded chert (Brummer and Mann 1961:1367). Some of the quartzites here may be recrystallized bands of chert. Further west in the Michikamau intrusion area there are remnant beds of red sandstone, siltstone, and limestone (Emslie 1968) which may indicate the presence of chert as well.

Another sedimentary series is found on the coast north of Hamilton Inlet in the vicinity of Aillik and Makkovik. These beds contain quartzites, shales, slates, conglomerates, and limestones ranging from unaltered ripple-marked beds to highly metamorphosed deposits (Douglas 1953, Kranck 1953). Kranck (1953:4) feels some of these are Archaean age and may be the oldest beds on the coast. Tanner (1944:83) associates the beds with littoral formations.

After peneplanation in the Late Tertiary the entire area underwent Pliocene uplift, and at this time the valleys of the Churchill and Naskapi rivers began to form (Tanner 1944:126). Subsequently, glacial activity gave the land its final sculpting.

The major ice-dispersal area seems to have been in the central part of the peninsula between Michikamau and Shefferville (Low 1896:290, Barnett and Peterson 1964:178–180). From this area ice flowed rapidly toward the periphery of the peninsula, so that in Hamilton Inlet its direction was west to east, or northeast, and was partially channeled by local topographic features, especially the Lake Melville basin. Extensive till sheets and drumlin fields are present north and west of the lake (Blake 1956:93). Glacial scouring deepened the Lake Melville and Grand Lake basins and morainic material was deposited at the east end of the Backway, daming the former outlet of the Lake Melville drainage and forcing its present outlet through the Narrows (Kindle 1924:19). Gray (1969:110) notes the lack of glacial activation during the Little Ice Age, 200–300 years ago.

Toward the final stages of glaciation the ice melted from the country surrounding Lake Melville while valley glaciers persisted in the river drainages. Huge delta deposits were formed at the outlet of the Churchill River and along the south shore of the lake, and recessional moraines formed at North West River. As the ice retreated up the major valleys toward the plateau, the large preglacial valleys were filled with glacial sands. Innumerable lakes appeared in the till sheet area and exposed bedrock; eskers and drumlins crisscrossed the countryside, and varved clays were deposited in dammed proglacial lakes.

The chronological sequence of deglaciation has not been worked out in detail for Hamilton Inlet, but it has been suggested on the basis of landform and radiocarbon-dated pollen samples that the retreat of the valley ice passed Churchill Falls shortly before 6000 B.P. (Morrison 1963:274). Similar dated pollen studies in the central plateau indicate most of the interior was glaciated about 8000 B.P. and final wastage occurred by 6000 B.P. Hare (1966:10) concurs, and it therefore seems likely that 4000–5000 B.C. will be the earliest possible date for occupation of the plateau interior. Presumably, occupation of the coast could have occurred earlier.

In Hamilton Inlet deglaciation resulted in complex topographic adjustment between isostatic and eustatic recovery. The most dramatic result was the formation of uplifted beach strands and marine and river terraces. The marine limit in this area varies between 200–400 feet (Kindle 1924:63) and probably extends up the Churchill River as far as Gull Island Rapids. (R. Fulton, pers. comm.) At this time Grand Lake and the Lower Naskapi was an arm of the sea which reached almost 200 miles into the peninsula. The marine limit in the Smokey Archipelago is approximately 250 feet.

Postglacial emergence curves have been constructed for the north coast of the peninsula, which show the maximum rate of land rise (approximately 26 feet per century) during the early phase of deglaciation (Matthews 1967:186). After 6000 B.P. this rate decreased to its present value of about one foot per century. A similar rate of uplift for the past two thousand years has been determined for Hamilton Inlet (Blake 1956:89; see pp. 27–30). The fact of continuing uplift today is evident from the comments of local fishermen who find that former harbors and channels used by their fathers are no longer navigable.

Hydrography and Oceanography

Hamilton Inlet has a physical structure similar to the glacial fjords of northern Labrador, Greenland, and Scandinavia. It is a series of glacially deepened basins interconnected by shallow sills across which water communication and hydrographic mixing occur (Figure 6). Groswater Bay is a shallow extension of the continental shelf dotted with islands and shoals and with bottom depths between 70–240 feet. In the Narrows the channel constricts to one mile in width and flows over a rock sill 40–90 feet below the surface (Canadian Hydrographic Service 1965:167). One mile southwest of Henrietta Island the sill drops 1000 feet into a glacial valley. Westward, the Lake Melville basin rises gradually to a second sill at the entrance of Goose Bay. This sill is a sandbar only a few feet below the surface, with a channel depth of 21 feet. Again the sill drops away to the west, this time to 150 feet and then climbs slowly toward the mouth of the Churchill River. A similar sill and basin structure is found at North West River and Grand Lake, which has depths over 400 feet. These basins serve as huge water reservoirs which preserve temperature and salinity balances for long periods of time.

The waters of Hamilton Inlet are derived from two very different sources. Groswater Bay is essentially a marine water body whose water comes from the Labrador Current. It is, therefore, arctic water—salty and cold. It enters Lake Melville through a complicated exchange process across the sill at the Narrows, and drops into the lake basin where it forms a distinct hydrographic layer as far west as Goose Bay. The fresh water input comes via the huge river systems emptying into the western end of the lake. These rivers drain more than half of Labrador, and during the spring runoff carry a half million cubic feet of water per second (Coachman 1953:5). This input is fresh and warm, and it spreads eastward on top of the colder salt water layer, acting as a moderating buffer on the local atmospheric conditions of the lake environs.

Arctic and river waters within Lake Melville are, therefore, separated by a distinct halocline and thermocline, which, owing to the fresh water input at the western end of the lake, slopes upward in depth towards the Narrows. Upward mixing across the interface does occur, however, and the entire lake is flushed every 170 days. Replacement of bottom water prevents oxygen stagnation, a common feature of fjord hydrography (Nutt 1953:183).

The biological effects of this hydrographic structure are profound. Unlike a true estuary, the presence of a distinct halocline with only limited (seasonal) mixing inhibits the capability for biological activity within Lake Melville. The fauna in the lake is marine, despite its fresh water surface, but both invertebrates and vertebrates are scarce, and few marine species of importance to man are found. An interesting note is the presence of octopi dredged from the depths of the lake during Commander Nutt's investigations. In short, the present hydrographic structure results in Lake Melville being a kind of ecological vacuum or

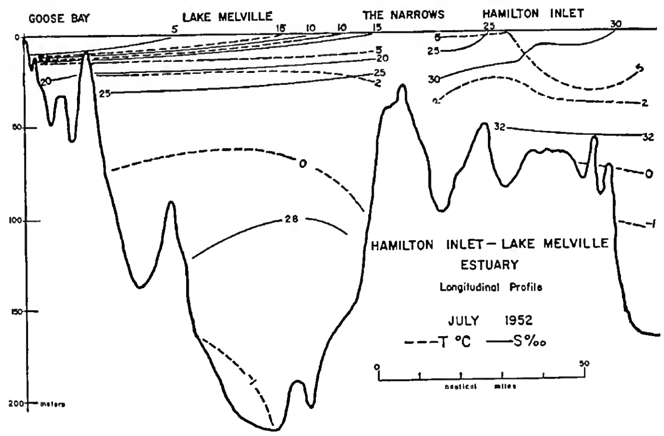


FIGURE 6.—Hamilton Inlet hydrographic profile. (After Nutt 1963: fig. 8)

doldrums when compared to the rich marine biological activity of the Narrows and the coast.

In the Narrows the result of tidal mixing of marine and fresh waters is nearly complete, and biological production is high. A full complement of northern marine fauna is present. In addition, swift currents in the Narrows keep it ice-free during winter when both Lake Melville and western Groswater Bay remain frozen. The necessity for open water for many marine sea mammals results in the concentration of these important resources in the open water of the Narrows.

In addition, the peculiar condition of the tides in the Narrows might be noted. Tidal ranges here and in Groswater Bay vary from 4–7 feet, and in Lake Melville, 1–2 feet. When it is high tide in Lake Melville it is low in Groswater Bay. In the Narrows this creates the strange phenomenon of the tide rising on the ebb, and falling on the flood.

Climate and Meteorology

The Labrador climate cannot be characterized by a single description. There are, in fact, two climates which notably impress the traveler. Holme (1888:189) described a trip from the coast to the interior saying that is was "like passing from winter to summer." Likewise, Kindle (1924:20) described "the Labrador" of the cod fisherman as a barren ice-strewn strip with subarctic climate which was dramatically different from the warm summer climate and heavily forested interior. Today it is common to see icebergs in Groswater Bay in July, a time when the water in western Lake Melville 100 miles to the southwest is comfortable enough to swim in.

This dual climatic picture reflects the dominant meteorological patterns of the area. The prevailing westerlies bring continental air masses across Labrador to the coast, where they meet colder air chilled by contact with the Labrador Current and are influenced by the North Atlantic weather systems. This produces the all too familiar unstable weather conditions of the Labrador coast, in which wind storms, showers, and sun can succeed each other with startling alacrity.

Within Lake Melville, climatic modification occurs as a result of water temperatures, elevation, and topography. At the western end of the lake these factors exert a strong influence during the brief summer season, boosting the mean temperature of the six warmest weeks of summer above the regional norm to 60 degrees (Harper 1961). The summer maximum is 100 degrees, and summer frost does not occur between 10 June and 14 September. As a result, and with aid from the long summer days, local residents manage to coax crops of cabbage, turnip, and potato from their sandy garden soils. The greatest difference between coast and interior climate is evident at this season, for while local conditions warm the western end of Hamilton Inlet the eastern portions remain cooled by the Labrador Current. Here, too, summer frosts are rare, but the mean summer temperature is 50 degrees, fully 10 degrees cooler than North West River. During winter these conditions reverse, and coastal temperatures generally are higher than those of the interior. North West River averages 0 degrees, and Rigolet 5 degrees. Winter minimums at both spots are —45 and —30 degrees respectively. In spring and fall coastal and interior means are the same with readings of 37 and 25 degrees for these periods. Finally, the seasonal and geographic variations between the two areas cancel out; both have annual mean temperatures of 30 degrees. Permafrost is not present within western Lake Melville but begins to be found east of Neveisik Island (Brown 1967). Hamilton Inlet is the southern limit of permafrost in Labrador.

Precipitation in Labrador is high for its latitude, and tends to be highest on the coast. The southeastern part of the inlet receives nearly 200 inches of snow in winter, while only 120 inches fall on the western portions. Summer rains approach 15 inches. Total precipitation for the area is equivalent to 30 inches per year.

Besides being a land of two summer climates, Labrador is visited by only two seasons—a long, cold winter and a relatively warm, short summer. During winter it is a land of ice and snow, which along the coast forms a tough crust capable of supporting dogs, sleds, komatiks, and snowmobiles, and facilitates transportation over the barrens and on the ice shelf bordering the shore. In the forest, snow accumulates and remains loosely packed, and here coastal transportation techniques give way to the toboggan and snowshoe. Dogs are seldom used for transportation on the interior. Fall and spring are brief and are characterized by unstable ice conditions and stormy weather, making travel difficult. Summer begins in late May after ice break-up and lasts until ice begins to form again in September. Once the ice has gone in spring the land warms rapidly, and the weather tends to be calm and ideal for boating, although severe storms may occur occasionally. In terms of aboriginal life these changing conditions require specialized techniques for subsistence, travel, and habitation which permeate the entire cultural realm.

Phytogeography

The most dramatic feature of the environment—the barren coast and forested interior—is a direct result of local climatic conditions, regulated by factors such as elevation, exposure, and, importantly, forest fire. In Hamilton Inlet, Hare (1959) has recognized five different cover types (see pages 14–15) which include close-crown forest, lichen woodland, lichen heath, bog, and burned areas (Figure 7). The boundaries of these zones are not fixed; considerable mixing occurs, especially where altitudinal factors affect vegetation. A more fine-grained phytogeographic analysis has been accomplished in western Lake Melville by MacKay (1956) using aerial photography.

The most marked transition in vegetation occurs in Groswater Bay and the Narrows. The Smokey archipelago consists of true arctic tundra dominated by lichens and occasional shrubs of dwarf birch and willow. West of Winter Cove this gives way to forest tundra with stunted spruce at sea level in the sheltered coves. At Bluff Head Cove the tree line elevation is 150 feet. Approaching the head of Groswater Bay environmental complexity increases. Here, the black spruce forest becomes well established, often in association with bog and lichen woodland areas. In protected spots, spruce may grow to thirty feet. This trend is continued in the Narrows, where the tree-line

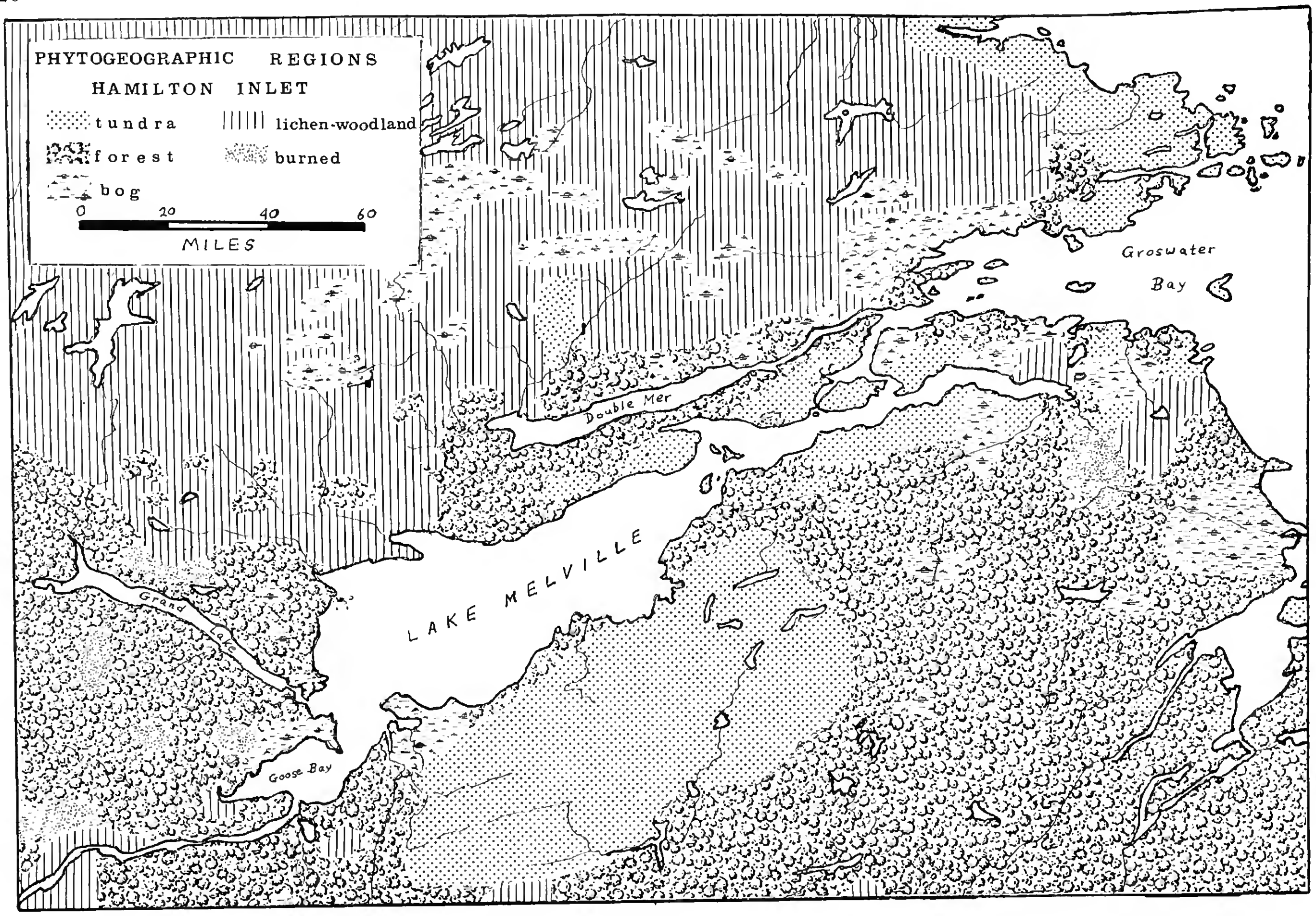


FIGURE 7.—Phytogeographic regions in Hamilton Inlet.

reaches elevations of 400 feet, and individual trees up to 50 feet high and 12 inches in diameter have been observed (Kindle 1924:33). Several new species begin to be found, including white spruce and birch. Lake Melville itself has extensive forests of black and white spruce rising to elevations of 1500 feet in Grand Lake (Tanner 1944:370).

Interspersed with the spruce and balsam forests of Lake Melville one finds large stands of deciduous trees. Birch, poplar, and aspen are most common in these forests. For many years their presence contributed to the theory that Lake Melville and the lower Churchill River was an outlier zone of the main boreal forest (Hare 1950:617). This idea was supported by vegetation and the presence of southern bird species (Harper 1961:21).

Today, with air photo interpretation, these patches of deciduous trees within the boreal forest are found to occur throughout the southeastern forest of Labrador, and the outlier theory cannot be maintained. It is true, however, that local climatic amelioration within Lake Melville has accentuated the development of hardwood stands, and they continue to be one of the most pleasant and distinctive features of the lake, covering extensive areas, and providing an important ecological component in the boreal habitat. These forests are unfortunately short-lived, as they are not part of the climax vegetation. Rather, they owe their presence to a fire climax in which the hardwoods are the first species to colonize after denudation. In twenty to thirty years they become well established; but soon conifers crowd them out, and within several decades the boreal forest is again reestablished (Hare 1950:615). Apparently this succession is not a recent phenomenon.

Apart from the major floral types, one finds a wide variety of smaller plant associations (Harper 1964). Beneath the forest cover the most common species are fragrant Labrador tea, dwarf birch, the willow; in boggy areas feather and sphagnum moss are common. In the tundra zones dwarf birch and willow occur also, but the dominant species are lichens of numerous varieties. In addition, both regions have flowering weeds and vascular plants which immensely enliven the landscape. Among these are fireweed, cotton grass, orchids, violets, butter cup, beach pea, and dandelion, to name a few.

Finally there is an important array of berries which provides an important source of nourishment for man, animal, and bird. Most cherished is the bakeapple (also called cloudberry and salmonberry), which is found in the tundra regions. Other fruits include blueberry, partridge berry, tundra cranberry, bearberry, blackberry, raspberry, and wild cherry. The latter three are confined to the forest.

Fauna

Hamilton Inlet has a wide variety of animal life. Within this diversity (which includes more than 225 recognized species of duck and geese alone) a relatively small number of animals are of major food value to man. The most important are the caribou, the seal, a variety of marine water fowl, and three kinds of fishes: salmon, trout, and cod.

Two species of caribou are present: The woodland caribou *(Rangifer caribou caribou)*, and the barren ground caribou *(Rangifer arcticus caboti)*. These two species have very different behavior patterns and distributions. The woodland caribou inhabits the southern portion of the peninsula and is found in small groups summering on the alpine slopes and uplands. It spends winters within the forest. The barren ground caribou, on the other hand, is adapted for tundra life. It is smaller than its southern counterpart, spends much of the year in large herds, and tends to migrate in systematic patterns. Both species feed on lichens and are specially adapted for winter feeding through the snow. Once present in very large numbers, these animals have been reduced, by both natural and human agency, to a bare fraction of their former density. From an estimated former population of 700,000, the 1955 stock of both species was found to be barely 6000 for the entire peninsula (Banfield and Tener 1958:564). However, recent aerial surveys indicate that the population may have climbed back substantially in the past decade (pers. comm. S. Whetmore of the Newfoundland Forest Service). To a large extent this resurgence seems to be a result of reduced hunting, lower incidence of forest fires, and generally favorable climatic conditions.

Hamilton Inlet has four principal groupings of caribou. The most distinctive and largest of these inhabits the Mealy Mountains. These animals are smaller than the others described for the region, and their herding characteristics suggest they are barren ground caribou. This herd has been heavily hunted in past years by Eskimos, Indians, and white. It is described as an inferior, pest-ridden herd, and is currently protected by statute after having been nearly exterminated at the hands of air-borne hunters. A second herd, according to Indian informants, is found in the Romaine River region; and a third, near the headwaters of the Beaver River (Mailhot and Michaud 1965:27). These animals are reported to spend their summers in small groups in the forest, calving. Toward October and November they begin to aggregate, and by December they are found in herds in the barrens above the forests. A fourth group, perhaps related to the Mealy herd, is found on the interior north of Groswater Bay. Informants describe these "deer" as larger than the usual Mealy Mountain caribou (they are perhaps the woodland species); they occasionally cross the ice near Big and Pompey islands during the winter. Caribou distributions, therefore, crosscut both boreal and arctic zones. In addition to caribou, the moose is becoming increasingly important to the Labrador boreal forest. Until recently this solitary grazer has been restricted to southern zones, but in the past fifty years it has been moving north and is now common in the country west of Grand Lake. This animal is part of the fire climax association, browsing on deciduous plants and trees, and on various bog mosses.

The second mammal of major importance is the seal. It is found in quantity in Groswater Bay and the Narrows and some species can be hunted throughout the year. Five species, each with different behavior and seasonal availability, are found: ring ("jar"), hooded, bearded, gray, and harbor. Seals have traditionally been the basic resource of the coastal Eskimo, but they are also found in small quantities within Lake Melville and as far west as Muskrat Falls (Kindle 1924:38). In addition, there is a land-locked population of harbor seals *(Phoca vitulina mellonae)* in Seal Lake (Rousseau 1964:58; Bigg 1969:1). The North West River Indians do not relish seal meat and spend little time hunting this animal.

Fish are another major source of protein. In Groswater Bay sea trout, salmon, and cod are most abundant. Capelin are near their northern limit here and can be collected in quantity annually when they throw themselves up on the beaches after spawning. Hydrographic conditions do not permit cod and capelin beyond the Narrows. Within Lake Melville salmon and trout are caught at river mouths, and smelt and tom cod occur as well as other fish of lesser importance (Backus 1957:332). In general, however, fish populations are low within Lake Melville but tend to be fairly high in the drainage basin to the west.

Numerous small animals are found in the forest: porcupine, fox, marten, mink, wolf, lynx, muskrat, beaver, otter, red squirrel, arctic hare, groundhog, lemming, mouse, frog, and even toad. Most of these have become important recently as a result of the fur trade, but they are not of great importance for food. Coastal and tundra denizens are fewer; fox, hare, and lemming are the most common.

The black bear is found both in the interior and on the coast. Formerly found in large numbers, it is still plentiful today. Polar bears are seen occasionally in Groswater Bay in spring when they drift south with the ice pack. In addition, there are grampus whale and walrus. The former is seen in the Narrows and Groswater Bay, but never enters Lake Melville. The walrus is no longer present, but the Eskimo name for Groswater Bay, Ivuktoke—meaning "Place of the Walrus"—testifies to its former importance.

Bird species have their greatest concentration in the marine regions. Ducks, geese, puffins, gulls, and terns can be captured easily, and their eggs are often collected from nesting areas on the island. Ptarmigan and partridge are found on both coast and interior and are extremely important to man. Besides these species, there is a host of smaller birds. Several of the birds, great auk, Labrador duck, and Eskimo curlew, formerly of great economic importance, have now become extinct. The bird life of Labrador is a great resource and, excepting arctic owl, ptarmigan, and partridge, is largely seasonal and migratory.

Finally, there are several marine mollusks of importance. Blue mussel *(Mytilus edulis)* and soft-shell clam *(Mya arenaria)* are abundant on the coast.

Numerous writers have commented at length on the most unused and probably greatest potential biomass resource in Labrador, black flies and mosquitoes. Conrad (1969:13) comments on their abundance and variety, reading like the label on a bottle of insect repellant. He concludes that "most of what is really worth saying about these creatures is unprintable."

The foregoing description depicts Hamilton Inlet as a unique environmental and geographic unit, located at the transition zone bordering the northern arctic environment and the southern temperate zone. This transition can be seen in microcosm within Hamilton Inlet. Its most striking characteristics are a series of contrasts between coast and interior, tundra and forest, and marine and lacustrine habitats. These trends and transitions segregate into two different ecological complexes, one basically coastal maritime, the other interior forest. Within the transition zone between there exist a wide variety of intergrading habitats partaking of elements of both extremes. Also within these zones may be found four basic geographic units whose ecological signatures are relatively unique. These are western Lake Melville, eastern Lake Melville, the Narrows, and Groswater Bay.

Resource Concentration and Diversity

Human adaptations in these areas depend primarily on the seasonal and geographic availability of resources. Two characteristics—resource concentration and resource diversity—dominate human exploitation in these regions. Resource concentration may result from the natural behavior of a species (such as caribou herding behavior), or it may result by environmental conditions (such as sea mammal concentration in the ice-free Narrows). Such concentrations allow cultures to specialize on a particularly abundant resource. If the game is fish or sea mammal this may mean relatively sedentary life is possible; if it is a migratory species, such as caribou, specialization may result in abundant food only if the hunter remains mobile.

On the other hand, resource diversity is important for survival in an environment in which principal resources are highly seasonal, as they tend to be in the arctic and subarctic, or where they are subject to population fluctuation. In general, those areas with greater resource diversity are more desirable site locales than those that are less diverse, and it is in the areas of greater resource diversity that most sites are found.

WESTERN LAKE MELVILLE.—This is a relatively poor area except for its important fishing resources. During the summer the river mouths and rapids concentrate large numbers of fishes, particularly salmon and trout, which can be taken with relative ease. During the winter smelt are caught, but these would not be sufficient to sustain life without other game. The area is also important in the early spring and fall when migratory birds pass through. At these times ducks and geese are plentiful. Partridges are an important winter resource when they flock and can be killed in large numbers. Caribou are not now, nor would they seem ever to have been, a major resource in this area. To hunt them, expeditions must be launched into the Mealy Mountains or the Red Wine Mountains. Other game is present but in low concentration. Porcupine, fox, lynx, black bear, and seal may be important as emergency food, but their solitary nature precludes their importance as a staple.

In short, North West River and western Lake Melville would appear to be a highly seasonal environment with faunal diversity, inhabitable mainly in the summer fishing season, during which other small game may also be important. It is likely to have been important as a staging area for hunting and fishing in other parts of the inlet, and as a funnel channeling human movement between the interior and the coast. The small size of the sites at North West River support this view.

Eastern Lake Melville.—In the eastern portion of the lake, faunal diversity is lower than in the west, though certain resources are concentrated seasonally in higher numbers. The Mealy Mountain caribou herds are an important winter resource, while seals are present in fairly large numbers at breathing holes in the winter and among the drifting ice during break-up. Migratory birds occur in seasonal concentration, while only in the English River is fishing important.

The faunal evidence suggests that this area may be important during the winter and spring, but its low species diversity makes it a chancy environment during other periods of the year. For this reason it would appear that eastern Lake Melville could be regarded as a buffer zone between coast and interior, and not an area of permanent residence.

The Narrows.—The terrestrial fauna of the Narrows is similar to that of eastern Lake Melville. Its marine fauna, however, is rich, especially during the winter and spring seasons of ecological compression into the ice-free zone. At this time seal and grampus are concentrated in a small area where they can be efficiently hunted. The Narrows is also close to the winter caribou hunting grounds, and to spring sealing in eastern Lake Melville. During the summer these resources are dispersed in the Narrows and surrounding environment, but heavy salmon, cod, and capelin runs occur, and trout are present. Bear, fox, ptarmigan, beaver, and other animals are also to be found.

The Narrows is, therefore, especially important as a resource-rich area during the winter season, while faunal dispersion occurs during other seasons.

Groswater Bay.—Groswater Bay is particularly important as an area of marine resources, though caribou, bear, fox, ptarmigan may also be found. During the winter, caribou often migrate across the ice of the bay, or may be hunted toward the Mealies or north of the bay. Walrus may be taken from the ice edge. The huge harp seal migration during spring and fall is a predictable resource, while harbor and ring seal, and grampus occur throughout the year. Spring and fall also bring large numbers of migratory birds; egg collecting is important in late spring and summer, while salmon, cod, capelin, and trout are obtainable during the summer, as well as birds and berries.

Groswater Bay is a very rich area which, in contrast to the Narrows, has winter dispersion and summer concentration of marine resources. It tends to be a poor winter area for habitation due to the severity of the climate and lack of forest protection in the outer regions. Caribou hunts and ice-edge hunts may, however, be the object of hunting trips based from the interior or Narrows. Finally, the area is one of great faunal diversity, summer marine concentration, and occasional winter caribou concentration.

This view of Hamilton Inlet reveals Lake Melville to be a biological buffer zone with low species diversity and only seasonal concentration of caribou and seal. Importantly, it is a poor fishing area (excepting perhaps the English River and a few other locations in the winter) when compared with western Lake Melville or Groswater Bay. Exploitation in the lake therefore would be expected to be seasonal and oriented to caribou and seal in winter and spring.

Biological concentration and diversity in the inlet reinforce the view that two separate ecological systems operate, one on the coast, the other in the interior, with Lake Melville as a biologically limited resource area. The coastal system is basically marine-oriented, with resource concentration in the Narrows during the winter and in the bay during the summer, and with high species diversity in all seasons and locales. Western Lake Melville would seem to be an important summer fishing locality for a population from a winter interior base. Faunal data would suggest that Lake Melville would be a cultural as well as an ecological buffer zone between coastal and interior environments, albeit one which could be easily exploited for its seasonal resources from either of these two zones.

On the other hand, the lake is a major geographical feature of the environment not only in terms of transportation, but also in terms of certain important ecological continuities. For instance caribou, ptarmigan, salmon, and trout—all basic components of interior economies—are found in considerable numbers on the coast; while a major coastal resource—seal—is found as far west as North West River, and up the Churchill and Naskapi rivers. For this reason the dramatic difference between coastal and interior physical environments does not constitute a complete biological cleavage. These species provide a potentially important bridge for man from one zone to the other. In terms of economic adaptations, however, the transition from an interior to a coastal environment would appear to be more feasible than the reverse due to the unspecialized nature of most interior hunting patterns and the presence of continuously distributed species. On the other hand, coastal adaptations tend to be more specialized owing to the requirements of sea mammal hunting, and these patterns are often inapplicable to interior hunting. The dramatically different character of these environments suggests, therefore, that coastal cultures will be more geographically isolated in those regions than will be interior cultures whose basic patterns would make life possible, at least seasonally, in both zones. During the past, when marine influence was stronger in Lake Melville than at present (see pages 30–40) the transition would have been equally feasible for either coastal or interior cultures, since marine species would have been distributed farther to the west in the lake.

PALEOENVIRONMENT

The study of past environments of Hamilton Inlet is beset with numerous problems, foremost among which is the lack of detailed geological and paleoecological studies by experts in these fields. Except for the hydrographic research of D. C. Nutt (1951, 1963) and pollen studies of C. G. Wenner (1947) there is little specific data relating specifically to Hamilton Inlet. Unfortunately no study of the past fauna of the inlet has been made, and this information is usually lacking in archeological sites which in this region have poor conditions of preservation. It is therefore necessary to base much of the following discussion on reconstructions which are to a certain extent hypothetical and unproven. By using contemporary ecological data, however, hydrographic structure, and published records of climate change it is possible to make reasonable, predictive statements about past environments. The physical nature of Hamilton Inlet is suited to this type of study of ecological changes due to the continuing effects of post-Pleistocene uplift on local geography. At present these reconstructions must be viewed as tentative suggestions and by no means as established facts. They may serve as much to guide future research as to aid present archeological interpretation.

Marine Submergence Limit

During the last glaciation the land was depressed by the weight of the continental ice sheet. As the ice melted, the sea level rose rapidly, until several thousand years ago it had reached within a few feet of its present level (see discussion of eustacy, pages 25–27). In Labrador-Quebec the melting of the ice lagged slightly behind the retreat of the southern ice sheets. Final stagnation occurred on the Labrador plateau around 6000 years ago. Marine flooding followed as the ice withdrew from the coast.

Transgression and submergence is often recorded on the landscape in the form of marine constructional formations, such as beaches, boulder ridges, and sand terraces, which must necessarily be below the actual marine limit. In addition, the evidence of submergence is indicated by the absence of perched boulders or the presence of surface washing. Glacial erratic boulders may give some indication of the marine limit, especially when observed on gently sloping hills or summits where the number of erratics change markedly without a change in topographic slope. Care must be taken not to mistake ice-rafted boulders for erratics. All of these methods have their problems, such as the difficulty in determining the difference between marine, fluvial, and kame terraces; likewise, topography must be carefully selected when using erratics as indicators.

Data relating to the marine limit in Hamilton Inlet have been collected by Kindle (1924), Tanner, Wenner, and Daly (in Tanner 1944 and Wenner 1947). These data are shown in Table A, along with observations made during the 1968 and 1969 survey. The locations of the observations are shown on Figure 8.

Earlier attempts to correlate submergence data for

TABLE A.—*Marine limit data in Hamilton Inlet*

Location	*Indicator*	*Height* (feet)	*Reference*
Moliak Cove ("The Scow")	marine-worked Pleistocene outwash delta	310	Kindle 1924
Rigolet	marine terrace	210	Kindle 1924
Rigolet	perched erratics	above 270	Kindle 1924
NW Backway	marine terrace	310	Kindle 1924
NW Backway	perched erratics	390	Kindle 1924
Palliser Point	perched erratics	320	Kindle 1924
Lower Churchill Valley	marine strand line	400–500	R. Fulton, D. Hodgson, (pers. comm.)
Ice Tickle Island	boulder limit	260	Wenner (1947)
Cape Porcupine	marine terrace	228	Fulton, Hodgson (pers. comm.)
Holton Island	boulder limit	220	Hamilton Inlet Project–69
Holton Harbor	boulder limit	250–280	Hamilton Inlet Project–69
Run-By-Guess Island	boulder limit	240–260	Hamilton Inlet Project–69
Emily Harbor	boulder limit	250	Hamilton Inlet Project–69
Sandy Cove	marine washed boulder terrace	300	Hamilton Inlet Project–69

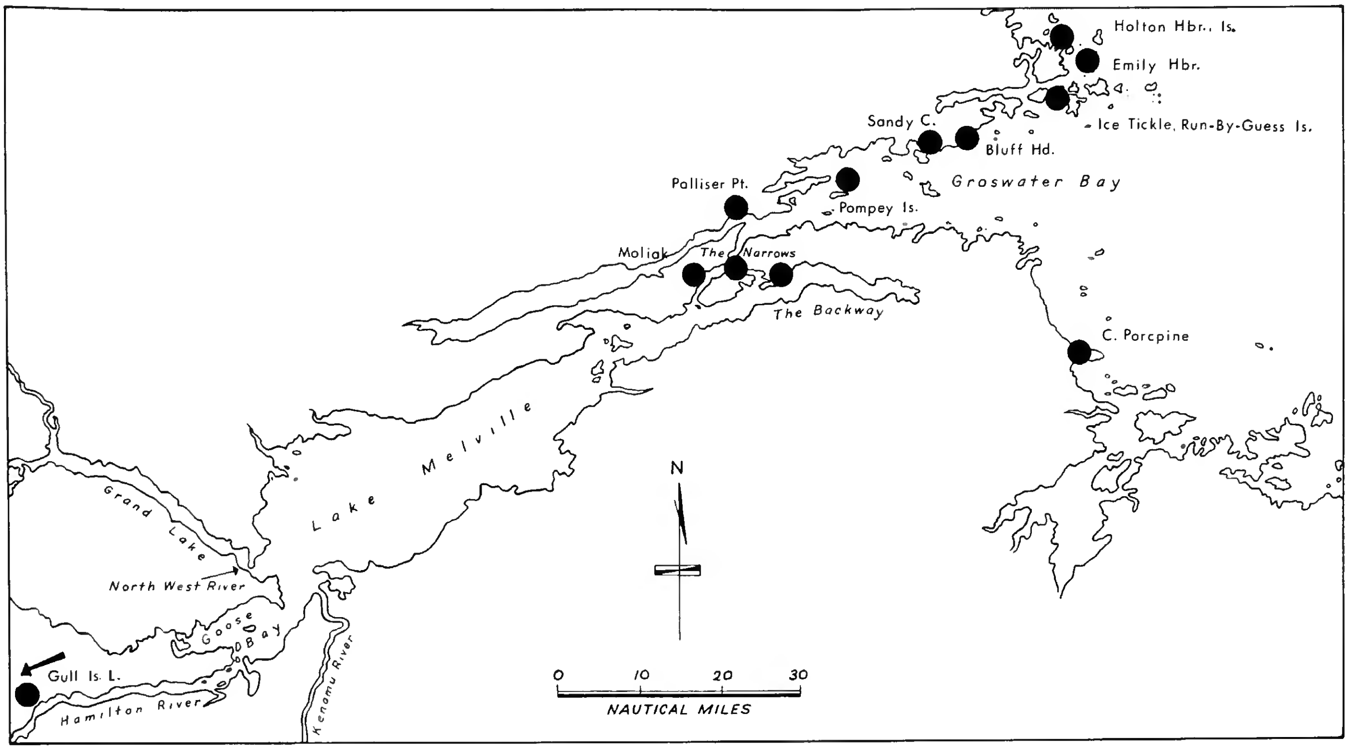


FIGURE 8.—Marine limit observations in Hamilton Inlet.

Hamilton Inlet have not met with success. Wenner (1947: fig. 14) tried to compile strand line observations using data from Tanner and Daly as well as his own, but he lacked the important values for the western end of the inlet, and radiocarbon dates (Figure 9).

From the data in Table A it appears that the late Wisconsin submergence limit for the outer coast and archipelago is around 250 feet. Deeper in Groswater Bay the limit rises to slightly above 300 feet. Kindle (1924:69) felt that the elevation of the "Scow" at Moliak Cove (310 feet) indicated that the submergence limit must have been approximately 325 feet. Finally, western Lake Melville has had the deepest submergence, somewhere in the order of 450 feet. It seems, therefore, that postglacial uplift has been approximately twice as great on the interior as on the coast, perhaps due to greater thickness of ice on the interior. Figure 10 presents this data in summary form. Since upper marine limits along Hamilton Inlet are presumably metachronous, the upper limit line in Figure 10 only indicates the overall trend of an increasingly elevated marine limit to the west, not the actual marine limit at any point (D. Hodgson, of Geological Survey of Canada, per. comm.).

Eustatic Movements

Before considering the problem of uplift rates and dating it is necessary to introduce a discussion of eustatic changes. Recently Scholl, Craighead, and Stuiver (1969) have published a new submergence curve with data from southern Florida based on dated freshwater peats which have been submerged under rising sea levels (Figure 11) This study arrives at different conclusions from those reached by Fairbridge (1961), which showed eustatic changes for the past 6000 years oscillating within 13 feet of the present sea level. According to Scholl et al., sea level has been continuously rising during the past 6000 years, and has never risen above the current level at least since the most recent glaciation. About 3500 years ago the rate of sea level rise changed from a previous rate of 3¼ inches per century to 1⅜ inches per century and afterwards held constant at the latter value. Furthermore, the authors feel that recent sea level has never risen above its present level (Scholl, Craighead, and Striver 1969:563). According to Figure 11, 5000 radiocarbon years ago sea level was about 12 feet below the present level; at 4000 years it was 8 feet below; at 3000 years, 4 feet; at 2000 years, 2.5 feet; and at 1000 years, about 1 foot. Applying this correction, uplift in Labrador has therefore been greater than present elevations would indicate. For example, Rattlers Bight has risen 30 feet in the past 4000 years, 8 feet more than its present elevation; while the 108 foot level at North West River actually has risen about 120 feet in the past 5000 years.

In fact, then, the effects of eustatic change seem

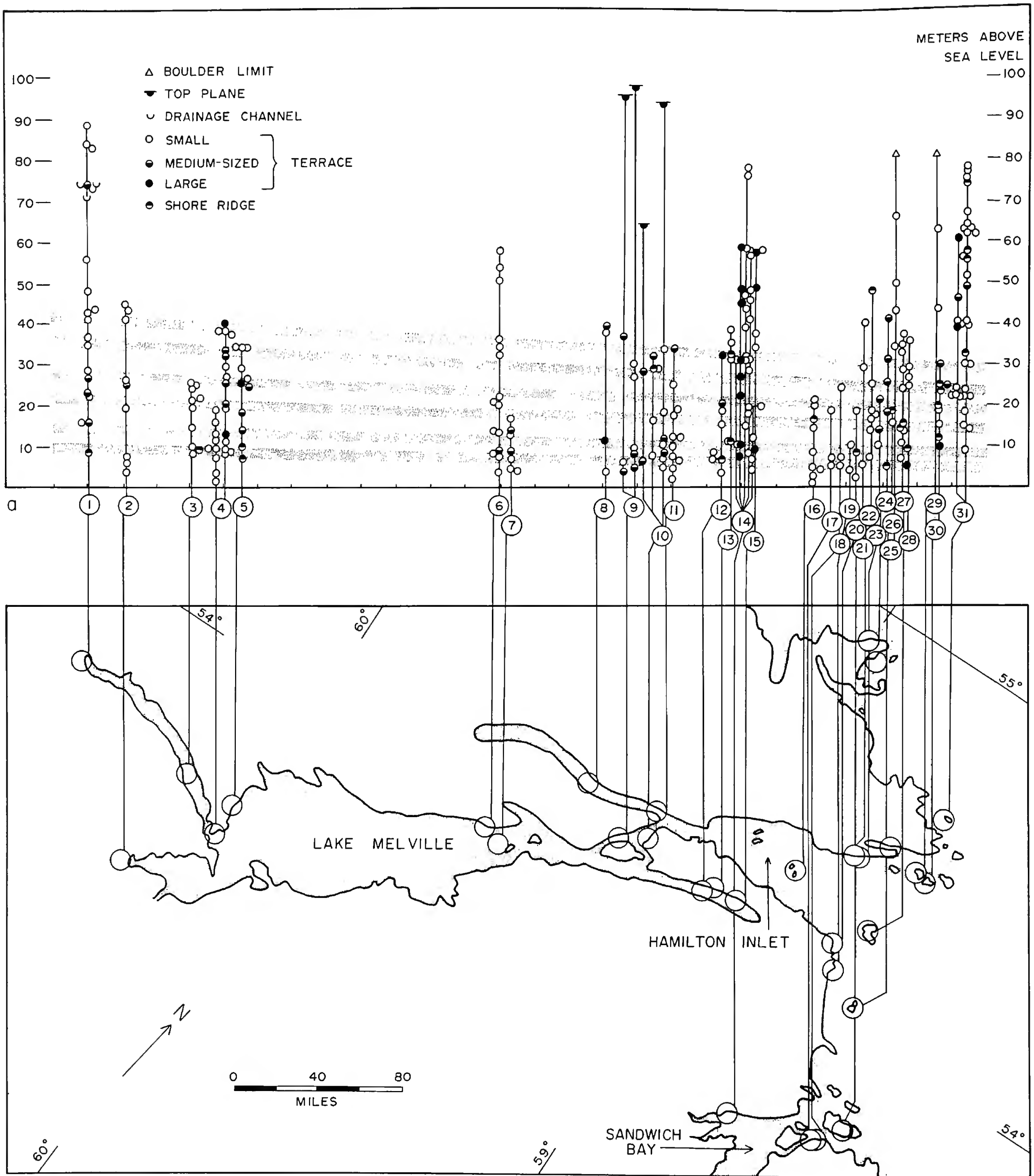


FIGURE 9.—*a*, Observation data. *b*, Strandline observations in Hamilton Inlet. Numbers indicate the source of observations, as follows: (1) Susan River, (2) Goose Bay, (3) Grand Lake, (4) and (5) North West River, (6) Charles Point, (7) Green Island, (8) Double Mer, (9) Moliak Cove, (10) Rigolet, (11) Double Mer, (12) and (13) Backway, (14) Dove Point, (15) Backway, (16) Saddle Island, (17) and (18) Cartwright, (19) West Bay, (20) Tub Harbor, (21) Huntington Island, (22) and (23) Bluff Head, (24) Cape Harrison, (25) Stag Island, (26) Sloop Harbor, (27) George Island, (28) Pottles Bay, (29) Ice Tickle, (30) Indian Tickle, (31) Holton Island. (After Wenner 1947: fig. 14a, b)

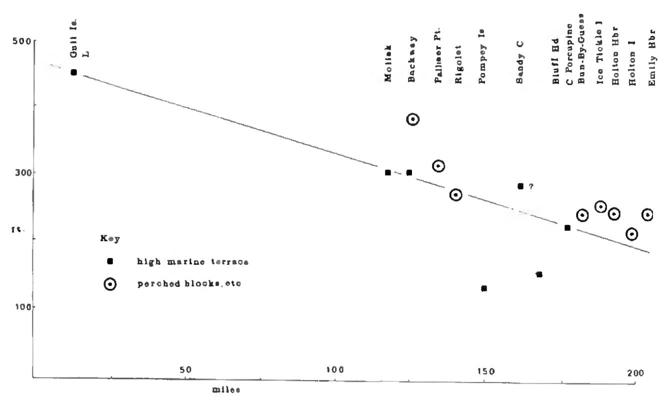


FIGURE 10.—Marine limits in Hamilton Inlet.

to be relatively slight when considered against the far greater magnitude of isostatic change. It is noted, however, that eustacy affects all sites equally while isostacy does not. There is a tendency for those areas that achieve maximum uplift early and where total rise was of lesser extent (such as on the outer coast) to be affected more by the slowly rising sea levels than those (such as North West River) where uplift has been greater, more recent, and continued at higher values for a longer period. This results in differential effects on relative beach level chronologies during recent millenia. For instance, in Rattlers Bight where uplift has been only 30 feet in the past 4000 years, eustacy has reduced this by nearly a quarter; on the other hand, at North West River the effect of eustacy has been a net reduction of elevation of only an eighth. As a result, the location of coastal sites associated with active shorelines is compressed within narrower elevation limits by nearly a factor of three when compared to interior sites. Accordingly, eustatic change accentuates the problems of using relative height above sea level for chronology in the coastal regions. Sites as old as 4000–5000 years may be found below the present 25 foot contour. At North West River, sites for the same period may be found spread throughout 100 feet of elevation with greater possibility for vertical separation and chronological seriation. This is an important consideration when establishing chronologies on relative elevations in different areas.

Isostatic Uplift and Radiocarbon Correlations

Estimates of the rate of uplift are important for dating sites and in interpreting geographic and ecological changes in an estuarine-marine environment. An attempt has therefore been made to correlate uplift rates, chronological periods, and changing shorelines. Relevant to this problem are the fifteen radiocarbon dates from the Hamilton Inlet region (Table B).

Blake (1956:89) has estimated from the elevation and dates (average of three samples 25–30 feet above sea level (a.s.l.) = 1910 ± 130 years B.P.) of fossil wood deposited in sediments in the banks of Crooked River that uplift during the past 2000 years closely approximated one foot per century. This conclusion assumes that the fossil trees were originally deposited at sea level and that subsequent uplift resulted in

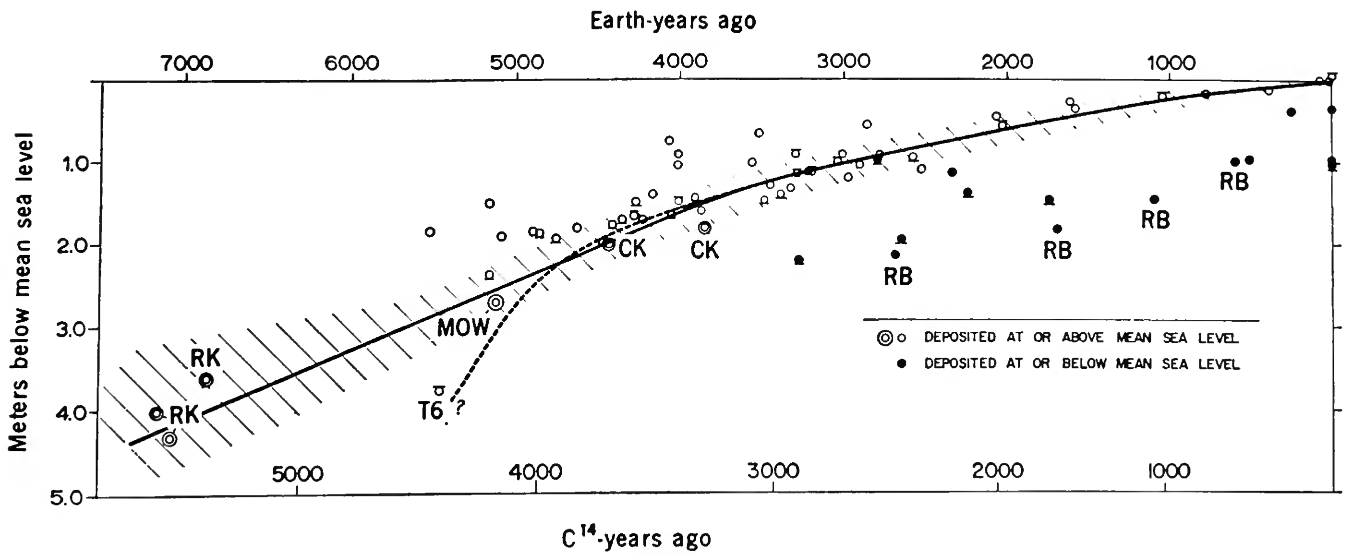


FIGURE 11.—Southern Florida submergence curve. Unbroken curve is the revised submergence curve for southern Florida; dashed curve is a previously published version. (After Scholl, Craighead, and Stuiver 1969: fig. 2)

TABLE B.—*Radiocarbon dates from Hamilton Inlet*

Site	*Designation*	*Date BP*	*BC/AD*	*Material*	*Elevation* (feet)	*Provenience or Reference*	*Lab. No.*
GEOLOGICAL							
Crooked River		2022±195	72±195 BC	fossil wood	25–35	Blake 1956	
Crooked River		2110±245	160±245 BC	fossil wood	25–35	Blake 1956	
Crooked River		1611±217	339±217 AD	fossil wood	25–35	Blake 1956	
North West River moraine*		5330±170	3380±170 BC	shell: *Mytilus edulis*	108		GSC–1135
Eskimo Island		2150±130	200±130 BC	*Mytilus edulis*	24		GSC–1210
ARCHEOLOGICAL							
Red Ocher*	FjCa–38	3090±180	1140±180 BC	charcoal	78	hearth	GSC–1280
Ticoralak 2*	GbBn–2	2690±140	740±140 BC	charcoal	31	composite	GSC–1179
Ticoralak 3	GbBn–4	2340±140	390±140 BC	charcoal	28	composite	GSC–1217
Ticoralak 5	GbBn–7	2400±160	450±160 BC	charcoal	24	hearth	GSC–1314
East Pompey Is.*	GcBi–12	2520±160	570±160 BC	charcoal	25	composite	GSC–1367
Henry Blake 1	FjCa–20	895±105	1055±105 AD	bone	23	hearth	GX–1578
Big Island 1	GbBm–1	720±130	1230±130 AD	charcoal	9	hearth	GSC–1196
Rattlers Bight*	GcBi–7	3830±140	1880±140 BC	charcoal	22	hearth	GSC–1260
Rattlers Bight*	GcBi–7	4020±150	2070±150 BC	charcoal	22	hearth	GSC–1379
(Northern Labrador)							
Thalia Point 2*	HfCi–2	3660±140	1710±140 BC	charcoal	37	area 19	GSC–1264
Thalia Point 2*	HfCi–2	2540±160	590±160 BC	charcoal	34	area 25	GSC–1381
Red Rock Point 2	GeBk–2	2200±120	250±120 BC	charcoal	31	hearth	SI–875
Sandy Cove 4	GcBk–4	4810±115	2860±115 BC	charcoal	45	hearth	SI–877
Hound Pond 4	GcBi–16	3195±120	1245±120 BC	charcoal	40	hearth	SI–927
Hound Pond 4	GcBi–16	3095±105	1145±105 BC	charcoal	40	hearth	SI–928

* Corrected for C^{13}/C^{12}.

their present elevation. It seems possible, however, that the trees may not have been laid down at sea level. In addition, I believe that the 5 foot elevation span in which they were found makes it difficult to know precisely the relationship of the fossil wood with respect to sea level at the time of deposition, since fossil deposition probably did not span the full period of emergence of 10 feet of sediments. Nevertheless, though there may be some leeway in the results obtained, the calculated uplift value agrees roughly with the value obtained from northern Ungava (Figure 12).

New data from Hamilton Inlet amplifies the view of local uplift phenomena. In particular, marine shell dated 5330 ± 170 years B.P. from the North West River moraine at 108 feet seems to have been deposited when this level was an active beach, or only slightly submerged. At the time Lake Melville was a thoroughly marine water body and marine influence extended beyond the present lake margins up the river valleys.

The Ellesmere and northern Ungava data show that rebound was initially rapid following deglaciation—as much as 25 feet per century in northern Ungava. The curve indicates a major break between 5000–6000 years ago, after which the rate became more or less constant at one foot per century. The form of this uplift curve seems to be similar in different parts of Canada; however, the specific values on the curve will vary from region to region according to the date of deglaciation, the amount of ice-loading, and the marine limit. Since a fairly constant rate for the past 5000 years has been suggested, it would be reasonable to apply the general curve to the Hamilton Inlet region. Here, however, uplift has averaged about 2.3 feet per century for the past 5200 years in western Lake Melville, while the Crooked River samples average between 1.38–1.60 feet per century. Similarly, uplift rates, corrected for eustatic change, can be calculated for other localities in the inlet, as in Table C.

For several reasons the uplift values in Table C do not carry equal weight. The most accurate approximations of actual uplift may be the geological samples; however, here, as has been previously mentioned, it is possible that the shell may have been deposited below the high tide mark, and these dates may therefore be more recent than the level on which they were found. Likewise, the archeological dates come from sites which probably would have been occupied when the active beach was between 3–15 feet lower than the site. These samples give minimum ages for the beaches on which the site was found, and maximum possible uplift rates for their elevations. Using the data under these constraints it is possible to bracket the range of the uplift curve. In addition, it appears that the Rattlers Bight dates, being late and at low elevation, must fairly closely follow the geological emergence of the 22-foot terrace. Cultural material distributions also suggest that the site was occupied when the terrace was emerging from the water. This site, therefore, gives a closer approximation of actual uplift than do the other archeological dates. Using the data in this way, it is apparent that the actual uplift values for Groswater Bay must be less than one foot per century, in the Narrows slightly more than one foot per century, and in North West River, below 2.5 feet per century. A comparison with two archeological dates from Thalia Point, Port Manvers Run, indicates that here, too, coastal uplift seems to have remained below the one foot per century level for at least the past 3000–4000 years.

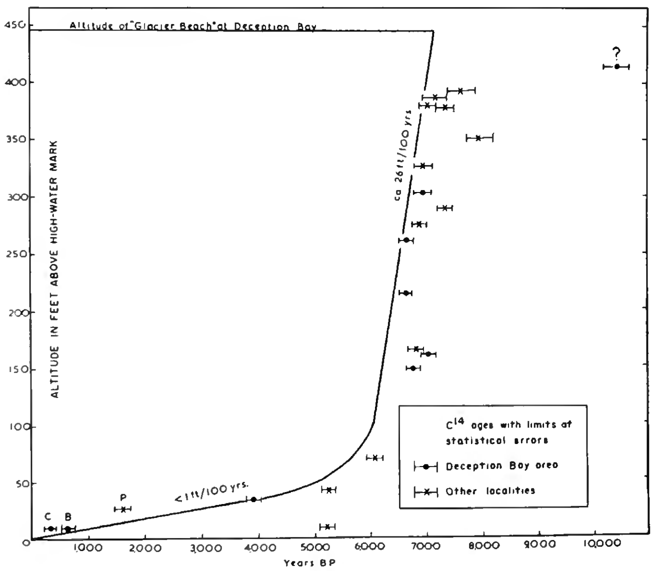


FIGURE 12.—Glacio-isostatic uplift curve for the area between Deception Bay and Cape Wolstenholme, northern Ungava, corrected for eustatic rise of sea level before 6000 years B.P. and isostatic tilt. C—charcoal; B—bone; P—peat. All other samples are marine shells. (After Matthews 1967: fig. 7)

Using data from Rattlers Bight and nearby East Pompey Island we can suggest that the Dorset site at 25 feet elevation on the island must have been occupied when the high tide level was about 12 feet above the present level, or about 12 feet below the site. By contrast, the similarity of the values based on the geological sample from Eskimo Island and the archeological dates from nearby Ticoralak suggests that these sites were occupied very close to the contemporary beachline. Such distinctions might have significance in terms of functional variations between sites, for

TABLE C.—*Average uplift rates for Hamilton Inlet**

Location	*Sample*	*Uplift rate* (feet per century)	*Duration (years BP)*
North West R.	geological	2.3	5200
Crooked R.	geological	1.38–1.60	2000
Red Ocher Site	archeological	2.73	3000
H. Blake Site	archeological	2.67	900
Eskimo Island	geological	1.26	2100
Ticoralak 2	archeological	1.30	2700
Ticoralak 3	archeological	1.35	2300
Ticoralak 5	archeological	1.12	2400
Sandy Cove 4	archeological	0.90	4800
Big Island	archeological	1.43	700
East Pompey Island	archeological	1.12	2500
Rattlers Bight (S1)	archeological	0.79	3800
Rattlers Bight (S2)	archeological	0.75	4000
Red Rock Point 2	archeological	1.40	2200

* Corrected for eustatic changes of sea level.

instance between hunting or lookout sites or living areas.

It is possible to construct a tentative uplift curve for Hamilton Inlet with these data covering the past several thousand years (Figure 13). Obviously, more data are needed to substantiate the curve. Nevertheless, its outlines appear reasonably well defined. This curve not only helps date archeological sites, but it demonstrates the usefulness of archeological data applied to geological problems (Matthews 1967:195).

In summary, these data show that the upper marine

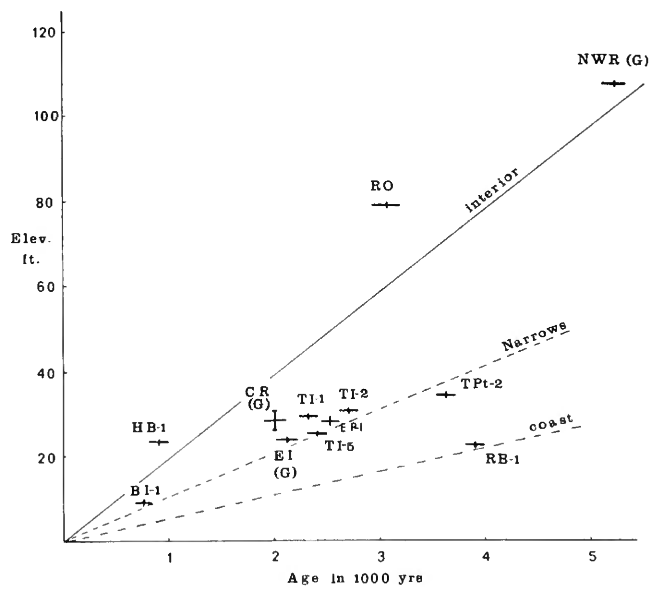


FIGURE 13.—Uplift curves for Hamilton Inlet for the past 5000 years, based on archeological and geological data (G). Abbreviations stand for site names.

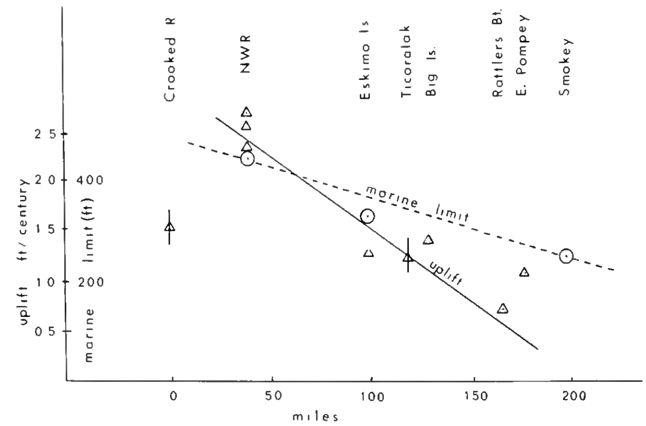


FIGURE 14.—Marine limits (⊙) and uplift rates (△) of the past 2000–5000 years for Hamilton Inlet.

limit varies from 450 feet in western Lake Melville and Gull Island Lake to 325 feet in the Narrows, and about 250 feet on the outer coast. Correspondingly, calculated rates of uplift for these regions during the past 4000–5000 years show the values to lie between 1.4–2.3 feet per century on the interior, to about 1.0 feet per century in the Narrows, and between 0.8–1.0 feet per century in Groswater Bay (Figure 14). Thus marine limits and recent uplift rates roughly correspond in relative magnitude and variation as one proceeds from interior to coast.

These data also suggest that deglaciation and uplift began early on the outer coast and islands and that uplift was largely completed by 4000 years ago. In the interior, deglaciation and uplift began later, had a greater magnitude, and continued for a longer period. At 4000 years ago the present 20-foot contour was an active beach at Rattlers Bight; at the same time, the North West River moraine had an active beach at about the present 70–80 foot contour. Thus the earliest known sites from North West River date roughly to the time of the Rattlers Bight emergence.

Dating

Quite apart from the geologic interest in amounts and rates of uplift, this information is valid for dating sites found associated with fossil beaches. The technique can be demonstrated by the following example from Groswater Bay.

The several Maritime Archaic sites from Sandy Cove have not been dated by the radiocarbon method. Using the local uplift data and site topography, however, it is possible to suggest a probable time of occupation. The sites are found on a large terrace 45 feet above the present sea level. It seems probable that sea level during the occupation of this site stood between 22–45 feet above the present sea level. A later occupation of the site when the beachline was less than 22 feet above present sea level can be ruled out on both cultural and geological grounds. The cultural sequence shows that there is no time available for a post-Rattlers Bight Maritime Archaic component, and topographic considerations at Sandy Cove would make this location unsuitable for launching boats after the sea level had dropped below the 25-foot contour. The protected cove, an important feature of local geography, would have been unusable after this date. Since the 22-foot beach at Rattlers Bight is approximately 4000 years old it is probable that the 25-foot contour dates to about 4300 B.P. The age of the 40-foot contour cannot be known until dates from that elevation are obtained; however, an estimate predating 6000 B.P. would appear reasonable. Thus a conservative geological estimate of the Sandy Cove occupation would place it between 6000–4500 years ago. Most likely, the actual date falls in the later part of this range. [At time of printing, this estimate has been confirmed by a radiocarbon date of 4810 ± 115 B.P. for the Sandy Cove-4 site.]

Paleogeography

A second and equally important use of uplift data involves paleogeographic and ecological reconstruction. Hamilton Inlet is a region with great topographic variety, with coastlines ranging from mountain flanks to rocky hills and low sandy or marshy plains. Because of its topography the inlet has experienced major changes in geography as the shorelines have shifted during the period of isostatic adjustment. These changes were of course greatest during the rapid initial recovery phase between 10,000–6,000 years ago. During this time Hamilton Inlet would have been a huge westward extension of the sea whose mouth was filled with large islands. Double Mer was connected to Lake Melville through Mulligan Bay; the east end of the Backway was open to the sea, as well as the Narrows and Double Mer; and marine waters extended far up the Naskapi and Churchill River valleys. Change during the past 6000 years has been less extensive, but, nevertheless has resulted in marked alteration of the landscape in regions lying below the 150-foot contour. Several examples reveal the effect of this change in terms of human geography, transportation, settlement, and ecology.

NORTH WEST RIVER.—North West River is one such important area. Its strategic location at the debouchment of the Naskapi drainage into Lake Melville has resulted in its frequent occupation by people moving between coast and interior. Fishing resources are particularly good here. The topography of the region is dominated by two moraines, the largest being the North West River moraine, a feature nearly ten miles long and with maximum elevations of 250 feet. During marine transgression immediately following glacial retreat past North West River (9000 B.P., Hodgson, GSC, pers. comm.) the entire area was submerged to the marine limit, about 450 feet. At this time the eastern end of Lake Melville was open to the sea across broad corridors in the Narrows and Backway, and marine influence extended west into the large river valleys.

Isostatic recovery of the land was swift. The ensuing changes can be seen by plotting relic shorelines at various contour intervals from topographic maps and aerial photographs (Figure 15*a-d*). The 250-foot summit of the North West River moraine probably emerged as a sandy island in a large marine bay about 7500 years ago. By about 6500 years ago a large portion of the northern end of the moraine had emerged, approximating the level of the 150-foot contour (Figure 15*a*). Some time soon after this it is probable that man first entered Labrador. Presumably, sites of this period would be located adjacent to the channel separating the northern end of the moraine from the mainland, now several miles inland, or in the Naskapi River valley to the west.

The land had again changed by the time the 108-foot shells were deposited. This was 5000 years ago, and the 100-foot contour reveals the southern portions of the moraine emerging as two islands within a marine bay (Figure 15*b*). By this time, Maritime Archaic sites were being occupied in Groswater Bay, and there is a suggestion of a similar culture from a site high on the moraine north of North West River.

Following 5000 B.P. the land emerged at an average rate of about 2 feet per century. Gradually the moraine rose, sealing off the bay and enclosing Grand Lake behind the sand barrier. The Naskapi drainage exited to Lake Melville through three outlets: one north of the tower where the moraine dips to about 50 feet, another through the lowlands south of North West River, and a third through the present outlet. Gradually the northern and southern exits were sealed (about 3500 years ago) and circa 3000 B.P. with the emergence of the 50-foot contour (Figure 15*c*). North West River began to assume its present form. By this time, marine influence must have diminished greatly in western Lake Melville, and Grand Lake would have become fresh water. The Backway, however, was still open to the sea. With the closing of the northern and southern channels between Grand Lake and Lake Melville the Naskapi cut deeper into the emerging sands of the North West River moraine, carving numerous terraces and strand lines on the north side of the river. It was on these landforms that succeeding groups of hunters and fishermen settled.

This review of topographic control of geography shows that extensive changes have occurred in the North West River area which affect archeological investigation and paleoecological studies. One of the first and striking implications is that early sites will not be found in the immediate environs of North West River. Although the area could have been inhabited as early as 5000 years ago (100-foot level), it is quite obvious that its present attractions for settlement would not have obtained at that time; rather, the search for early sites should be centered around the northern regions of the moraine at the margins of the 70-foot breach north of the tower for the 3500–4500 B.P. period, and for earlier periods at the channel that existed between the north end of the moraine and the mainland. Today these potential site locales are miles inland and almost wholly inaccessible.

With the closure of the northern and southern breaches, settlement opportunities shifted to North West River, and one can surmise that the earliest sites should be located below or only slightly above the 70-foot beaches. Given the average rate of uplift for the area these early North West River sites should date approximately at 3050 B.P. Acually, the earliest site presently found lies on the 78-foot terrace, and has a radiocarbon date of 3090 ± 180 B.P. Perhaps more important, the relevance of this geographic analysis of settlement possibilities is verified by the complete absence of any culture of the Maritime Archaic tradition from the North West River sites which lie below the 80-foot contour and later than 2000 B.C.

The further usefulness of this type of analysis is seen in its contribution to the paleoecology of the area. During the early postglacial periods the extension of marine conditions into western Lake Melville and the large river valleys would have attracted marine resources, including seal, walrus, and probably capelin, cod, and whale. The present estuarine balance would have been shifted to the westward. It is doubtful that a strong halocline could have existed, and the thermocline would have been reduced (see pages 18–19). The entire inlet would have been subject to greater mixing and increased biological productivity. Relevant models for this condition can be found in marine inlets in Labrador today.

During subsequent periods marine influence was gradually withdrawn as the land emerged and marine access to the sea through the Narrows and Backway diminished. Slowly, hydrographic and ecological conditions became more like those of the present. But, even so, major changes may not have occurred until

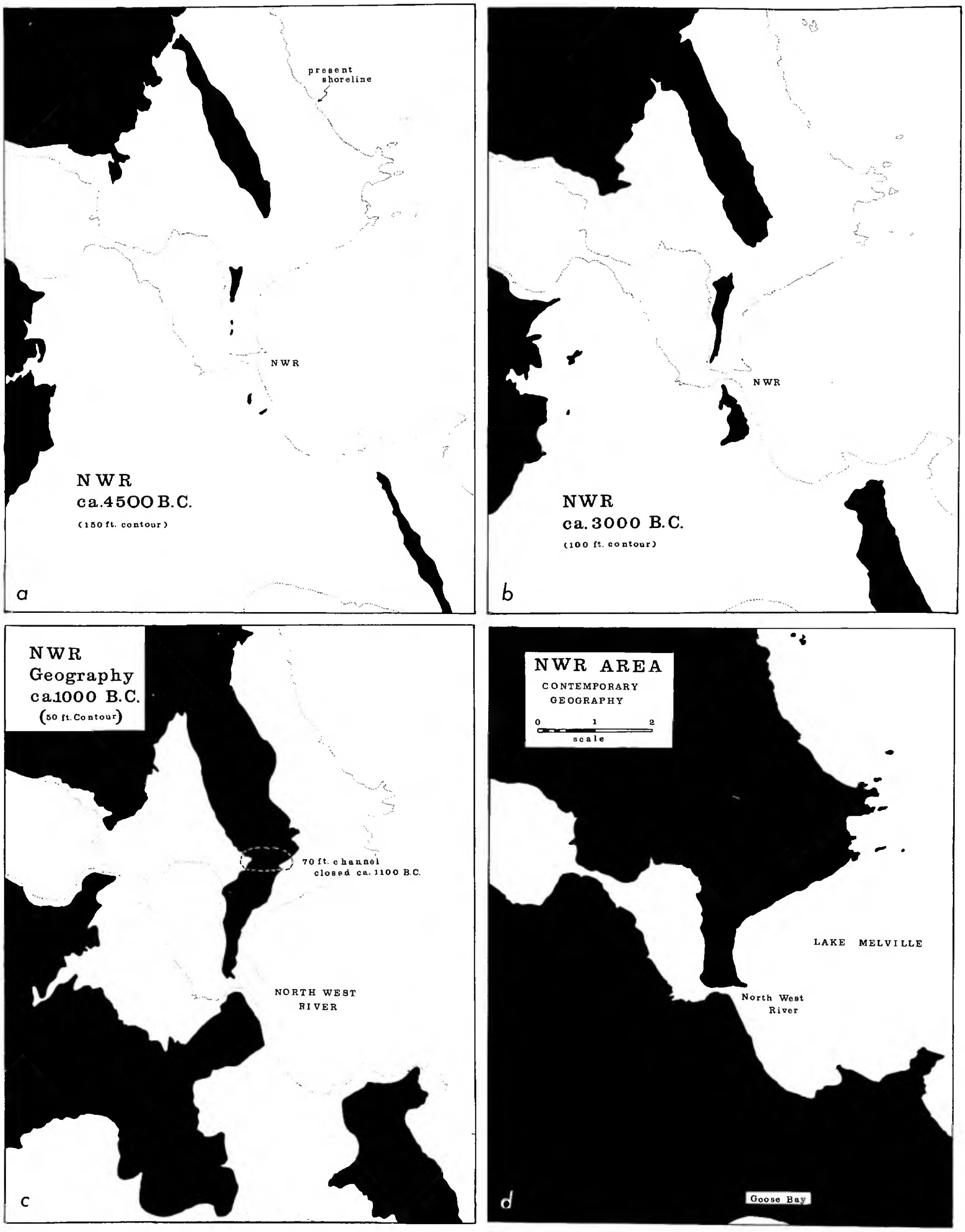


FIGURE 15.—Paleogeographic changes in the North West River area during the past 6500 years. *a, Circa* 4500 B.C., *b,* Circa 3000 B.C., *c,* Circa 1000 B.C., *d,* Contemporary geography. (Scale in miles.)

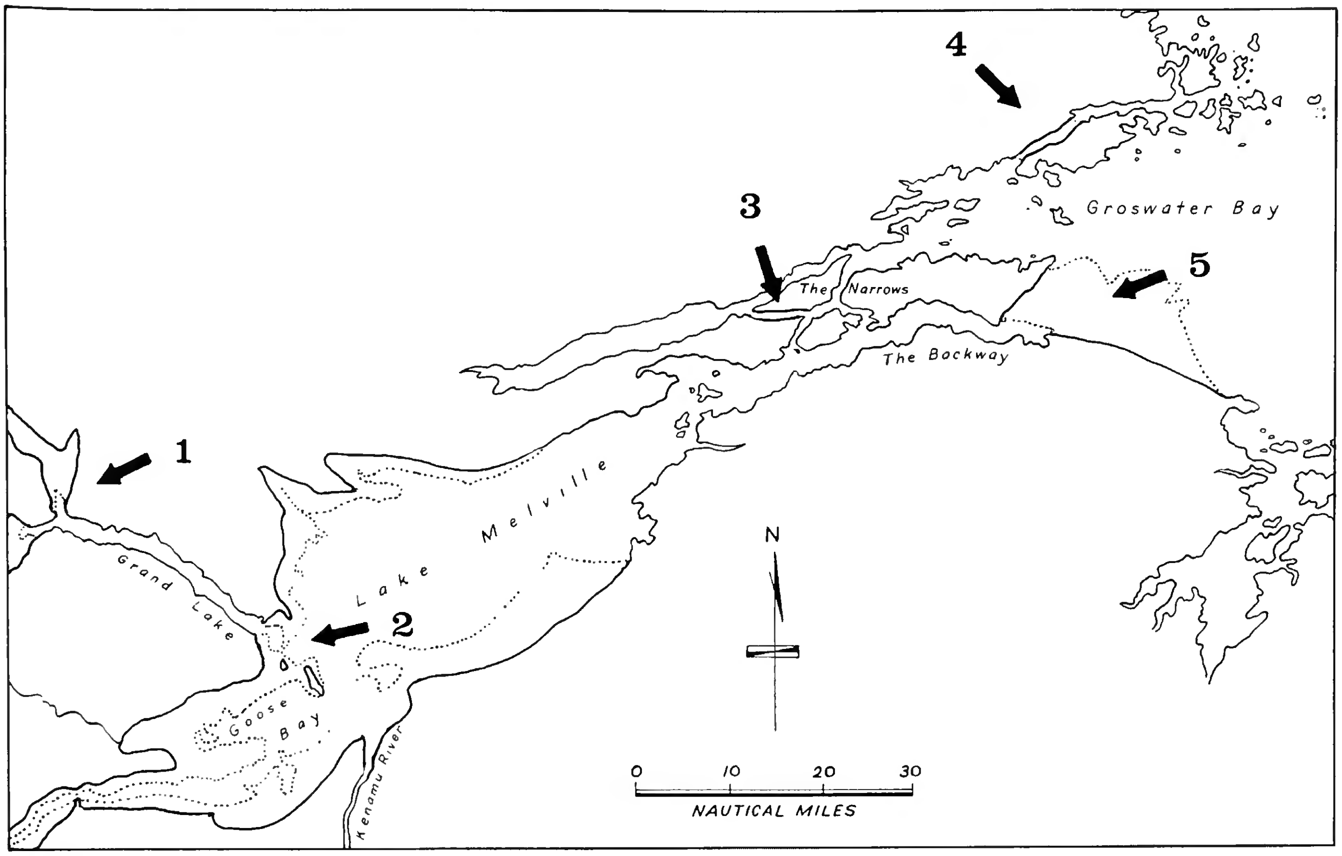


FIGURE 16.—Hamilton Inlet circa 5000 B.P. Major areas of change are the river expansions (1), the Goose Bay and North West River enlargements (2), the Moliak channel (3), the Pottles Bay channel (4), and the Backway channel to the sea (5).

after the Backway breach was closed, circa 2000 years ago. Therefore, in the range of early human occupation, between 4000–6000 B.P., the depth of the sill in the Narrows would have been 32–46 feet greater (uplift minus eustacy), or between 120–140 feet deep. At that time the Backway channel was between 12–26 feet deep and perhaps as much as 2–5 miles in width. These physical changes would have greatly influenced the contemporary ecology of the inlet (Figure 16), which is today controlled largely by the marine exchange occurring across the 90-foot sill in the Narrows.

It is reasonable, therefore, to suppose that as late as 4000–2000 B.C. considerable marine influence was still felt in Lake Melville. In the first place, marine shells from North West River document this condition at least as late as 5000 B.P. The presence of harbor seal in Seal Lake suggests the western extent of former marine influence. Even if the inlet was not suitable for walrus in 3000 B.C. capelin and cod would have been in the inlet, and therefore possibly whales as well. Indeed, it can be assumed fairly safely that the biological activity of the lake has been consistently diminished from a former relative abundance of marine species to its present reduced potential as thermocline and halocline structures became increasingly stabilized through time. It can also be assumed that the increased productivity and presence of marine species were important to the early inhabitants of Lake Melville.

Unfortunately, the early archeological sites so far found in the North West River area do not contain any preserved faunal remains to document this paleoecological reconstruction. In any case, the analysis would seem to warrant the conservative statement that during the past 5000 years Lake Melville has undergone increasing reduction of higher marine biological activity, including the numbers of species present as well as their concentration. To the greatest extent this trend toward a more estuarine environment has been caused by topographic and hydrographic changes resulting from isostatic adjustment. Analysis of the effects of uplift on human ecology and geography, therefore, has important bearing on site location, archeological surveying techniques, dating, and paleoecological reconstruction.

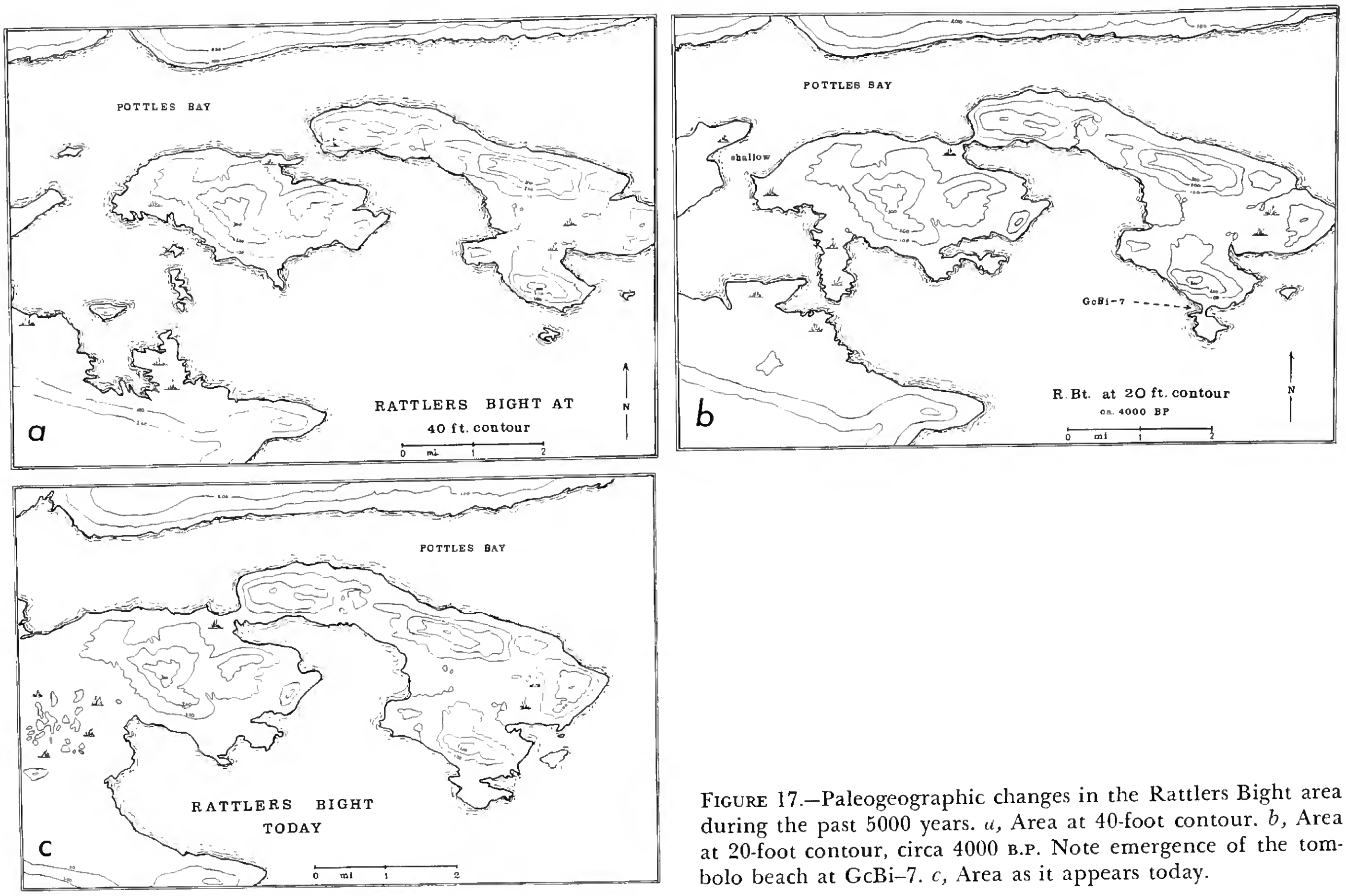


FIGURE 17.—Paleogeographic changes in the Rattlers Bight area during the past 5000 years. *a*, Area at 40-foot contour. *b*, Area at 20-foot contour, circa 4000 B.P. Note emergence of the tombolo beach at GcBi-7. *c*, Area as it appears today.

RATTLERS BIGHT.—Outside of Lake Melville similar, if less dramatic, changes occurred as a result of the interaction between topography and isostacy. This is best seen in an area of strong topographic contrast, such as Rattlers Bight. Even here, where uplift has been less than at North West River and where eustatic change has diminished relative geographic change, considerable alteration of the environment has occurred (Figures 17*a-c*).

The control point at Rattlers Bight is the 22-foot beach at the Rattlers Bight 1 site, radiocarbon dated to about 4000 B.P. For reasons already given, this date probably follows closely the emergence of the 22-foot beach. Earlier, the entrance to Pottles Bay was dominated by two large islands divided by shoal waters and marshy flats (Figure 17*a*). These shallows would have been ideal for summer seal hunting, and for birds, fish, and perhaps walrus, which would have fed on the extensive shellfish beds. At that time a small island lay off the southeastern entrance of the bay with a shallow underwater sand bar beginning to build up as a tombolo bar to the main island.

By 4000 years ago this island became connected to the larger land by the emerged bar (Figure 17*b*). The geography of the site made it an ideal summer camp for the marine hunters and fishermen. Although water communication between the large islands gradually began to close, hunting possibilities would have remained about the same as before.

Later, the coastline of the area changed further as the islands joined the mainland (Figure 17*c*). Rattlers Bight, however, remained an important hunting and fishing area for both Indians and Eskimos during the following centuries. Ecological changes here seem to have been minimal compared with Lake Melville, but the area maintained an important position in human geography due to its being the eastern limit of the mainland still protected from ocean storms and because of its good hunting and fishing. It is therefore understandable that the area should be so rich in archeological sites.

Climate

The contemporary climate of Labrador has been discussed in an earlier chapter. There it was noted that a 4–5 degree (F) drop in the mean annual summer temperature would result in net accumulation of snow on the interior plateau (Hare 1966:10; Terasmae 1961:667). Labrador is, therefore, a sensitive indicator of relatively small climatic trends whose effects may be registered first in this area. It is to be expected that these changes may result in fairly great ecological shifts in flora and fauna, which themselves may affect a human population. In addition, there are the effects of climatic change on the marine environment, particularly on the distribution of winter pack ice. For these reasons, it is necessary to assess the present state of knowledge concerning past climates and their possible influence on human adaptations and distributions.

Fortunately, palynological data is fairly abundant for Labrador. The major research is an extensive study by C. G. Wenner (1947), growing out of his association with Tanner's research. Wenner took 75 pollen cores from the forest and tundra zones of central and northern Labrador. In the analysis, which was conducted without the aid of radiocarbon dating, Wenner found most of the interior cores showed a "normal" development from an early period of birch-alder growth to spruce forest conditions. Among others, this was seen in cores from Susan River, North West River, Muskrat Falls, and Rigolet. There was also some evidence of this development in the tundra zones, particularly around Nain (12 cores), and at Cape Harrison and Sandwich Bay. In many of the present tundra locales Wenner (1947:148) noted a "revertence" from a normal forest development to tundra conditions. He attributed this revertence to southern forest expansion followed by a decrease of forest cover due to "paludification" in forest regions, associated with climatic deterioration.

Wenner noted five revertence zones consisting of distinct heath levels in the cores. These he attributed to shifts between cool/wet and warm/dry periods which he correlated with the revertence zones from northern Europe where they dated (without radiocarbon) 4300, 3200, 2600, 1600, and 700 B.P. Paludification following Level III (2600 B.P.) marked a major climatic deterioration (Wenner 1947:151), with revertence to tundra in many regions. Wenner found the forest had extended north prior to Level III, and linked this with the climatic optimum (hypsithermal) to the south. Other forest-tundra shifts were noted, but that in Level III was greatest.

In the Churchill River and Lake Plateau area west of Wenner's study an important pollen study has been conducted by A. Morrison (1963, 1970). Here, in a series of radiocarbon-dated cores which included the transition from base ground to spruce forest, Morrison concluded that the immigration of new species into the previously glaciated plateau occurred rapidly during the period between 5700 and 5200 B.P. Since that time relatively minor vegetation changes have occurred which he ascribes to minor climatic fluctuations and fire disturbance. Although his pollen zones are not exactly contemporaneous with Wenner's from Lake Melville, the sequences of zones corresponds (Morrison 1970:1965). It would seem that the earliest pollen zones from the Susan River and North West River cores in Wenner's samples date to the immediate postglacial period and are considerably older than those zones on the plateau to the west.

A third pollen study, conducted by J. F. Grayson (1956), continues this chain of research from Lake Melville west to the Kaniapiskau River. Grayson analyzed a series of radiocarbon-dated cores from Schefferville and the Kaniapiskau area and concluded that most of this area had been deglaciated by 8000 B.P., and that practically all ice had melted by 6000 B.P. The subsequent postglacial climate was characterized by a continued warming trend with only minor oscillations from the glacial period to the present.

Three periods were observed in the floral succession. Following a brief period of tundra vegetation came a shrub-woodland period (birch-alder) which lasted until about 5000 years ago, at which time the arboreal period began. In the northern interior (Knob Lake) this transition did not occur until about 3500 B.P.

Within this sequence, Grayson (1956:203) found numerous cool episodes which, however, did not retard the general warming trend. At 5300 and 3400 B.P. he noted two "xerothermic" and arboreal maxima. Consistent with Wenner's work, he found a return to cooler times following thermal maxima, with bog development commencing each time. The lower temperatures, however, did not represent a revertence to tundra conditions. Grayson felt that the thermal maximum "was not as warm, or at least no warmer than the present." Among other observations he noted the importance of fire in the floral succession in Labrador-Quebec.

J. Terasmae (1961:667) offers a slightly different interpretation based on his pollen studies from northern Ontario and Quebec. Here he found evidence for a climate beginning about 7000 B.P. with a mean annual temperature that was

> about 5 degrees (F) higher than the present; summer and possibly also winter precipitation was probably lower. The hypsithermal interval came to a close when the average annual mean temperature gradually dropped some 10 degrees (F) and was accompanied by heavier accumulation of snow. The climate was then more severe than it is now and may have resulted in expansion of the permafrost zone.

This view is at odds with Grayson's (1956:203) claim for a lower hypsithermal temperature.

A final piece of climatic data for Labrador-Quebec comes from Barry Matthews' (1967) research on the northern Ungava beaches. Here, on the *Aporrhais* Beach at Deception Bay (dating 5230–3900 B.P.) Mat-

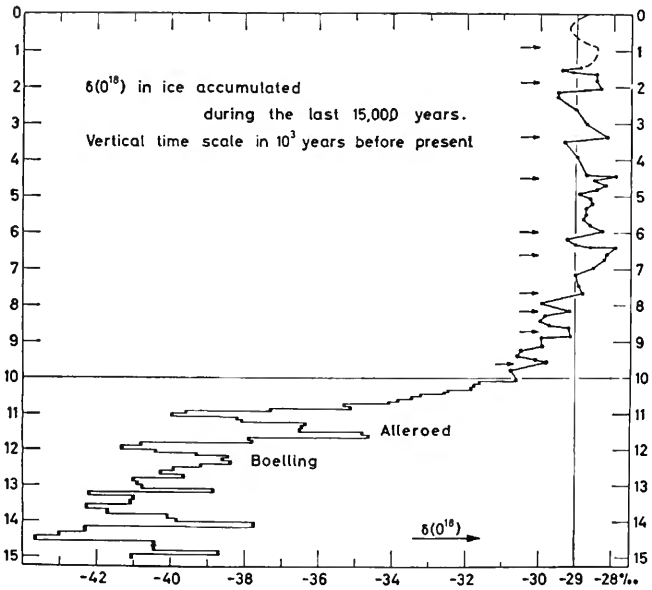


FIGURE 18.—Climatic variations reflected by δ(O[18]) variations in the ice of the Camp Century core from the present to the late Wisconsin glacial period. The data points in the upper portion of the curve represent time periods of from 25 years to 50 years. The step curve in the lower portion of the curve represents a continuous sequence of measured samples, each extending over approximately 100 years. A 940-year climatic period is suggested, which is indicated by the arrows in the upper curve and the maximum peaks in the lower curve. (After Dansgaard, et al. 1969: fig. 4)

thews noted the appearance and high percentage of southern mollusk species now restricted to waters south of Newfoundland. These data indicated a northern marine isotherm shift of about 4 degrees Fahrenheit. For the same period he found a great increase in the percent of conifer and alder pollen in the *Aporrhais* Beach organic sediments. Today the forest boundary is about 300 miles to the south. This floral shift also approximates a 4 degree (F) northern shift of the climatic isotherm (Matthews 1967:191). In addition, Matthews found evidence for a cooler and wetter period after 2500 B.P. on the Hemithyris Beach of Sugluk and Deception Bay.

It is useful to place the Labrador data into a larger framework by considering climatic data from pollen studies west of Hudson Bay and from the recent Camp Century oxygen-isotope climatic sequence in Greenland.

In 1956 Bryson, Irving, and Larsen reported on buried podsols and charcoal horizons from the Dubawnt Lake area. Between 5500–3500 B.P. the spruce forest had extended into this area, 175 miles north of its present location, and burned, after which it did not regenerate until a second northward extension occurred circa 1000 B.P. Again the forest burned and failed to re-grow. The evidence indicated cold periods from 4000–3000 B.P., and again following 900 B.P.

Nichols (1967) amplified these conclusions with palynological data from the present forest-tundra ecotone at Ennadai Lake. He concluded that late Wisconsin ice covered the area as late as 8000 years ago, and had melted by 6500 B.P. The period between 5700–3600 years ago was a warm period, but had a cool episode at 5000 B.P. The forest extended north to Dubawnt Lake and burned about 3410 B.P. Between 3650 and 2600 B.P. there was a generally cooler period, but it had major peaks in sphagnum growth, indicating warm, wet intervals, at 3650, 3140, and 2670 B.P. Other sphagnum peaks occurred at 2710, 1510, and 630 B.P.; 2600–1500 B.P. was a drier, cooler period, followed by a warm interval with northward forest extension. About 600 years ago deterioration again set in. He also notes the congruence of these results with Western Europe, and the Viking voyages.

Finally, we may compare the foregoing studies with the remarkable 100,000 year climatic record (Figures 18, 19) from the ice core taken at Camp Century, Greenland (Dansgaard, et al. 1969). The accuracy of this record appears unquestionable. Its recent end has been verified against historic records for the past 500 years; earlier, it agrees with the climatic fluctuations known from the postglacial period, including the data reviewed here for northeastern North America. Furthermore, its reference to temperature makes it a more sensitive indicator than vegetation changes. However, the ice-core data does not specify relative wetness or dryness, factors which may be as important as temperature in the over-all effects of climatic change.

Dekin, (1969, 1970) has presented a summary of climatic data for the eastern Arctic for the period from 4500–900 years ago. I have expanded his sequence to include the Labrador and Camp Century data (Table D). Eight periods are suggested. While there is obviously some regional variation in the actual expression of these trends, the general climatic picture seems to be close to this scheme. A similar sequence has been proposed by Bryson and Wendland (1967), which gives more detailed treatment to the period from 2500 B.P. to the present.

The relationship between climate, ecology, and culture is only beginning to be investigated in the north, and very few concrete facts and correlations have been made. As climatological and environmental data accumulate (including pollen analyses, and faunal evidence from archeological sites) and as cultural distributions and radiocarbon dates come to light it is becoming possible to investigate these problems in a

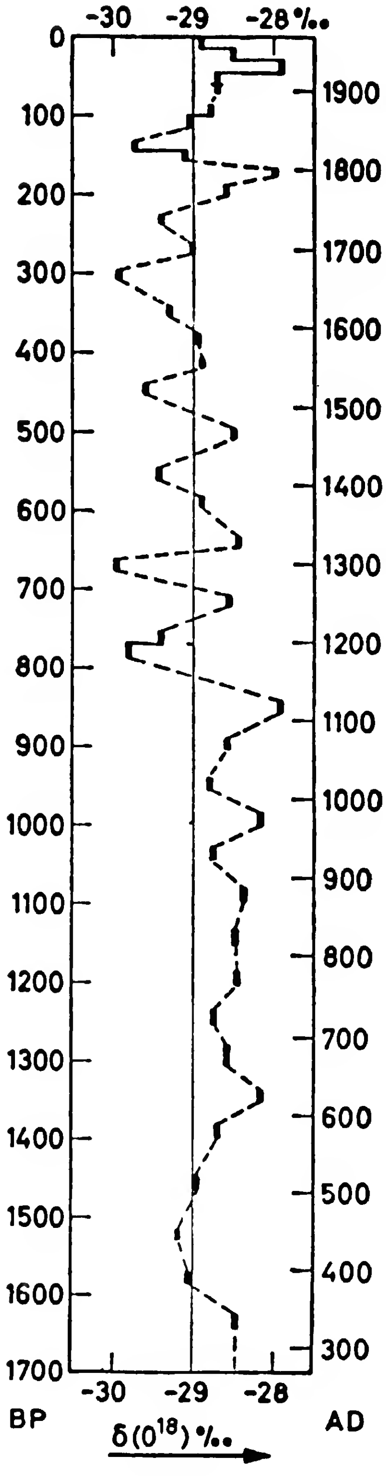


FIGURE 19.—Temperature changes during the past 2000 years. Variations in the $\delta(O^{18})$ in the upper 470 m of the Camp Century ice core plotted against the calculated age of the ice. Cold periods are represented by low $\delta(O^{18})$'s, < -29 per mille (-29 ‰). (Dansgaard, et al. 1969: fig. 3)

TABLE D.—*Climatic periods in northeastern Canada*

Period	*BP*	*Climate*
	8000	
I		Cool. Warming. Tundra to shrub transition.
	6000	Cool episode about 6000.
	5500	
II		Climatic Optimum with several cool episodes, such as at 5000; otherwise relatively warm and dry. Forest moves north of present boundary by 3500.
	3500	
III		Fluctuations. Generally cooler; certainly wetter. Forest retreats south.
	3000	
IV		Fairly stable period. Warm, but cooling.
	2500	
V		Cool period. Wetter.
	2000	
VI		Warmer and drier. Forest again moves north. Cooling episode about 1500.
	1500	
VII		Gradual warming resulting in Little Climatic Optimum around 1000 AD, thereafter slight cooling.
	800	
VIII		Climatic fluctuations. Warm to cool. Gradually cooling more after 500. Little Ice Age about 400–300.
	300	

scientific fashion. This involves going back to basic ecological, physical, and biological principles and accumulating a large body of firm associations between cultural movements and change and environmental conditions before firm statements can be made.

One of the striking facts regarding relationships between culture and climate in the north is the frequency with which important cultural events coincide with climatic shifts. For example, there is the initial movement of Arctic Small tradition into the eastern Arctic during the latter part of the Climatic Optimum, and the similar move east by the Thule peoples, again at the height of a warm period, this time the Little Climatic Optimum. There is also the coincidence of Thule movements into the interior from the coast in both North Alaska and the central Barren Grounds with the onset of the Little Ice Age. During the same period, the Thule movement south down the Labrador coast occurred.

While the facts of these cultural movements are plain, their explanations are most difficult to perceive since they are the result of indirect and complex relationships between physical, biological, and cultural realms. A suggestion as to the interrelationships between these variables may be found in a provocative volume by Christian Vibe (1967, 1970) in which he relates animal distributions in Greenland to climatic and environmental change. According to Vibe, faunal distributions and population fluctuations are closely related to changes in pack ice distributions and weather patterns. Cultural events in Greenland correspond with these physical and ecological changes. Vibe's work, and ecological and historical studies such as Elton's (1942), point out many of the climatic-controlled ecological factors which may influence human populations in the Arctic and subarctic. Some of the facts that affect interior ecology are the prevalence of forest fire, heavy winter snow, and winter icing of feeding grounds. All of these may cause population crashes of musk-ox and caribou, staples of interior economies. Factors affecting marine ecology are more indirect and long term in operation. Many of the important marine mammals are adapted to life in and along the edge of the winter pack ice. Ice characteristics and distribution shift according to climatic and oceanographic conditions. When these conditions change, cultures adapted to them must shift also. In Labrador, it appears that cultural events on the interior and on the coast often coincide with climatic shifts which result in important ecological changes.

LITHIC MATERIAL SOURCES

Raw Materials

The use of raw materials analysis in archeological interpretation is becoming more common as physical and chemical methods are devised which allow more percise identification and description of their characteristics, enabling one to make more confident statements concerning source locations and trade patterns. Although usually restricted to the more distinctive types of materials, such as obsidian, special flints, and cherts, it is also possible by clearly defining a geographic region and working with materials used by different cultures within a regional "resource universe" to achieve useful results from more common materials like quartzites, slates, and undiagnostic cherts. This section is devoted to the problem of source locations of raw materials in Hamilton Inlet archeological sites.

The two principal uses of raw material analysis are for determining trade patterns or cultural movements between source locations and final destinations, and secondly for determining culturally distinctive patterns of usage relating to functional and technological attributes of the material, cultural choice, availability, and other factors.

The identification of source locations to determine patterns of trade and movement has recently been pioneered by studies in the Near East (Renfrew, Dixon, and Cann 1966) and in North America (Gordus, Wright, and Griffin 1968). These studies for the first time apply accurate scientific methods such as neutron activation and mass spectrometry to problems of lithic identification which have previously rested on the folklore of gross physical characteristics and generally insufficient geological knowledge. They provide some degree of objective assurance that positive identifications can be made to support arguments for trade networks and distributions across cultural boundaries. These methods have been applied to the Hamilton Inlet and Labrador data to determine the distinctiveness and possible source location of Ramah chert.

Sources

METHODS

The methods used to interpret the meaning of raw materials in Hamilton Inlet sites are briefly discussed below. They include three categories of inquiry, primarily aimed at determining the source locations and geological identity of these materials.

Geological Data

Intensive geological investigation of the Labrador-Quebec peninsula is just beginning. However, the literature on Labrador is fairly extensive, especially for the coast, and permits some statements regarding specific and probable source locations of some rock types, as well as more general statements for others. In cases where specific identifications cannot be made, general areas of probable sources can be indicated from regional geology, since most of the central Labrador region is Precambrian shield and devoid of lithic materials of particular use to man.

Archeological Distributions

The distribution of raw materials in archeological sites provides a method for locating general regions in which certain materials are found. While not indicating specific quarry sites in most cases, they can nevertheless be of great use, providing archeological data is sufficient and the materials in question are not commonly available. Besides the physical composition and structure of the material, such evidence as cortex flakes can be useful, for nodular cortex flakes may indicate their presence in glacial debris or deposits which are no longer in geological context, while cortices showing stratigraphic contact zones show they were quarried from stratigraphic context, enabling one to pin down their provenience more closely.

Physical-Chemical Methods

These methods include a variety of visual, petrographic, and composition analyses. At present most of the materials from Hamilton Inlet have been studied only from the point of view of gross physical characteristics. In the case of Ramah chert more extensive tests have been conducted, since the distribution of this material represents a major archeological problem of importance not only in Hamilton Inlet but the greater Northeast as well.

GENERAL SOURCES

The following statements can be made concerning the probable source locations of some materials in Hamilton Inlet sites.

Red Quartzite, White-Gray Quartzite, Quartz

These materials are commonly found in the glacial deposits throughout the Hamilton Inlet region and have been used extensively by several prehistoric groups. Cobbles of these materials are also found along the rivers and shores. Although there are no geological in situ deposits of red and white quartzite known in the inlet, quartz is present in veins in the basement rocks of the region.

Banded Lava

This material is used in several North West River sites. It does not seem to be locally available; nor is it present on the coast. It seems likely that its source location is in the Seal Lake area where geologists report volcanic deposits, including banded tuffs and lavas (Christie, Roscoe, and Fahrig 1953; Brummer and Mann 1961).

Purple-tan Chert and Felsites

Opaque fine-grained bedded cherts and felsites varying from purple to pink, lavender, and tan in color form a large part of the raw material complexes of the earlier North West River sites and several sites from the coastal zones in Hamilton Inlet and to the north (Strong collection). This material often has small light-colored inclusions and at times is fairly coarse-grained. It appears to be very similar to materials known from the Seal Lake area, according to geologists (pers. comm. Murray Piloski of BRINEX; also Brummer and Mann 1961; Emslie 1968). In the absence of other sources its location is tentatively placed in this area, though erratic boulders of the stone might be found in glacial dispersion paths east of Seal Lake.

Mottled Chert

A second variety of chert is found in Dorset sites in Groswater Bay. This is a crypto-crystalline material which seems to occur in nodules; its color varies from dark brown to tan, green, and even blue—sometimes in the same piece of rock. The cortex is chalky and weathered. No reliable source area for the stone is known, though it would appear to be in the coastal zone of central Labrador. A likely source is in the limestone beds on the east side of Kaipokak Bay (Douglas 1953).

Black Chert

A single specimen of black chert was found in North West River and a few pieces in Dorset sites on the coast. It is a common material in pre-Dorset and Dorset sites of northern Labrador and has been found in the Hopedale area as well (Junius Bird collections). The material would appear to have a northern distribution in Labrador. At least in the north, black chert may form part of the Ramah series (Coleman 1921). Ramah chert occasionally grades into a crypto-crystalline black rock which appears identical to black chert, though when associated with the Ramah chert bed it usually has a vitreous lustre which the black chert often lacks.

Slate

Archeologically, slate distributions are found in Maritime Archaic and Dorset contexts only. Presently, it is known primarily from the coast, although interior specimens have been found by MacLeod (per. comm.) in the Sandgirt area. Slate is also found archeologically at Indian House Lake in northern Quebec. Presumably it will be found in greater quantity on the interior as Maritime Archaic sites are located there. The slate from Sandy Cove and Rattlers Bight includes tan, green, and red slates. The green slate is the most metamorphosed, while the tan material is often poorly preserved.

More work will have to be done on bedrock geology before source locations of the slate can be determined.

Extensive deposits exist in the Belle Isle region and Newfoundland. Others are found in the Ramah Series. Closer sources, however, seem more likely. The Aillik Series (Kranck 1953:4; Douglas 1953; Christie, et al. 1953) contains sedimentary deposits of quartzites, limestones, and shales in highly metamorphosed form. It is likely that these remnant beds, found as far east as Cape Harrison (Double Island) and in scattered occurrences between Double Mer and Aillik (Kranck 1953), contain slates and cherts as well. In addition, shales of red (continental) and black-green (marine) variety, and slates associated with quartzites and dolomites exist in the Seal Lake Series.

Soapstone

This soft rock, technically known as fibrous actinolite, is archeologically found in Maritime Archaic and Dorset cultures. Its only known locations are in central northern Labrador, where Eskimos for many years kept its precise location a secret from Europeans. Three deposits are known: one in Saglek fjord, another on Cut Throat Island near Okak (Wheeler, n.d.) and a third on Freestone Island off the northeast tip of Ukasiksalik Island at Davis Inlet (David Edmunds, pers. comm.). It is also present in northern Newfoundland.

Copper

To date, copper has only been found in archeological sites of early Labrador Eskimo in northern Labrador in contexts which are probably European, but may be native. No native copper has been found in Hamilton Inlet, although the Seal Lake area has been found to be rich in native copper. Here the metal is very pure and easily accessible near the lake. Cupric stains on prominent rock faces mark its precise location, but there is no evidence that prehistoric man either used or was aware of the metal.

Mica

Mica has been found in Maritime Archaic sites in Groswater Bay. Local fishermen report that this material can be obtained from several locations in the hills west and north of Pottles Bay. The liveyeres used to use mica for condensers in their fishing boat engines when commercial supplies were scarce.

Red Ocher

This material, prepared from ground hematite and animal fat, was used widely by prehistoric cultures of Hamilton Inlet. Hematite occurs in glacial deposits and seems to be available locally in most areas.

RAMAH CHERT

For the past several decades archeologists working in the far Northeast have noted a distinctive translucent "chalcedony" or "quartzite" which appears sporadically in collections south of the St. Lawrence and more frequently farther north. This material, which has a distribution in both Indian and Eskimo cultures from northern Labrador to southern New England, poses a major problem of archeological interpretation, since its only known source is from a thin bed in the Ramah Series of northern Labrador. Considerable attention has, therefore, been devoted to the analysis of this material from the point of view of determining its uniqueness and precise source location. Various studies have been initiated, including gross physical description, and petrographic, geochemical, and neutron activation analyses. While these studies have suggested hopeful results, they are as yet by no means conclusive.

Problem

The widespread occurrence of chipped artifacts of this stone has been evident for some time. The material, first figured in Howley (1915) and Moorehead (1922:fig. 48), established its distribution from Newfoundland to Maine. Moorehead referred to the stone as "Labrador stone," and he very likely based this attribution on its similarity to material in early Peabody Museum collections made by Jewel Sornborger and Owen Bryant in northern Labrador in 1888 and 1906, and also to the Kidder collections from Newfoundland and southern Labrador. Willoughby (1935: fig. 31) illustrated several stemmed points and large blades of this material found in Rhode Island and Maine, and called it "translucent quartz." Bird (1945: 153) found artifacts of the material near Hopedale and commented on its distinctiveness in eastern North American archeology. Later, Smith (1948:34–7) commented on the use of a distinctive translucent gray-blue quartzite often found associated with burials of the Maine Cemetery complex. Further distributional data show occurrence of the material in Ithaca, New York, where a flake was excavated from a garden (E. P. Wheeler, pers. comm.); and specimens of this material have been found as far south as Maryland and Florida. It is found occasionally in collections from Nova Scotia and New Brunswick, and a considerable distance up the St. Lawrence River. It is rarely found on the interior of Quebec or to the north or west of Cape Chidley, northern Labrador. A Ramah chert point has also been found in the Sandnes Viking graveyard at Brattlid, West Greenland (Meldgaard 1961:371).

The distributional evidence points definitely toward a southern dispersion from an origin somewhere in Labrador. The fact that it is not commonly found in Eskimo cultures and that the tools are generally of Archaic affiliation suggests that the primary means of dispersal of the material was through Archaic Indian culture. Furthermore, the tools made from this material found in the south are usually large stemmed points, and in Maine, where most of the specimens have been found, they occur frequently in grave assemblages of the Moorehead complex in contexts which themselves do not usually include the use of stemmed points. Here, the tools are found as finished pieces, and very few flakes have been reported. This evidence suggests strongly a ceremonial use of these artifacts which were apparently traded into southern regions in fully finished form. Typologically, the points are identical to those found in Labrador in Maritime Archaic contexts. The possibility of such an extensive trade network between related cultures over 1000 miles apart at a time level between 2000–1500 B.C. requires assurance that the raw material is truly distinctive, and that its source location can be determined with accuracy. If for no other reason, its validity as a horizon marker in the Archaic of the Northeast makes such studies warranted.

Terminology

The history of terminology of the stone has been rather confused. Moorehead called it "Labrador stone." Willoughby referred to it as "translucent quartz"; Smith, as "translucent gray-blue quartzite." Strong (1930a) called it "translucent chalcedony"; while Harp adopted Smith's "quartzite" appellation. In Maine the stone is locally known as "sugar quartz." In geological reports the material has been variously termed "chalcedony or chert" (Coleman 1921:41), "chert" (Douglas 1953), or "quartzite" (S. A. Morse, pers. comm.). Which, if any, of these is a better term is a moot point depending on variation within the specimen and the interpretation of geological events under which it formed. Raymond Thompson (Harvard University) believes it to be a re-crystallized chert, and BRINEX geologists who are familiar with the stone and its source call it "Ramah chert." It is this terminology which will be used here.

Description

Ramah chert's thoroughly distinctive visual appearance can be described briefly. Bird (1945:153) notes that it is similar to chalcedony "though it differs almost as much from most chalcedony as it does from common white quartz. Fractured surfaces have the texture of sand-blasted clear glass, and it has a similar translucence and color. A few pieces range from clear to bluish black in color and others are mottled, somewhat like moss agate." A. P. Coleman (1921:41), a geologist, referring to the type bed in the Ramah Series, describes it as a "very fine-grained silica, sometimes white and sometimes dark grey, suggesting chert or chalcedony, and it breaks in a concoidal fracture like flint, but in thin sections it proves to be distinctly granular and so must be called quartzite." This granular appearance and rough texture, unlike most flints and cherts, is a distinctive feature of the Ramah chert; in addition, freshly broken pieces of the stone have a glassy, vitreous appearance resulting from a smooth clear silica matrix in which individual crystals are bonded. Grain size varies considerably from small sand-size grains to fine or cryptocrystalline. Color is equally distinctive, as noted by previous observers. Most common is a translucent clear form; however, there are often linear black streaks or smears running through the rock, apparently from graphite staining (S. A. Morse, pers. comm.). Some specimens assume a jet black color. In addition, it frequently contains small flecks of brown rust-colored material. Certain varieties in Hamilton Inlet archeological sites are stained with green or yellow, although always retaining the vitreous granular texture.

Bird (1945:153) notes that the Ramah chert is unlike any material he has seen in North America. In the East its closest visual relatives would seem to be with Nova Scotian chalcedony found in the Debert site (MacDonald 1968), Arkansas novaculite, and Mistassini quartzite. The latter, similar in sometimes having black streaks, tends to have a milky, opaque color, lacks the vitreous sheen, and is generally more fine-grained. This material has been carefully described by Martijn and Rogers (1969:204–211), and while figuring prominently in the archeology of central Quebec, Tadoussac (possibly), and the St. Lawrence River region, its distribution is mutually exclusive with the Ramah chert, assuming an interior aspect, while the Ramah is usually limited to the coast. The Eskimo term for the Ramah chert is *tunnuyakh*, meaning "like caribou back fat" which it resembles in color and texture.

Weathered samples of Ramah chert patinate to a milky white, or brownish gray if fire-burnt or exposed for a long period to the elements. The surface, however, retains its vitreous character and never becomes chalky or soft, or subject to spalling, as does most chert or flint.

Sources

RAMAH SERIES.—For many years there was no clue as to the possible source of this material, though its origins had been assumed to be in Labrador. Harp (1963:253) noted that a source location had been discovered by BRINEX survey teams in northern Labrador in a distinct, thin bed in the stratigraphic Ramah Series. This bed had been mentioned and described in the geological literature as early as 1921 by A. P. Coleman, and again in 1953 by G. V. Douglas. The Ramah Series is the largest of several widely separated stratigraphic deposits remaining uneroded in Labrador. Located in the northeastern extremity of the continent, it is a remnant of a much larger feature which has been protected from destruction by the limited extent of continental glaciation in the dry mountainous zone.

The Ramah Series forms a synclinal band exposed along the coast of northern Labrador for a distance of some thirty miles, from Saglek to Nachvak fjords, and extending about seven miles into the interior. The deposits include some 4000 feet of well-stratified sediments laid down in shallow water, including slates, quartzites, arkose, dolomites, and-amphibolites (A. P. Coleman 1921:25). Douglas (1953:fig. 8) has mapped the column exposed at Ramah Cirque, Ramah Bay. Here the chert horizon is clearly seen as a marker bed for the entire series. E. P. Wheeler (n.d.) has described the chert bed as about 20 feet thick, in several bands with differing characteristics. In places the bed may be as thin as 1–2 feet (P. Grimley, pers. comm.). That this thin bed should extend for thirty miles along the coast is remarkable. The series has undergone metamorphism at least twice, during which mineralization has occurred. Sulphurous solutions have permeated many of the beds, and at least one attempt has been made to commercially mine pyrites in the deposits. Pyrites are frequently found in the chert bed, and it seems to account for the brown stains and solution pits sometimes occurring in Ramah chert.

MUGFORD SERIES.—Seventy to eighty miles south of Saglek, the southern-most limit of the Ramah Series, is a second stratigraphic zone called the Mugford Series. Although similar with respect to its underlying gneiss, the Mugford Series differs greatly from the Ramah beds, with tuffs and agglomerates composing the larger part of the series, but beds of dark slate, quartzite, sandstone, limestones, and chert are also present (A. P Coleman 1921). The chert is not described, and the familiarity of geologists with this region and with the Ramah chert suggests there is no correspondence between the beds, and that nothing like Ramah chert occurs in the Mugford beds. Douglas (1953:47) mentions a jasper in the Anchorstock Harbor area of Ogualik (Cod) Island area south of Cape Mugford.

HUNT RIVER, JACK LANE BAY.—A final possible source location for Ramah chert is in the Hunt River area at the head of Jack Lane Bay. This source, known to the Naskapi, has been mentioned by W. D. Strong (1930a:128) who made archeological collections in the vicinity of Sharp Hill. These collections, now in the R. S. Peabody Foundation, Andover, Massachusetts, contain Ramah chert materials exclusively. Strong reports that a vein of "translucent chalcedony" lies partially covered by glacial sediments at the site. Though he does not specifically state that this quarry yields the same material found in the archeological site, this seems to be a fair assumption, and certainly one which requires verification. For, if a bed of Ramah-like material is found here, it is possible that other remnant beds may exist further south, between Hopedale and Hamilton Inlet. The fact that Douglas (1935) reports uninvestigated beds between the Aillik Series and Hamilton Inlet raises the possibility of other possible source locations for Ramah-like material.

Geologically, however, the occurrence of Ramah chert beds in these regions would be most unlikely according to the most experienced geologist of Labrador, E. P Wheeler (pers. comm.), who writes:

> Of course, the Hunt River, where Strong reported a quarry of sorts, is little-known geologically, like much of Labrador, so there is a possibility that the Ramah Series reappears there, or in other parts of Labrador. However, I know of no grounds for suspecting that it does, and its presence there would radically change the geologic map of Labrador. Even if this series does [reappear], how many unique beds 30 feet thick can be traced for some 250 miles?

Wheeler suggests the possibility that the Hunt River bed might be more similar to vein quartz than Ramah chert.

Physical-Chemical Analyses

In view of these problems, and the importance of determining the uniqueness and specific source locations for this widely used archeological raw matetrial, a comprehensive program of analysis was undertaken. Preliminary results are presented below. Archeological samples of Ramah chert from sites in Okak, Saglek, and Hebron were chosen from Peabody Museum collections as representing material surely quarried from the chert bed in those regions; specimens from Strong's Sharp Hill site were taken which probably derive from the quarry site at that location. In addition, archeological samples of Ramah chert from Hamilton Inlet and from several sites relating to the Moorehead complex in Maine were selected. Geological control came from specimens of Ramah chert collected by Peter Grimley (BRINEX) from their geological context in the Ramah beds from Bear's Gut, near

Ramah Bay. Finally, comparative samples of Tadoussac and Mistassini quartzite, common beach white quartzite, and several archeological specimens from New England which looked superficially similar to Ramah chert were used as control samples.

Three types of analysis were undertaken, including geochemical, neutron activation, and petrographic studies. The results of these analyses can be recounted here briefly. Further details of the work are given in Appendix 4.

The British-Newfoundland Exploration Company conducted the geochemical work on intermediate trace elements, zinc, copper, lead, nickel, cobalt, manganese, iron, molybdenum, barium and silver. These elements did not show any consistent segregation of Ramah chert specimens from other samples. In fact, geochemical variation between different materials was so slight as to be of no significance. Only in one case could a possible distinction be made. Here the covariation of manganese and barium suggested a possible division between the Winter Cove-Sandy Cove specimens of Ramah chert and the northern Ramah chert, Mistassini quartzites, and common quartzite samples. This distinction, if verified by further tests, might support the idea of a southern quarry in Labrador which would be distinct from the northern Labrador archeological and geological samples.

A more substantial program of analysis was undertaken by the University of Michigan under the direction of A. Gordus and J. B. Griffin. Fifty samples were submitted which included archeological and geological samples from sites from northern Labrador to Massachusetts. These initial studies analyzed only three elements: sodium, manganese, and potassium. The results for this small run were not conclusive and no clear distinctions could be made between Ramah chert and non-Ramah chert specimens. All elements varied within the same range. However, the results showed a possible distinction within the Ramah samples, northern ones tending to have low values for potassium, sodium, and sodium/manganese, while southern Ramah materials usually had higher values for these elements. This, too, suggested the possibility of a southern quarry for Ramah chert, which, however, was visually indistinguishable from the northern samples. Furthermore, the Sharp Hill specimens tended to cluster tightly in sodium, and though not distinguishable from the wide range of Hamilton Inlet and Maine samples, they may indicate a separate quarry. On the other hand, similar values would be expected if the samples had been taken from the same core, a possibility that cannot be ignored in this sample of archeological materials.

The final study was a petrographic analysis conducted by S. A. Morse of Franklin and Marshall College. Morse's detailed study included petrographic characteristics of foliation, sorting of grain size, grain roundness, grain boundaries, strain, and mineral inclusions. This work showed that Ramah chert is likely to be better sorted than other quartzites, that it tends to have fuzzy grain boundaries, that it is sure to be strained, that it is likely to contain pyrite and interstitial graphite, and that it never contains mica or zircon. Morse was very hopeful that with further study of more samples these criteria might prove useful in correctly identifying Ramah chert.

General Conclusions

These studies do not yet provide any definitive answers to the problems posed on the possibility of multiple source locations and internal variability in the material, which are crucial questions in the positive identification of the stone in archeological contexts far removed from Labrador. At present, there is no evidence of a source south of Hamilton Inlet, although there is a possibility that a second source exists in central Labrador to account for the truly enormous quantities of this stone which appear in the coastal archeology in Groswater Bay and central and southern Labrador. It is a remarkable feat if all of this material, which must naturally be considered a miniscule fraction of all the material in undiscovered sites, has been transported in native boats from the nearest Ramah chert bed, in the Ramah Series, 300 miles to the north, down a treacherous and storm-ridden coast. Indeed, the quantities of waste debris discarded at sites such as Shell Island 1 (over twenty pounds in five 5-foot squares) argues impressively for a source relatively close to Hamilton Inlet.

There seems to be no longer any doubt that its dispersal in archeological contexts south of Hamilton Inlet resulted from trade. Natural sources in the glacial drift can be excluded since the movement of ice in the Labrador area has been generally west to east; likewise, ice-rafted boulders would have to buck the Gulf Stream off Nova Scotia and Newfoundland, and in any case could not account for the numbers of specimens found in Maine. It is significant that in its southern distribution Ramah chert is almost always found in Moorehead complex mortuary deposits, rarely in occupational debris. Here they consist almost exclusively of projectile points, broad-bladed and with tapered stems, identical to the contemporary Maritime Archaic points from Labrador. These points are dramatic physical evidence of a vast interrelated cultural horizon stretching from New England to Hudson Strait. Rarely, if ever, does Ramah chert appear in any other cultural context in the south.

At present, the most diagnostic aspect of Ramah chert is its physical appearance. In general, it is possible to make a positive identification on this basis once one is familiar with its characteristic colors and glossy granular texture. On a more scientific basis it appears that petrographic and neutron activation analysis will serve to distinguish this rock from similar but different specimens. Most valuable at this point, however, will be the possible identification of multiple sources, for there seems as yet to be no visual basis for distinguishing these varieties, if they exist.

Although these problems are troublesome in the broader interpretations of Labrador prehistory and human movement, the distribution of Ramah chert predominantly in coastal sites, or interior cultures with strong coastal components suggests that it definitely has a coastal source. The presence of this material within a site, therefore, is a reliable indicator of coastal cultural contacts.

Human Environment

European contact with the native peoples of Labrador began with the Viking voyages to this region circa 1000 A.D. Our information regarding the *Skraelings* encountered by the Vikings there is contained in the various Norse sagas, which, unfortunately, as a source of ethnographic information are of limited value due to the uncertainty of geographic and cultural identity of the natives and the lack of specific descriptions of more than a few cultural items. For these reasons the sagas can be used only in a general way and probably shall never be of great importance to ethnographers.

Important and continued contact with the native peoples of Labrador did not begin until after Cartier's voyage of 1532. Yet between this time and the publication of the first true ethnography, Lucien Turner's report on the Eskimos and Naskapi of northern Ungava in 1894, there passed three hundred years of contact for which only the most rudimentary notes and records are available. These traces, sifted from the pages of discovery journals, the Jesuit *Relations*, and traders' reports provide clues to early ethnographic conditions in the southern part of the peninsula. Not until the publication of Cartwright's important Labrador journal do we have any reliable information on Eskimos, Montagnais, and Beothuck of Labrador and Newfoundland. By this time extensive trade and contact had occurred in the south for more than two hundred years. In central Labrador the dateline of contact preceded Cartwright by at least half a century, the first trading establishment having been erected in Hamilton Inlet at North West River by Louis Fornel in 1743 (see pages 208–211) for a review of early history of Hamilton Inlet). Farther north, the Moravian Mission was established at Nain in 1771, while on the northern periphery of the peninsula significant contact did not begin until Nicol Finlayson and Erland Erlandsson built a trading post for the Hudson's Bay Company at Fort Chimo on the Koksoak River in 1830. Subsequently, Erlandsson and John McLean (McLean 1932) made the first traverse by white man into the interior of the peninsula from Fort Chimo to North West River in 1838, exploring the Naskapi territory and setting up trading posts.

This review points out a significant aspect of the early history and ethnography of the Labrador-Quebec peninsula, namely, the 300-year sloping time horizon of the "ethnographic present." Contact by white man with the southern Montagnais, Beothuck, and Labrador Eskimo began early in the 16th century in the St. Lawrence and Newfoundland area and resulted in extensive and rapid cultural change. Proceeding farther north to the central Labrador coast and Ungava, contact occurred progressively later and influenced the natives to a lesser extent. Nevertheless, it was customary even in the 16th and 17th centuries for northern Labrador Eskimo and Naskapi Indians to undertake long trips into the southern regions to obtain iron, birch bark, and other important trade materials. While birch bark trade may have been aboriginal, the new changes in material culture generally did not affect the traditional sociocultural patterns of the northern peoples.

The history of ethnography in Labrador, and particularly in Hamilton Inlet, presents the anthropologist with two major problems. The first and most pervasive of these is the near complete lack of competent ethnographies for the entire region. Those reports that do exist are peripheral to Labrador or are of such late date as to be little more than cultural reconstructions. This poverty of anthropologically collected information is compounded by the fact already mentioned that the natives of southern Labrador experienced substantial culture change in the early contact period, and their cultures can be studied only obliquely, gleaned piece by piece from diverse early sources. The only method of studying the early periods is by ethnographic reconstruction, proceeding first with the early ethnographies and attempting to eliminate the impact of European culture on the native way of life. This procedure works reasonably well for Labrador, thankfully, because its peoples have been shielded from drastic culture change by the undesirability of the environment to white settlers and the impracticability of pursuing any other life

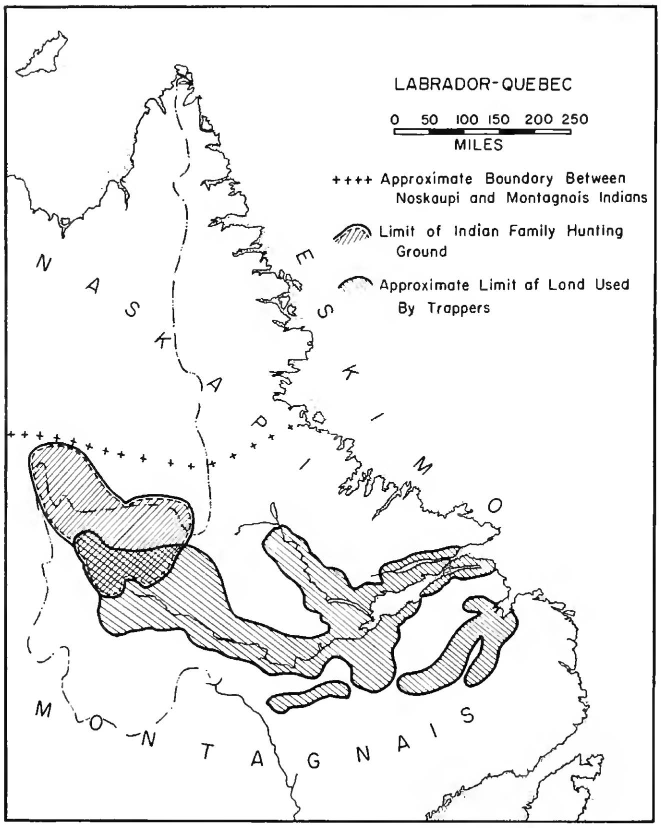


FIGURE 20.—Cultural geography in central Labrador. Approximate location of Montagnais Indian family hunting territories and trapping grounds of white people around 1937. (After Tanner 1944: fig. 253)

there than the one the Indians led. The impact of the outside world, therefore, was mainly in material goods and through the trapping economy. A third force—commercial fishing—had little effect.

In one sense, it can be said that the acceptance of European material culture did not greatly alter the aboriginal way of life. Le Jeune, in his 1632 and 1634 *Relations* commented on the Montagnais' acceptance of blankets, cloth, pots, knives, and guns (Thwaites 1897, vol. 5:25), and by 1660 he noted the near complete replacement by European goods of the traditional materials of bark, bone, hide, wood, and stone. Far from drastically changing lifeways, these introductions seem to have strengthened and stabilized some native patterns by "conserving energy formerly expended on native manufacture and processing of raw materials" (McGee 1961:126). As late as 1940 the North West River Indians were spending the majority of the year hunting, fishing, and trapping on the interior (Mailhot and Michaud 1965:14); likewise, the Rigolet Eskimos continued in their traditional pattern until about 1850. It is therefore not difficult to reconstruct the basic patterns of aboriginal economic life.

A more significant change has resulted from the fur trade. The Indians' dependence on trade goods necessitated participation in the white economy. This caused a reduction of winter orientation toward interior caribou hunting, for at that time of year caribou are found in the plateaus and not in the forests which shelter the furbearing animals. Trapping therefore caused the Indian to adopt a more sedentary winter pattern, and the result was increased dependence on trade goods and European food and therefore the continual necessity for successful trapping seasons. The fur trade also drew the Indians out of the interior to the coast during the summer. This pattern was common for certain groups in pre-contact time, but it eventually depopulated the interior and overexploited the coast, as well as necessitating long journeys to reach the trading establishments from the hunting and trapping grounds. Early attempts to set up posts on the interior were quickly abandoned due to the difficulty in maintaining them. In interpreting season rounds in pre-contact time it is therefore important to recognize the intensification of the dual seasonal pattern and increased sedentarism at both extremes of the cycle, the winter trapping grounds on the one hand and the summer settlements at the posts on the other. Finally, the influence of the missionaries was to accentuate this economic force toward residence near the post.

A third and recent factor in understanding seasonal movements is the encroachment within the past century of white trappers on land formerly inhabited by the Indians. This is especially evident in western Lake Melville (Tanner 1944:fig. 253; Figure 20).

In general, however, one arrives at the conclusion that the impact of western culture on the Labrador natives has been remarkably light during the long period of contact, which spans about 450 years. The possibility of determining traditional patterns of exploitation makes the ethnographical data limited though it is of considerable value to the archeologist.

Ethnographic Analogy

Ethnographic analogy is currently a controversial issue in archeology and has been discussed at length by numerous writers, including R. Ascher, L. R. Binford, K. C. Chang, K. M. Anderson, K. G. Heider, and J. M. Campbell. There is general feeling that analogy may be useful where direct continuity can be demonstrated, but that the relationship between form and function is too variable to allow extended applications. While acknowledging many of these shortcomings, I would suggest that controlled analogy can serve an important function in a cultural ecological study, as recognized by Coe and Flannery (1964) and Campbell (1968). In the Hamilton Inlet project three such analogies were suggested, the specific, functional, and ecological.

The specific analogy involves the use of ethnographic data to interpret archeological material where the direct historical approach applies. An example of specific analogy is to relate the Naskapi custom of disposing certain animal bones by incineration (Thwaites 1897, vol. 6:211; Henriksen 1969) with the archeological evidence for the lack of randomly distributed fish remains in proto-Naskapi sites.

The functional analogy is a broad category encompassing a wide variety of application, from specific tool function to the interpretation of functional activity sites or subsistence patterns. This analogy is not restricted to a specific culture, as is specific analogy, and can include cross-cultural analogy from societies at similar levels of economic or social development.

The ecological analogy involves the application of ethnographic cultural ecology to an archeological pattern to determine the "goodness of fit," thereby aiding the interpretation of the subsistence-settlement system of a prehistoric group. Of necessity, the use of such analogy is limited to a specific geographic region, and it presumes knowledge of paleoecology and environment. Its many shortcomings, however, are outweighed by the advantage of developing models with ethnographic and ecological perspective on the past. It is the use of this type of analogy which concerns us at present.

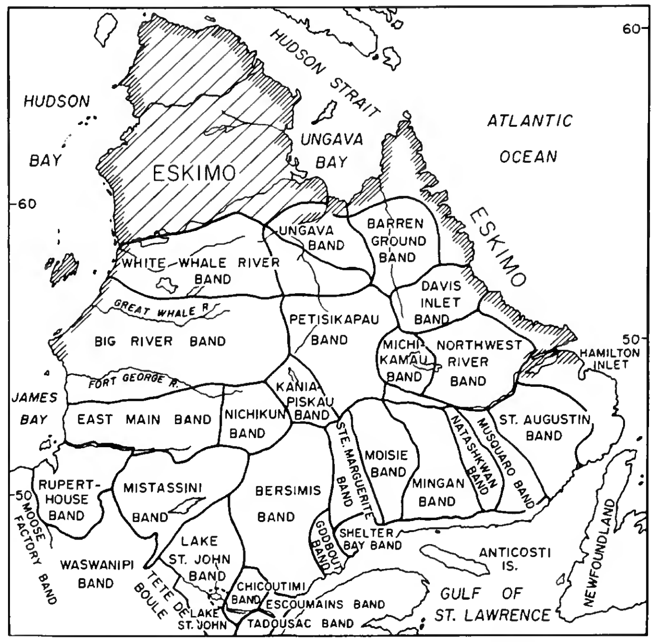


FIGURE 21.—Approximate locations of Montagnais-Naskapi and Eskimo groups since 1850. Narrow oblique lines indicate Eskimo occupation of the coast; wider oblique lines indicate territory inhabited only during inland caribou hunts by Eskimos. (After Speck 1931: map 2)

Ethnography in Hamilton Inlet

The environment and ecology of Hamilton Inlet have been described in the foregoing sections. The following description of the ethnography of this region attempts to show several patterns of exploitation which are or have been used during the recent past. The description concentrates on subsistence-settlement systems, and no attempt is made to give a complete ethnographic account. Two of the cultures are basically aboriginal; two are Euro-Canadian. All four, however, share many common features of hunting and gathering economies, and even in the case of the Euro-Canadian cultures they are largely independent and self-sufficient. Together, the four utilize most of the ecological zones in the inlet. They are therefore useful for developing models for interpretation of the past.

MONTAGNAIS AND NASKAPI INDIANS

The Montagnais and Naskapi are the sole inhabitants of the huge interior portion of the Labrador-Quebec peninsula from the tundra zone south to the Gulf of St. Lawrence and west to Lake St. John. The distribution of groups and their constituent bands has been discussed in detail (Figure 21). The Montagnais and Naskapi have variously been considered as a single culture as viewed by Speck, their most informed student, or as separate but related cultures, the Montagnais occupying the southern part of the range and the Naskapi, the northern. The Montagnais were named by the early French explorers and traders; the term "Naskapi" was a derogatory appellation given by the Montagnais to their northern relatives who properly called themselves "Nenenot" (True People). Both groups speak dialects of Eastern Cree and are part of the larger Algonkian linguistic family.

The relationship between Montagnais and Naskapi is of considerable importance to the culture history of Labrador-Quebec. Their status as separate groups is reinforced by the recent arrival of Montagnais in southern Labrador, a fact recorded in the Jesuit records and acknowledged by Speck (1931:561), though he thought the two groups were basically similar. The evidence for considering them as separate groups is discussed on pages 180–181.

Montagnais and Naskapi life was closely tuned to geographic and seasonal variation in the environment. Band sizes averaged between 50–100 individuals who customarily gathered as a group once or twice a year, generally in the early spring or summer, and split into smaller extended family hunting groups for exploitation of dispersed resources during the remainder of the year (see Leacock 1969). The early records indicate a seasonal cycle in which caribou hunting was the important winter activity and occurred in the interior forests and plateau. With the coming of summer the group would move to the coast or large interior lakes to fish or hunt water fowl or seal (Speck 1926:297). This, however, is an oversimplification which obscures the great local diversity of resources and adaptations within this large culture area. For instance, moose and seal hunting were important activities in the south, while the late summer caribou hunt was the economic mainstay of the Naskapi.

The material culture of the Montagnais and Naskapi has been described in detail by Turner (1894), Rogers (1967), Flannery (1939), and Lips (1947). A brief listing will suffice here. The majority of tools were of bone and antler, and included such items as fish leisters, gorges, and composite hooks, toggling harpoons, barbed and unbarbed arrow and spear points, bear tibia skinning and fleshing tools, caribou rib knives, leg bone beamers, shoulder blade scrapers, snowshoe needles, awls, meat and ice picks, needle cases, bag fasteners, and pipe cleaners. Wooden artifacts included bowls, spoons, net floats, net and sewing needles, canoe mallets, hafts of numerous types, canoes, snowshoe frames, toboggans, sleds, snowshovels, bows, arrows, and lances. Birch bark was employed for containers and canoes. Iron tools included blades for crooked and semi-lunar knives, files, axes, and awls. Stone tools were of limited use: bone crushers and mauls, netsinkers, whetstones, and keeled pipes. Besides these, gill nets, rifles, crossbows, slings, and dead falls were used. Transportation was by canoe during the summer, and by snowshoe, sled, or toboggan in winter. Several types of dwelling were employed according to the season (Rogers 1963, 1967, Rogers and J. H. Rogers 1959). Summer tents were conical or dome-shaped, of skin and, later, canvas; winter lodges were more substantial and included the partially excavated and snow- or earth-covered conical lodge with rectangular porch, used as late as 1900.

This inventory seems to have been only peripherally influenced by white contact. Beside the rifle, the major introductions were iron tools, the crossbow, and possibly the gill net. Eskimo influence seems apparent: toggling harpoon, semi-lunar knife, dog sled, and a host of lesser additions (Rogers 1964). Prior to the acquisition of iron, stone was used for arrow points which are said to have detached in the wound (Tanner 1944:639), and for scrapers, as well as the above-noted items. Thus, stone seems to have played an insignificant role in the economy.

This brief review reveals that less than one percent of the Montagnais-Naskapi material culture would withstand the test of preservation in the subarctic climate and acidic podsols. Archeological investigation of recent sites shows that within fifty years all but stone decays. Furthermore, ethnographic data suggests that tent sites tend to be occupied only once, and for periods averaging only a few weeks. While site locales may be returned to frequently during summer seasons, winter trapping sites are generally abandoned after each occupation for periods up to ten years to allow replenishment of firewood, spruce bough, and animal resources (Rogers 1963:226). Faunal evidence tends to be scarce due to religious constraints on the disposal of animal remains. Most bone material, as noted above, is incinerated, stored on elevated platforms, or thrown in the water to keep from being despoiled by dogs. As a consequence, archeological remains, even for recent sites, are minimal.

North West River Band

The North West River band is one of 26 groups of Montagnais-Naskapi, and its material culture and general adaptation is similar to that described above. The band now resides at North West River and has been described by Tanner (1944:627), McGee (1961), and Mailhot and Michaud (1965). Historically a diverse group with strong affinal and trading ties to the Sept Isles and Davis Inlet (former Barren Ground) bands, the North West River group in 1949 numbered 131 individuals, most of whom still pursued their traditional nomadic way of life. However, in the past two decades, with the growth of relief funds, medical aid, education, housing, and a subsidized logging operation, the band has become largely sedentary. Now only occasional hunting and fishing forays are made into the bush.

Formerly the band used to hunt and trap extensively in the Churchill and Naskapi River valleys during the fall, winter, and spring, returning to North West River (called *Sesacit*, or "narrow place" by the Indians) to trade and visit with relatives before dispersing about the western shores of the lake for river mouth fishing. Their annual cycle is complex, with many alternatives available during a particular season. It is likely that the North West River band is actually a composite band consisting of people formerly living around Lake Melville and the Mealy Mountains with others whose ranges extended up the river valleys to the western plateau. In the early days of contact the two groups seem to have merged, retreating westward, when their former territory in central and western Lake Melville became occupied by Eskimo and Europeans, respectively (Speck 1931: 588).

ANNUAL CYCLE (Figure 22).—It is almost impossible to give an accurate description of the annual cycle of the North West River band. The data are not complete and much of what is available comes from the period after the Indians had settled down at North West River. Before this time, the band was composed of smaller groups of families (Holme 1888:190), each of which exploited a different geographic region and therefore had a slightly different round. In the 1930s there were five such groups, each composed of five to ten families who would set out for their summer fishing and hunting grounds in late July, after several weeks of trading, feasting, and visiting with friends assembled at North West River. The traditional hunting grounds of these groups according to Tanner (1944:607) were the regions of the Kenamu River and edges of the Mealy Mountains (10 families), the Lower Churchill River to the mouth of the Minipi River (4–5 families), the Goose River region (5–6 families), the drainages of the Beaver and Susan Rivers (7–10 families), and the Naskapi River valley (5–8 families). A former region, long since appropriated by white settlers, would have been the Mulligan and Sebaskachu areas, and North West River. The composition of these bands was fluid, but each group tended to return to the same general area each year. In 1940 the distribution of these summer camps was as shown in Figure 23. From the summer camps each group moved inland, up the river valleys toward the plateau during the fall and winter, returning to the neighborhood of the summer camp again in the spring, or to a prearranged meeting ground with other groups, or bands.

During late July and August the primary economic activities were salmon and trout fishing and small game hunting. Salmon were speared in pools and rapids while gill nets were used for taking trout and other fish. Line fishing utilized gorges and composite hooks. Fish were the major food source during the summer, and large amounts were split and dried for fall and winter use. In August the berries would ripen and be collected. During September, besides berry collecting, small game was hunted (rabbit and partridge) and geese and duck appeared on their way

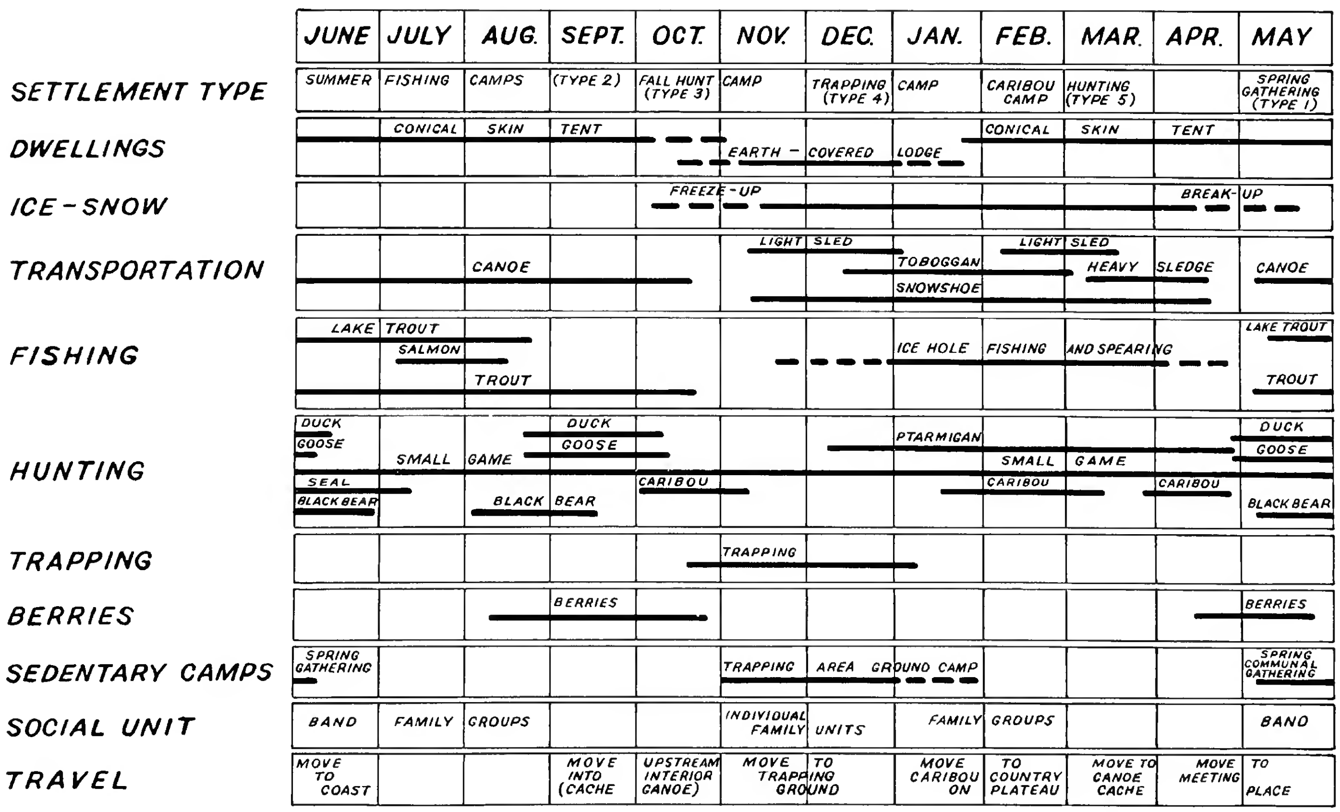


FIGURE 22.—Sesacit annual cycle.

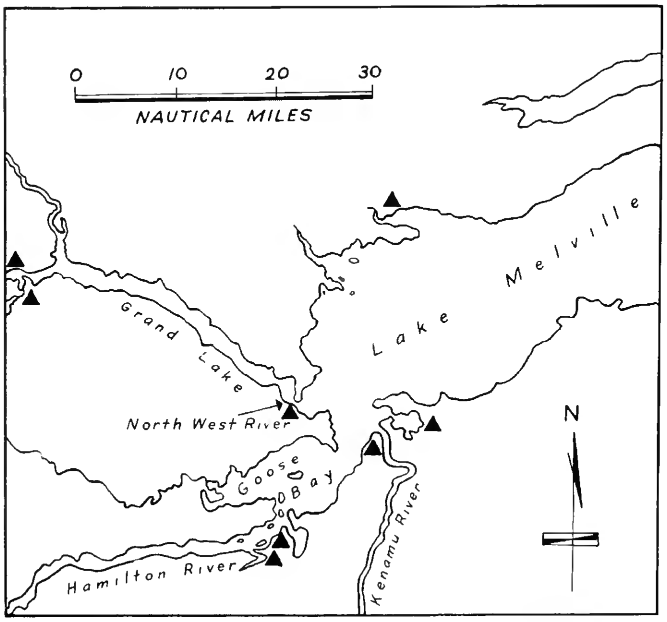


FIGURE 23.—Summer camps used by the North West River band circa 1940. (After Mailhot and Michaud 1965: fig. 1, and Tanner 1944:607.)

south. During this time preparation began for the fall and winter hunts.

By October, when the partridge berries ripen, freeze-up begins. This lasts about two weeks, and was often a difficult period for the Indians since the fish begin to seek deep water and canoe travel is halted. By the time freeze-up is complete in early November, winter has descended on the land and the movement to the trapping and hunting ground was made by snowshoe and light sled *(otatnanask)*. Sometimes a fall caribou hunt was made en route to the winter camp. Formerly, the fall hunt utilized large caribou traps constructed of wooden fences erected in a funnel pattern with a circular enclosure at its neck. Caribou were driven into the trap and speared (Tanner 1944: 618). Similar types of traps have been reported by Cartwright (1792) for Newfoundland and the Naskapi of Indian House Lake. These descriptions are always of wooden fences with either terminal enclosures or with ends opening at a body of water which the animals must then swim. They are then speared in the water or upon emerging. Sometimes holes are left open in the fences, and in these, large babiche nets and snares were set. None of these traps were noted during the author's survey of the Lake Melville region.

The best trapping months are those from late October to early January. After January severe cold restricted movement of men and animals, and during early winter the Indians usually concentrated on fur trapping in the forest zones of their ranges. The fur trade tended to stabilize their life during these months and only small game was hunted. In more recent years it became customary for the Indians to make a trip to North West River in early January to replenish supplies and trade in their furs, but before 1900 most families remained in the bush. This often created severe hardship, and the loss of the food from the trapping season made it imperative to have a successful caribou hunt in January and February.

Very little other food is available at this time of year, and to hunt caribou required constant camp shifting. Winter shelters were flimsy and cold. February is the best month for caribou hunting, since by this time the animals have formed large herds and can be found on the barren plateaus and mountains. A common hunting technique was to surround the herd and drive them into a deep patch of snow in which they foundered and could be easily speared or shot. Snowshoes maintained the hunter's mobility, and his game could be carried easily by toboggan. Other economic activities of winter included porcupine and rabbit snaring, and ice fishing. The latter was a last resort, rendered difficult by the thickness of the ice. In general, the winter was a severe period for the Indian. Death was a constant companion, from cold, lack of caribou, or inability to hunt in long periods of stormy weather. Great expenditures of energy went into procuring and cutting firewood. Finally, in March the formation of an icy crust on the snow made caribou hunting almost impossible. The Indians saw this as the most dangerous period of the year. Often life was sustained only by caribou meat cached earlier in the winter.

Hunting again improved in April; but May, the month of break-up, was another period of difficulty. Neither land nor water transportation is feasible and weather is generally poor. Hard times were encountered until the streams and lakes were freed for canoe travel. By late May the ice is gone, fish rise in the streams, bears emerge, and the migratory birds arrive from the south. Wintered-over berries provide a special treat. In the past this period of abundance was cause for a communal gathering of numerous smaller groups on the shores of Michikamau and Sandgirt where commiseration over the winter merged with feasting, marriage, and other social activities. This was also a time when long canoe voyages might be undertaken to trade for birch bark and other materials. As time passed, it became usual for the large spring gatherings to be replaced by trips to North West River, and before long the gatherings were held there instead. Sesacit, the Narrow Place, became the social center from which the summer fishing dispersion occurred.

SESACIT SETTLEMENT TYPES (Figure 24).—The foregoing description reveals a subsistence-settlement system which I have termed the "Sesacit type," the local North West River variant of the Montagnais pattern. The Sesacit type is characterized by six settlement types, defined both on the basis of the physical structure of the site (dwelling types, group size) and economic activities.

Type 1: Spring Gathering sites, later including summer and mid-winter congregations at North West River, can be considered "central base" at which smaller groups came together for social activity. The group size averaged between 50–100 individuals, and economic activities included fishing, bird and small game hunting. Circular conical and dome-shaped dwellings with central hearths were used, in addition to sweat bath structures. In addition, larger, oblong wigwams with three hearths have been described from Cabot Lake, north of Michikamau, a favorite meeting ground of Montagnais and Naskapi (Ellis 1908:148). It is impossible to say if this type of dwelling was used exclusively for spring gathering camps. Rather, it seems that several types of dwellings may have been used concurrently. D. MacLeod (pers. comm.) found a variety of dwelling types in the Michikamau area during surveys there in 1967–1969.

Type 2: Late spring and summer fishing camps were sites of smaller economic units (2–10 families) which were engaged in fishing, sealing, and small game hunting along the shores of the larger lakes, at river mouths, salmon pools, and rapids. Circular conical and domed dwellings covered with caribou hide or canvas were used.

Type 3: Fall hunting camps were located in the caribou country away from the lakes and adjacent to the caribou wintering grounds. At these sites groups of families gathered to construct caribou fences and conduct drives. Circular conical and domed dwellings were used. Mounded earth was often piled against the base of the tent walls.

Type 4: Winter caribou hunting camps were transitory in nature, constructed upon the snow and set back into the forest edges for protection. Conical skin tents were used, and the group included several families. The men hunted caribou nearby in the open country, and camp had to be moved frequently according to the movements of the game.

Type 5: Bivouac camps were constructed by hunters or travelers while away from their families. These camps left almost no structural or material remains. Frequently, they consisted of only a wind-break and hearth.

Type 6: Trapping camps were located in the forest trapping grounds and were relatively permanent structures. Some were partially excavated, earth-covered conical lodges. Economic activity centered around the trapline and the social group was fragmented to the basic family unit. This settlement type is probably not pre-contact in origin.

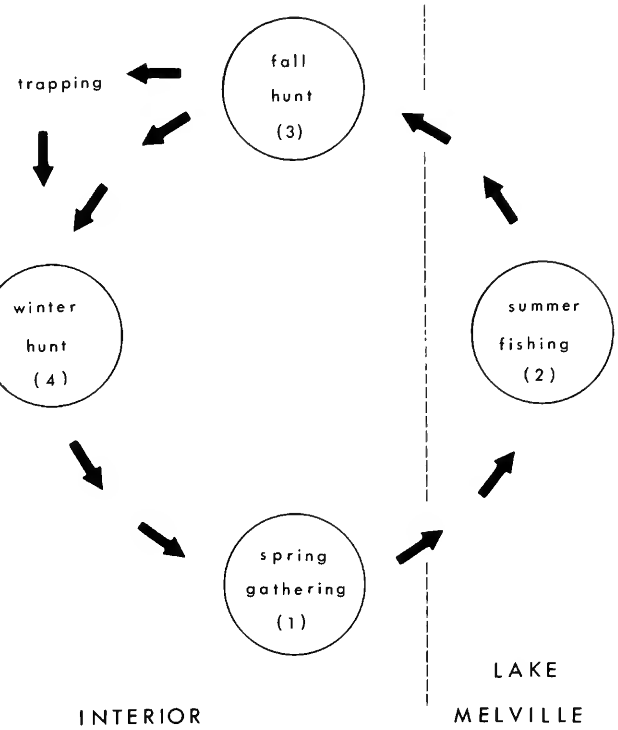


FIGURE 24.—Sesacit subsistence-settlement system. Settlement types in parentheses.

Needless to say, recognition of these settlement types from archeological materials alone would be difficult. Except in rare conditions of preservation the remains would be limited to stone tools, hearths, and limited structural evidence (hold-down stones, mounded earth walls, pits). Under these circumstances archeological interpretation of settlement type must depend on size and location of the site as much as from its material remains. In spite of these problems, the distribution and types of settlements in the Sesacit pattern is a useful ethnographic model to use for prehistoric cultural interpretation. It represents one type of adaptation to an extremely rigorous subarctic interior environment that permits relatively few variations to this basic pattern.

The geographic distribution of the North West River band settlement system, compiled from field observations, informants, and the available literature, is presented in Figure 25. Figure 26 shows the reconstructed Sesacit settlement system and its distribution in western Lake Melville.

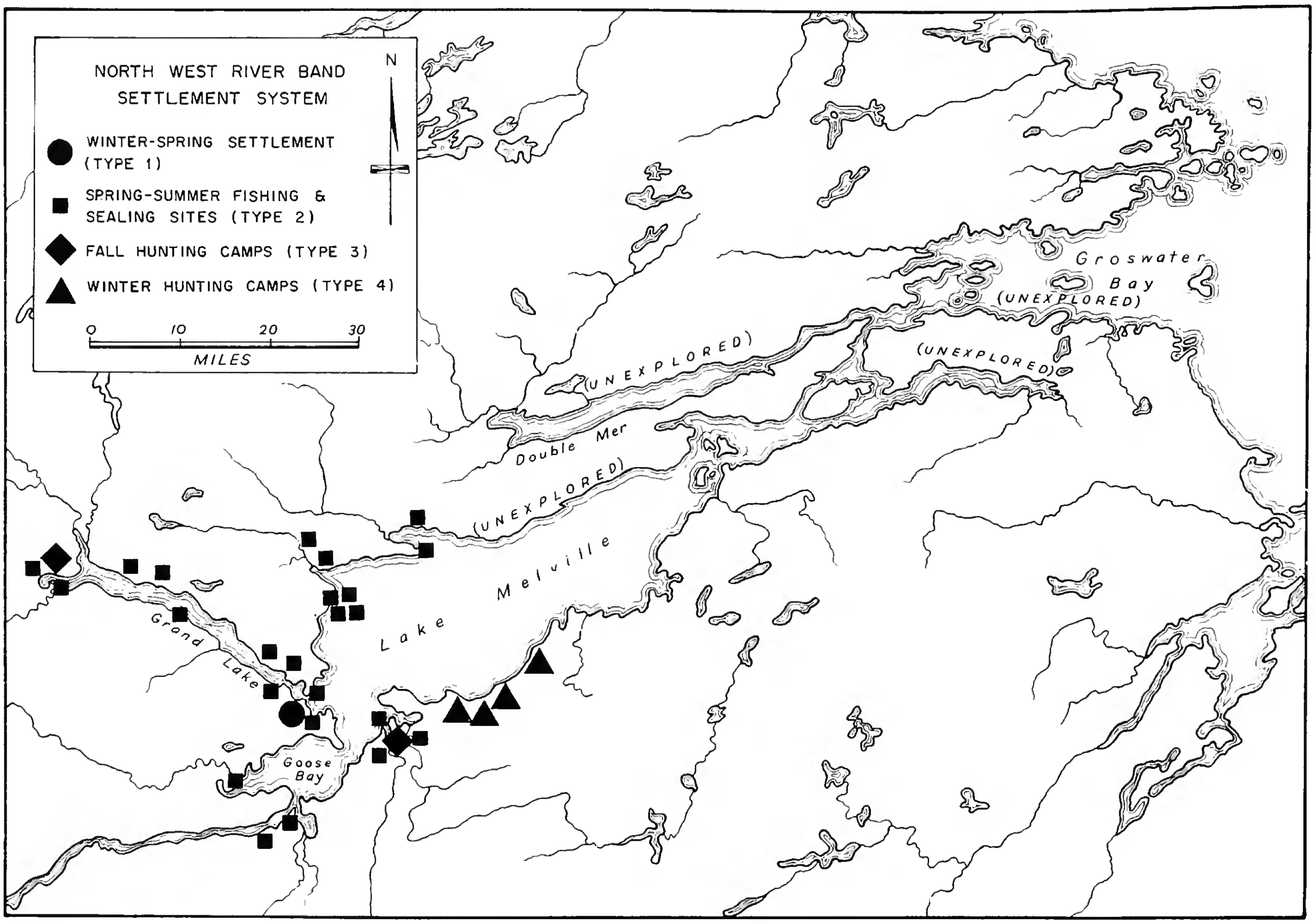


FIGURE 25.—North West River band settlement system.

THE LABRADOR ESKIMO

Early Contact History

The Labrador Eskimos are the most southern Eskimo in the world. At present their boundary lies in Hamilton Inlet, but formerly the Labrador side of the Strait of Belle Isle was occupied by Eskimos, and there is considerable evidence to suggest that they frequented the north shore of the Gulf of St. Lawrence as far west as Sept Isles. The data concerning this former range, however, deserves an extensive review, and only the outlines of this topic are relevant here.

The first well recorded venturing by a post-Viking European into the southern Labrador area was by Jacques Cartier in 1534. In Cartier's journal it is significant that at this time he made no mention of Eskimos in this area. The same is true for the brief notes of the Gaspar Cortereal expedition of 1501, which seems to have reached the Newfoundland-southern Labrador area (Hoffman 1961:28–29). During this trip 57 natives were captured, and their brief description, the first from this area, would suggest that they were Indian. If so, the absence of reference to Eskimos from this area is also significant.

A century later, after considerable European activity in the fishing grounds of the St. Lawrence, and the establishment of numerous support facilities for the fishermen on the mainland, the Jesuit missionary, Le Jeune, notes the presence of the Eskimo in the Strait of Belle Isle, but makes no note of them further west. Subsequently, it appears that Eskimos advanced as far as Sept Isles and Mingan, near Anticosti Island, for there are many Eskimo place names in those regions, as well as traditions of Montagnais battles with the Eskimos over seal hunting rights along this coast (Hind 1863, vol. 2:11, 30, 49; Packard 1885). In these regions the Eskimos rarely ascended the rivers into the interior beyond the first rapids. The belief, held by Speck (1931, 1936), that Eskimos once inhabited a substantial portion of the interior of southern Lab-

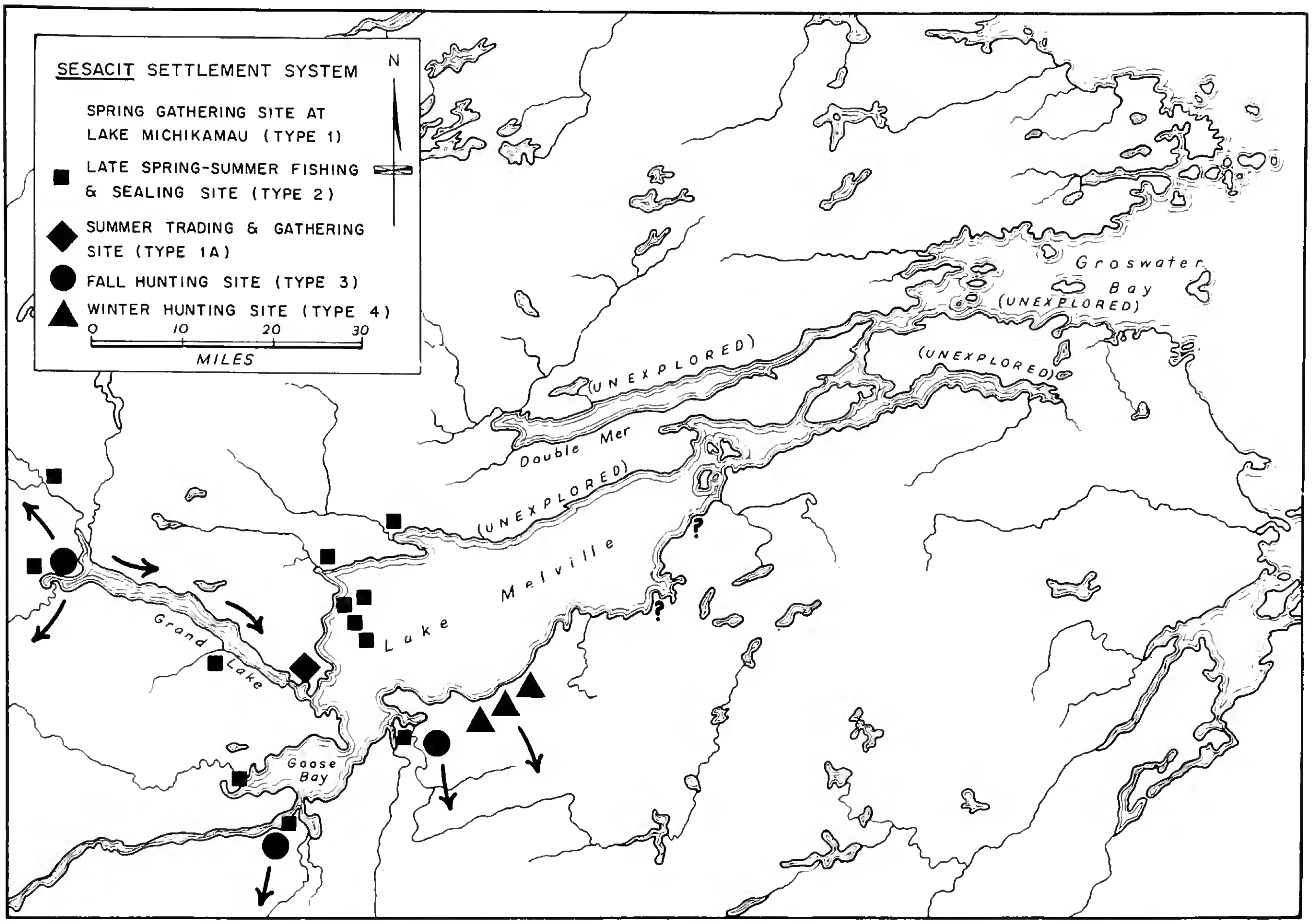


FIGURE 26.—Sesacit settlement system.

rador finds very little support today beyond the original data which Speck elicited from early ethnography and linguistics. In part, Speck's hypothesis depended on the journal of Father Crespieul (1669–1696) concerning the latter's dealings with the "Esquimaux" in the Saguenay River region. Burgesse (1949) has since shown that these people, in fact, must have been Algonkian and very likely were an isolated group of Etechemin from the south side of the Gulf. Another analyst, Birket-Smith (1918), placed the Eskimo as far west as the Moisie River in 1600. He further speculated that Eskimos, as *Skraelings,* had occupied the Saguenay region during the time of the Viking voyages and that they had since retreated further toward the coast. In this conception he was undoubtedly influenced by Steensby's inland origin hypothesis for Eskimo culture and the data from early archeological sites in New England which suggested Eskimo ties from that area.

By 1800, however, the Eskimos were driven out of the Gulf into the Strait of Belle Isle by the combined force of the Europeans, whose fishing camps the Eskimos had continuously plundered and robbed, and the Montagnais Indians, who were being pushed east by Iroquois and were by this time armed with firearms. The first attempt at peaceful sustained contact with the Labrador Eskimo was made by the Moravian missionary, Christian Erhard, in the Hopedale area in 1752, but he was apparently murdered by his would-be friends. In 1764 Jens Haven landed at Quirpont Island, off the northwest tip of Newfoundland, and encountered a friendly Eskimo group nearby. The next year he returned and explored the coast from here to 56 degrees North, in the vicinity of Davis Inlet, but reported seeing no Eskimos. His colleague, Lawrence Drachart, however, found an Eskimo group of "not less than three hundred persons" encamped near Chateau Bay in conical skin-covered tents, using traditional Eskimo hunting implements, except for European kettles (Crantz 1820, vol. 2:291). Several years later George Cartwright established the first trading post in the Chateau area, introduced firearms, and commented extensively on many facets of Eskimo life. Finally, during the 19th century the Labrador Eskimos retreated north to Hamilton Inlet, where they have remained until the present.

Besides the problem of Eskimo extensions in the St. Lawrence there is the question of whether they ever occupied the island of Newfoundland. Again the data is scanty, and there is inconclusive evidence as to whether actual settlement of the island occurred. Arguing in favor of at least transient occupation is Cartwright's reputed sighting of an "Eskimo" hunting by boat near Fogo Island in 1771, and the fact that Governor Palliser of Newfoundland attempted unsuccessfully to restrain the Eskimos of Labrador from crossing the Straits to Newfoundland, where they traded with the Beothuk and acquired a wood which was unavailable in Labrador and was used in making hunting bows and darts (Crantz 1820, vol. 2:295, Jenness 1929). Cartwright (1792, vol. 1:9) calls this wood "sycamore." To date, no undisputed sites of Labrador Eskimo have been found on the island. However, a site which Wintemberg (1939, 1940) discovered on Keppel Island, later visited by Harp (1964: 30), may possibly have a Labrador Eskimo component, indicated by several stone house rings and a line of *nangissat,* or hopping stones, lying above what is clearly a Dorset stratum as shown by the tool types found. In any case, it is evident that any occupation of Newfoundland by Labrador Eskimo would be minimal and probably limited to the two centuries between Cartier's voyage of 1534 and the Moravian contact period of the 1760s.

A further question that should be considered is the nature of the Eskimo occupation in the southern Labrador and St. Lawrence regions. In particular, it has been suggested by Gosling (1910:166) that the Eskimos did not move into southern Labrador until after initial settlement by the Europeans in the 16th century, and that their movements in these regions were the result of seasonal summer trips aimed at seal hunting and acquiring European material culture, especially iron tools and wooden boats. Bird (1945:178), who briefly surveyed the Hawkes Harbor area, commented on the lack of Eskimo winter houses south of Hamilton Inlet. These beliefs do not agree with the claims for three Eskimo settlements south of Hamilton Inlet which are discussed by Hawkes (1916:34) and corroborated by other sources discussed by Speck (1931:570). It would seem impossible that large groups of Eskimos, numbering in the several hundreds if one is to believe the Moravian records, could abandon completely the south coast each winter to seek refuge at winter sites in Hamilton Inlet for the sites here are too small to accommodate such large numbers. Rather, it would appear that 16–17th century sites must exist further south than Hamilton Inlet. In fact, the literature contains a few references to possible winter sites. Jens Haven found "scattered tumuli, with the arrows and implements of the dead deposited near them" at Chateau Bay (Crantz 1820, vol. 2:288). This may be a summer site with graves. However, Cartwright (1792, vol. 1:162) reports deserted winter houses on Granby Island, and Hind (1863:130) mentions stone and turf houses with relics and human bones scattered about on Eskimo Island in St. Paul's Bay.

Despite the possibility of permanent winter residence in the Strait it is very likely that Gosling's main thesis of a recent appearance of Labrador Eskimo will be upheld and that the further extensions of Eskimos into the Gulf occurred as seasonal expeditions. Such an hypothesis, expanded to include a massive southern movement of the Labrador Eskimo to the limit of icebergs and walrus hunting in the Gulf of St. Lawrence, is supported by the data from the Hamilton Inlet survey and also corresponds to oral traditions of the northern Labrador Eskimo which include tales of a southern migration (Kohlmeister and Kmoch 1814).

If these views of a recent movement to the south are correct, an explanation is forthcoming regarding the numerous claims for Eskimo and Indian battles which are said to have raged along the entire Labrador coast from the Gulf to Davis Inlet. These are recorded in histories, in place names, and in oral traditions; archeological data has been cited as evidence as well. One of these battles is said to have occurred on Eskimo Island in Hamilton Inlet. The battle, which took place late in the 18th century, is noted by Holme (1888:193) and by Tanner (1944:482) who visited the island in 1937 and discovered numerous stone graves, including one whose occupant had a bullet hole in its skull. It is reportedly this battle which brought Governor Palliser to Labrador in an attempt to make peace with the Eskimo, an undertaking which resulted in such goodwill on the part of the Hamilton Inlet Eskimos that their chief assumed the Palliser surname in gratitude. The name is still common in the area.

Other writers, such as Hind (1863:10), cite the prevalence of coastal graves and sites that are littered with human bones as evidence for battle sites at which, inevitably, the Eskimo losses seem to have been severe judging from the number of skeletons found. More likely, these sites were the customary graveyards used over several hundred years by the Eskimos, who deposited their dead in stone cairns which were later ravaged by animals or curiosity seekers. The tradition of specific battle grounds and the large losses of life thought to have occurred probably grew from the acquaintance of early settlers with these sites. These comments, however, are not intended to diminish the reality of the bitter emnity which existed between the Eskimos and Indians along the Labrador coast between 1500–1800. It is likely that this hostility is based in large part on the recent southern movement of the Eskimo and their expropriation of the rich coastal regions formerly important to the Indians during the summer fishing season. The denial of marine resources to the Indians during a period of limited food supplies in the interior constituted a severe economic hardship, and the Europeans therefore easily enlisted Indian assistance in the expulsion and annihilation of the southern Labrador Eskimo.

Ethnography

The culture of the Labrador Eskimo stands in high contrast to the nomadic inland culture of the Montagnais-Naskapi. While there is some evidence for peaceful contact between the two groups, the traditional view that their cultural patterns were distinct and that they exploited different ecological zones seems largely maintained (Malaurie 1964:20). The boundary between, however, remains blurred, for the Eskimo have always engaged in summer and winter caribou hunting in areas adjacent to the coast (Wheeler 1930:454). While Indians traditionally came out to the coast during the summer in southern Labrador and Quebec, they rarely did so in historic times north of Hamilton Inlet, except in periods of ecological crisis, such as occurred in 1843, 1855–1860, and 1916 (Strong 1930b:2; Tanner 1944:441, 630).

Preservation of the Eskimo way of life is most complete in northern Labrador, due to the efforts of the Moravian Mission which, in 1771, established in Nain the first of a series of posts. The posts were gradually expanded to cover the entire northern coast from Makkovik to Hebron. By this time, the Eskimos had been driven north from Battle Harbor and Sandwich Bay to their present southernmost settlement at Rigolet. Shortly before the opening of the Nain station the Moravians investigated the possibility of establishing a mission at Aivertok (Hamilton Inlet) but apparently decided that the influence of the traders on the Eskimo there was already too great to allow the mission to prosper (Gosling 1910: 263).

Acculturation during this period was very rapid in the south owing to the cessation of hostilities between whites and Eskimos, and by 1800 major changes in Eskimo material culture and life had already occurred. Many of these changes did not occur in the Moravian areas to the north for another fifty years. Along with these changes and with increasing contact with whites came the first of the epidemics which racked the Eskimo populations periodically thereafter. The Moravian *Periodical Accounts* (1790–1958) tell of epidemics in the 19th and 20th centuries which were brought to the settlements by the re-supply ship, the *Harmony* (Kleivan 1966). By 1900 the Eskimo population of the entire Labrador-Quebec peninsula was estimated at 2500, and by 1952 despite a continuously high birth rate it had reached only 2578 (Balikci 1964:376). The figures for Hamilton Inlet are more revealing. In 1824 the Eskimo population was 220, with about 100 Euro-Canadian traders and fishermen present (Jenness 1965:10). In 1939 only 55 Eskimos remained (Tanner 1944:438).

Eskimo culture in Labrador was similar to that of northern Eskimo and though not well-documented for this area is known from other regions. Pertinent ethnographic accounts include Cartwright's journal (1792), Tucker (1839), Turner (1894), Hantzsch (1931–1932), Hawkes (1916), Tanner (1944), Balikci (1964), Jenness (1965), Kleivan (1966), and G. Taylor (1968, 1969, 1970). Jenness deals primarily with government administration; Kleivan and Taylor consider acculturation, demography, and settlement pattern changes from the Moravian records. Unfortunately, there is no extant record of the life of the early Ivuktoke Eskimo of Hamilton Inlet beyond a brief description by Tanner, and inferences from Cartwright.

Cultural adaptations of the Labrador-Quebec Eskimo are summarized by Balikci (1964:377–379) and G. Taylor (1968). Whale hunting was a major activity of the Labrador Eskimo, and was of particular importance in Hamilton Inlet. The lack of mention of extensive whale hunting by the Eskimos described by Cartwright (1792) suggests that it was not a major summer activity in southern Labrador. Large whaling harpoons and umiaks (or stolen wooden boats in post-contact times) were employed for the hunt. Its success in the Hamilton Inlet area is attested to by the reported presence in one abandoned house on Eskimo Island of 45 long tons of decaying whalebone, which at 1910 prices was estimated (Gosling 1910:196) to have been worth £20,000. Implements for marine hunting are described by Crantz (1820, vol. 2:293; see also vol. 1:136) as being harpoons, darts, and lances of the five types known to the Greenland Eskimos, as well as a new sixth type, called an *ungak*, barbed with three spikes and ten inches long, used in bird hunting. Seals and walrus were hunted with toggling harpoons from kayaks at the edge of the winter land-fast ice (called in Eskimo, the *sina*), at breathing holes, or while basking on rocks in the summer. Caribou were intercepted on the interior in what appear to have been communal drives (G.

Taylor 1969:158) and taken with bone-pointed lances and arrows by hunters who drove the animals into lakes and rivers where they were killed from kayaks. Birds were hunted with the bow and arrow, the bird dart, and bolas. Fishing technology included the three-pronged leister which was used to spear salmon and trout trapped in stone weirs at the mouths of shallow rivers; antler "sleeper" hooks were baited and used for lake trout and cod. Ice-hole fishing was conducted with leister, lure, and hook. Berries contributed a large part of the diet in the late summer and early fall.

The supposed absence of fish and seal nets in aboriginal Labrador Eskimo culture has been noted by several authors (Gosling 1910:284, Kleivan 1966:48–49) who felt that they were introduced during the initial period of contact. There is a lack of specific references to aboriginal nets in the early literature, and Kleivan noted the over-exploitation of salmon and char from streams in the Nain area by Eskimos who had acquired gill nets from the Moravians. However, the presence of seal nets in pre-Mission Eskimo sites in the Saglek area (Schledermann 1971) raises the possibility that fish nets also may have been used. In any case, it appears that shortly after contact fish nets replaced stone weir traps as the dominant fishing method (Balikci 1964:381).

Dwellings of the Labrador Eskimo are of four basic types. During the summer, conical wooden frames were covered with caribou hide or sealskin, weighted down at the edges by boulders. Around 1900 the conical tent was replaced by the canvas ridge-pole rectangular tent. Settlements were shifted frequently during the summer season. Winter dwellings were more substantial and seem to have been more or less permanently occupied. Three types of winter houses were used. Snow houses included the hemispherical dwelling with entrance tunnel described by Cartwright (1792) and the public gamehouse, or *kache*, described by Crantz (1820, vol. 2:308). The latter structure, 16 feet high and 70 feet square with a long entrance tunnel, was built by the Eskimos in Nain in 1777 much to the grief of the Moravians, who insisted that its use be abandoned due to the depravity which occurred therein. The other winter structure, used primarily in the fall and early winter, was the semi-subterranean earth-covered lodge. Bird (1945:131–135, 179), Kleivan (1966:26–43), and G. Taylor (1968) discuss changes in settlement and house types in considerable detail. Between 1550–1850 the earth-covered lodges show an evolution toward the "great family" type of structure, sometimes assuming massive proportions and housing up to 25–30 people. Extremely long passageways and auxiliary rooms were common. By the mid-19th century these houses were abandoned and smaller, single-family houses were constructed above ground from timber and turf (Tanner 1944:516). Whalebone apparently was not used commonly for structural support in Eskimo houses in Labrador in areas where spruce was plentiful. The houses were heated by blubber lamps and wood fires. Many of the changes in the house types in Labrador correspond to the evolution of house types in West Greenland (Mathiassen 1934; Paterson 1939). Recent archeological excavations conducted in Saglek by James Tuck and Peter Schledermann (Schledermann 1971) provide new data on the development of Thule house types in northern Labrador.

Transportation during the summer was by kayak or umiak, and in winter the komatik was used with dogs. The snow crust on sea and lake ice is hard and suitable for this heavy sled. Snowshoes were used during the Eskimo's brief excursions into the forest. Other significant adaptations included soapstone cooking vessels and tailored winter clothing.

Social adaptations also appear to have played important roles in Labrador Eskimo life. The relatively large size and semipermanent nature of winter settlements has been noted. During the summer these settlements broke up into smaller groups of extended families. One such summer camp is described in detail by Cartwright and contained 32 individuals. These groups have been described as "plural families" (Kleivan 1966:26) or "joint families" (G. Taylor 1968: 190–193) and were polygynous. Among other duties, the women rowed umiaks, and later, wooden boats. The structure of the group involved a complex net of social ties and obligations within and between families (Kleivan, 1966:42).

These adaptations centering around the whale hunting, sealing, and walrus economy produced a tightly integrated socioeconomic group which was highly mobile in the maritime zone. The evolution of the great family house probably represented an intensification of this pattern with increasing stress placed on the younger males of the group to leave the family and establish their own households. With a high birth rate and abundant natural resources such a situation could result in rapid population growth and territorial expansion (M. Sahlins 1961). This hypothesis which has some support from the historic records (G. Taylor 1968:228), may help explain the rapid Eskimo expansion down the Labrador coast in the 16th and 17th century, and should be investigated archeologically. However, Bird's (1945:179) and Schledermann's (1971) conclusions and the data from Eskimo Island indicate that the great house developed during the 18th century after the initial territorial expansion had begun.

A further aspect of Eskimo ethnography is the custom of burial in stone cairns. These cairns are abundant along the entire length of the Labrador coast and are its most conspicuous archeological remains. First noted by Jens Haven and George Cartwright as "tumuli" containing human bones and artifacts, they provide an important source of archeological data. Unfortunately most of these in the southern regions have been destroyed. Here, and in northern Labrador, cairn burial was used until the Eskimos became Christianized in the late 18th and early 19th centuries. In extreme northern Labrador, however, beyond the influence of the Moravians the tradition remained until the mid-19th century. It is from this area that we have the important but little-known description of burial practices collected in 1906 from Eskimo informants and from excavations of graves themselves by Bernhard Hantzsch (1930). Hantzsch describes the construction and location of graves, the disposition of the body and grave goods, and influence of European culture on burial customs. Archeologists will find especially useful the statements on sexual variation in the types and quantities of grave goods, mythological background to the practices, and demographic representativeness of graves for inferences about the total population structure. A brief description of cairn burial from southern Labrador (Tucker 1839:102) indicates that it was only rarely used at this time, and that bodies were wrapped in blankets and placed in holes excavated one or two feet deep, then covered with an arch of stone and piled with earth on top. Appropriate hunting implements and an empty cup were placed in these graves. Occasionally burial was done by simply thrusting the body into a crevice in the rocks. This simple form was used in addition to cairn burial in Hamilton Inlet and elsewhere on the south coast.

The effect of European influence on traditional Eskimo culture remains a problem. The major technological introductions were the rifle, the wooden boat, and perhaps the gill net. Rifles reduced, but did not obviate, the need for communal caribou drives and produced a reduction of seal breathing-hole hunting in favor of ice-edge hunting (Balikci 1964:381), just as it did in Alaska (Nelson 1969:302–309). Guns also made bird hunting more efficient. Nevertheless, it is doubtful that firearms produced a revolutionary change in Eskimo life in Labrador, where traditional hunting implements and hunting patterns persisted until long after firearm introduction.

Other important new elements were iron for tool manufacture and wooden boats. The latter were superior to skin-covered boats for whaling and sealing along the ice leads and the sina edge since they could not be cut by the sharp, newly formed ice. The importance of this type of hunting in Labrador made wooden boats highly desirable.

Balikci (1964:381) feels these changes and the attendant mission and market economy of cod fishing and trapping wrought far-reaching organizational and socioeconomic changes. It is undoubtedly true that many changes did occur, especially ones resulting in group fragmentation and more individualized hunting techniques, while European trade broke up traditional social obligations and interfamily ties (Kleivan 1966:42). Atomization, however, seems not to have occurred in Hamilton Inlet prior to 1800, when the great family houses were probably still in use. In northern Labrador it is probable that these changes did not occur until around 1850 (Schledermann 1971). Packard (1885:559) noted the Eskimo use of two-family houses in the Hopedale area as late as 1864.

Annual cycle.—There is no early record of the annual cycle of the southern Eskimos or those of Hamilton Inlet during the important period of 1770–1800 when Cartwright first introduced rifles and possibly nets to the Hamilton Inlet Eskimos. The evidence for northern Labrador is better. Here it was not until after 1800 that these changes began to be felt (Kleivan 1966:60), while fox trapping and cod fishing did not become important until mid-century. For these reasons, it appears that the data on the annual cycle of the Nain Eskimos gathered from Crantz' and Reichel's remarks in the Moravian *Periodical Accounts* for the period between 1850–1870 reflect fairly accurately the seasonal variation of local Eskimo economy, summarized in Gosling (1910:303) and Tanner (1944:487–503). In addition, the activities displaced by cod fishing and trapping continued to be known by the Eskimos, who frequently persisted in the old cycle as alternate activities when the fur or cod failed to materialize.

NAIN

The following seasonal round of the Nain Eskimos is taken from the records of the early Moravian missionaries as presented by G. Taylor (1968:143–166).

The fall season included the period from mid-October through mid-December. Early in October the caribou returned from the hunt on the interior and in mid-October moved to their winter camps on the coast to await the fall harp seal migration. Harp, hooded, and bearded seals appeared from the north, first collecting in the bays, and then forming huge herds at the newly formed ice edge *(sina)*. Whales and walrus were also taken during this period, and especially in November. Kayaks were used for the hunt until the ice was thick enough to walk on. The sina at this time of year is treacherous and thin and sinks if broken off with a man on it. For this reason Eskimos usually conducted the fall hunt from kayak, though it, too, was vulnerable to the razor-sharp ice. During the transition period when neither boating nor walking was safe, it was customary to make winter clothes. Generally the men helped dress the caribou skins while the women made the garments. During this early winter season the large communal houses were occupied.

When the ice was solid in late December the early winter breathing-hole sealing began. Temporary ice houses were occupied during these hunting forays which included sina hunting also. Besides seal and walrus certain species of birds (black guillimots, eider ducks, and Atlantic puffins) wintered over on the coast and could be hunted. Ptarmigan were usually available on the interior.

In times of need trips might be made into the interior to fetch cached caribou meat from the fall hunt or to conduct caribou hunts if the animals were available. Often there was a period in midwinter when bad weather and deep snow hindered the breathing-hole hunting and resulted in hunger spells. If food was extremely scarce on the coast some families would go into the interior to fish and hunt caribou. During hard times this alternate pattern would persist throughout the winter, in which case its success depended largely on the supply of cached caribou meat laid up during the fall hunt.

After the arrival of the Moravians fox trapping was introduced to the Eskimos and became moderately important in the local economy because it provided a source of cash. Fox trapping, however, never became very widespread in this area for several reasons: foxes were not prevalent; the Eskimo tended to be an indifferent trapper; and the trapping season conflicted with the more important food-getting activities of sealing and caribou hunting.

Late winter was a time of heavy snowfall, which often obscured breathing holes. Consequently, the hunt was conducted at the sina and in rattles where open water persisted all winter. Occasionally ice-hole fishing for tomcod or char was done with lures, spears, or hooks, and caribou hunts were made. Breakup occurred in May and June. At this time travel was difficult and the Eskimos relied on cached food. Starvation diets included seaweed, mussels, and grass.

Spring was a time of relative plenty. Just before breakup most of the Nain Eskimos moved from their winter quarters along the inner island archipelagos to the outer islands. Here the spring hunt began as the ice broke up and the northward migration of harp seals began in late May. At this time also, ring seals emerged from their dens under the land-fast ice, and harbor and bearded seals were available. Seaward island sites were commonly occupied at this time since it was here that the earliest open water appeared. Walrus and polar bear were hunted from the edge of the shore ice, among the inshore floes, and from the water by kayak. With the harp seals came flocks of migratory birds. During June and July bird hunting and egg collecting were important activities, in addition to basking seal hunting. Whale and walrus were also available.

The summer fishing season began in July with the first runs of sea trout and salmon. The Eskimos moved to streams at the heads of small bays and constructed stone traps. In the 19th century it became common for the summer salmon and trout fishery to be replaced by cod fishing, first using jiggers, and later large net traps. Cod had an economic value and was one of the few means of obtaining cash. Though practiced, cod fishing was never very important to these Eskimos until after 1800. White whale hunts were also conducted during the summer from kayaks and umiaks.

One of the important late summer activities, which to some extent was replaced by cod fishing, was the August caribou hunt. These hunts were conducted as small communal drives in the valleys and plateau west of the trout streams. Often the women remained at the fishing sites. During these drives the Eskimos traveled west nearly to the valley of the George River, as shown from William Turner's notes of a 1780 excursion (G. Taylor 1969). There is no record of caribou fences *(inuksuks)* being used by Labrador Eskimos. Also during the late summer, berry picking was an important activity, and ring and harbor seals could still be hunted.

HAMILTON INLET ESKIMO

The early Hamilton Inlet, or *Ivuktoke,* Eskimos are poorly known in comparison to the northern Eskimos. Moravian influence did not extend this far south, and traders are notoriously poor observers and recorders. Tanner could discover little about these people. Although these Eskimos are reportedly pure of race, the early population figures include many half-breeds as well as pure Eskimo (Jenness 1965:10). It seems likely that some intermixture has occurred. Religious affiliation is with the Church of England.

Today the remainder of the Ivuktoke Eskimo live at Rigolet in wooden frame houses and tarpaper shacks. All speak Eskimo and some speak English. Centralization of settlement has occurred for many of the same reasons here as in North West River: welfare, government housing, education, and medical assistance. Although these Eskimos hunt seal, caribou, birds, and fish for part of their livelihood, the traditional pattern of their life has been lost. The older Eskimos, such as "Big Joe" Palliser, remember the days at the turn of the century when the winter settlement was at Snooks Cove, and life was partially nomadic. This settlement provided most of the Eskimos (including Joe Palliser's mother, Mary) who were brought to the Chicago World's Columbian Exposition in 1893 (see pages 00–00).

In 1937 Tanner found eleven Eskimo families living in Hamilton Inlet. These people were the direct descendants of the Ivuktoke Eskimos who, according to a map affixed to an early report in 1757 (Tanner 1944:509), resided during the winter in the Narrows. The seasonal wanderings of groups of the Ivuktoke Eskimo are supposed to have stretched "far to the north and south along the coast, [and] also some distance inside Lake Melville, even up the valley of the Hamilton River," according to Tanner. Conflict with the Indians is supposed to have driven them back to their present location in the eastern end of the inlet, ending with the Indian attack on Eskimo Island about 1760.

The distribution of Eskimos within Hamilton Inlet between 1500–1850 is unfortunately very poorly known, and there seems to be little evidence to support Tanner's claims for Eskimo extension into the Hamilton (Churchill) River valley. Contrary to Tanner's claim (1944:478), Austin Cary (1892) does not mention the presence or former presence of Eskimos on the Hamilton River, nor did William Martin in his visit to Muskrat Falls in 1773 (Gosling 1910:448). In fact, Martin met Indians at the falls, and noted the extensive commerce carried on between the Canadian traders and the Red Indians in western Lake Melville (see page 209). There is little reason for believing, therefore, that Eskimos ever occupied the Churchill River valley since trapping would have been the only incentive for such a movement into the forest. It is more likely that the western limit of Eskimo occupation lay near the western tundra limit at Etagaulet Point, where in the summer of 1968 an abandoned Eskimo early spring sealing and bird hunting camp was found. This area, including the country east into the Backway, is also a staging point for caribou hunting in the Mealy Mountains. In addition, Eskimos probably hunted and fished west from the Narrows to the head of Double Mer, thus extending their range halfway into Lake Melville. The fact that early French maps of the 18th century list Hamilton Inlet as Grande Bay des Eskimaux (Gosling 1910:131) or that it was called Eskimo Bay by W. H. A. Davies (1843) is of little consequence since the early recorders were most familiar with the outer portion of the inlet, Groswater Bay. Finally, Martin mentions the presence of cod fisheries for forty miles up the "river" which must in this case be taken to mean Groswater Bay and the Narrows, certainly not the Hamilton River. The presence in Lake Melville of tomcod notwithstanding, the cod fisheries are all restricted to the coast, and in early days it is this apparent confusing reference to the Narrows as a "river" which led Tanner to make his statement.

Settlement pattern.—By the time of Tanner's visit, the life of these Eskimos had changed considerably. Beginning with the importance of trapping in the early 19th century, the large communal settlements in the Narrows were abandoned for a more dispersed winter settlement pattern based on single-family units. Of the eleven families in 1937 the following distribution of winter quarters was noted: Mark, James, and Hugh Palliser (English River), Joseph Palliser of Mark (Snooks Cove), Joseph Palliser of John (Webers Cove), Mark Mucko and Peter Adams (Peter Lucy's Brook), William Ikey and Charlie and Wilfred Shiwak (Backway), and William Shiwak (Rigolet). Even though the traditional cycle had been disrupted, these families still preserved a semi-nomadic life. Unfortunately, only one family's cycle is reported. Mark Palliser spent the winter fox trapping and caribou hunting at English River. In June and July he fished for salmon at Henrietta Island, and in late July he moved out to Turner's Bight, in Groswater Bay, where he spent the remainder of the summer cod fishing. In September or October he moved back to his winter site at English River. It is interesting that none of the Eskimo maintained winter settlements east of the Narrows. The reason appears to be the greater possibility of fur trapping in eastern Lake Melville and the Narrows; in addition, the Mealy Mountain caribou were more accessible and seals were abundant.

Within this pattern there were traces of the earlier cycle. For instance, during the winter months caribou hunts were made, and sealing expeditions of several days occasionally took Eskimos to the ice-edge in Groswater Bay to hunt seals during the spring migration. Winter sealing at breathing holes was important in eastern Lake Melville, and large catches could be made here during spring break-up. Seals were also hunted during the summer fishing season in Groswater Bay. Many of these activities still take place today.

Tanner (1944:510) concludes his observations of the Hamilton Inlet Eskimo with the statement:

> It would be difficult to think out any other arrangement which fitted in better with the resources of the districts and the possibilities of their utilization. A proof of this is the fact that the natural conditions have compelled also the liveyeres of the area to adopt the same life and customs.

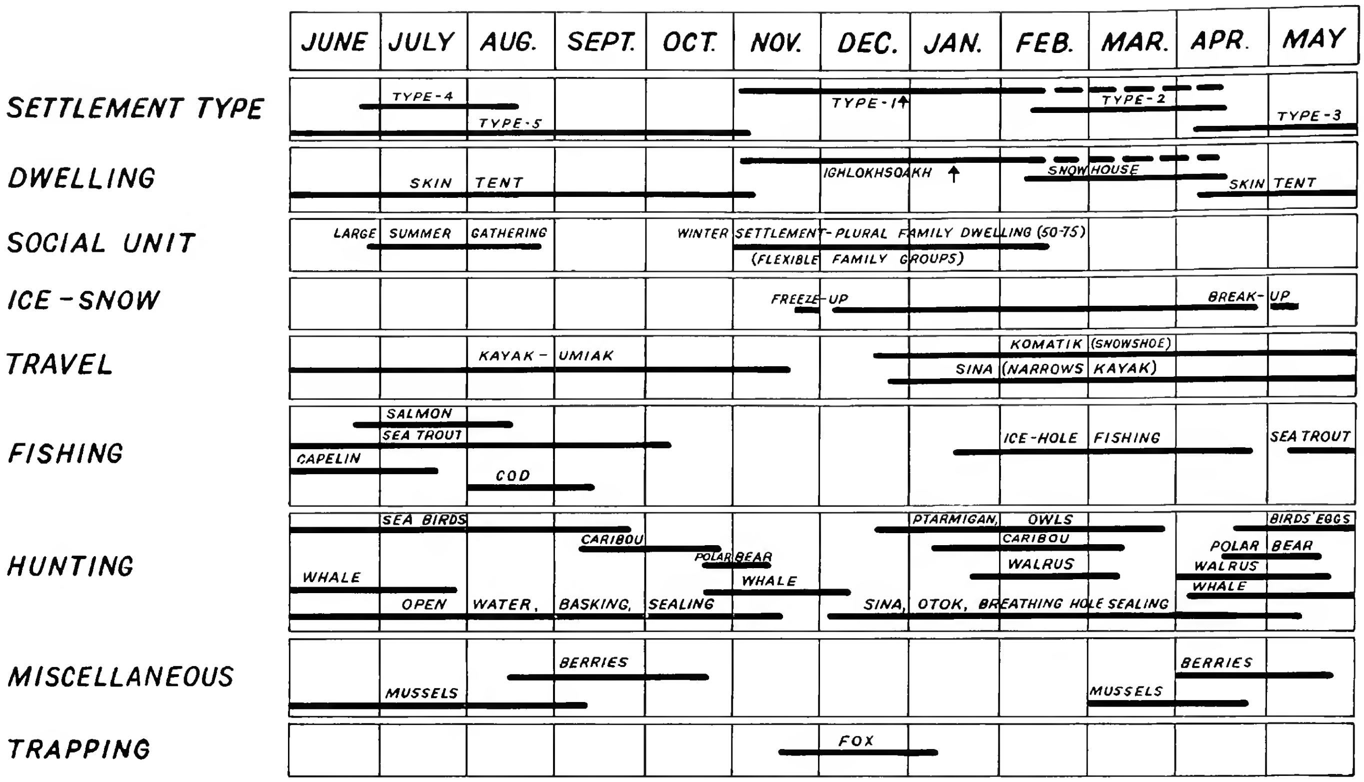


FIGURE 27.—Ivuktoke annual cycle.

ANNUAL CYCLE (Figure 27).—From this data, and comparison with the annual cycle for the Nain and Hopedale Eskimo, it is possible to reconstruct the former cycle of the Ivuktoke Eskimo. Settlement dispersal from the large communities in the Narrows would begin in March. Some families would have moved camp to the islands in Groswater Bay, and from these bases walrus and seal would have been hunted among the ice floes. Dwellings consisted of conical skin tents. Other families may have moved west into Lake Melville to hunt seals among the decaying ice. By late May the migratory birds had arrived, and bird hunting and egg collecting commenced. In June capelin runs began in Groswater Bay, and salmon and trout fishing commenced along the shores and in the river mouths. Fish would have been speared and hooked, and in suitable rivers, like the English River, stone weirs may have been built. Later in the summer codfish were caught with hook and line, or possibly jigged. Bird hunting continued with bird darts, bolas, and bow and arrow. Berries ripened in late August and September, and the fall bird hunt began, with geese and ducks being most important. Some birds would have been preserved for winter consumption. During September or October a caribou hunt undoubtedly occurred, if not near the Mealies, perhaps in the country north of Groswater Bay among the "Greenwood Deer."

Another resource not often associated with Eskimo economy is shellfish, of which the blue mussel (*Mytilus edulis*) appears to have been the most important. Although no direct ethnographic data is available concerning the use of this mussel for food, its presence in large quantities in houses and middens excavated by Bird (1945:131, 134) in Hopedale attest to its utilization in the fall and early winter. Mussel shells have also been found in Ivuktoke Eskimo houses of Eskimo Island.

The annual southern seal migration would have taken Eskimos to the newly formed ice-edge for the fall seal hunt in kayaks. Walrus and polar bear probably were hunted as well.

By December, the various family groups had again congregated in their winter semisubterranean dwellings on Eskimo Island. These communities may have contained 90–100 individuals who lived relatively permanently in the settlement until March. Seal, whale, and fish are available to kayak or umiak hunters throughout the winter and formed the economic basis for the large settlement. During the winter other activities included walrus and seal hunting at the sina in Groswater Bay, breathing hole sealing in Lake Melville, ice-hole fishing and fox hunting with stone traps. Caribou hunting would have been conducted in the nearby Mealies, and on Groswater Bay. During late winter the earth houses were probably abandoned for ice-house settlements in preparation for the spring seal hunt.

IVUKTOKE PATTERN.—The foregoing description of the life of the early Hamilton Inlet Eskimo depicts a relatively secure cultural adaptation to an ecologically rich coastal environment. These people had the dual advantage of an Eskimo type of adaptation in an arctic maritime environment as well as the added possibilities of the subarctic forest, which included abundant wood for winter fuel, boat, and house construction. The addition of the subarctic faunal resources unavailable in the Arctic, including salmon, cod, capelin, black bear, and other small fur-bearing animals added to the resource base of the Labrador Eskimos, but did not result in major differences in cultural patterns. Other economic advantages of the Eskimo included the possibility of food preservation unavailable on the interior. Seal and whale oil was frequently used as a preservative, while permafrost provided a natural deep-freeze.

Finally, the marine zone of Hamilton Inlet supports a great diversity of species, many of which are available in geographical or seasonal concentration. Such high density of economic resources resulted in large food harvests even with native technology, with minimum expenditures of time and effort. Especially important in Hamilton Inlet was ecological concentration during the winter season. The technological and social adaptations of the Eskimo during this period resulted in large, stable communities, in which individuals were adequately protected from the weather by warm clothing and housing, while food preservation added a margin of safety during periods when transportation was difficult. To a large degree, then, culture and ecology released the Eskimo from many of the daily subsistence problems of the Indian. Its success can be most readily seen in the higher population density per economic unit for most seasons of the year, when compared to contemporary Indian culture.

This Eskimo pattern has been termed the Ivuktoke subsistence-settlement pattern (Figure 28). It implies a distinctive seminomadic Eskimo way of life in the transitional arctic-subarctic environment of the central Labrador coast. Specifically, the term applies to the early Ivuktoke Eskimo of Hamilton Inlet for which the above-described settlement pattern, cultural distribution, and economic adaptations apply. Six major settlement types belong in the Ivuktoke pattern.

Type 1: Large sedentary winter communities were located on Eskimo Island and along the shores of the Narrows. These early winter settlements accommodated 50–100 individuals, and consisted of semisubterranean log and earth covered structures with entrance tunnels. Economic activities included sealing, whaling, fishing, and caribou hunting. Large middens developed at these sites. During the 19th century socioeconomic changes caused the last communal winter settlement to break down, and a dispersed pattern of winter settlement began to be used.

Type 2: Snow houses, including the public gamehouse, or *kache,* leave no structural remains, except to give a structural outline by the distribution of cultural debris. If located on the ice, as many were, no remains at all would be found. These sites would have been used during winter hunting excursions to the sina, or for caribou hunts, especially in late winter.

Type 3: Late winter and early spring sealing tent sites were occupied in April in Lake Melville and Groswater Bay. One such site at Etagaulet Point contained circular and rectangular tent rings, remains of komatiks, wooden tubs, oil drum kettles used for rendering blubber, and duck blinds for the spring bird hunt. The site appeared to have been occupied sporadically over an extensive period of time. These sites are not necessarily associated with beaches or protected coves, since ice-travel continued into early spring.

Type 4: Summer gathering places were occasionally occupied on islands in Groswater Bay when sufficient resources were available to support a large group. Sites such as Ticoralak Island and Big Black Island have large numbers of tent rings and graves and may have been used as this type of settlement.

Type 5: Summer fishing sites are found scattered along the shores of the Narrows, Groswater Bay, and eastern Lake Melville, and at river mouths. No stone

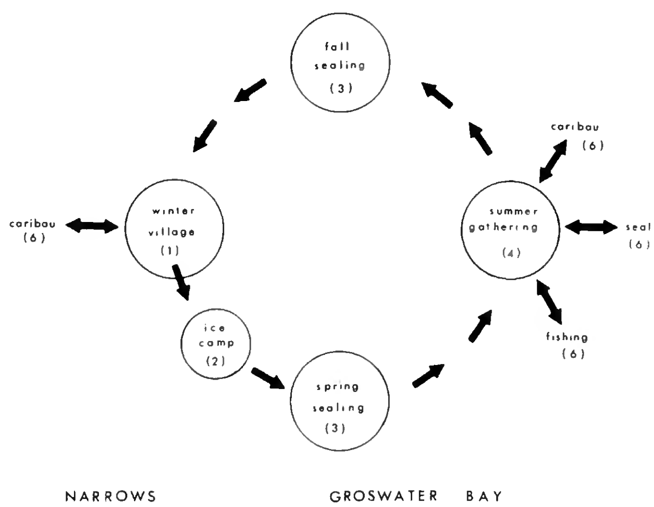


FIGURE 28.—Ivuktoke subsistence-settlement system. Settlement types indicated in parentheses.

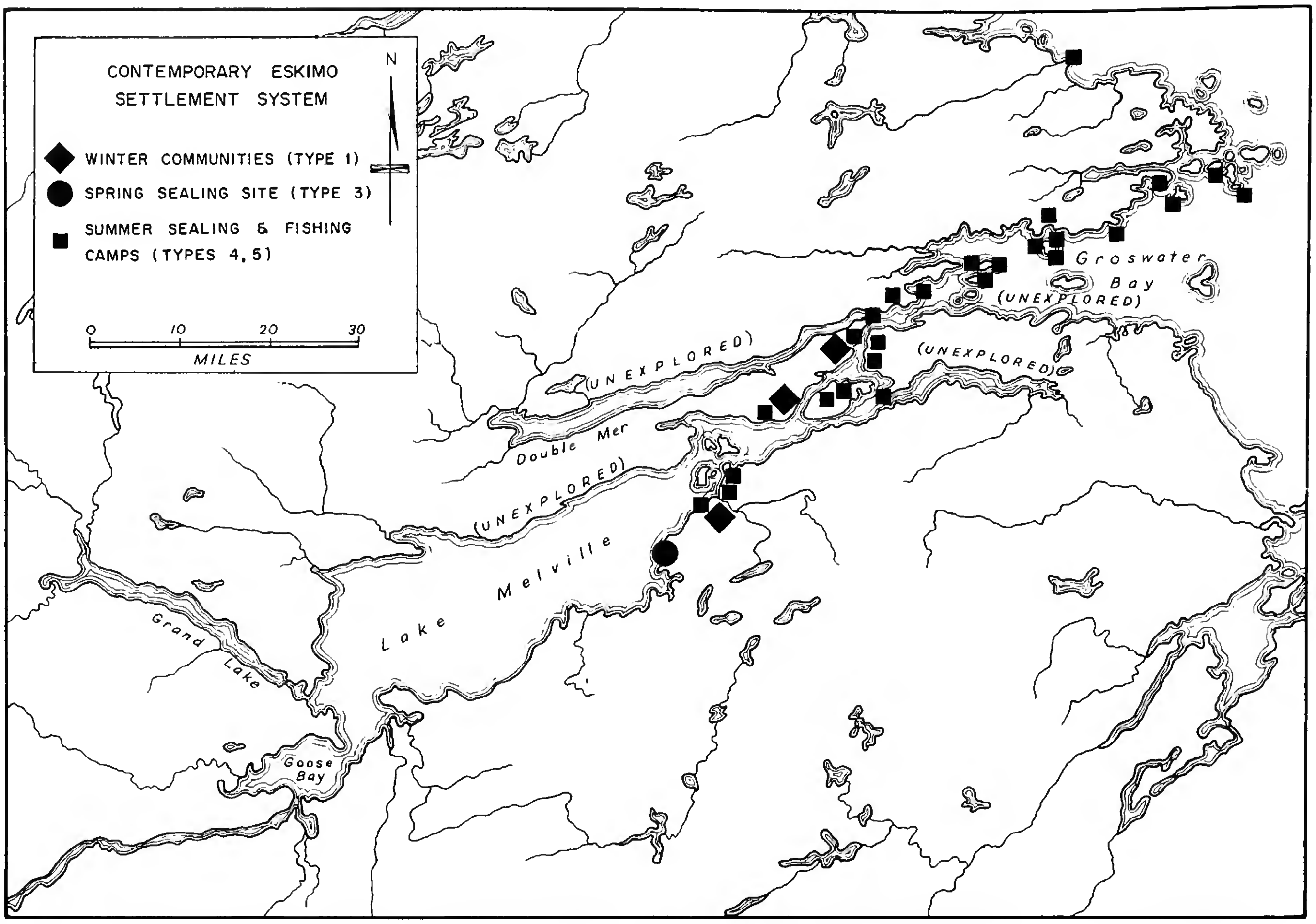


FIGURE 29.—Contemporary Eskimo settlement system.

fish weirs were noted. Circular stone tent rings indicate conical skin or canvas tents were used. More recently stone and wooden stakes show rectangular tents had been introduced. These sites almost invariably are located near suitable beaches, and are found close to the water, not more than 4–5 feet above the high tide mark.

Summer sealing sites are generally found along the shores and on islands in Groswater Bay. Bird blinds may be present, and circular or rectangular tent rings are common. These sites would be difficult to distinguish from fishing sites, except by tools and fauna. Fall sealing or bird hunting sites, and travel camps look similar. In this case site location helps determine function.

Type 6: Bivouac camps of hunters or transients often consist of little more than hearths and windbreaks.

Figures 29 and 30 present the distribution and settlement systems of the contemporary and Ivuktoke Eskimos of Hamilton Inlet.

NORTH WEST RIVER TRAPPERS

We conclude the ethnographic subsistence-settlement systems with brief summaries of two Euro-Canadian adaptations which are similar to the Indian and Eskimo patterns in their near complete reliance on locally obtained resources. These two groups are the interior trappers and their coastal relatives, the liveyere fishermen. Both have somewhat different histories of settlement and economies, and in many cases they are socially and culturally distinct. They serve as models of alternate subsistence economies which, though tangential to, and in some ways dependent upon, a market economy, are fundamentally self-supportive and show the diversity of lifeways possible within the geographical confines of Hamilton Inlet.

The history of the trapper population goes back to the initial French settlement of the inlet following Louis Fornel's first post in 1743. After William Martin's visit in 1820, English and Scottish settlers arrived. By 1900, population growth had resulted

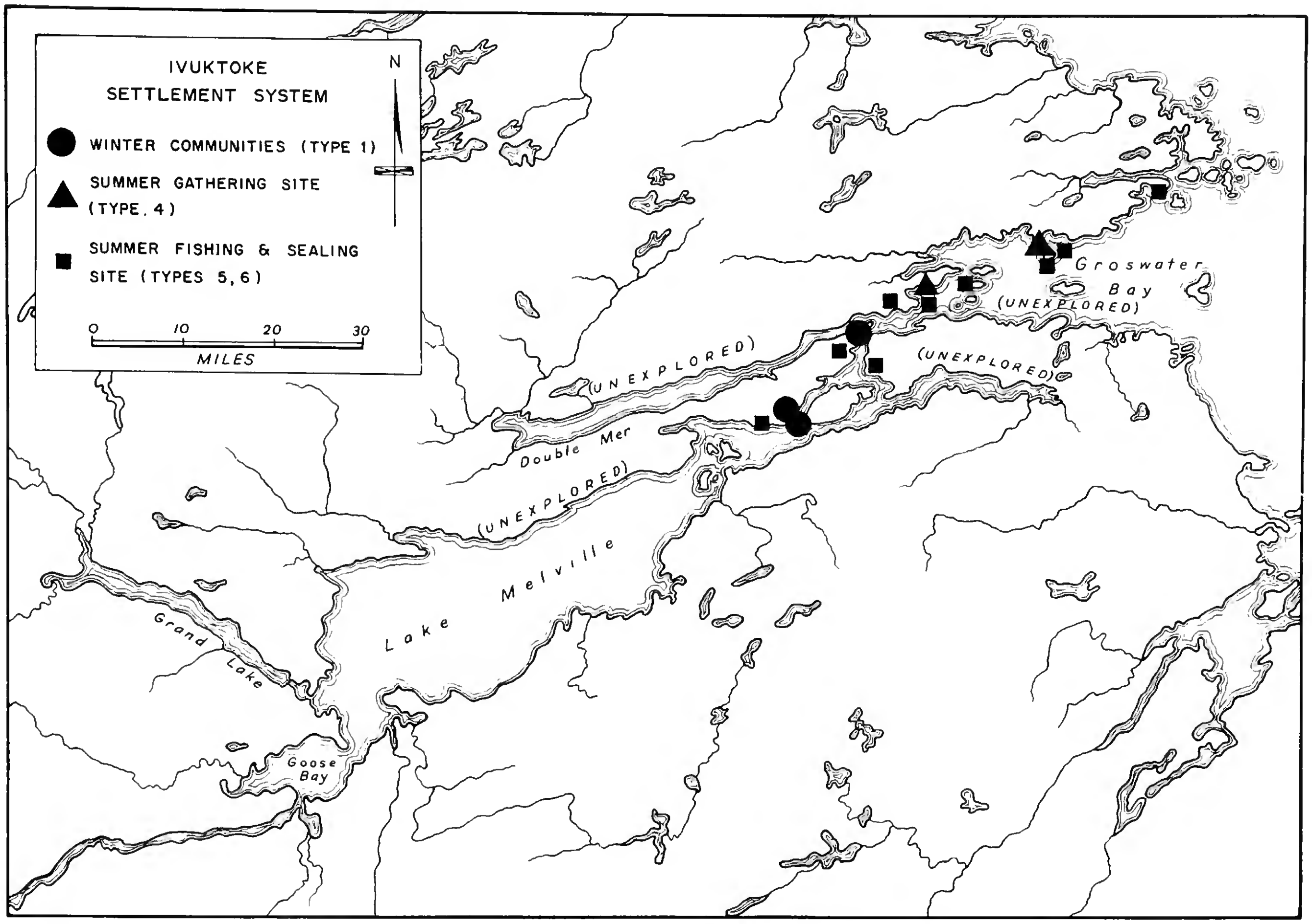


FIGURE 30.—Ivuktoke settlement system.

in complete utilization of the best trapping grounds in the lower valleys of Churchill and Naskapi rivers. Following this, expansion began into the "height of land" to the west. Only the river valleys were occupied (Figure 20), as here grew the closed-crown boreal forest which sheltered the best fur animals. By 1937 Tanner (1944:703) listed 87 trappers here, each with exclusive trapping rights to a parcel of land which was to be passed on to the eldest son. Younger sons, or elder sons whose fathers still trapped, were forced continuously to take new land upstream. By 1939 Tanner estimated that 15,000 traps were being set in this country. The rivers were the arteries of movement, and the trappers seldom strayed far from their banks.

As the trappers moved further upstream Indians occupying these areas retreated westward until all of their former hunting lands had been relinquished to the whites. At time of writing, Tanner forsaw the gradual reduction of the Indian territory until only the barren reaches of the plateau remained of their once vast lands, and he predicted Indian extinction by geographic strangulation. Fortunately, other factors intervened, most importantly, massive socioeconomic changes following 1945.

In 1937 the average income from a trapping season ranged between $1000–7000 depending on the abundance and quality of the fur. Thus, in a poor year the Hudson's Bay Company posts in western Lake Melville bought about $87 thousand worth of fur; in a good year as much as $579 thousand. However, it would be unusual for all the trappers to have a good year simultaneously, and the average purchase probably lay somewhere in the $100–250 thousand range. Since the trappers were frugal by nature, they accumulated a large income in the form of credit at the post. Many of the older trappers are now living off that credit. Today, fur farms and wage employment have greatly reduced the trapping industry, and it is rare to find a young trapper heading into the bush. Consequently, during the past thirty years the trapping lands have shrunk to a small fraction of their previous limits. In 1952 the Hudson's Bay Company at North West River bought only $14 thousand worth of fur (McGee 1961:24).

Population centralization at Happy Valley and North West River is equally recent. In 1900 Happy Valley did not exist, and North West River consisted of two trading posts (Revillon Freres and Hudson's Bay Company) and a summer Indian camp. The trappers were distributed in small settlements scattered in several areas of western Lake Melville: The Rapids, Mud Lake, Carter Basin, and at the Mulligan, Beaver, and Naskapi rivers. Here they maintained winter quarters for their families while the men trudged off to the trapline. For many months of the year the mother was the family head. Life was hard, but rewarding; religious values were strong. Honesty, simplicity, and familial obligation pervaded personal relations. As a result, the changes of the post-1940 era have been swift, extensive, and, to many of the older generation, disillusioning.

Annual cycle (Figure 31).—The seasonal activity of the North West River trapper is extremely variable and is difficult to characterize in a single pattern due to geographical variety. Following is Tanner's account of one such cycle for the 1930s.

During September the trappers living at North West River set out for their trapping grounds by canoe loaded with staples such as sugar, tea, and flour. Those individuals whose traplines lay farthest west left first. Their families remained behind, supplied with firewood and food. The men remained in "the country," living in tiny log "tilts," and making their weekly rounds on the traplines, until, in December or early January they returned to North West for the new year festivities, and to sell their fur. Some men returned to the traplines to lay in stores for the next fall and for a midwinter hunt between February and March. In this case, they returned to North West River in March with their furs and canoe carried on a short sled, called a catamarran, sometimes with a dog helping pull the load. Others, remaining at North West River set seal nets under the ice or hunted seals on the Lake Melville ice. At other times, caribou hunts were led into the Mealies or the Red Wine Mountains. Ice-fishing for smelt and trout was usually productive, especially in April.

Break-up occurred in May, and with it came large flocks of migratory birds. Duck and geese were hunted from canoes camouflaged with small sail shields and bushes. Gardens of potatoes, lettuce, cabbage, and

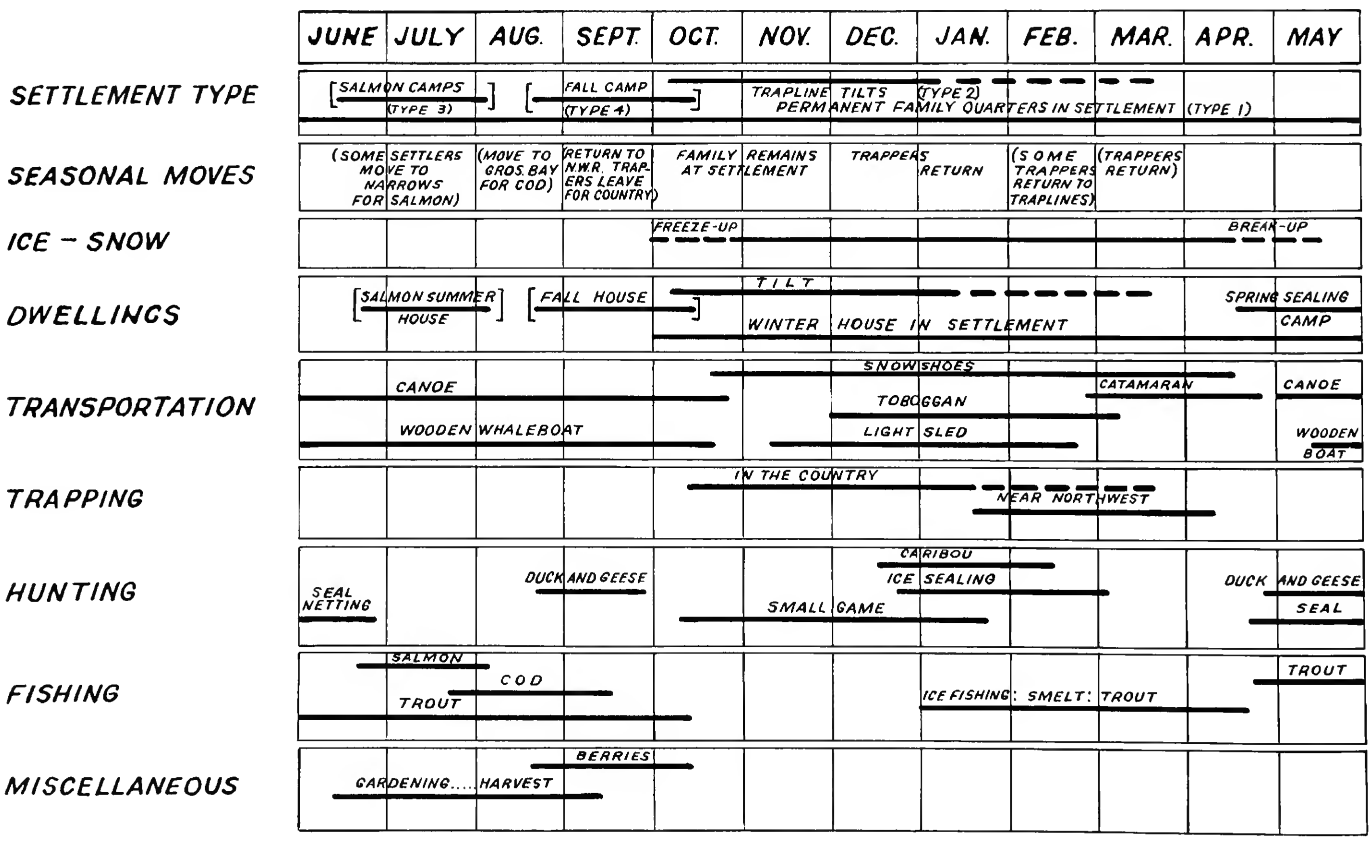


Figure 31.—Trapper annual cycle.

turnips were planted from house-primed seedlings as soon as night frosts ceased in June. July was a month of salmon net fishing. Salmon were sold to Hudson's Bay Company or pickled in brine. Some families moved to small cottages in the Narrows for the salmon run, and in August men occasionally went codfishing in Groswater Bay. Everyone returned to North West by September to hunt birds or to prepare for the fall trapping. Some families maintained three or four homes scattered about Lake Melville to which they moved to better exploit different resources.

In many respects this pattern (Figure 32) and the material culture on which it was based was adapted from the Indian example. The trapper's life would not have been possible without the sled, snowshoe, or canoe. Hunting and fishing techniques were similar. Finally, other items such as crooked knives and caribou skin boots were adopted. Tanner (1944:719) found the trapper's "purely predatory life" a paradox in their Scot-English ancestry and European culture, for despite their many Indian adaptations they maintained throughout their history a strong commitment to European cultural values and ideals.

A comparison between the trapper and the Sesacit pattern of settlement reveals two major areas of difference, and many areas of congruence. On the one hand the trapper's family did not accompany him to the trapline, as did the Indian's. This seems to be due to cultural ideals regarding the role of women and family in their respective societies, and the fact that the trapper always considered himself as a pioneer, surviving under rigorous conditions. Secondly, the trapper's more complete adaptation to the market economy enabled his family to live without him during the winter months. The other major difference is the trapper's possibility for summer fishing on the coast. This was an opportunity either undesirable, or more surely, unavailable to the Indian because of Eskimo occupation. These factors, among others, resulted in a very successful trapper adaptation both to the environment and its natural resources, and to the European market economy, maximizing with

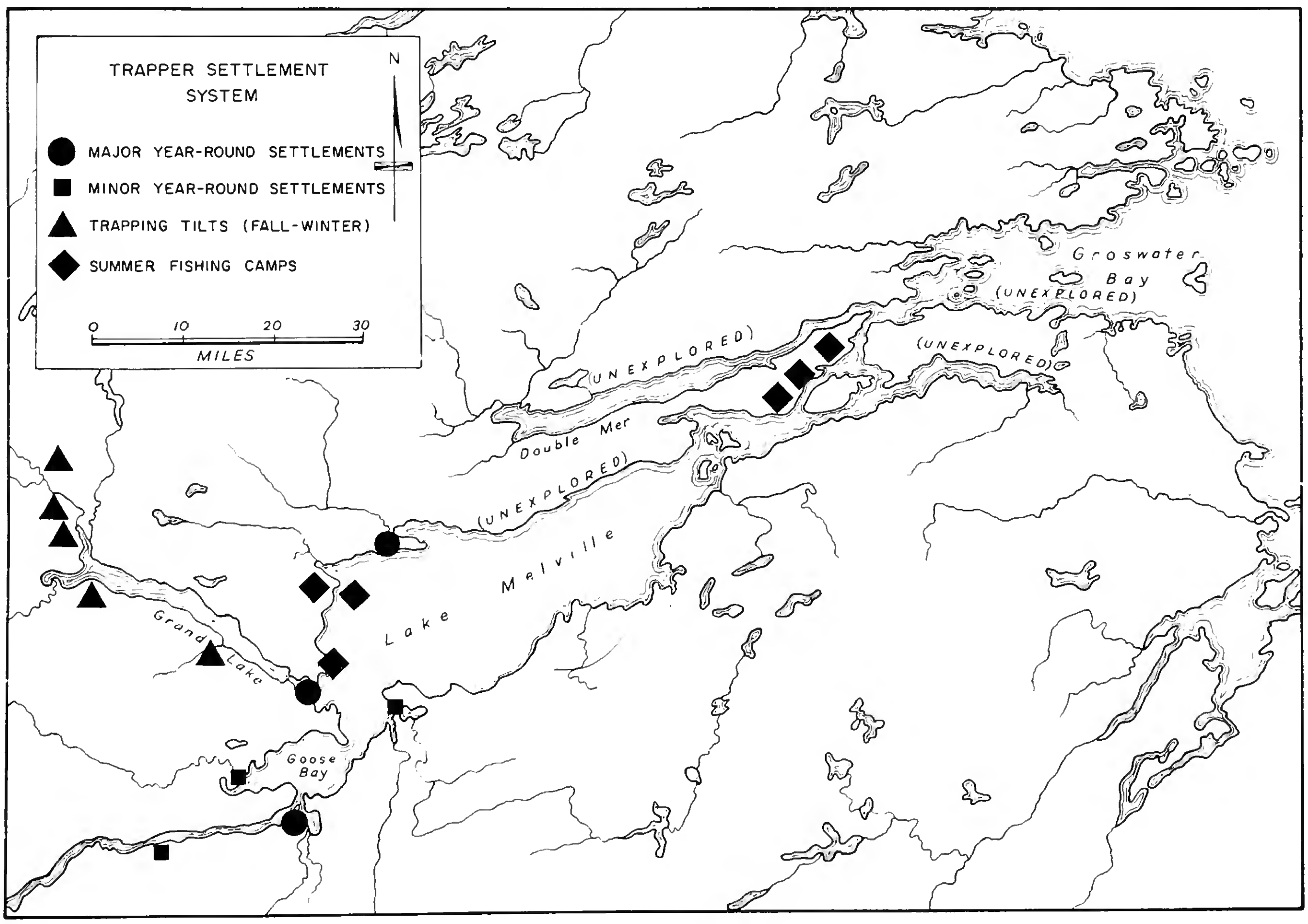


FIGURE 32.—Trapper settlement system.

thrift and diligence the best of both impinging worlds.

THE LIVEYERES

The prosperous life of the North West River trapper contrasts greatly with the liveyere fisherman of Groswater Bay. The term "liveyere" describes white fishermen (often with Eskimo blood) who live along the sea coast throughout the year. He is to be distinguished from "planter" or "stationer," terms restricted to white inshore fishermen who spend the summer only and return to southern Labrador or Newfoundland for the winter, and also from "floaters," "Labradormen," or "bankers" who are summer schooner fishermen and rarely set foot on shore.

Many of the present liveyeres originated as transient "planters" or "floaters" who decided at some point to remain behind and spend the winter on the coast, and eventually married.

The liveyere life was dependent on the salmon and cod fishery. Winter trapping on the coastal tundra or forest-tundra was poor. Local game resources were utilized much in the Eskimo fashion, and Eskimo adaptations such as dog sled, ulu, and mukluk boot, became important. Seal hunting occurred but never assumed important financial or gastric proportions. In terms of material culture, the liveyere inventory is simple. It has been described for the settlement of Blanc Sablon by Junek (1936) and Breton (1968). sistence-settlement system is much simplified from that of the interior trapper, the Indian, or the Eskimo.

ANNUAL CYCLE (Figure 33).—The liveyere sub- The cycle involves a dual settlement pattern (Figure 34) with summer residence in small cabins on the rocky islands and outer coast, and a winter settlement in a patch of forest, usually at the head of the nearest wooded bay. Frequently the axis of movement involved only a few miles. The summer camps consisted of a cramped cabin, a fish stage, and drying shed located at the water's edge; the winter house was more substantial, with a large stove, but equally cramped. Excellent descriptions of liveyere life are given by W. Stearns (1884) and Tanner (1944:727–746).

The annual cycle began with the salmon run in late June and July. By this time the liveyeres were located in the summer camps, building boats, mending nets and equipment, and "waiting for fish." Bird hunting was an occasional activity at this time of year. Cod fishing began in July and August. Two types of fishing were used: jigging among the schooled cod with a treble-mounted hook, and net trapping. Netting was a fairly recent introduction which required more money than was usually available. In late August and September the catch was dried in the open, stored for winter use, or sold.

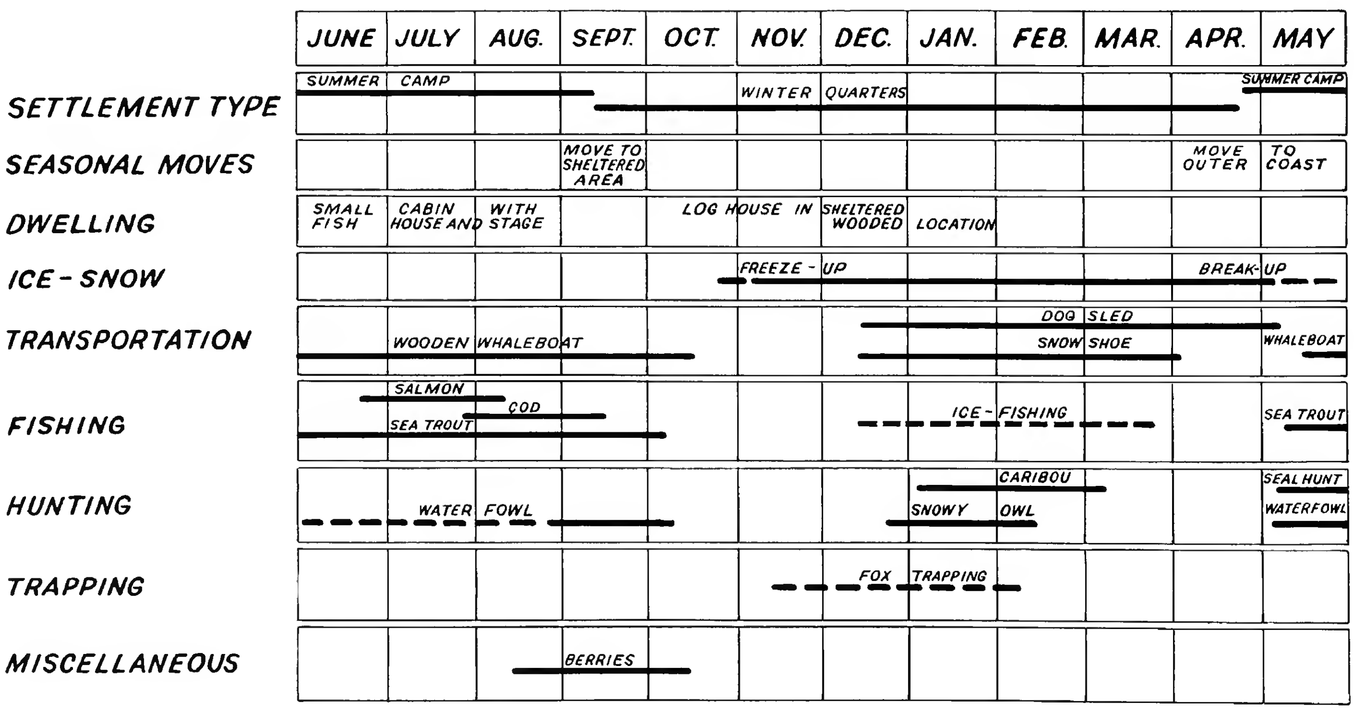


FIGURE 33.—Liveyere annual cycle.

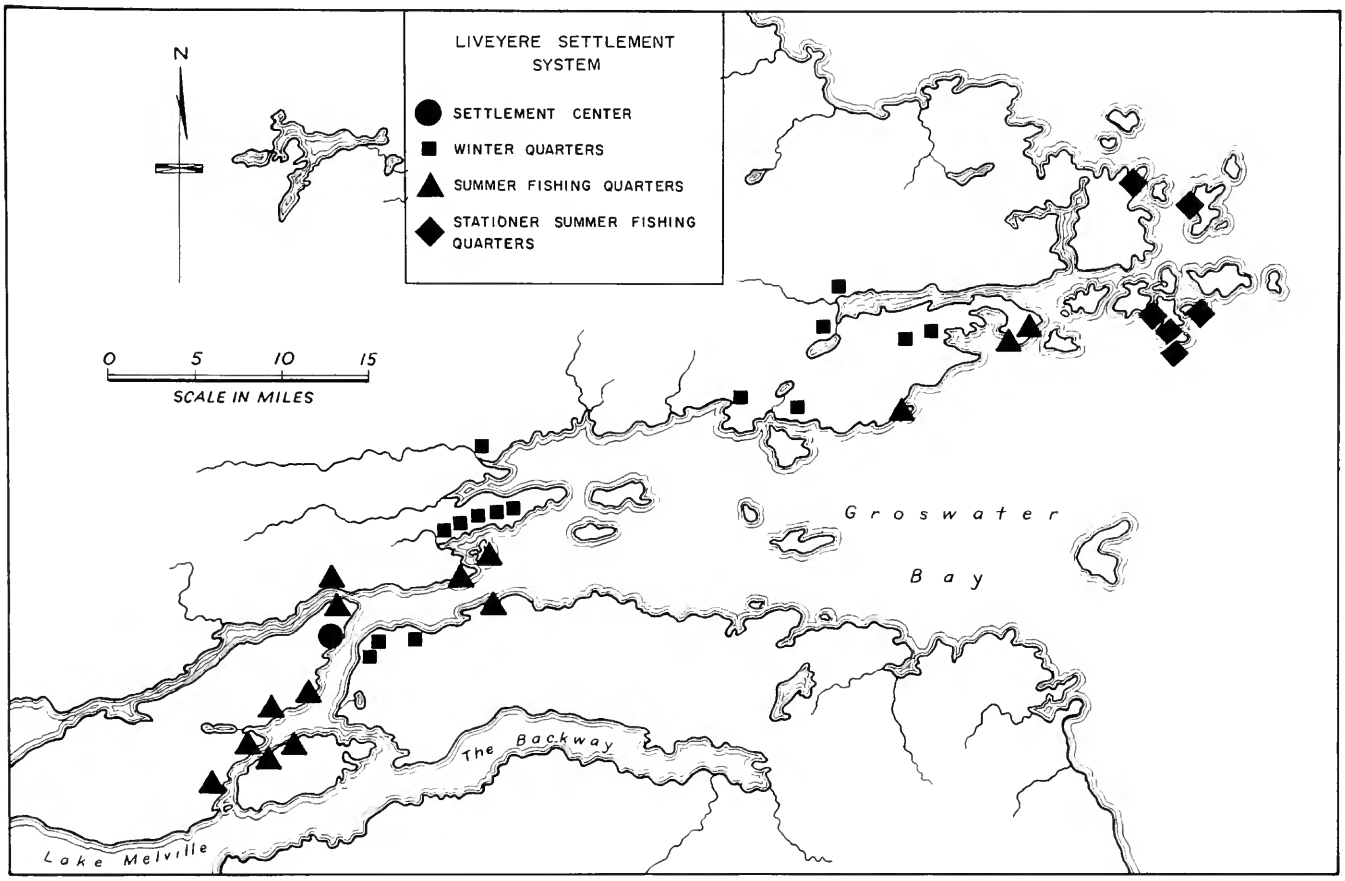


FIGURE 34.—Liveyere settlement system.

In October, the family moved into the deeper bays for the winter. Almost no activity took place in this long season, except a small amount of fox and snowy owl trapping, and fuel gathering. Social contact was limited to Sunday visits to nearby families or relatives. If caribou had been seen in the interior a brief hunt might be made, but the liveyere's fear of the interior forest restricted him almost solely to the coastal strip. Just before spring break-up a move was made back to the summer camp, from which a seal hunt might be made among the ice-floes while waiting for the fishing season to begin. This hunt utilized seal nets, rifles, and harpoons.

Poverty is a dominant feature of the liveyere economic history. Trapping is poor, and the only other source of income is from fishing. The latter is subject to fluctuations in the world market and the availability of fish. Occasionally, salmon or cod have a poor run, or even fail to appear at all. And when fish are plentiful, the limited techniques of preservation result in a glut on the market which reduces the price to a pittance. As "fish" (a term utilized locally for cod only, and does not include trout or salmon) must be salted and dried in the open, a period of stormy weather may ruin an entire summer's catch. As a result, poverty was widespread, and malnutrition and disease were common.

Today the creation of cooperatives subsidized by the government lends some hope that the restrictive family-based economic unit may be broadened and that economic gains may be made by the population. But even this may be a stop-gap measure only, since depletion of the fishery by offshore draggers is proceeding at a rapid rate, and demoralization of the liveyere population is widespread. In fact, it is a recognizable cultural trait. Tanner noted that eastern Hamilton Inlet is one of the worst areas for living on the dole. That was 1937; today the situation is no better, and depopulation of the coast is proceeding rapidly.

While the liveyere has accepted much from Eskimo culture, his reluctance to abandon the sedentary life of the European, and to accept a seminomadic pattern as practiced by the North West River trappers, or the Eskimo, has seriously hampered his developing a broadened resource base and achieving a more stable adaptation. It is a startling fact to discover while traveling among these people that few know the country or the water more than fifteen or twenty miles on either side of their home. By contrast, Eskimo, or Eskimo-white settlers have a totally different outlook on life and are succeeding in making the transition into the modern world which includes retention of many of the seminomadic patterns of their Eskimo ancestors.

In conclusion, the liveyere lives in a world circumscribed geographically by his limited use of the environment, his restricted movement, and economically by the availability and price of fish in the outside market—two variables he has no possibility of controlling. By circumstances of history, a limited cultural adaptation, a relatively inflexible system of values, and even more limited aspirations, he has become trapped in a dependent relationship to a failing fishery, subsisting more and more on the beneficence of the provincial and federal government, and unable to take the steps necessary to redirect his future. Worse, the economic prospects for the fishery, and coastal economy in general, are extremely poor. The major economic development of the future appears to be in pulp and paper, and in mining, both interior operations. The future of the liveyere, and to some extent, the Eskimo, represents a major challenge for government and economic planners.

Cultural Patterns of Hamilton Inlet

This chapter has analyzed in detail the ethnographic and historic data pertaining to several subsistence-settlement systems presently operating in the Hamilton Inlet region. Ethnographic data indicates four different subsistence-settlement types: Sesacit, Ivuktoke, trapper, and liveyere. These types show a wide range of adaptations, of which the two native patterns are of direct importance in demonstrating some of the features of cultural ecology of the inlet.

INTERIOR CULTURAL ADAPTATIONS

One of the most important observations is the difference in the structure and composition of boreal interior and arctic maritime ecologies (see pages 167–180). Boreal ecology is characterized by a food chain with few trophic levels in which many small animals are present in low density, but few large animals exist in high concentration. The instability of the food chain results from natural population oscillations and disasters such as forest fires and winter icing of feeding grounds which directly affect the populations of the most important winter resource for man—the caribou. During the summer caribou herds are dispersed and difficult to hunt, while fish resources are plentiful.

Interior cultural adaptations therefore necessitated a dual economic cycle. Transportation and settlement systems had to be adapted to nomadic life; social groups were small and flexible in composition; material culture was simple and transportable. The lack of concentrated economic resources, difficult winter transportation, and the unpredictability of the winter hunt made survival a source of constant anxiety. Alternate resources during the periods of hardship were widely scattered and required large expenditures of energy for meager nutritional returns.

In short, there was inherent instability in interior cultural adaptations of the sort exemplified by the Sesacit pattern. Furthermore, it is difficult to imagine a different aboriginal interior adaptation which would have circumvented the severe limitations of the environment.

CULTURAL ADAPTATIONS TO THE COAST

Coastal maritime ecology, however, permits greater cultural variability and stability. In the Ivuktoke pattern we see combined ecological diversity, numerous alternative resources, greater faunal population concentrations without severe fluctuations, and geographic conditions permitting relative ease of summer and winter transportation. The Eskimo adaptation has developed a sophisticated technology to utilize this potential. Reliance on a more diversified economic base, including seal, walrus, whale, fish, and caribou, greater opportunities for preservation, and increased mobility through umiak and dog sled travel resulted in larger group sizes and relative permanence of winter settlement.

In addition, ecological diversity within the maritime zone enabled alternate economic structures to be built into society at various levels. The availability of different resources in different microenvironments made subgroup specialization possible. During the winter, certain Eskimo groups utilized caribou and seal in the open water of the Narrows, at breathing holes, or at the sina in Groswater Bay. Likewise, bird hunting and egg collecting provided alternatives to the spring seal hunt; and in late summer fishing and caribou hunts were possible. Therefore, ecological conditions enabled economic diversification within the band. If one resource failed to appear alternate subsistence plans were readily available. Such shifts in settlement and subsistence probably occurred frequently and would have been facilitated by preservation and transportation systems.

ETHNOGRAPHIC MODELS

Ethnographic and ecological considerations reveal that there are only two, and possibly three, exploitation models suggested by the foregoing analysis.

Ethnographic-Historic Model

This model represents the present or early contact ethnographic situation in Hamilton Inlet. According to this scheme, Hamilton Inlet contains two distinctly different environmental and ecological zones. The boundary between these zones lies in eastern Lake Melville west of the Narrows. This ecological division is paralleled by a cultural distinction along the same boundary, with an Ivuktoke type subsistence-settlement system in the marine zone and a Sesacit type in western Lake Melville and the adjacent forests. While this model emphasizes the distinctness of the zones, it does not exclude mutual utilization of transitional zones between interior and coast. For instance, the Mealy Mountain caribou were hunted by both Indians and Eskimos. Likewise, both groups utilized the fishing and game resources of Double Mer. However, the boundary remains clearly drawn, and Sesacit and Ivuktoke groups tended to observe it. Contact across the boundary was minimal, and intergroup relations was punctuated by conflict.

Sesacit-Extension Model

An alternate model, based on a variant of the Sesacit pattern, might be suggested as a possibility. According to this scheme, winter adaptations would be similar to the winter Sesacit pattern with small groups hunting caribou in the highlands around Lake Melville. After break-up, however, some of these groups would move to the coast to hunt sea birds and seal, and fish. Thus a seasonal movement from coast to interior would dominate the annual cycle, and there would be greater polarity between the two phases than seen in the present Sesacit pattern.

Unfortunately, it is impossible to verify the ethnographic reality of this model. Still, its existence as a possible culture-ecological adaptation should not be ignored. First of all, this type of adaptation appears to have occurred in southern Labrador and Quebec (Speck 1926:297), and it is also a common pattern from the Maritime Provinces and northern New England. Finally, the gradual retreat of the Indians into western Lake Melville from the eastern portion of the lake has already been mentioned (see pages 48–49), and Cartwright regularly had dealings with Indians in the coastal regions around Cartwright Bay and to the south. It can be assumed from the few comments in early histories that former Indian activity was centered farther east than seen in the contact records of the 18th century.

Ivuktoke-Extension Model

This model represents the alternate possibility to the Sesacit-Extension model and is a pattern ethnographically known from northern Labrador and the Arctic. In this case, the coast is occupied by peoples with an Eskimo type of adaptation, who live on the coast during the winter and hunt and fish the otherwise unoccupied interior in the summer. There would seem, however, to be very little reason for a coastally adapted people to use this pattern in Hamilton Inlet since fish and game are plentiful on the coast and summer caribou hunting is poor during most of this season. In the area of northern Labrador this type of pattern was effective in exploiting the summer caribou migrations of the interior.

These models form the basis of interpretation of the archeological remains from Hamilton Inlet. They are not exhaustive in their coverage of the characteristic subsistence-settlement patterns. However, they provide a template against which to test archeological distributions, settlement types and function, and other data. As such, they should contribute to greater accuracy of interpretation and understanding of the way of life of the inlet's prehistoric inhabitants.

CULTURAL AND NATURAL AREAS

One further point might be mentioned regarding the foregoing comments on the environment and ethnography of Hamilton Inlet. The division of ecological and cultural zones into coastal and interior components is an historic and ethnographic reality as much as it is an ecological one. The congruence of these zones in the early historic period, however, should not imply a fixed correlation between culture and natural areas in the inlet, for cultural areas are delimited on the basis of successful adaptation and occupation of areas by man, not on the basis of their physical or biological signatures. In the case of Hamilton Inlet there is no inherent reason why the coastal tundra or the boreal interior environments must be separate culture areas. Indeed, it will be shown later that during most of its history these environments were in fact components of a single culture area. In recent times the maintenance of two separate culture areas and their correspondence with natural areas results only from the Eskimo occupation of the coast, and their adaptation to sea mammal hunting which enabled winter coastal subsistence. Without such an economy it is doubtful that two separate culture areas could be supported. In this case the inlet would probably revert to a single culture area with a subsistence-settlement type emphasizing winter caribou hunting on the interior and summer fishing on the coast.

Culture History

SITE AND ASSEMBLAGE DESCRIPTION

This chapter presents the substantive data from the surveys and excavations in the Hamilton Inlet area in 1968 and 1969 and also includes data on the sites and collections made by D. Charles and D. MacLeod in North West River. The body of the report presents data of a general nature, including the environment of a site locale, a brief description of the site itself, its vegetation, soils, structures, features, and a brief statement on the tool assemblage. Where possible, a statement on the culture-complex designation will be given also. A detailed analysis of the collections is in Appendix 3.

SITE DESIGNATION

The sites reported here have been classified according to the Borden System (Borden 1952); in addition, each site has been assigned a descriptive name by which it was known in the field, indicating the general site location. Since most of the sites are small and represent a small group size with limited site occupancy, each distinguishable archeological unit separable in space has been given a different site designation, even if it is only a few feet from another "find" location. If a site, however, has several areas of concentration and can be seen as a continuous occupation it is given only one designation. The aim of this procedure is to approximate archeological site designation with ethnographic settlement, and to allow the greatest possible differentiation in terms of cultural, activity, or chronological dimensions. Lumping of these minimal units is best accomplished after analysis.

TYPOLOGY

Type designations have been purposefully avoided in describing the collections. Instead, a purely descriptive system has been used. In general, the framework of Rouse (1960) has been followed. The basic unit is the site. Collections are first broken down into major industries, such as chipped stone, ground stone, microblade, bone, wood. "Series" has been used in a flexible way, to designate a category within an industry ("unifacial series" within chipped stone industry) or cross-cutting industries ("end scraper series" might include tools from ground or chipped stone, or bone industries). Within an industry the major tool category is the "class." These are designated usually on functional grounds, although formal criteria are used where function is not apparent or is unclear. The most common classes include point, knife, scraper, and utilized flake. Below the level of class, simple descriptive terms are used: e.g., side-notched point; stemmed end scraper, flake graver. When several artifacts share a great number of attributes they are described as a group, including significant metrical data; otherwise, tools are described individually. References to illustrations and to similar artifacts at other sites are given.

I believe that this procedure, involving a combination of parametric and nonparametric statistical and attribute level studies, lengthy as it is, will prove to be of greater usefulness than giving type names for specimens for which only small samples are available and where the range and variation in both chronological and spatial terms is completely unknown. Formal types tend to promote a static view of culture and obfuscate the study of process and change. As useful as types may be in the early stages of knowledge in a given area, the combined use of functional and formal (attribute-level) classifications are likely to be the more sensitive tools in archeological analysis. This also circumvents the sterile controversy over the reality or unreality of "types." Accordingly, the following major tool class terminology is used:

Point: Tool class restricted to use as projectile tips. Artifacts placed in this class generally have basal modification for end hafting, are symmetrical, and have sharp tips. The class may include some tools which were used as knives or for multiple functions.

Knife: Tool class for which cutting function is paramount. The artifacts of this class generally have blunt or unfinished tips, are often asymmetric in blade orientation, and have their lateral sides sharpened. Usually the lateral edges are not sinuous, as is often the case with points, but are carefully retouched. Bases are frequently unfinished and thick, and lack notches or stems.

Biface: Tool class which includes artifacts with bifacial chipping that cannot on other grounds be grouped functionally as knives or points or blanks. Tools in the biface category may actually have served in any of these functions, but the specimen generally does not indicate which. All nondiagnostic bifacial fragments are included in this class.

Blank: Tool class of bifacial or unifacial specimens in uncompleted form, generally intended for either points or knives. Recognized by sinuous edges, lack of retouch, large flake scars, and thick body.

Scraper: Tool class composed of formal scraping function artifacts not including casual tools like flake scrapers.

Flake Tool: Tool class of specimens made on irregular flakes without a standard form being applied to the finished product. These tools were often byproducts of other manufacturing processes. They were used casually and discarded.

Blade: Tool class restricted to specimens with parallel sides and medial ridges which have been detached from cores specially designed for the production of such flakes. The term "blade" is restricted to larger size pieces (over 2⅜ inches), and the term "microblade" is used for smaller ones. The presence of a core or a large number of blades is the justification for employing this term. Individual specimens are not so described since "pseudoblades" occur in small numbers in any assemblage. Standardized flakes (such as the triangular flakes taken from pyramidal cores in the Charles complex) are not termed blades even though they are produced from cores with a repetitive process.

North West River

GEOGRAPHY

All of the prehistoric sites which were located within the confines of Lake Melville came from the vicinity of the North West River settlement. This community today numbers about 800 individuals of which nearly half are white settlers or personnel of the Hudson's Bay Company, the Grenfell Mission, or the British Newfoundland Exploration Company. These Euro-Canadians live on the north side of the river. With the exception of a few Eskimo families who also live here, the remainder of the population is Indian and lives in a government-erected community on the south side of the river.

The local geography of the North West River area requires some description since the locale has been important in cultural activity in western Lake Melville for the past 3500 years (see pages 30–33). The main attraction of the area is the river itself. Its importance in human geography as a gateway to the interior is enhanced by the natural resources of the area. Today, after about two centuries of relatively permanent occupation, the major wildlife species are trout, salmon, smelt, seal, ducks, and geese. Larger mammals, if they once occupied the environs, have now retreated farther into the interior. Fishing and bird hunting are the prominent activities.

The topography of the locale is dominated by two recessional moraines, one damming the base of Grand Lake, and the larger North West River moraine damming not only the base of Little Lake, but at one time the entire Naskapi drainage. If uplift continues, the shallow margins of Little Lake will emerge above water, and the lake will become an extended river channel joining Grand Lake to Lake Melville.

The North West River moraine is part of a large end moraine system stretching from the foothills six miles north of the settlement to Sandy Point, at the mouth of Goose Bay, 15 miles to the southeast. The North West River segment of the moraine, and the smaller one at the Rapids, appear to have been formed by a valley glacier advance or standstill from the Naskapi Valley ice flow. A similar flow from the Churchill Valley seems to have resulted in the formation of a moraine which once blocked the entrance to Goose Bay. Its remnant is the sill noted by Nutt (1951:7).

South of North West River the moraine top has been terraced by marine water action at slightly over 100 feet, with two small sand knolls rising to 150 feet further south. Immediately north, the highest land is a narrow spur, terraced at 80 feet, which gradually rises as it extends north to an elevation of 200 feet at the radio tower one and a half miles from the river. Beyond this, there is a dip to the 70-foot saddle, after which the moraine rises to 250 feet and joins the hills northeast of Grand Lake.

Surrounding the flanks of the moraine, air photo study reveals raised beaches and terraces which characterize the microtopography of the locale. They are seen both stereoscopically and as vegetation patterns. Visual observations from the surface of Little Lake reveal as many as 14 separate terraces or beaches on the cleared slope of the fire break a mile north of the river. Terraces, however, are most clearly defined in the settlement on the north bank of the river. Here they have steep faces and large flat throws suitable for habitation areas. Four or five different terrace series are present; none correlate completely with the others, due to varying times and processes of formation. Occasionally, terraces are separated by raised beach series. These terraces and beaches form the basis of the chronology of the North West River cultural sequence. For a complete examination of terrace chronology see pages 24–34.

SOIL PROFILE

The soil profile (Figure 35) for all undisturbed sites at North West River tends to be similar and is typical of most well-drained boreal podsols. The surface cover consists of black and white spruce, a low brush component of Labrador tea and various berry bushes, and a ground carpet of mosses, often *Cladonia*. The A0 horizon is a humic layer of rotting mosses one half inch thick; beneath this is a duff layer of thickly intertwined roots and decaying plant material (A1). Most of the spruce and brush roots are contained in this zone, which is a natural moisture trap; a few spruce roots extend into the sand below, but in general they spread radially in the duff horizon. The duff zone is usualy 2–4 inches thick and is difficult to penetrate without an axe. Due to the process of its formation, the duff level is usually sterile and represents about 50–100 years of vegetation growth. Beneath the duff lies a 1–2 inch A2 zone of fine white-gray leached sands. The upper A2 zone contains small particles of organic matter in the final stages of decay or in the process of being mechanically removed by percolation. Within the A2 zone are found most of the prehistoric remains. Below this, the yellow sands of the B zone begin, in which A2 iron has accumulated. An inch or two beneath the junction of the A2 and B zones the yellow sand becomes more gravelly, and the unaltered C zone begins. Rarely is cultural material found in the B or C zone.

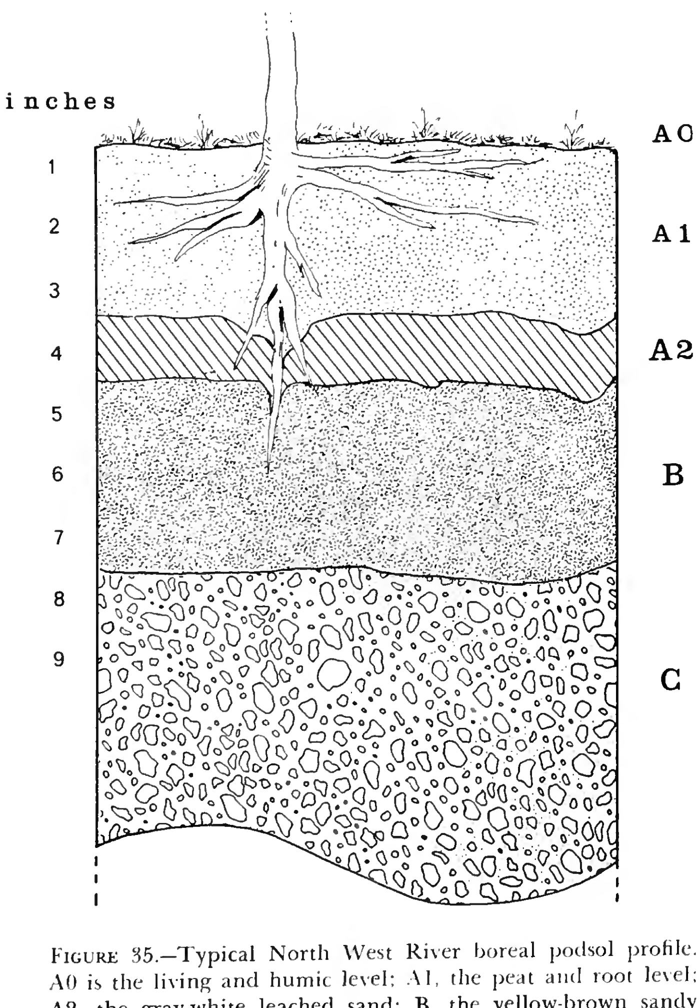


FIGURE 35.—Typical North West River boreal podsol profile. A0 is the living and humic level; A1, the peat and root level; A2, the gray-white leached sand; B, the yellow-brown sandy unleached soil; and C, the unaltered sandy gravel level.

All of the soils in North West River locale have been exposed to beach formation activities as the land rose out of the water. The extent of the leached zone therefore depends somewhat on the time elapsed since emergence, sites higher than 10–20 feet above high water having developed a leached layer.

Forest fires occur frequently in this sector of the boreal forest, at which time both the surface vegetation and the A1 zone are consumed. A carbonized layer is then deposited on the leached sand of the A2 zone. Complete regrowth may take up to one hundred years, after which it may burn again, and so on. The combined effects of forest fire and tree throw (which introduces charcoal into the A2, B, and C zones) make it very difficult to distinguish natural from cultural charcoal. Dating samples must be chosen with care and restricted to hearth associations or burnt bone. The latter, unfortunately, is rarely preserved under normal conditions beyond 1000 years. Unburned organic materials rarely survive a century. Consequently, most prehistoric remains from North West River are lithic specimens.

The processes of humic decay and burning do not result in soil formation or accumulation. Rather, the organic ingredients of soil decay and are washed out of the sandy soil. A discarded artifact placed on the ground surface swiftly becomes incorporated within the moss and duff layer. As the bottom layer of duff rots out, new growth at the surface continues, and the cycle carries the tool through the duff from top to bottom, finally depositing it on the surface of the leached A2 horizon within 100–150 years, or swifter in the case of a fire.

This process creates problems of interpretation. A multiple component site is not likely to be recognized by stratigraphic principles since in time a second component will migrate through the duff level and come to rest with an earlier component in the A2 zone. Therefore, auxiliary means of recognizing components must be used, such as horizontal displacement, raw materials, typology, and technology. Fortunately, most sites at North West River are small, and uplift has resulted in areas of settlement being shifted laterally or downwards as geography and terrace formation changed.

With the exception of sites found in bulldozed heaps, roadbeds, modern trash piles, and other anomalous locations, the above view of soil stratigraphy can be taken as a general characteristic of undisturbed regions of the forested areas in the vicinity of Lake Melville. When sites are found in paths or on cleared land where the soil has not been greatly disturbed these same conditions apply, the basic difference being the absence of the duff layer in the case of paths or its replacement by a turf layer where grass has been planted.

THE SITES

FjCa-1: Radio Shack Site

This site (Figure 36) is located on the Brinex property on a small terrace 60 feet above sea level, overlooking Little Lake and North West River. Its westerly exposure and location below the brow of the moraine afford protection from the worst storms,

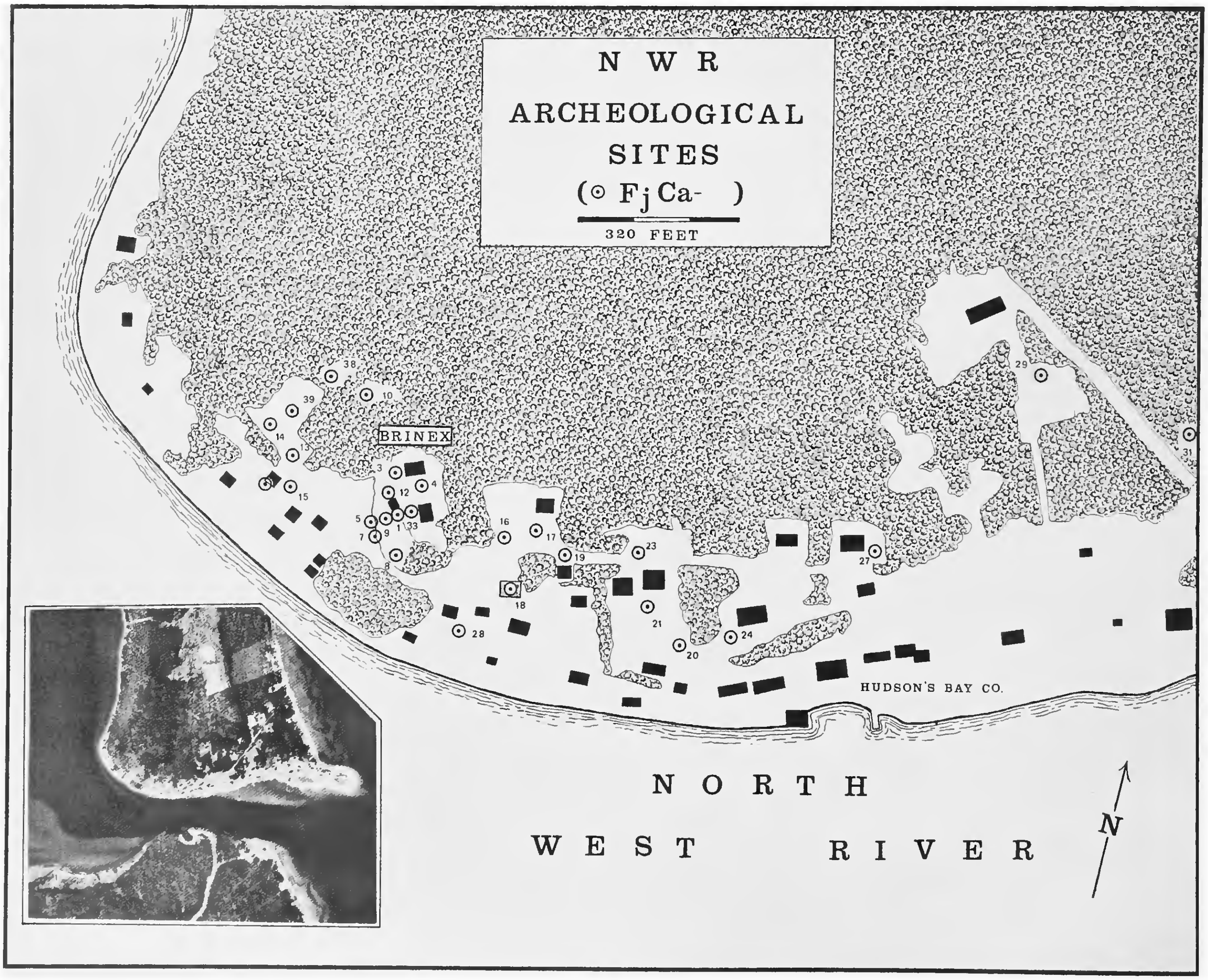


Figure 36.—Archeological sites at North West River. Black squares are contemporary houses.

which come from the north and east. The site is now completely destroyed, having been found ten years ago by Donald Charles when BRINEX acquired and began clearing the land. During the period when the radio shack was being built, Charles, then director of the BRINEX base camp, noticed and collected the material as it appeared. Subsequently a small building was constructed south of the radio shack and more of the site was unearthed, but none of this material is available today. Occasionally a specimen still erodes from the duff, but there seems to be no major deposit left.

The collection from the site includes 23 artifacts, most of them chert or felsite biface fragments (Plate 37). One specimen may be a fragment of a small corner-notched point which might be intrusive from the Bunkhouse site nearby. Twenty biface fragments were found, of which nine were bases. Squared, slightly waisted, and tapered base forms occur. In general, the bifaces are consistently lanceolate and squarebased. All are highly fragmented, suggesting purposeful thermal fracture, perhaps in a water-doused fire. A small scraper fragment and a utilized flake were also found. The functionally specialized nature of the collection is evident, but it is impossible to state whether the function was biface manufacturing or use, or ritual. The site may represent a functional distinct component of the nearby Piloski Garden site (FjCa–9).

Designation: The site is a component of the Charles complex and includes the following sites: Piloski Garden (FjCa–9), Road Site 1 (FjCa–13), Louis Montague site (FjCa–39), and North West Brook 2 (GcBk–7).

FjCa-3: Cookery Site

This site (Plate 4) is directly in front of the BRINEX cookery on the 68-foot terrace overlooking Little Lake. Like FjCa–1 it has a protected western exposure; 108 square feet of the site were excavated, but previous disturbance was indicated by the presence of unrotted wood and iron nails in the lower portion of the thin deposit. Subsequently it was discovered that Mr. Charles had excavated the site originally, and his 14 specimens increased the artifact sample to 26.

The collection (Plate 39) consisted predominantly of white quartzite tools with a few specimens of quartz and purple chert or felsite. Tools included a small leaf-shaped point, three bifacial knives, eight biface fragments, five biface preforms, one scraper, and seven flake tools.

Designation: The site bears certain relationships to the North West River Phase of the Shield Archaic with its asymmetric and leaf-shaped bifaces, and quartzite tools; but the presence of quartz and chert tools would be unusual in Shield Archaic. In addition, a point (FjCa–4:1) found at the edge of this site by D. Charles probably belongs to this assemblage, the Little Lake component (see page 114).

FjCa-4: Dining Hall Site

Several specimens were found in the vicinity of the cookery building at 68-feet elevation (Plate 4). These are surface finds. No excavations were conducted since no in situ deposit could be located. A site seems to have existed under the cookery, and many of the artifacts and debris scattered around the building may belong to that site.

The collection (Plate 38) includes red quartzite, white quartzite, and dolomitic rock: a small side-notched point, a large stemmed point, a roughly finished bifacial knife, a large hand knife, one scraper, and three cores.

Designation: Unassigned. This sample may represent more than one site. The only diagnostic specimen is the large stemmed biface (Plate 38*a*) which is similar to the Mansion Inn blade type from eastern Massachusetts (Dincauze, pers. comm. and 1968:16–17). On the basis of this parallel the specimen is placed tentatively in the Little Lake component, for which a complex is yet to be described in Labrador.

FjCa-5: Brinex Path

A small concentration of quartzite debitage was found above the road a few feet north of the BRINEX steps. No artifacts were found.

FjCa-7: Garbage Site

Another chipping concentration lay just south of the BRINEX steps and was given a different designation because of its unique raw material—a fine-grained weathered sandstone. The only artifact found was a small side scraper fragment of tuffaceous felsite.

FjCa-8: Roadbend Site

This site is located on a 38-foot terrace above the river, 75 feet south of FjCa–7, on the northeast edge of the road. Collectors and road construction destroyed the site several years ago. A remnant undisturbed deposit was found at the edge of the road. The artifacts recovered included a broad biface tip and a utilized flake. The biface (Plate 56*b*) is similar in manufacture and form to a specimen given to D.

MacLeod by a local resident of North West River in 1967 (FjCa–32:2)

Designation: Unassigned.

FjCa-9: Piloski Garden Site

This site is located on a narrow terrace 51 feet above Little Lake on the B–1 terrace, a few feet west of FjCa–1. The site has a protected western exposure. D. Charles discovered the site in the summer of 1956 when he erected a tent camp on the location. Mr. Charles found 11 scrapers in a "cache" within a few inches of one another. Jorgen Meldgaard, at that time conducting a survey of Labrador for Viking sites, met Mr. Charles shortly after the find and thought it might represent a burial, although no bones were found.

The collection (Plates 40, 41) from the site included 35 artifacts of pink-tan felsite and chert. They include a biface tip, large disk and stemmed end and side scrapers, numerous utilized flakes, and 32 "linear flakes" struck from prepared pyramidal core of banded lava (Figure 37; Plate 41*d*). The collection is unique for its lack of bifaces, its large number of scrapers, and its linear flake tools. The site seems to functionally complement the Radio Shack site (FjCa–1) which has a high frequency of hunting and cutting tools and almost no scrapers. It is possible that the two sites represent functional or activity components of a single occupation. Temporal distinction between the components, however, might be suggested by site elevation or more cogently by the distribution of raw materials: FjCa–1 has only purple cherts and felsites; FjCa–9 has mostly tan or pink cherts and felsites.

Designation: The Piloski Garden site is a component of the Charles complex, with FjCa–1, 13, 39, and GcBk–7 (North West Brook 2).

FjCa–10: Sutton Site

The Sutton site is located in the fire break about 150 feet north of the BRINEX field director's cabin, 80 feet above Little Lake. Test excavations in this area produced a few chips. No larger cultural deposit could be found.

FjCa–12: Test Pit Site

A test pit dug several yards north of the BRINEX radio shack on the B–2 terrace 60 feet above Little Lake resulted in the discovery of a large bifacial projectile point of pink chert (Plate 56g). The point seems to be a stray, as no extensive cultural deposit could be found.

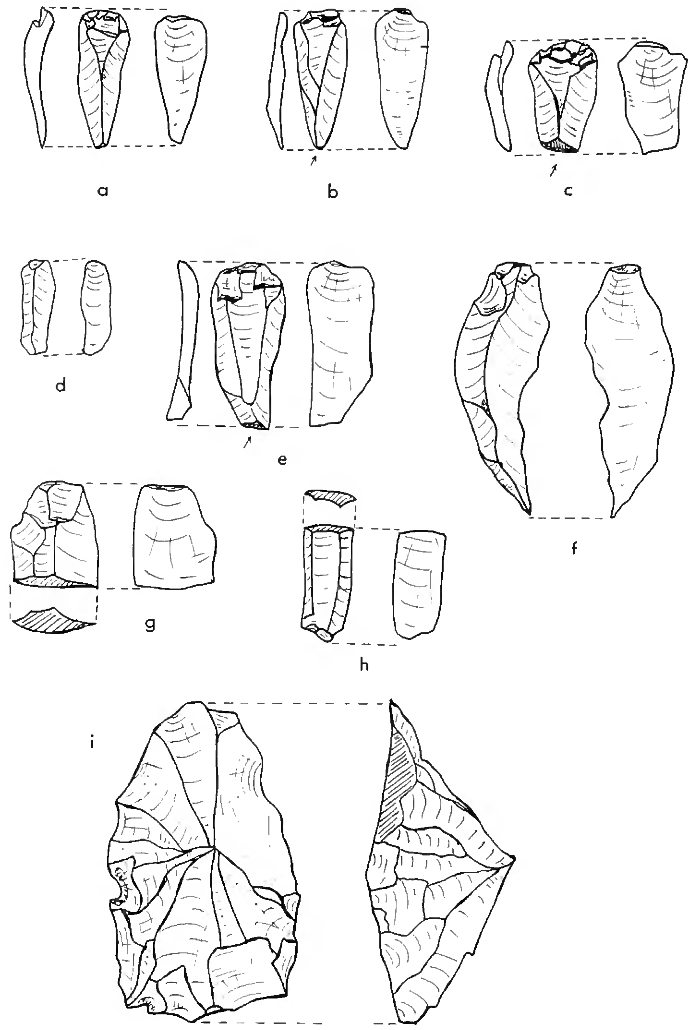


FIGURE 37.—Triangular flakes and core from the Charles complex. Arrows indicate areas of utilization and retouch at the distal ends of some of the flakes (*a–h* from FjCa–9; *i* from FjCa–13). Scale is two-thirds actual size.

Designation: This point is related to the Henry Blake complex. Compare with Henry Blake 1 (FjCa–20; Plate 46*a*) and Ticoralak surface collection (GbBn–6; Plate 66*a*).

FjCa–13: Road Site 1

The remnants of this site (Plate 5) were found scattered about a section of dirt road 70 feet east of Russell Montague's house, overlooking Little Lake. Its elevation is 43 feet. From here the land drops in a gentle series of beach ridges. The site was first excavated in 1968 when a lens of humic soil below the road gravel was found to contain cultural material. It was soon discovered to be a mixed site containing marbles, rubber, and undecayed wood.

In 1969 an in situ deposit was located several yards south of the former find. This portion of the site formerly extended into the road, from which it was later moved north during road construction.

The collection (Plate 42) includes 37 artifacts, mostly utilized flakes. A biface fragment, a scraper, and a pyramidal core were the only diagnostic tools. A great amount of chipping had been done at the site, and it was unusual to find so few tools.

Designation: The site is closely related to the Piloski Garden site, the Radio Shack site, and the Louis Montague site (FjCa–9, 1, 39). It is grouped in the Charles complex.

FjCa–14: Road Site 2

Road site 2 lies on the east side of the road about one hundred yards north of FjCa–13. The remains of the site when discovered consisted of a heap of earth pushed off the road bed by construction machinery. Like FjCa–13, this site lies 43 feet above Little Lake on the gently rising beaches. A salvage operation rescued the artifacts from the site.

The collection (Plate 44*a-k*) included thin square-based points with tiny side notches, end scrapers made on thick flakes of chert with triangular cross-sections, flake scrapers, and utilized flakes. A variety of opaque cherts, Ramah chert, red quartzite, vein quartz, and white quartzite were used.

Designation: This site is unique in the Hamilton Inlet sites and is placed in its own category, the Road component. Similar points are common in the St. Lawrence River and Gulf regions, and the Maritimes.

FjCa–15: Herbert Michelin 1

A small site was located in the garden above Herbert Michelin's house, on the sloping beach ridges 37 feet above Little Lake. Most of the artifacts are of white quartzite and were collected by H. Michelin while cultivating cabbage. Subsequent surface collection recovered a few more specimens, but test excavations showed the site to be exhausted. There appear to be two components on the site: a quartzite one containing the artifacts in the upper part of the garden and a second component in the lower area which contained a concentration of lavender chert flakes.

The collection of white quartzite tools (Plate 44*l-q*) contained a small stemmed point, one asymmetric knife, two bifaces, and utilized flakes.

Designation: The quartzite component of the site is related by its technology, lithic material, and typology to the North West River Phase, including FjCa–21, 24, 29, and several Groswater Bay sites.

FjCa–16: Michelin Trailer Site

This site was found 32 feet above the river on the SM–3 terrace (see pages 107–108). The few flakes in the collection came from the edge of the road bank. Only nine flakes were recovered.

FjCa–17: Selby Michelin Site

On the SM–4 terrace a few feet south of Job Michelin's house 44 feet above the river, Herbert Michelin once had occasion to bury a dog and discovered a site. The Hamilton Inlet Project excavated the site, excepting the burial, and recovered a few specimens (Plate 43*d-h*). The lithic material used was gray banded lava. The two biface blanks and flake tools were not diagnostic.

Designation: Unassigned.

FjCa–18: Selby Michelin Basement Site

The remains of this site, which once existed in Selby's Michelin's basement about 25 feet above the river and 50 feet south of FjCa–16, were found in a trash pile where the material had been dumped after Michelin had excavated his cellar. These remains undoubtedly represent only a small portion of the original site. The three artifacts were not diagnostic. The raw material was an eclectic combination of cherts, Ramah chert, quartz, and quartzites.

Designation: Unassigned.

FjCa–19: David Michelin Site

On the north side of the river, north of the road opposite David Michelin's house and 30 feet above the river, a bulldozed pile contained the remains of a site formerly excavated by D. Charles. The collection (Plate 45) contained straight-stemmed and tapered-stemmed points, large biface blades, biface fragments, and flake scrapers. A specimen collected by D. MacLeod in 1967 (cataloged as FjCa–32:2; Plate 56*c*) probably belongs with this collection.

Designation: This collection defines the David Michelin complex.

FjCa–20: Henry Blake 1

An undisturbed site was discovered at the brow of the HB–2 terrace 23 feet above the river on Henry Blake's property. Excavation revealed the site to be a small encampment 9 feet in diameter with several tools and a scattering of industrial debris (Plate 7). In the central part of the site was a circular cobble hearth which contained a sample of burned small mammal bone, which was used for radiocarbon dat-

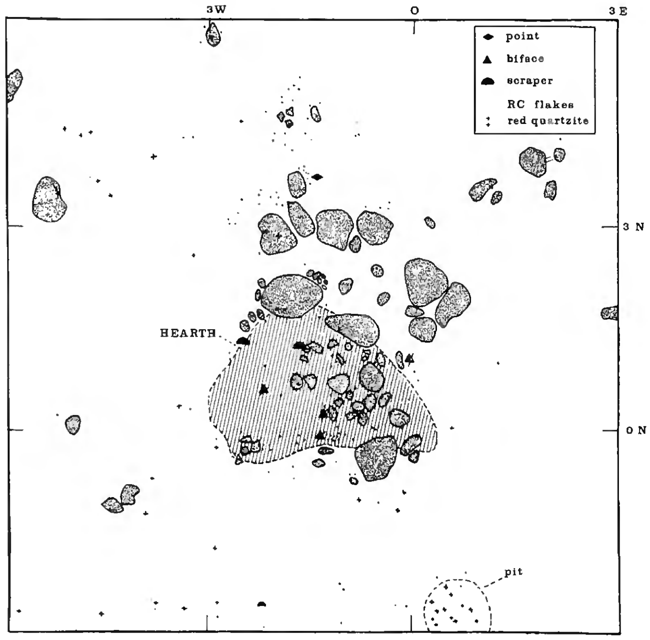


FIGURE 38.—Henry Blake 1 (FjCa-20).

ing. Most of the cultural material was found close to the surface (2–4 inches deep) beneath the grassy turf of H. Blake's lawn. The site appears to have been relatively undisturbed by land clearing. The artifacts were found clustered around the hearth (Figure 38). The importance of this site, so typical of the small, brief occupations commonly found in this area, is diminished only by its small artifact sample.

The collection (Plate 46*a-d*) contained a large corner-notched biface, several biface fragments, flake scrapers, side scrapers, and a combination scraper-knife tool—all of Ramah chert. This is the only site in North West River yet found to use this coastal material to near exclusion of other materials.

Designation: Point Revenge complex. This is the only site found on the interior for this complex, dated here at 1055 ± 150 A.D. Other sites include Big Island 1 (GbBm-1) and Ticoralak surface collection (GbBn-6).

FjCa-21: Henry Blake 2

Approximately 75 feet north of FjCa-20 there exists the remnants of a site eroding out of the upper part of Henry Blake's path, 28 feet above North West River. This site has only been partially tested and contains the remains of a stone hearth ring. No charcoal was recovered. A large birch tree is now growing in the center of the site.

Designation: The two artifacts (leaf-shaped bifaces with convex bases) and the lithic raw material and technology suggest affiliation with the Sid Blake site, and the North West River Phase. Related sites include FjCa-15, 24, 29, 37.

FjCa-22: Surface Collection South of Henry Blake's House

A collection from Henry Blake's path includes two side scrapers made on small flakes of Ramah chert and numerous flakes of the same material and white quartzite. The scrapers probably belong with the Henry Blake 1 site, while the quartzite belongs with the Henry Blake 2 site, having eroded down the path.

FjCa-23: Surface Collection North of Henry Blake's House

Two specimens—an oval quartz blank and a utilized flake of lavender chert—were found beside the road north of Henry Blake's house. No designation can be made.

FjCa-24: Sid Blake Site

This large and important site rests on the SB-2 terrace 25 feet above the river on the southeastern corner of Sid Blake's lawn. Test pits revealed the full extent of the site to be over 3600 square feet, qualifying it as by far the largest prehistoric site yet known for the North West River area. The site extends from the woodshed south to the terrace front and west to the edge of Henry Blake's yard. Excavations in 1968 opened up a small area on the north side of the site (Plate 9) and the next year a larger area was exposed (Plate 8). A third area of concentrated cultural remains was found but not tested in the patch of spruce woods 25 feet west of the 1968 excavation.

The stratigraphy was similar to that of other North West River sites. Artifacts and chips were found concentrated in 2–3 inches of leached sandy soil immediately beneath the grassy turf of Sid Blake's lawn. Rarely were cultural materials found below the junction of the white sandy soil and the brown gravelly soil. Numerous pits and features were recorded. Some of these appear to have been hearths; others were shallow pits (Figure 39). In most cases it was impossible to distinguish aboriginal pits from tree-throws. Charcoal was prevalent throughout the site but none could be isolated with assurance that it had not been contaminated by forest fire or land clearing. This site appears to be single component with at least three major loci of activity.

The collection (Plates 47–49) includes a variety of leaf-shaped and lanceolate bifaces with convex bases and often with skewed or asymmetric blades; asymmetric knives, small, stemmed points, flake tools, core scrapers, hammerstones, and other materials were found. The entire assemblage, which includes

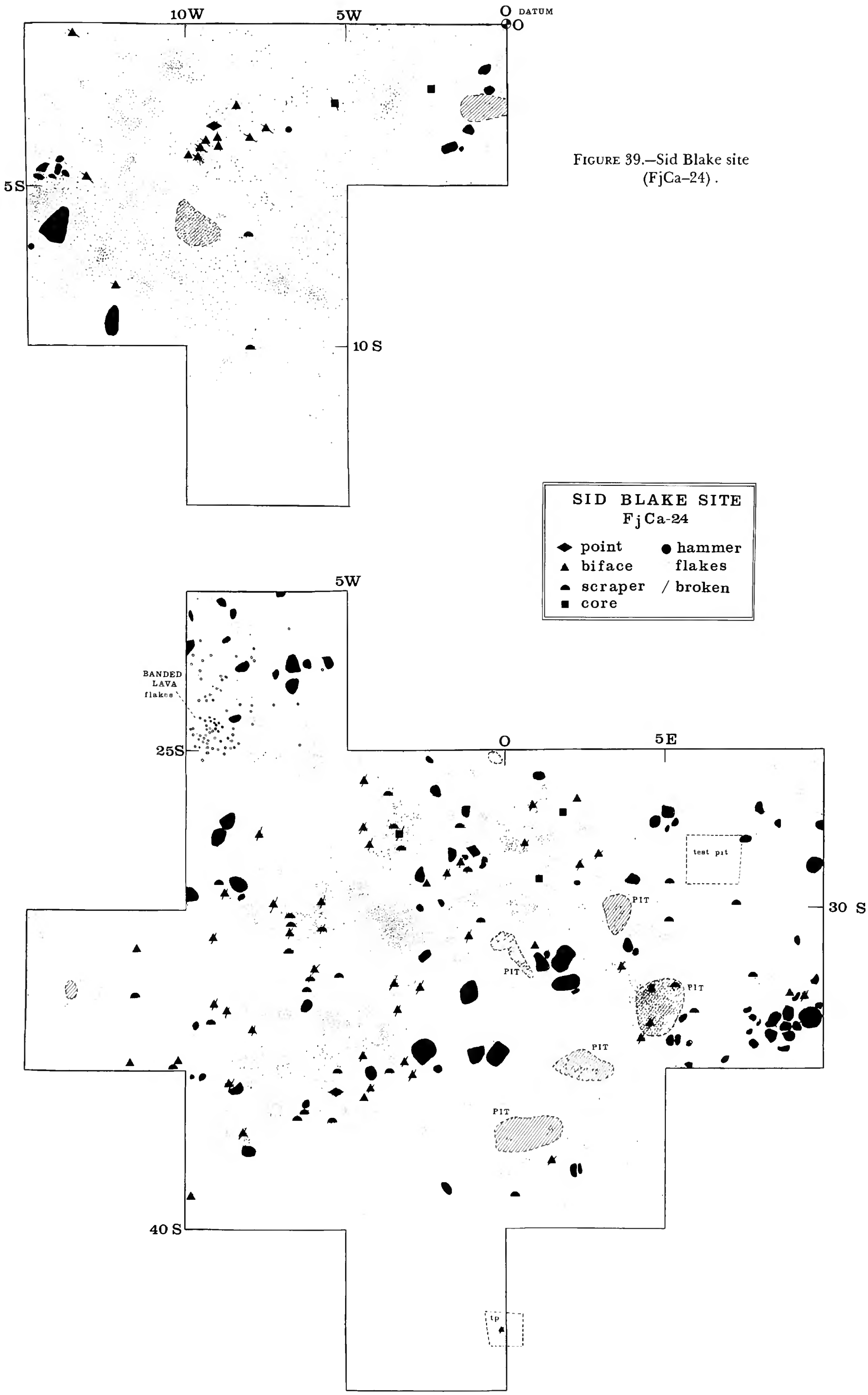


FIGURE 39.—Sid Blake site (FjCa–24).

over 100,000 flakes and 138 artifacts, is made with a consistent technology from locally available common white-brown quartzite. No bone was preserved, and no formal class of scrapers was found.

Designation: The Sid Blake site is the major component defining the North West River Phase of the Shield Archaic Tradition. Related sites are FjCa–15, 29, 37, GbBn–8, and GcBi–1.

FjCa–25, 26

These sites, cataloged in 1968, were later found to be extensions of FjCa–24. They are located between the two excavation areas of FjCa–24, and on the SB–2 terrace front, respectively.

FjCa–27: Dance Hall Site

Surface collections around the Dance Hall produced a single point, which very likely was carried to the spot from elsewhere in North West River. No flakes were found nearby. The corner-notched point of white quartzite does not have direct relationships to any of the known North West River sites. Its closest parallel would seem to be in the Henry Blake 1 site.

FjCa–28: Stuart Michelin Site

Evidence of a site on the 12-foot terrace (SM–1) above the river was noted in the vicinity of Stuart Michelin's house and shed. Test pits produced several flakes and two artifacts. The area may contain an important late prehistoric site, but the owner would not permit further excavation. The tools were scrapers of Ramah chert. No indication of a cultural designation was obtained.

FjCa–29: Graveyard Site

To date, the Graveyard site is one of two of the most easterly prehistoric sites found in North West River. It lies along the northern edge of the old United Church graveyard and originally came to light during excavations for graves. The part of the site outside the graveyard has been dug by local youths and the specimens have been lost. The site was re-excavated in 1968 and several artifacts were recovered. It is located east of the large terrace series on the re-deposited moraine sands 29 feet above the river.

The salvaged collection (Plate 43*a-c*) included only four artifacts: a small contracting stem point, an asymmetric knife, a biface tip, and a leaf-shaped biface blank.

Designation: The Graveyard site is a small component of the North West River Phase, along with FjCa–15, 24, 37, GbBn–8, and GcBi–1.

FjCa–30: Tower Road Site

A number of flakes were found along the edge of the road leading to the abandoned USAF radio tower north of North West River. The site, located at about 150 feet elevation, is several hundred feet south of a large gravel pit and has been destroyed by road construction. Its former location could not be located. The finds included several flakes of red quartzite and slate-like rock.

FjCa–31: Ronald Watts Site

Surface collections at the lower (south) end of Ronald Watts' house indicated the presence of a site here at 20 feet above sea level. No deposit could be located. The site is the most eastern of the prehistoric sites found in the settlement.

FjCa–33: Brinex Bunkhouse Site

Mr. Charles discovered and excavated this site, which is located on a southern spur of the B–3 terrace 68 feet above the river. The site overlooks Little Lake and the river, and part of Lake Melville. A few feet away and on the next terrace below is the Radio Shack site, while the Cookery site and Dining Hall area sites are only 150 feet to the north on the same terrace (Plate 4). Charles did not note or record any structural remains, though he commented on the presence of reddish stains, apparently red ocher, in the soil of sites on this terrace.

The collection (Plates 50; 51) includes 25 artifacts; a small corner-notched point, leaf-shaped bifaces, thumbnail end scrapers, end scrapers on blade-like flakes, scraper planes, bifacial disk-knives, perforator/drills, and utilized flakes.

Designation: The Brinex Bunkhouse site is an important component of the Brinex complex, which includes FjCa–38 (Red Ocher site), GbBo–1 (Rigolet site), and GcBk–6 (North West Brook 1).

FjCa–34: North West River Miscellaneous Collections

Twenty-eight random specimens have been collected from North West River by Charles, MacLeod, and local residents. Some have no provenience data. Several other scattered finds are also illustrated here and have been described under the sites from which they came. Most of the other pieces are not diagnostic. Plate 56*d*, however, shows a base of a side-notched point identical to the Red Ocher site point (FjCa–38) and probably came from the B–3 terrace or above.

The remaining specimens (Plate 57) are not especially meaningful, except that the quartz end scraper (Plate 57*e*) came from above 45 feet in the Brinex area and is similar to scrapers from the Piloski Garden site (Plate 40).

FjCa-35: Hudson's Bay Company Site

The clearing north of the Hudson's Bay Company contains the remains of earlier European settlements. Several cellar pits are visible, as well as rectangular house foundations and small earth mounds. While some of these structures may be only a few decades old, others probably date back to the original trading settlement established by Louis Fornel in 1734. Local collections from this area include clay pipes and French and English gunflints dating to the 19th and perhaps 18th centuries (Plate 54). Excavation of these structures would be an important addition to our limited knowledge of this early period (see Appendix 1). Most of these sites are well preserved.

FjCa-36: Indian Campground

Several hundred yards east of the Grenfell Mission hospital is an Indian campground which is known to have been used at the turn of the 20th century by Indians who came out of the interior in the summer to trade at the post. The site was abandoned 60–70 years ago when the Indians began to spend more time at North West River and moved to more permanent quarters across the river, as the European settlers had by that time taken the best land. Today the outlines of at least 15 rectangular tent floors can be seen in the sod.

FjCa-37: Herbert Michelin 2

A few artifacts and flakes were found in a small garden abutting the west side of Herbert Michelin's house, about 25 feet above high water on Little Lake. The site extends beneath the house. The exposed portion of the site was destroyed when a small garden was planted.

The collection included only six artifacts, none diagnostic. The elevation, flaking technology, and sole use of white quartzite suggests the site is a small component related to FjCa-24, 15, and 29.

Designation: North West River Phase.

FjCa-38: Red Ocher Site

The Red Ochre site is the highest site at North West River in which tools were found. It rests on a 78-foot terrace overlooking Little Lake. This terrace is an extension of the highest (80 foot) terrace in the Brinex series.

The site was discovered when a test pit in the upper terrace yielded a trace of red ocher in the sandy soil. Further tests localized the center of the site, and the land was cleared of its thick spruce cover; 150 square feet were excavated (Plate 3; Figure 40). The soil profile was typical of undisturbed sites in North West River. Culture material tended to be in the gray sandy soil. In places this zone was disturbed by tree-throw and rotting or partially burned roots extending into the gray and yellow sands. In the center of the site lay a hearth, around which the cultural material was distributed, including the heaviest concentration of red ocher. A charcoal sample was collected from the hearth. The sample consisted of flecks of charcoal scattered in the burnt sands of the hearth. These pieces might have been contaminated since charcoal was common in a burn horizon at the base of the duff zone, and burned roots were found in the sandy soil below. Natural charcoal, however,

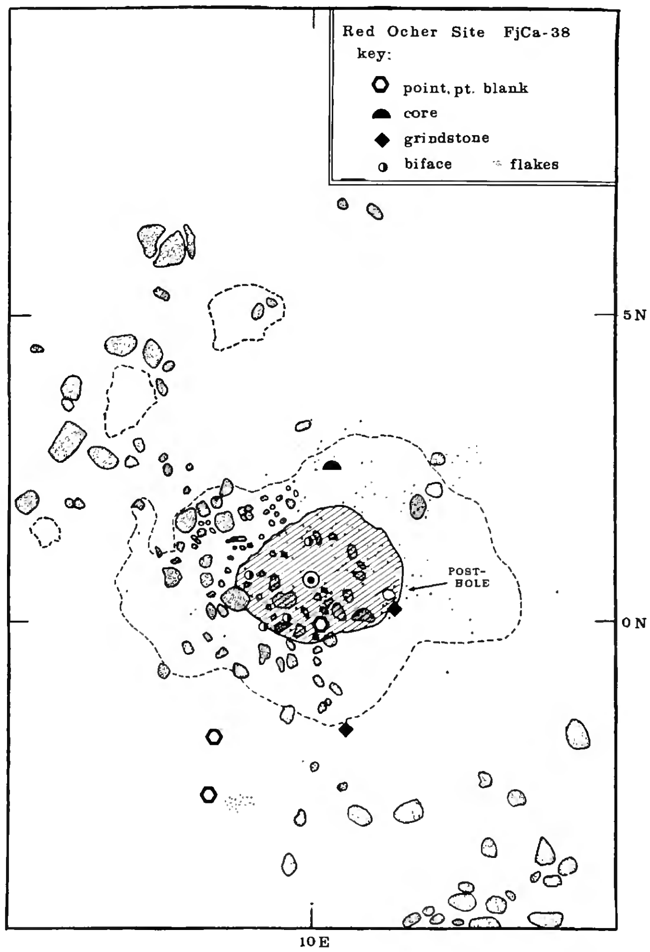


FIGURE 40.—Red Ocher site (FjCa-38).

could be distinguished from the sample charcoal by its consistency and tendency to follow continuous rootholes or horizons. The flecks of charcoal whose limits were coterminous with the hearth stones and burnt sand were felt to be relatively free of contamination. Further analysis of the cultural features of the site are presented elsewhere.

The collection from the Red Ocher site (Plates 52, 53) included eight artifacts. Most diagnostic were the medium-large side-notched, convex-based points of white quartzite. A small triangular chert knife, convex-base bifaces, a red quartzite flake core, a basalt grindstone, and red ocher completed the collection. The grindstone was probably used for ocher preparation.

Designation: The Red Ocher site is a small component of the Brinex complex and is dated at 1140 ± 180 B.C. Other related sites include FjCa–33, GbBo–1 and GcBk–6.

FjCa–39: Louis Montague Site

Seventy-five feet west of FjCa–38 another small site was located. This site, slightly above the road and a few feet east of FjCa–14, lay in a newly cleared lot where Louis Montague plans to erect a new house. Site elevation is 51 feet. Previously, the site was heavily bushed with spruce and Labrador tea; its soil profile was similar to FjCa–38, and cultural material was found beneath the duff in the upper few inches of leached gray sand; 200 square feet of the site were excavated (Plate 6), and a hearth with a small sample of charcoal and burnt bone was isolated. Tree-throw and root action seem to have disturbed the site considerably. There was no evidence of red ocher. Fire-cracked rock is common throughout the site.

The collection (Plate 55) includes several scrapers, a flake core, and utilized flakes. The scrapers were of three varieties: a large oval double-ended type made of a dark banded chert, a single-ended stemmed variety, and a side scraper made on a flake of chert.

Designation: The large formal scraper types relate the site to the Charles complex, and are found also at FjCa–9, 13, and GcBk–7.

The Narrows

Surveys in the Narrows produced only one prehistoric site. This was surprising and seems to be a result of continuing uplift, heavy forest cover, and a lack of detectable structural features. A similar lack of sites would have characterized our survey of North West River had not current cultural activity exposed them. The historic sites which were found include a series of early historic Eskimo winter settlements, which document an important period of transition for these people. They are apparently some of the southernmost permanent winter sites known for the Labrador Eskimo (Figure 41).

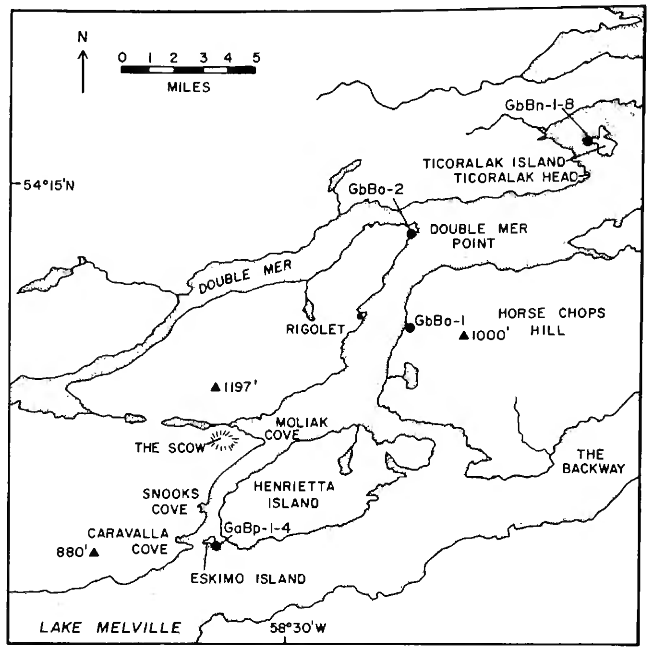


FIGURE 41.—Archeological sites in the Narrows.

ESKIMO ISLAND

Three of the five Eskimo winter sites (Plates 10–12) are on Eskimo Island, a low island only thirty feet high, between Caravalla Head and Henrietta Island at the southwest end of the Narrows. Here, currents up to five knots race around the margins of the island, clearing the ice in winter and providing a feeding ground for marine mammals. The island itself is small, only one half mile from tip to tip of its two wing-like halves. The Eskimo winter sites are at the summits of the two hills on the eastern wing. Two of the three sites are easily recognized by their abundant growth of grasses and briars. The third is located on a hill to the west, where there is little vegetation to indicate a site. All three have southern exposures and their entrance passages stretch toward the island's southern shores, presumably, as with exposure, to conserve heat. The sites have been known for some time and were visited in 1956 by Jorgen Meldgaard, and again, in 1963, by Helge and Steine Instad. No excavations were undertaken by these investigators, who were searching for Viking sites.

GaBp–1: Eskimo Island 1

On the crest of the eastern wing of the island, at an elevation of 30 feet, is a complex of three semi-

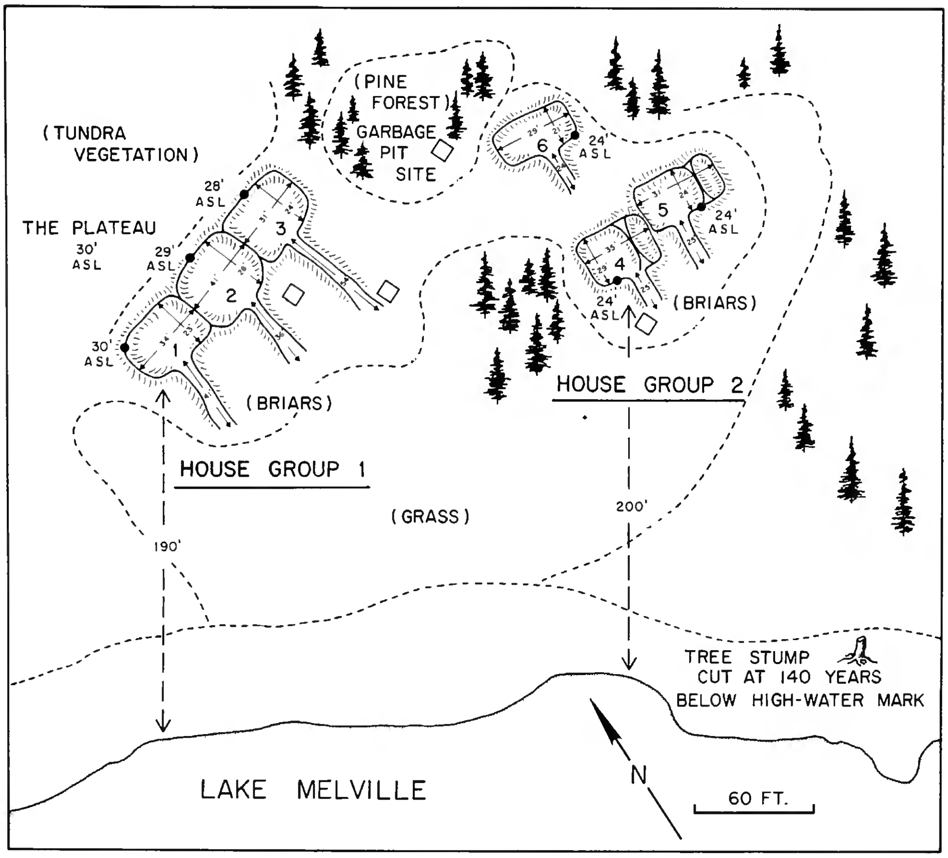


FIGURE 42.—House groups 1 and 2 of Eskimo Islands 1 and 2 (GaBp–1,2). An extensive midden deposit lies between the two sites.

subterranean winter houses (Plate 10; Figure 42) with extremely long entrance tunnels. The houses are roughly rectangular, with walls of turf and peat rising about two feet above the surrounding ground surface. Their centers have been excavated to bedrock (2–3 feet below ground surface). All three houses have been built in a line; houses 1 and 3 share common walls with house 2. The most remarkable feature of these structures is their unusually large size and the great length of their entrance passageways (in feet): H1 (23 × 34; 41), H2 (28 × 41; 36), and H3 (24 × 31; 54). These houses are larger and have longer entrance passageways than any other Eskimo winter houses discovered in the Narrows. Superficial inspection would indicate that they are single room structures and were roofed with turf-covered logs.

Test pits dug outside the houses revealed quantities of trade materials including ceramics, hand-cut iron spikes and projectile points, copper, lead, brick, and glass. More "aboriginal" are soapstone vessel fragments and a bone toggle (Plate 58). Food bone (primarily seal) is present, along with bone artifacts, wood, and, in some cases, seal and whale skin. Organic preservation is excellent due to local permafrost and tannic acid in the water-saturated peat deposits. Cultural debris in the midden in front of the house reaches a depth of 15 to 20 inches.

GaBp–2: Eskimo Island 2

Ninety feet east of GaBp–1 is another complex of semisubterranean houses slightly below the elevation of the other (Plate 11). They, too, face south and bear an even more luxuriant growth of grass and briars, perhaps indicating a more recent date. In size they are smaller and have shorter entrance passages than GaBp–1 (in feet): H1 (29 × 35; 25), H2 (24 × 31; 25), H3 (21 × 24; 24). Significant structural differences include the independence of H3 from the group, the fragment of shared wall between H1 and H2, and the fact that the latter two houses are two-room structures. A single test pit was dug outside the entrance to H1, revealing good preservation of bone, skin, and bark. A wide variety of native and European materials was recovered (Plate 59).

GaBp–3: Eskimo Island 3

West of GaBp–1, on the southern slope of a hill south of the island's "isthmus," lies another group of three single-roomed turf- and peat-walled houses

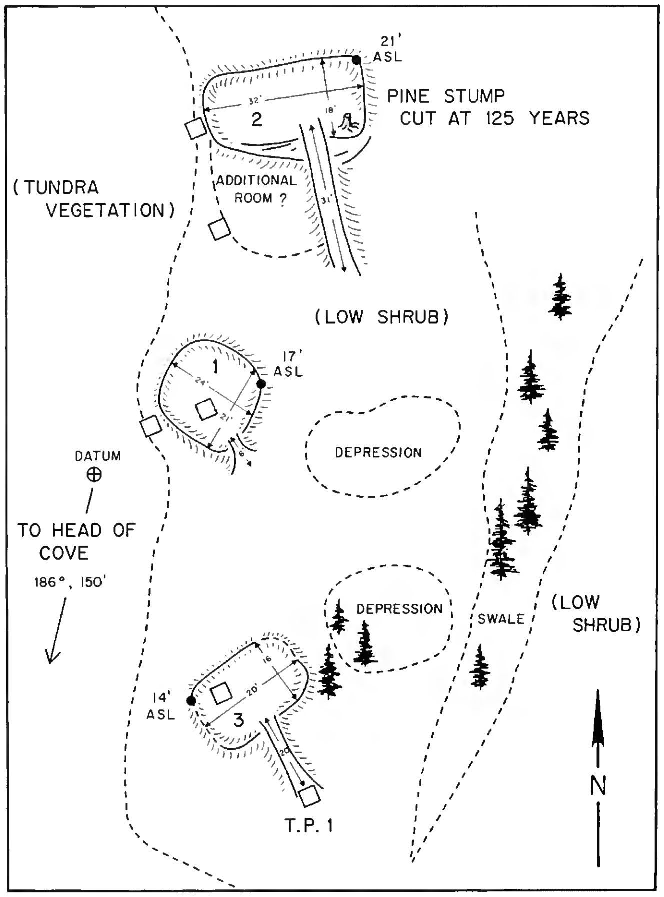


FIGURE 43.—Eskimo Island 3 (GaBp–3). The depressions were not tested and may contain additional house sites.

(Plate 12; Figure 43). In this case all three are independent units. They tend to be rounded or subrectangular in shape, and are smaller and have shorter entrance passageways than either two preceding sites (in feet): H1 (21 × 24; 6), H2 (18 × 32; 31), H3 (20 × 20; 16). Also atypical is the lack of grass and briar growth on this site, suggesting either limited accumulation of debris or depletion of that which was deposited. No external midden could be located outside these houses. H3 may be unique in more than its size and rectangularity for there is a possible second room adjacent to the entrance along the south wall of the main room.

Test pits were dug into each of the three houses because they appeared to be the oldest on the island. The presence of permafrost and seeping groundwater in thaw areas made excavation difficult, but there was always excellent preservation. Artifacts (Plate 60) included iron spikes, musket balls, ceramics, glass beads, and a portion of a sealskin parka with stitching intact. Food bone was present in limited quantities. One test pit provided structural evidence for roof support in the form of the rotten base of a log pillar set into a piled boulder foundation on bedrock. Test pit 2 in the same house contained well-preserved roof beam logs.

A minimum age for H2 was obtained from a ring count of a dead spruce which once had been growing inside the house. It gave an approximate age at cutting of 125 years, and since badly rotted, probably began growing at least 175 years ago.

GaBp–4: The Midden

This site consists of an area of midden deposit roughly 50 feet in diameter, bearing cultural debris to a depth of 18 inches. The area was probably used as a dump for both GaBp–1 and 2. Preservation is excellent, and in four test pits a great quantity of food bone including seal, whale, caribou, and fox was excavated, as well as numerous artifacts (Plate 61).

GaBp–5

A single disheveled cairn burial near GaBp–3 was found to contain a number of tubular and round glass beads, a cylindrical lead pendant, and fragments of mussel shell (Plate 62*b-i*). No skeletal material was found.

SNOOKS COVE

This cove opposite Eskimo Island on the western side of the Narrows had had a complex history of settlement, and in our cursory examination we did not attempt to piece it together. Today the Baikies have a salmon fishing camp on the north side of the cove. About 1900, according to local Eskimos, the cove was the site of three Eskimo winter houses. These remains have been obliterated by the subsequent occupation of the site by the Baikie family. Also present in the cove are the remains of an early trading settlement, Hunt and Henly, which was sold to the Hudson Bay Company in 1865, and was later moved to its present site at Rigolet.

RIGOLET

GbBo–1: Rigolet Spy Site

Extensive sand terraces border the eastern side of the Narrows opposite Rigolet. The lowest and longest of these rises to a height of 72–78 feet above shore and is covered with a thick spruce forest which is only occasionally interrupted by sandy blowouts at its brow. The largest string of blowouts occurs directly opposite Rigolet, and in one of these the remains of a site were found. Flakes of red quartzite, vein quartz, lavender chert, and bluish quartzite were found dispersed in three adjacent areas; but the remains were thinly distributed, and very few tools were found, even in the more concentrated find locations. There was no evidence of any stone structures or hearths, and only in one spot was a trace of in situ deposit found.

The tools recovered (Plate 63) included a small leaf-shaped unifacial knife, a quartz biface fragment, two small end scrapers on blade-like flakes, and five utilized flakes. This collection is too small to indicate definite cultural relationships; however, the similarity of the end scrapers and the correspondence of raw materials utilized suggest a tentative alignment with FjCa–33 (Bunkhouse site) at North West River.

Designation: Brinex complex. This meager artifact return from such an extensive site seemed peculiar. In particular, it seemed likely that the site had been previously collected by experienced archeologists. Later, it was learned from a local resident that in 1937 two Scandinavian men, later thought to have been spies, had made archeological collections in the vicinity of the Narrows, had chartered the Hudson's Bay Company boat to visit Double Mer, and that they had maintained a camp somewhere near this site.

The most likely explanation of this story is that this was V. Tanner, who in 1937 surveyed the Narrows and certainly visited the terrace location. Furthermore, Tanner had some interest in archeology. If this explanation is correct, it might help solve a second mystery. G. Rowley, in his distribution map of Dorset culture sites (1940: fig. 4), included evidence from Hamilton Inlet for a site on Ticoralak Island. Rowley (pers. comm.) does not recall the basis for this claim, and the information source cannot be ascertained. It seems plausible, therefore, that Tanner was the original discoverer of the Ticoralak Dorset sites and that he relayed to Rowley information of this find. Unfortunately, the present location of the collection if one was made at Ticoralak Island, and from the Narrows, is not known. It may well be in a Finnish museum, although the author searched futilely for it in Helsinki in April of 1971.

GbBo–2: Double Mer Point

Just south of Double Mer Point is a shore-side set of three Eskimo winter houses apparently unknown to the local people. This site (Plate 13) is similar in plan to GaBp–1 with rectangular houses sharing lateral walls with the central unit. All are single-roomed and have relatively short entrances. They differ from the GaBp–1 houses in the latter feature and in the smaller size of their rooms. No excavations were made. This site is located at a tide rip at the intersection of converging currents from the Narrows and Double Mer. Like Eskimo Island, it is an ecologically rich area.

Western Groswater Bay

TICORALAK ISLAND

Just north of the entrance to the Narrows lies an amoeba-shaped island named Ticoralak, which, judging from the number of sites, has been an important Indian and Eskimo campground for the past 3000 years. The island, lying only a mile off Ticoralak Head, blocks the mouth of a shallow bay which harbors basking seals, geese and duck; salmon, trout, cod, capelin, and grampus are plentiful also. The geology of the island provides coves and uplifted beaches protected between ridges of resistant gneiss. The beaches are covered with shingle and gravel; soil development is almost nonexistent, although in protected areas tamarack and spruce have taken hold. The small island has several fresh water ponds.

Sites are scattered around the perimeter of the island, but occupation was heaviest on its northern and western peninsulas where boat landings and sites are sheltered by a series of beaches and cusped coves (Figure 44). About 30 stone tent rings were noted at or slightly above the present shoreline. The rings were about 10–15 feet in diameter with 8–12 hold-down stones. They occurred sporadically or in groups and were often accompanied by stone cairns whose shape indicates they were probably graves, similar to those of Eskimo Island. Several stone fox traps were noted. The heaviest concentration of structures was on the Western shore of the northern peninsula, where 16 rings and 3 graves were found. Test excavations produced seal bone and historic artifacts. The presence of pagan burial here indicates at least a pre-1875 date for most of the structures. The large number of sites, the fact that most of the rings are intact, and the presence of the graves suggest that the site was used yearly by a fairly large group of people, perhaps as an early summer gathering camp (Figure 44; Type 4 in Ivuktoke settlement type; see page 61).

Prehistoric sites are found at higher elevations on the beaches. With the exception of GbBn–1, and unlike the later sites, these are located on the raised tombolo beach of the western promontory 25–40 feet above present sea level. This locale has been termed the "Beach Pass" area. The sites were apparently associated with once active beaches, and as the land rose, the small camps were repeatedly placed at lower

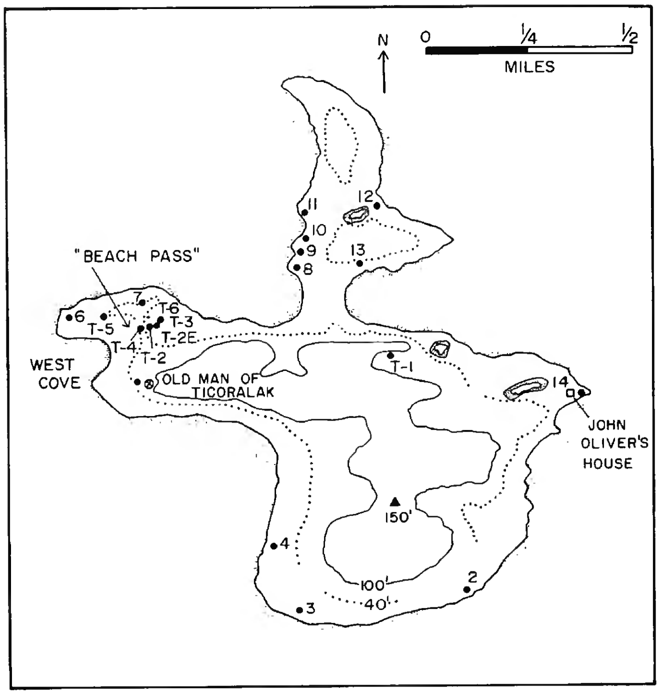


FIGURE 44.—Archeological sites on Ticoralak Island. (1) Tent ring and circular depression, (2) tent ring and grave cairn, (3) three tent rings, (4) recent rectangular tent site, (5) three food cache pits 40 feet above sea level, (6) five tent rings, (7) five food cache pits 25 feet above sea level, (8) ten tent rings and three grave cairns, (9) two tent rings and one grave, (10) two tent rings, (11) one tent ring, (12) one tent ring, (13) two tent rings, (14) two grave cairns.

elevations. Most of the sites are found on the eastern slope of the beach between its 40-foot crest and where it drops abruptly to lower beaches after the 30-foot level (Figure 45; Plate 14). At the time of Dorset occupation the cove was open to the sea, and the northern peninsula was a separate island.

Associated with these sites are the remains of circular depressions in the gravel, 2–4 feet in diameter. The margins of these features were slightly mounded, their centers slightly depressed. They seem to have been used as food cache pits. Three were found on the beach adjacent to the "Old Man of Ticoralak" rock profile, while five were found on the northern shore of the peninsula. All are located 25 feet above sea level. The lack of these pits in the vicinity of most recent Eskimo sites, and Ivuktoke sites, and their elevation suggest they belong with the Dorset occupation, although such pits may have been used by later peoples. Generally, however, later Eskimos used above-ground rock cairn caches.

Today the vegetation of the Beach Pass is scanty. Swales between the low ridges have accumulated an inch or two of dark soil covered with dwarf birch, mosses, and lichens; the more exposed ridges have merely a few birch plants and lichens and no soil deposit. Excavations on the Beach Pass consisted of carefully digging through the gravels and soil pockets for cultural material. Below the 30-foot contour on the east side of the beach and bordering the beach to the south there are clumps of stunted spruce. The lack of soil development farther north on the beach slope would seem to have retarded an expansion of this vegetation onto the entire beach, even during warmer climatic periods.

Besides the sequential series of small Dorset sites on these beaches, there was evidence of sporadic Indian occupation. These sites either represent contemporaneous overlapping zones of Indian and Eskimo exploitation, or shifts in culture areas through time. Few faunal remains were preserved in these sites, and it is not positively clear that the Indians hunted seals here, as the Eskimo must surely have done. For the most part, the small size of the sites, and their lack of structural remains suggest they were used as transitory hunting camps by small groups of people, often possibly males alone, for short periods of the summer season.

GbBn–1: Ticoralak 1

This site was found on a fossil beach of an uplifted cove on the eastern side of the island (Figure 44). Its elevation was not measured, but is above 20 feet. A few flat rocks vaguely suggest a shelter of some kind was erected; in the center there was a hearth. Cultural remains were sparse. A few feet away on the same beach ridge two small cache pits were found. Since no other cultural evidence was noted, these undoubtedly are associated with the stone ring. Only three flakes of Ramah chert and no other materials were found on the site.

Designation: Unassigned. Elevation and presence of cache pits known to be associated with Dorset sites on the Beach Pass suggest probable Dorset affiliation.

GbBn–2: Tocoralak 2

On the east side of the Beach Pass 31 feet above sea level and 45 feet from the brow of the upper cove a small Dorset campsite was found and excavated (Plate 15). The site was about 10 feet in diameter and consisted of a slab-rock hearth (from which a radiocarbon sample was recovered) and several larger stones drawn up about the fire. If remains of a tent ring structure once existed, stones had been subsequently removed for use in later sites, and no structure could be reconstructed from the remaining rocks.

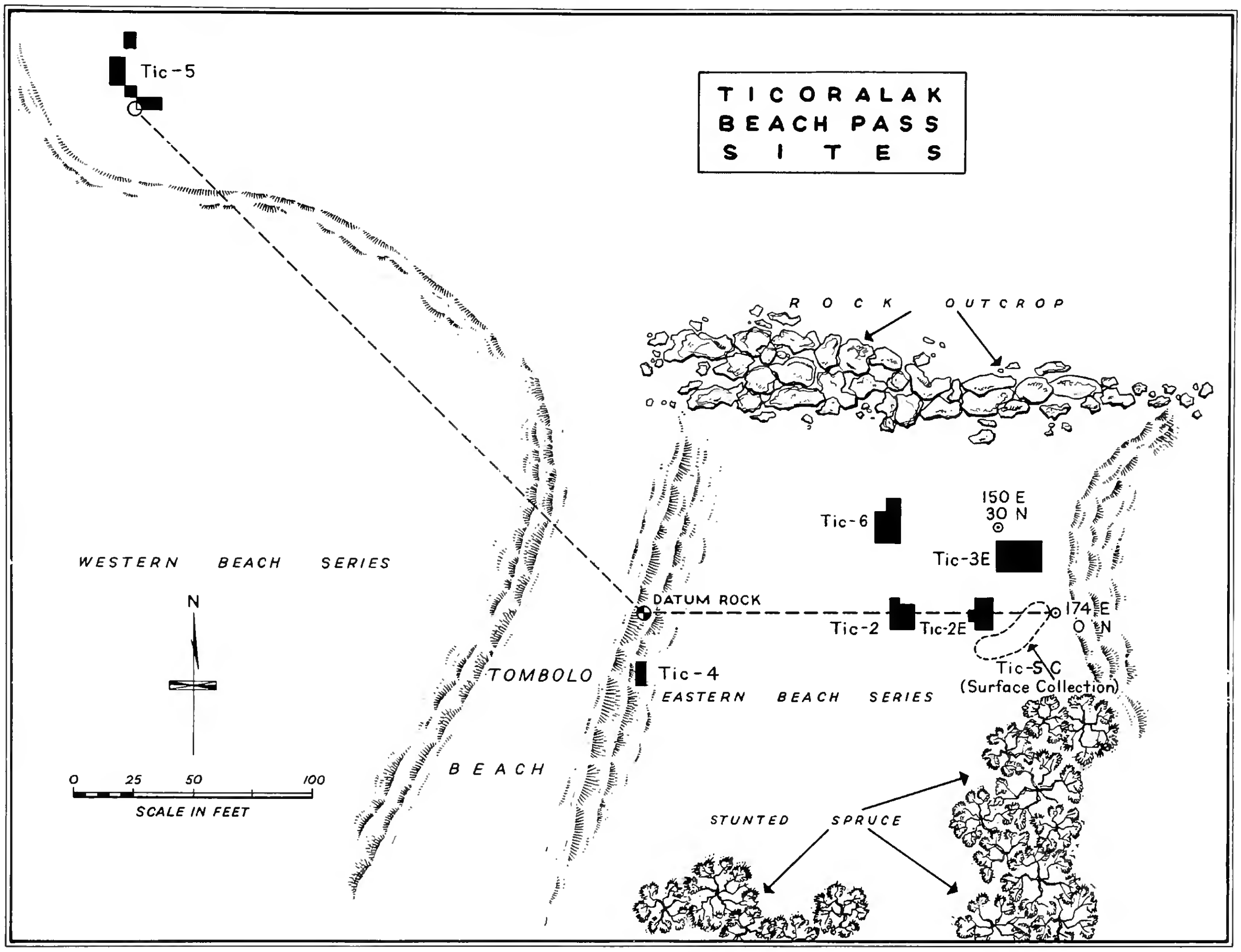


FIGURE 45.—Ticoralak Island Beach Pass sites.

The collection (Plate 64) included 21 artifacts: fragments of a biface knife blank, a small chipped and ground burin-like tool, a chipped and ground crescent, microblades, a core fragment, and ground slate fragments.

Designation: Groswater Dorset Phase. Related to other Dorset sites on Ticoralak and elsewhere in the bay. Radiocarbon dated at 740 ± 140 B.C.

GbBn–3: Ticoralak 2 East

A second small Dorset camp is 33 feet east of Ticoralak 2, at 28 feet elevation. This camp may be slightly younger than the other, but it may in fact be an extension of GbBn–2. As with GbBn–2, this site contained a hearth, a few scattered slabs of rock, and several tools. A charcoal sample from the hearth was collected but not submitted.

The collection (Plate 65*a-g*) consisted of seven artifacts, including a small corner-notched knife, five microblades, and a piece of polished slate.

Designation: Groswater Dorset Phase. Probably dates between 750–400 B.C.

GbBn–4: Ticoralak 3

A larger sample came from a third site, the lowest of the eastern Beach Pass series, at an elevation of 28 feet above sea level. It is situated at the brow of the fossil cove and postdates the higher sites. Shortly after occupation of this site conditions of beach development changed, resulting in a marked increase in beach slope, which drops away sharply from the site to the present cove. This change apparently resulted from the emergence of the isthmus bar joining the northern peninsula to the island east of the site.

Dorset occupation of this part of the beach terminated with this development. Once again, the site contained scattered rocks and a hearth, from which a charcoal sample was taken, and dated 390 ± 140 B.C.

The collection (Plate 66) included 77 artifacts: large "box-based" side-notched points which are plano-convex and bear grinding facets on their planar surface, asymmetric knives, quartz grindstones, ground slate fragments, small circular end scrapers, microblades, and utilized flakes.

Designation: Groswater Dorset Phase.

GbBn–5: Ticoralak 4

A small arrangement of rocks 25 feet south of the datum, and on the same 39-foot elevation beach line was tested and yielded several specimens. The collection (Plate 65*h-k*) included three microblades and an eared end scraper.

Designation: Groswater Dorset Phase.

GbBn–6: Ticoralak Surface Collection

In the vicinity of 168E 0N a concentration of 50 flakes of red quartzite and a corner-notched point were found. Also scattered about the brow of the eastern beach near GbBn–3 and 4 were utilized flakes of white quartzite, quartz, and a few sandstone slabs (Plate 67*a-b*). This material is not Dorset but Indian, and the white quartzite debris may be related to the GbBn–8 site. The red quartzite flakes and point seem to be a second Indian component since no red quartzite material was found in the GbBn–8 site. The function of the sandstone is unknown. It is a piece of the Double Mer (ripple-marked) sandstone formation, which outcrops on Ticoralak Island.

Designation: The red quartzite point and flakes are assigned to the Point Revenge complex. The point is typologically similar to the point from FjCa–20. The white quartzite probably belongs with nearby GbBn–8 site.

GbBn–7: Ticoralak 5

Northwest of the datum (300 feet, bearing 313°) a second fairly large Dorset site was found (Plate 16). It lies on a flat stretch of rocky ground which forms the headland of the western cove. The elevation is the lowest for any Dorset site at Ticoralak, 24 feet. During occupation the site would have been on a narrow peninsula; 125 square feet of the more promising part of the site was excavated. Time did not permit further work that might have elucidated the meaning of the scattered rocks and stone slabs which are part of the site. One arrangement of slabs in square 5 seems to have been a hearth, and from this a charcoal sample was taken. Concentrations of tools of specific types in different areas of the site indicate separate workshop or activity areas.

The collection (Plates 68, 69) included 108 artifacts: side-notched triangular points, bifacial knives, side blades, chipped and ground burin-like tools, ground slate, microblade core fragments, microblades, and utilized flakes. As with the other Dorset sites, the assemblage employed a fine mottled chert for its chipping industry, and tan slate for its ground slate tools. Quartz crystal was occasionally used for microblades.

Designation: The site appears to be a later representative of the Groswater Dorset Phase. The points appear less well made, the elevation is low. However, a preliminary reading has given a radiocarbon date of 450 ± 160 B.C. Its side blades, burin-like tools, and other artifacts resemble the Dorset assemblage from other sites in Groswater Bay.

GbBn–8: Ticoralak 6

This Indian site is about 40 feet north of GbBn–2 and 50 feet west of GbBn–4 on the 31-foot beach. Seven squares were excavated across the swale and ridge of this beach, and a considerable quantity of white quartzite debris and several tools were found. There was no evidence of a structure or hearth, although a few chunks of carbonized seal fat were recovered. Most cultural material was in situ beneath peat and 2–6 inches of black soil in swale hollows, directly over the beach gravel. Several chert flakes and a triangular chert blank were found, apparently a Dorset component intrusion. A second intrusion may be represented by the red quartzite point, since no flakes of this material were found in the excavation, and it is typologically foreign to the major component of the site and the assemblage as defined from the Sid Blake and related North West River sites. The white quartzite convex-based biface and the utilized flakes from the site fit within the North West River Phase.

Designation: The site is probably a three-component site, although this could not be determined stratigraphically. The chert blank appears to be a preform of a Dorset triangular point. The red quartzite point does not appear similar to either the Point Revenge complex or the North West River Phase as presently known, but is similar to a specimen from Blanc Sablon 1 dated by Harp (1963:pl. Ia) and Harp and Hughes (1968:44) at 124 ± 50 B.C. The major occupation of the site is by a group of the North West River Phase of the Shield Archaic.

BIG ISLAND

GbBm-1: Big Island 1

Six and a half miles east of Ticoralak Island a site was discovered midway down the north shore of Big Island on a low barren promontory which we unofficially named Point Revenge. The point has a flat sandy top covered with tundra vegetation. Its elevation is 9 feet. Three historic tent rings were located on the perimeter of the point, while towards its center there were two concentrations of prehistoric materials (Plate 18; Figure 46). The northern concentration, termed area A, (plate 19) contained a hearth with charcoal and burned mammal bone, two other charcoal concentrations, a large amount of Ramah chert debris, and several large stones. No specific structure could be discerned. Area B (Plate 20) contained a well-defined hearth ring with burned bone and charcoal, and the remnants of small spruce logs beneath a layer of tundra lichens and peat. The logs lay at the base of the peat, associated with flakes and artifacts of Ramah chert. The arrangement of the logs suggested they were the ruins of a tepee frame which once stood over the central hearth. The structure appears to have fallen toward the east. The lack of hold-down stones was unusual; however, they may have been scavenged by the occupants of the later sites. The lack of logs in area A resulted from its thinner vegetation cover, the logs having rotted away. It is likely that two skin-covered tents had been erected here while their occupants hunted seal, small game, and birds in the bay.

The collection (Plate 70*a-f*) included a small inventory of corner-notched, convex-base points, and flake scrapers. The raw material used was Ramah chert.

Designation: Point Revenge complex. Dated 1230 ± 130 A.D. by charcoal from a hearth in area B.

POMPEY ISLAND

GbBm-2: Pompey Island 1

There is a local legend of Eskimo houses and whalebones located at the top of Pompey Island. A brief investigation here, however, established only the presence of three boulder structures on a boulder field just below and several hundred yards west of the 300-foot summit of the island (Plate 21). Each of the structures is circular, and has been constructed by piling up boulder walls 1–3 feet high. Some of the rocks weigh over 200 pounds. All bear a thick encrustation of lichen and have not been disturbed for many years, ruling out a very recent date for their construction and use. The centers of the structures were sunk below the original level of the boulder field by clearing out the larger rocks. There is no solid floor, however, and any cultural material once left behind has fallen through the spaces between the boulders and disappeared. The houses are aligned in a V shape with House 2 at the southern apex. House 2 is the largest, with a diameter of about 20 feet, and is located on the crest of the boulder field; House 3, 8 feet in diameter, lies a few feet to the northwest; House 1 is to the northeast of House 2 and is 10 feet in diameter.

The function of the structures is uncertain. However, the absence of fresh water and their location on an eminence overlooking the western end of the bay suggest they may have been used as winter camps from which to spot caribou movements on the winter ice. This portion of the inner bay is generally frozen solidly in midwinter, and similar hunts are still conducted in this area today.

No whalebones were found on the island. It is reputed that a fossil skeleton exists in the sands of some of the higher beaches on the island, but no such fossil was found during our visit. Alternatively, the bones may have been incorporated as roof structures for the stone houses. If so, this would suggest an Ivuktoke affiliation, for Thule and Labrador Eskimo are known to have constructed similar stone and whalebone houses. Similar structures are not known from Dorset or Indian cultures.

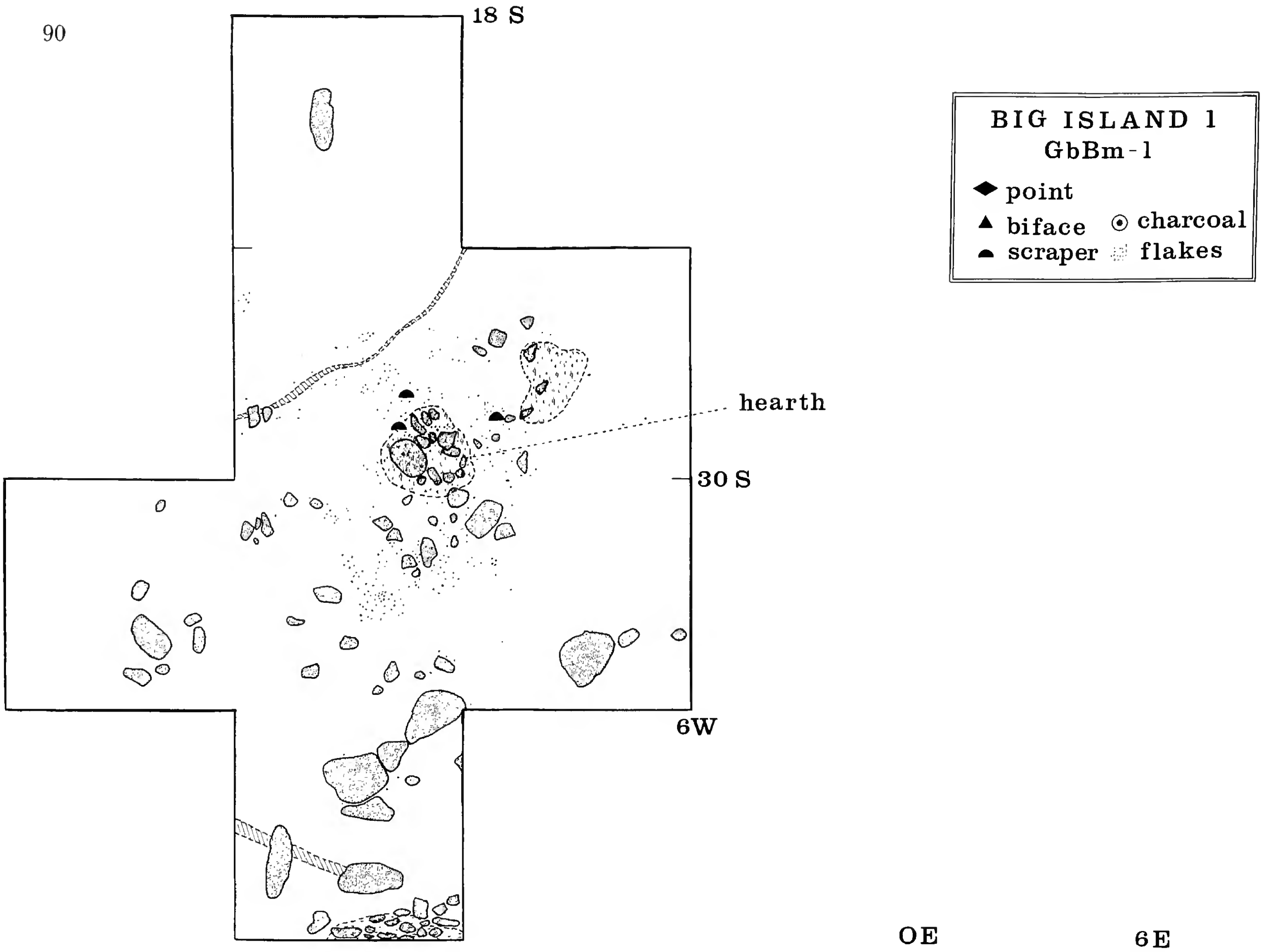
Designation: These structures are tentatively assigned to the Ivuktoke Phase of the recent Eskimo occupation of Groswater Bay.

Eastern Groswater Bay

BIG BLACK ISLAND

Strong influence of the ocean marine environment begins to be felt at Big Black Island and Sandy Cove. Here the forest, now restricted to low elevations, begins to dwindle; hardier tamarack replaces spruce, and tundra patches at sea level become common. East of Sandy Cove trees are stunted and grow only in small sheltered areas. Equally important, the marine swell reaches west to Big Black Island, and only in severe storms does small-boat navigation become hazardous farther west, due to the blockade of islands and shoals. The eastern shores of the island, however, receive surf. Even in fair weather there may be a dangerous swell rising on shoals, breaking, and making boat landing and launching perilous. For this reason most sites tend to be located on western shores or in protected coves.

Only a few hours were spent surveying Big Black Island. Undoubtedly, it has prehistoric sites, though



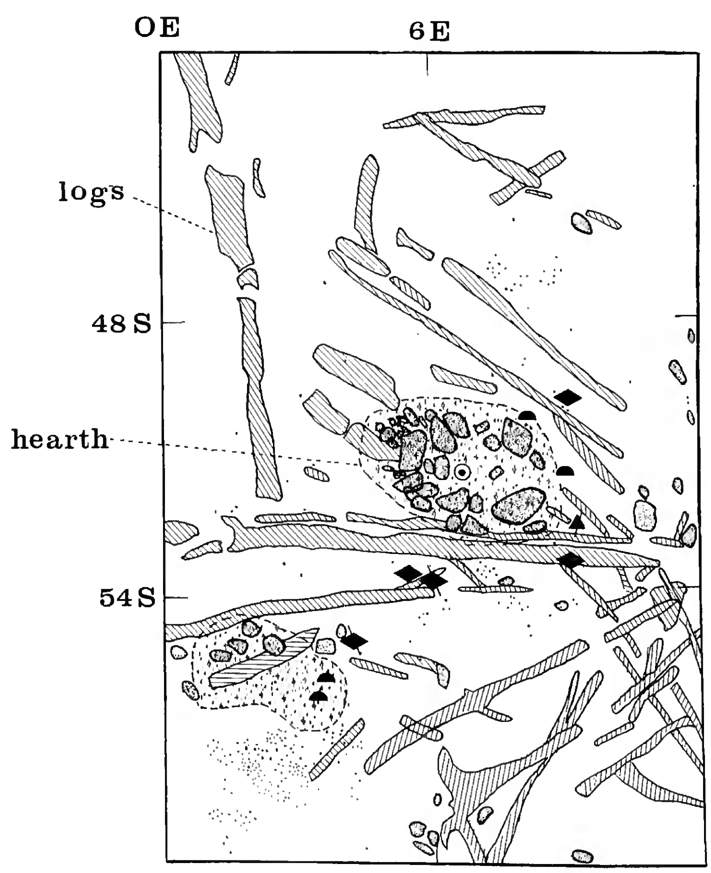


FIGURE 46.—Big Island 1 (GbBm-1).

none were discovered. The most apparent sites are the remains of historic Eskimo camps. The southwestern tip of the island has a large site, including 10 tent rings, numerous food caches, and 20 burial cairns (all looted); fox traps, duck blinds, and unidentifiable stone structures are common. Test pits in several tent rings produced historic artifacts, but no stone chipping was found. Informants say that this site was an important summer gathering place for the old Eskimos. This statement is supported by the large number of tent rings and graves. Finally, it seems likely that this is the site where the Eskimo Caubvick, befriended and brought to England by Captain Cartwright, was found dead of smallpox with her entire family by William Phippard in 1773 (Gosling 1910:240).

Several historic Eskimo camps were found on the eastern side of the island. Here there are also the remains of an abandoned copper works.

SANDY COVE

Sandy Cove lies northeast of Big Black Island. Fishing schooners for the past century have taken refuge here from northerly storms. The northern side of the cove is fairly protected from the swell and consists of a broad sandy beach bridging gaps between small rocky outcrops (Figure 47). North of the beach, hills rise to 500 feet. The area is rich in fish and game. Shallow water north of Big Black Island has flocks of duck. Salmon, cod, trout, and capelin can be caught, and grampus and seal occur. In the sandy blowouts around a small freshwater stream bear, rabbit, lynx, and fox tracks were seen. Caribou could have been easily spotted as they passed across the barren hills behind the cove. These hills contain

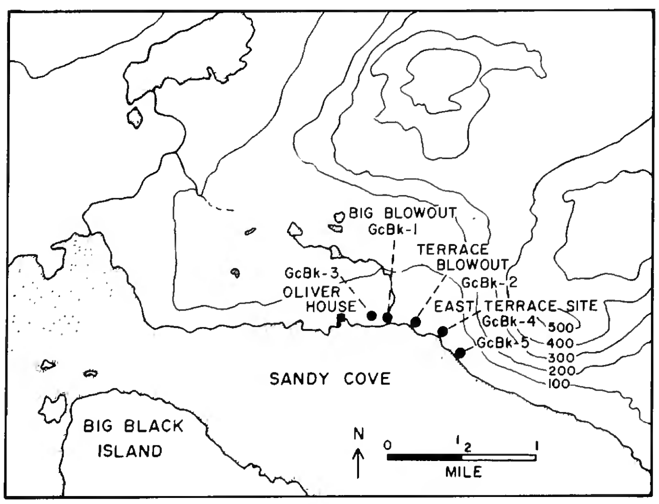


FIGURE 47.—Archeological sites at Sandy Cove.

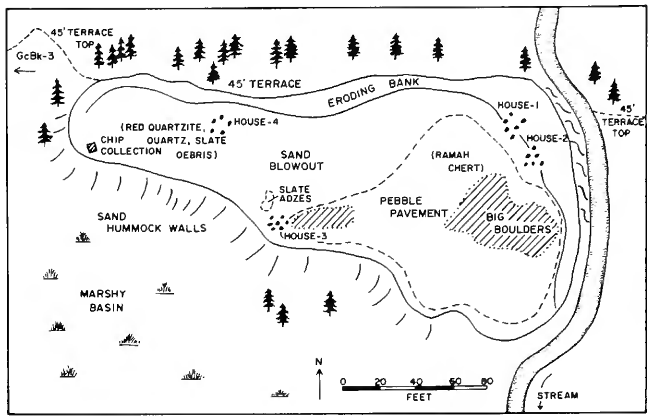


FIGURE 48.—Sandy Cove 1 (GcBk–1).

quartz, which was an important raw material in the sites.

The geology of the area is dominated by high beachlines at 300 and 240 feet, and an extensive sandy terrace at 45 feet. This terrace, on which all the sites were found, is about half a mile long and rings the northeastern end of the cove. It is bisected by a brook, and when the water was 20–40 feet higher than today the area would have been a series of small sandy coves protected by rocky peninsulas. Today, portions of the terrace are covered with low spruce and tamarack; other areas are in tundra vegetation, with scattered blown out patches.

GcBk–1: Sandy Cove 1

West of the brook a large blowout has formed on an east-west axis along the brow of the 45-foot terrace, and within it were found a variety of archeological remains. The feature (Figure 48; Plate 22) is about 300 feet long and has a maximum width of 120 feet. It is ringed by a steep wall of blown sands. In the bottom of its eastern end is a rocky pavement; the central and western portions are sandy. The blowout has been used frequently as a camping place, and sites are eroding out of its walls from a buried soil surface as the feature enlarges.

The distribution and types of artifacts, structures, and chipping concentrations suggest that the area can be subdivided into the eastern, central, and western areas.

EASTERN AREA.—Two small boulder tent rings (Houses 1 and 2) are presently eroding out of the eastern wall (Plate 23). These tent sites appear to have been placed on the terrace outside the blowout and were later inundated with sand as the feature expanded. Associated with the rings were Ramah chert flakes and artifacts, including small corner-notched points (Plate 71*d-m*). The distribution of Ramah chert extended from here to the eastern edge of the stony pavement.

Designation: Early Point Revenge complex. The points are similar to those collected by Harp (1963: 210) at Blanc Sablon and dated to A.D. 690 ± 46 (Harp and Hughes 1968:44).

CENTRAL AREA.—A circular arrangement of large flat rocks was designated House 3 (Plate 24). Its diameter was about 10 feet, and in its center was a possible hearth feature. It seems likely that this structure was built within the blowout during its early age, since the slabs are not disarrayed as are the stones of Houses 1 and 2, which are eroding out of the blowout's sloping wall. No tools or flakes were found within the structure; however, a ground slate-knife fragment, a quartz knife, and five adze blades (Plates 71*a,c*, 72) were found a few feet away, and there were chipping concentrations of quartz, red quartzite, and slate nearby.

Designation: Sandy Cove complex of the Maritime Archaic Tradition, dating about 2800 B.C.

WESTERN AREA.—In a narrow, recent extension of the blowout small chipping concentrations were found, and another possible structure (House 4). Few tools were found; the chipping concentrations were of red quartzite, quartz, and slate. As in the central area, no Ramah chert was found.

Designation: Sandy Cove complex of the Maritime Archaic Tradition.

GcBk–2: Sandy Cove 2: Terrace Blowouts

A large number of artifacts were collected from scattered shallow blowouts on the 45-foot terrace several hundred yards east of GcBk–1 (Plate 25). Once more heavily forested, this extensive terrace is now barren, and blowouts have developed and been stabilized by vegetation several times. Artifacts have been exposed, covered and re-exposed, and, in the process, their locations may have changed slightly, though the find locations are probably accurate within a few feet. For instance, chipping concentrations of different materials were found to be unmixed even when situated within a few feet of each other. All artifacts were mapped relative to three datum points (Figure 49).

The results of distribution analysis reveal a remarkable cultural homogeneity. Most of the time quartz and red quartzite debitage are associated with rough tools of this material or fragments of slate; less common was an association of Ramah chert in this complex. There was a slight tendency for red quartzite to be more common in the western portions of the site and slate to be more common in the east. However, these distributions are not exclusive. In fact, the poor preservation of the exposed pieces of slate suggests that this part of the site may have been more recently exposed, the slate having decayed in the western portions. Stemmed points were widely scattered on the terrace and were almost always made of Ramah chert, suggesting that they belong with the complex of quartz, red quartzite, and slate. They were often found in the midst of chipping concentrations of these materials. The lack of stone structures —tent rings or hearths—was strange as was the absence of ground slate from the collections. Habitation, with structures, must have occurred here though its remains are scanty. The test excavation (GcBk–2a) produced charcoal and red ocher, indicating living activity similar to that found at Rattlers Bight. The site suggests small workshops and transient occupation by small groups of people over a considerable period of time.

Two of the specimens collected here were slightly anomalous and deserve note. These were stemmed points made from a fine-grained weathered chert or siltstone. Both are typologically slightly aberrant in the typical Sandy Cove point series. One (GcBk–2:40; Plate 73*a*) is a single-shouldered point with very carefully flaked edges and tip. It has an unmodified striking platform at its base. The other (GcBk–2:21; Plate 73*f*) is a smaller point made of the same material, with a longer tapered stem compared with most of the other points of this type at the site. It also has a more convex blade, and more careful flaking than is usual. These points, and a point collected by Harp (1963; pl. VIII) in southern Labrador, are typologically similar to pre-Dorset points, particularly those of the Sarqaq variety (Larsen and Melgaard 1958, Mathiassen 1958), but also of Canadian pre-Dorset (G. Taylor 1968:fig. 16). At the Sandy Cove 2 site, this suggestion is diminished by the fact that the smaller point was found within a chipping concentration of quartz and red quartzite, alongside another small-stemmed point of quartz (GcBk–2: 22; Plate 73*i*).

The collection (Plate 73) includes 50 artifacts: 10 stemmed points, 17 point fragments, 1 point blank, 9 knives, 1 flake knife, 12 utilized flakes. Chipping debris was extensive, and was plotted into the site map according to raw material type, but was not collected.

Designation: The Sandy Cove 2 sites are grouped in the Sandy Cove complex of the Maritime Archaic Tradition, dating sometime about 2800 B.C.

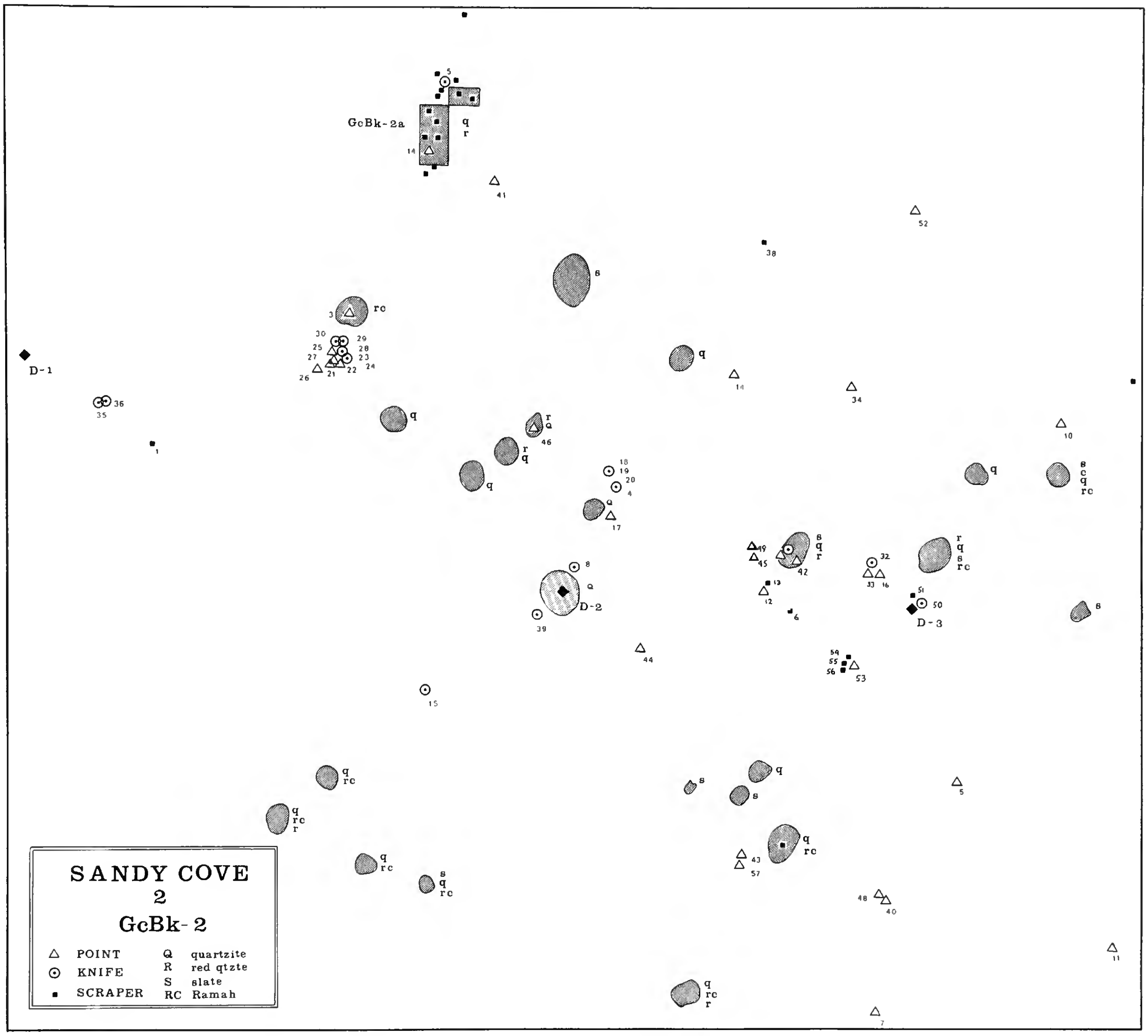


FIGURE 49.—Sandy Cove 2 (GcBk–2).

GcBk–2a

Two and a half squares were excavated along the northern periphery of the terrace blowouts where a heavy concentration of red quartzite flakes could be seen in a small blowout. The excavation produced in situ materials within a black soil horizon immediately below the shallow surface vegetation. Charcoal was common throughout the culture zone, but positive association with culture could not be determined. Red ocher was also present in this zone, along with many flakes of red quartzite and quartz. No slate was found. The site has been disturbed by blowout activity after the removal, by man probably, of a former spruce forest which once covered the terrace, as it now does near GcBk–1 and 3.

The collection from this portion of the larger Sandy Cove 2 site includes 15 artifacts: 1 point stem, 1 flake knife, 1 whetstone, 2 flake core fragments, and 10 utilized flakes. The collection is typologically similar to the Sandy Cove 2 assemblage.

Designation: Sandy Cove complex of the Maritime Archaic Tradition.

GcBk-3: Sandy Cove 3

A small in situ site was discovered and excavated on the front of the 45-foot terrace about 150 feet west of the Sandy Cove 1 (Plate 26). Between the terrace and the present shore lies a marshy basin about 30 feet above sea level which once formed a deep protected cove, ringed by sandy beaches. It seems likely that this basin was a cove during the site's occupation (see page 30).

The site is small—about 20 feet in diameter—and is covered with a heavy growth of lichens. Tamarack and dwarf birch are scattered on the terrace clearing. A hearth was found in the center of the excavation, around which were scattered large quantities of chipping debris, including quartz, slate, red quartzite, some lavender chert, and a few flakes of Ramah chert. The deposit was thin. The culture zone was in the upper 2 inches of gray leached sand; beneath was sterile yellow sand. An inch or two of humic soil and roots covered the site. Charcoal horizons and red ocher deposits were present throughout. There was no evidence of a structure.

The collection (Plate 74) included 17 artifacts: 2 celts (one of ground slate, another of chipped red quartzite), 2 stemmed point fragments, 1 biface fragment, 1 ground slate fragment, 2 flake core fragments, and 8 utilized flakes. The collection is similar to that found at Sandy Cove 2.

Designation: Sandy Cove complex of Maritime Archaic Tradition.

GcBk-4: Sandy Cove 4

Several hundred yards east of GcBk-2 test pits on the 45-foot terrace front revealed the presence of quartz flakes and red ocher beneath the lichen cover. Three test squares were excavated, resulting in the recovery of a large quantity of quartz and slate chipped debris, red ocher, a hearth, and a few artifacts (Plate 27). The thick peaty soil overlying the site rests on a charred level, which in turn covers the culture-bearing ocherous sands. Thin flat rocks were found on the surface of the sand, many of them rotting or existing only as stains. An unusual feature of the site was the great quantity of weathered chipped slate, none of which bore evidence of grinding. Ocher stains were most heavily associated with the slate debris. There was very little red quartzite on the site.

The collection (Plate 75) included 12 artifacts: 2 biface fragments (one a point stem), 6 utilized flakes, and 4 battered slate pieces. The materials are not diagnostic typologically, but the lithic complex and red ocher suggest the site is another in the Sandy Cove series. Further excavation should clarify the high frequency of slate debitage which is absent from the other sites. The fact that this site was buried beneath the forest duff and not exposed may have contributed to preservation of slate which may have been destroyed in exposed sites. Even here, it was in very poor preservation. A charcoal sample was taken from a hearth and dated 2860 ± 115 B.C.

Below the site, near the beach, are the remains of cut tree stumps as large as 24 inches in diameter. Such timber growth is unknown in the area today, where the largest trees are tamaracks 6–8 inches in diameter. The stumps, probably cut about 75–100 years ago, document a period during which conditions seem to have been more favorable than the present for tree growth and forest expansion. Today the hills surrounding Sandy Cove have fossil forests on their slopes. Earlier, the forest boundary probably lay further east, near Bluff Head Cove or Rattlers Bight.

Designation: Sandy Cove complex of the Maritime Archaic Tradition.

GcBk-5: Sandy Cove 5

A site was located and tested briefly near the southeastern limit of the 45-foot terrace. It fronts on the terrace brow and is covered with tundra and stunted spruce vegetation. The raw materials used were hematite, red quartzite, quartz, and gray chert. Red ocher was common. A single quartz biface edge was found, and flakes of quartz, red quartzite, gray chert, Ramah chert, and mica were noted. The site will be fully excavated in the future.

Designation: Tentatively assigned to the Sandy Cove complex of the Maritime Archaic Tradition.

NORTH WEST BROOK

Two sites were found at the head of Pottles Bay on the 61-foot terrace north of the mouth of North West Brook (Figure 50). Both sites overlook the river mouth and have views east toward the Winter Cove-Rattlers Bight area 15 miles away, and across the bay to South West Brook and the low divide separating Pottles Bay from Rock Cove on the north shore of Groswater Bay. This pass is an important overland transportation route and is used especially during the winter by the liveyeres, some of whom used to winter at North West or South West Brook. As the elevation of the pass is below 40 feet, it would have been a water route as recently as 5000 years ago.

Pottles Bay is rich in game resources, including birds, caribou, and seal. Shellfish are prevalent, leading one to expect that walrus would have been common here also. A whale rib was found along the shore of the bay. We were unable, however, to locate a fossil whale skeleton reputed to exist somewhere on an upper raised beach of the bay. The vegetation of the western end of the bay is broken spruce forest. Formerly it was more heavily wooded; a thick though stunted forest still exists. Forest fires and wood gathering by the liveyeres have decimated the forest.

GcBk-6: North West Brook 1

Blowouts have developed at the brow of the 61-foot terrace on both the east and west sides of a gully which drains into the mouth of North West Brook from the north (Plate 28). North West Brook 1 was located just to the north of this gully. Cultural material was scattered along a distance of about 15 feet in front of the actively eroding bank, and much had already been tailed down the sandy slope toward the brook. This material was traced to its source in the bank, and a small test pit showed in situ deposit still remaining in the upper two inches of leached sandy soil below a buried horizon. The bulk of the deposit has already eroded away; however a few artifacts, a small charcoal sample, and red ocher were found.

The assemblage (Plate 76) contains five convex-based, side-notched points, a small triangular point, chert and quartz bifaces, thumb-nail and tear-drop end scrapers, blade-like flakes, and many utilized flakes. The most common raw material is red quartzite; quartz and chert were used in small amounts. The assemblage, lithic materials, and red ocher appear to relate the site to the Red Ocher site (FjCa-38) in North West River.

Designation: Coastal component of the Brinex complex.

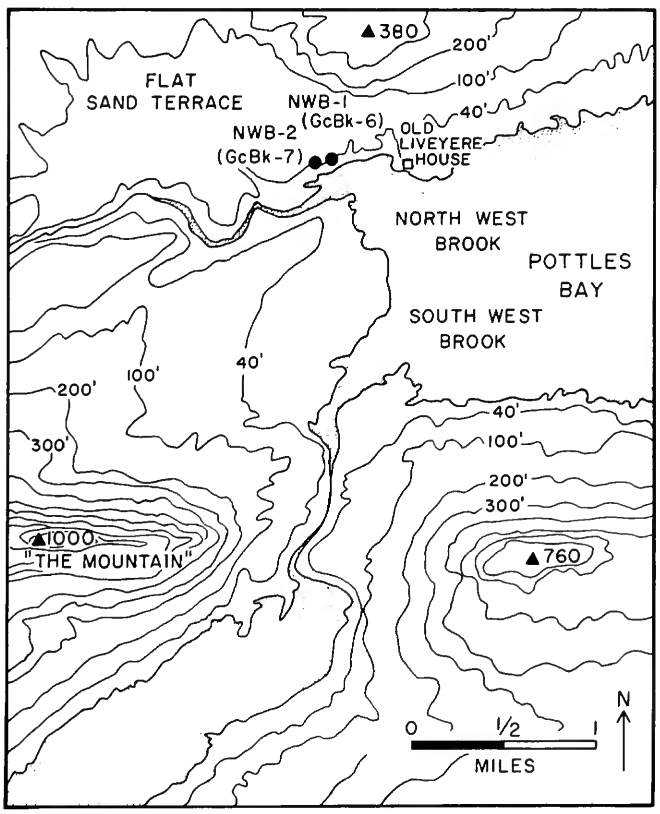


FIGURE 50.—Archeological sites at the west end of Pottles Bay, North West Brook area.

GcBk-7: North West Brook 2

On the west side of the gully there was another small site which had completely eroded from the bank and was found scattered about a shallow blowout at the front of the terrace (Plate 28). The site was not only spatially distinct from North West Brook 1, but was different in raw material and typology. The site is at the same elevation, 61 feet.

Of the seven artifacts collected five are of diagnostic types (Plate 77). Two are large-stemmed end scrapers with wide, thick working ends; two others are disk-shaped scrapers made on flat flakes; one specimen is a fragment of a round-based biface. Six of seven pieces are made from an intractable fibrous gray quartzite, unknown from other collections; the seventh is a gray cherty stone which chips poorly and has angular cleavage. The scrapers from this site are of the same types as found at the Piloski Garden site (FjCa-9).

Designation: Coastal component of the Charles complex.

BLUFF HEAD COVE

The next natural harbor east of Sandy Cove is Bluff Head Cove, which takes its name from a high rocky headland joined to the mainland by a massive sandy bridge (Plate 29) similar to the Ticoralak tombolo beach. Today the cove, which faces the east and is an undesirable area in easterly storms, is inhabited during the summer months by fishermen, and their paths and activities have increased the natural exposures which facilitate site discovery. The cove is largely barren of anything but tundra vegetation and beach grass. A few stunted spruce can be seen. In general, the area is not a protected one; nor does it appear especially rich in game. Prehistoric settlement here seems to have been light and infrequent, probably used for transient travel camps in moving by boat along the fairly rough stretch of water between Sandy Cove and Rattlers Bight.

GcBj-1: Bluff Head Cove 1

The top of the tombolo beach has been terraced at an elevation of slightly above 45 feet. Its broad expanse is covered by shallow blowouts. In the center is a European graveyard. Along the southern brow of the terrace flakes of chipped quartz were found; and adjacent to a large boulder, there was a concentration of purple chert flakes, and a few of greenish brown chert similar to that used by Dorset peoples. A tent ring was found about 15 feet east of the boulder. Here, in a test pit flakes of green and purple chert, Ramah chert, and quartz were found amidst red and green stains in the sands. These stains appear to be of ocher and rotting greenish rock slabs. No tools were found. The site probably has multiple Dorset and Maritime Archaic components.

GcBj-2: Bluff Head Cove 2

A few flakes of Ramah chert were found in the path at the southwest corner of the graveyard. The area immediately west of the path, at the brow of the slope, contained flakes of red quartzite. This material came from a buried soil profile at the junction of the second humus level with the underlying gray sand. Since occupation the site has been covered with a thin layer of wind-blown sand and a level of humus and surface vegetation. The collection consists of flakes of Ramah chert, red quartzite, and purple chert.

GcBj-3: Bluff Head Cove 3

Ten flakes of Ramah chert were found in a small blowout at the western end of the terrace near a recent campfire.

GcBj-4: Bluff Head Cove 4

Several hundred feet west of John Oliver's house is an area which has been severely disturbed by wind erosion. Blowouts pock-mark the area, which lies below the level of the upper terrace on which the other sites were found. Unlike the others, this site overlooks Bluff Head Cove rather than Groswater Bay. A small amount of cultural material was found in several of the blowouts, eroding from a buried ground surface overlain with windblown sand.

It was from this same area of small dunes and blowouts that Raymond Oliver, a local resident, in 1967 found the partly fossilized jawbone of an immature walrus. The exact location of the find could not be relocated, and its association with cultural material is undemonstrated. Its position on the beach between 30–40-feet elevation suggests it belongs in the same time span as the cultural materials.

Besides containing flakes of Ramah chert and quartz, and a few small (probably recent) mammal bones, the only finds were two small tapered stem points of Ramah chert (Plate 70*g*-*h*). Although different in some details, they resemble the small-stemmed points from Sandy Cove.

Designation: Sandy Cove complex of Maritime Archaic Tradition.

RATTLERS BIGHT-WINTER COVE AREA

Several miles east of Bluff Head the hills that rise sharply from the water open into a large cove whose western and northern margins are swampy and low and stretch across to Pottles Bay. As described earlier (page 34), Rattlers Bight and Pottles Bay once communicated across these lowlands, and the present eastern end of the mainland was part of the Smokey archipelago.

Rattlers Bight and the surrounding islands have a strategic location in terms of human geography, and they are exceedingly rich in economic resources, even to the present day. Geographically, the area around the mouth of Pottles Bay is a crossroads of navigation among numerous deep, sheltered waterways (Figure 51). To the southwest lie the less protected waters of Groswater Bay. Here, sheltered by a dense island chain from the Atlantic storms, hunting and fishing grounds extend into Pottles Bay. Alliuk Bight (which during all but the past few hundred years communicated through a narrow gut with the ocean), and east among the islands. The waterways tend to be calm throughout the summer. Winter Cove has long been the eastern limit of permanent European settlement.

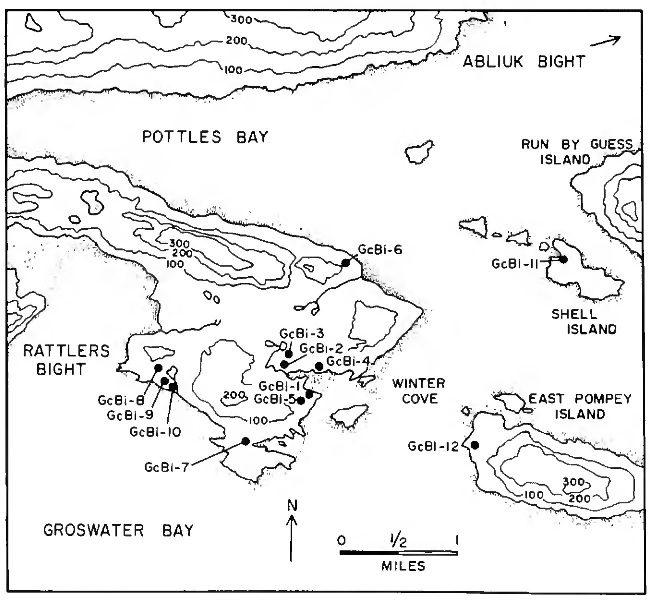


FIGURE 51.—Archeological sites in the Rattlers Bight-Winter Cove area.

Today the area is east of the forest zone. The landscape is stark, covered with tundra vegetation, with barren hills erratic-strewn above the marine limit, and with small ponds or bogs in the hollows. Economic resources include many species of marine water fowl, salmon, cod, capelin, trout, grampus, seal, black bear, caribou, fox, and arctic hare. In addition, berries and shellfish are abundant. In the past, these game were more plentiful. Walrus were present as well as polar bear. Economically and geographically the region is the most advantageous summer living place in northern Groswater Bay. No other locale embodies as many geographic advantages for hunting and fishing success. In addition, it is likely that the forest once encompassed the land as far east as Winter Cove. Rattlers Bight still has a few small stunted spruce patches that are the remnants of larger stands cut for firewood and building during the past two hundred years. Lack of firewood today is the chief reason that most liveyeres from the area have moved their winter quarters further west.

Rattlers Bight, Winter Cove, and the mouth of Pottles Bay were briefly investigated during the 1968 season and were more intensively explored the following year. Twelve sites were found and tested. Even so, much of the area still remains to be surveyed. Excavations and surveys here could profitably fill two or three more field seasons. The 1969 research only sampled the cultural diversity of the area. At present, it appears to be the most promising archeological area in Hamilton Inlet besides North West River, to which the Rattlers Bight area maritime environment is a great contrast. For this reason the many cultures with a fully or even seasonal maritime adaptation should be represented.

WINTER COVE

This small shallow cove lies on the eastern extension of the mainland south of Pottles Bay. Winter Island is in the mouth of the cove and with East Pompey Island, a mile offshore, provides storm shelters for the shallow boulder-strewn cove. The cove is about one half mile deep, with a small stream entering its western end. The surrounding land forms a basin with hills rising 200 feet to the south and west. Its northern side is particularly advantageous for settlement due to its southern exposure, and three well-developed sand terraces at 8, 25, and 42 feet, respectively. The upper terrace extends north into a flat basin filled with ponds and bogs between the hills separating it from Hound Pond and those along the southern shore of Pottles Bay. To the northwest the marshy plateau stretches across to the eastern arm of Rattlers Bight. Several hundred years ago the cove would have been more suitable for occupation than it is today, for its flat boulder and mud bottom is now so shallow that only with difficulty can boats be brought into its western end. All of the sites found are at the western end of the cove from which the water has receded. The contemporary summer inhabitants of Winter Cove live at its southwestern entrance. With slightly deeper water the cove would have been an excellent summer seal-hunting ground.

During the early historic period Ivuktoke Eskimos occupied the cove, living near the point now inhabited by the settlers. The site seems to have been used as a summer camp; no winter houses are known for the vicinity. The hillside south of the cove was used as a burial ground.

GcBi–1: Winter Cove 1

The site lies along a foot path about 100 yards west of Ralph Newell's shed on the moss-covered lower slope of the hillside. It is about 50 feet from the water at 15-foot elevation. A test square contained several artifacts, scattered charcoal, and traces of red ocher stain in a thin cultural level beneath a thin surface cover of moss, lichen, blackberry plants, and peat. There was no evidence of a stone structure visible on the surface. A charcoal sample was collected from a possible hearth in the test square.

The collection (Plate 78*a*) included a convex-base biface of white quartzite, a scraper fragment of dark chert, a biface tip of Ramah chert, and a utilized flake.

Designation: Very little can be said concerning such a small recovery; however the site elevation, biface base, and technology suggest a possible affiliation with the North West River Phase.

GcBi–2: Winter Cove 2

Across from GcBi–1 on the north shore of the cove a few flakes of Ramah chert were eroding out into a footpath leading toward the northeast arm of Rattler's Bight. A single test square was excavated in the site, which is located at the brow of the 25-foot terrace overlooking the present marshy head of the cove. During occupation the cove head would have been flooded. A small stream enters the cove to the west side of the site. Besides several artifacts and a large amount of debitage, the square contained charcoal and red ocher, and the remains of a stone feature. The cultural level spanned the lower portion of a 2–3½ inch peat horizon and the upper leached gray sands.

The collection (Plate 78*b-d*) included ten artifacts of which the most diagnostic were two basal fragments of stemmed points of Ramah-chert and a fragment of ground slate.

Designation: Rattlers Bight Phase of the Maritime Archaic Tradition.

GcBi-3: Winter Cove 3

Slightly above GcBi–2 on the upper 42-foot terrace a site was found in shallow blowouts between the front of the terrace and the southeast end of a small pond. No in situ deposit existed, and the only tool found was a utilized flake of purple chert. This was the only material used at the site; it is rarely found in coastal sites, as noted from GcBj–1 (Bluff Head Cove 1), and when found it is at high elevations.

GcBi–4: Winter Cove 4

A low terrace on an 8-foot elevation midway along the northern shore of the cove contained the remains of two distinct stone tent rings, which appeared from their low elevation to be recent, but were found to yield flakes of Ramah chert. One of the structures, about 15 feet in diameter, was partially excavated. The cultural zone lay at the base of a 3 to 4-inch peat level and on the sand and gravel below. No diagnostic tools were found. The seven specimens were undiagnostic biface fragments and utilized flakes. The raw material was Ramah chert, much of which contained iron-stained cortex surfaces common from other sites at low elevations, such as GcBi–11 (Shell Island 1) and GbBm–1 (Big Island 1). The location of the site indicates that it must be of fairly recent origin. Further excavation is intended.

Designation: Probable relationship with the Point Revenge complex.

GcBi–5: Winter Cove 5

A test pit was dug on a level, uplifted beach on the south side of the cove directly above GcBi–1. A few flakes of Ramah chert were found, but no concentrated deposit existed. Several feet to the west a circular depression in the beach may be the remains of a meat cache. The remains of a burial were noted in a rock cranny beneath a large rock outcrop just south of the site.

GcBi–6: Buxo Bank

A brief reconnaissance was conducted on a high eminence on the mainland at the southeastern entrance of Pottles Bay. The site is west of Shell Island and north of a small brook draining the ponds north of Winter Cove. Two terraces, one about 80-feet elevation, the other about 40 feet, dominate the terrain and provide ideal lookouts over this marine crossroads. In a small area on the upper terrace, flakes of red quartzite and a broken biface blank were found. The area remains incompletely explored.

RATTLERS BIGHT

Rattlers Bight is the largest cove on the north shore of Groswater Bay, opening to the north one mile west of Winter Cove. It has two arms, one of which extends northwest toward marshy lowlands and ponds; the other stretches north to Pottles Bay, from which it is separated by a narrow strip of land 10–15 feet high. Through this pass water communication with Pottles Bay existed slightly more than 2000 years ago. The eastern shore of the bight contains sheltered sandy coves. Reconnaissance of these regions included only the southeastern portions of the bight, where four prehistoric sites were located near the Rattlers Bight fishing settlement and in the Hound Pond area.

GcBi–7: Rattlers Bight 1

The summer fishing hamlet of Rattlers Bight lies in a small cove at the southeastern edge of the inlet. Behind the settlement a sandy tombolo beach rises gently to a maximum elevation of 22 feet and then drops precipitously to 10 feet in two relic coves facing East Pompey Island. The sea has now receded eastward from these coves. The tombolo formed as a connecting bar between the mainland, which rises to 100 feet north of the beach, and a small island to the south. Water action terraced the bar, and surf carved its eastern coves, producing a broad flat expanse 500 feet long and about the same distance wide. The eastern side of the terrace is sandy and well drained with tundra vegetation and dwarf birch interspersed with a few shallow blowouts. To the east it drops into the coves; westward, the land becomes marshy with peat bogs and small ponds, and gradually slopes toward Rattlers Bight.

The terrace contains the remnants of the largest prehistoric site found in Hamilton Inlet (Plates 30, 31). The site, which was tested with 22 squares, extends along the eastern edge of the terrace bordering the relic coves. Excavations produced cultural material in considerable quantity throughout the 500-foot length of the terrace (Figures 52, 53). The western limit was not determined, but probably lies along the edge of the marshy ground.

This site setting has many advantages. Its location near the mouth of the bight affords it a strategic

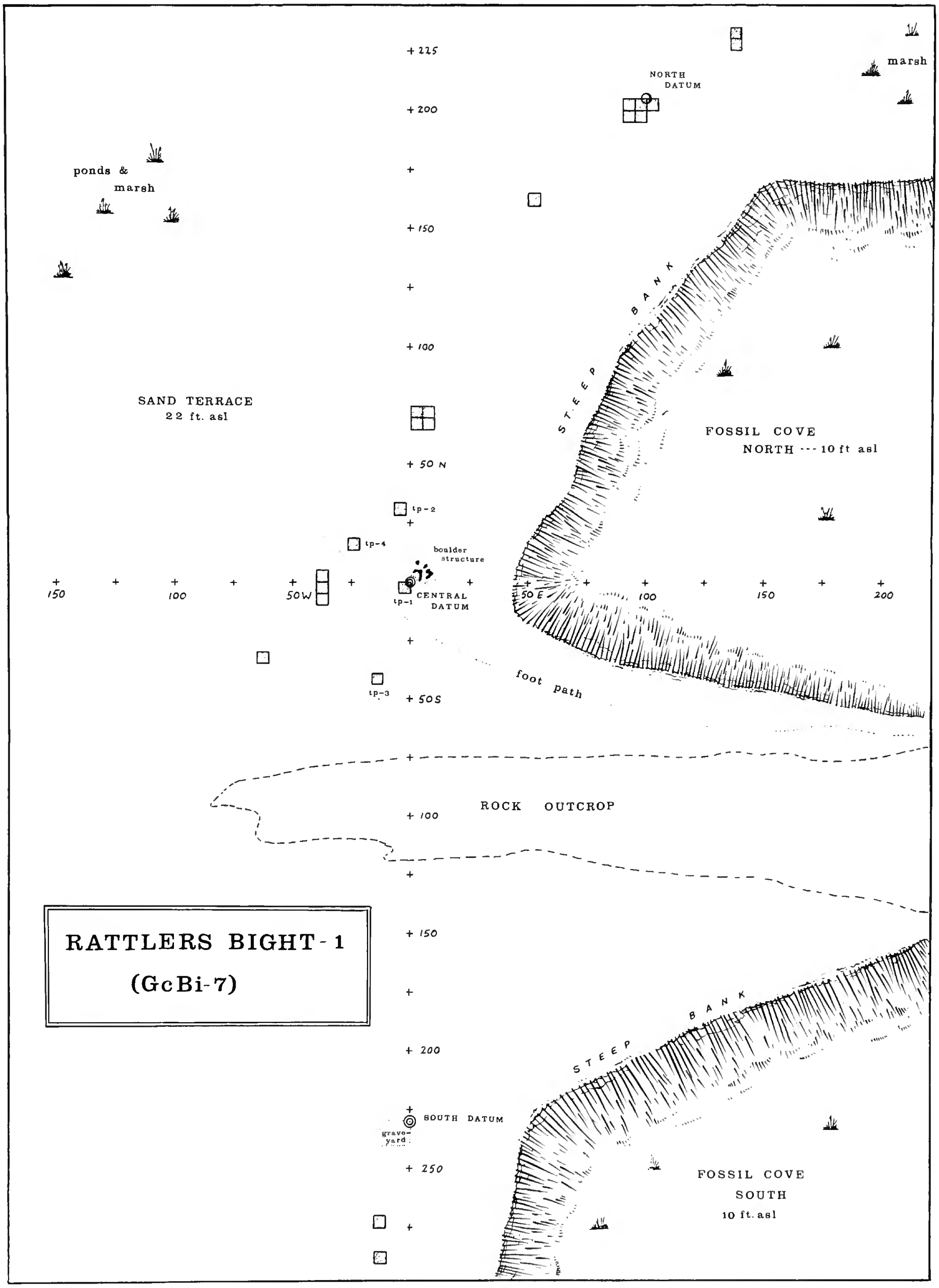


FIGURE 52.—Rattlers Bight 1 (GcBi-7).

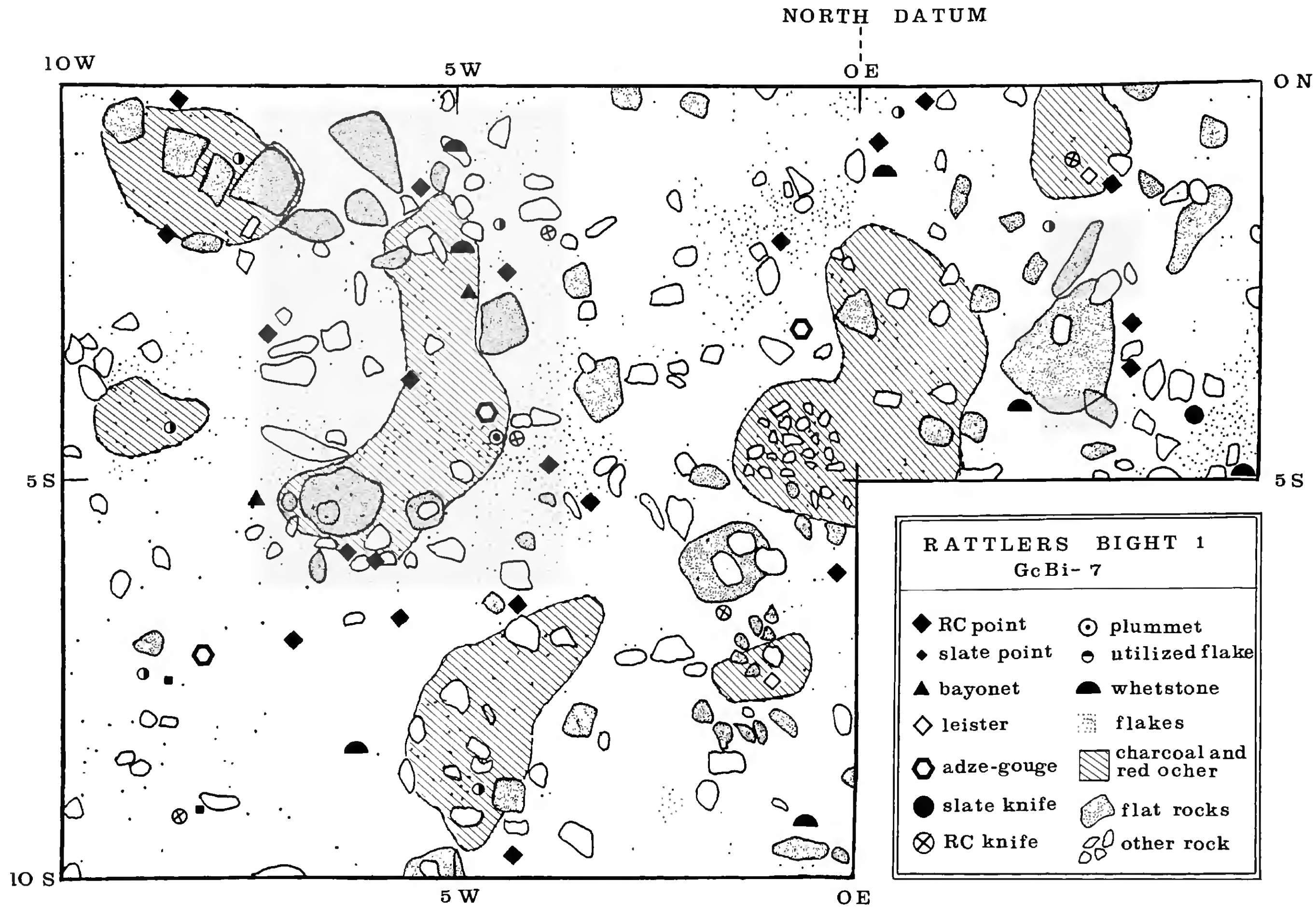


FIGURE 53.—Rattlers Bight 1, north datum excavation (GcBi-7).

position for viewing a wide expanse of marine hunting grounds. The hill north of the site is an ideal lookout with views east to the islands and west toward Bluff Head Cove. The site is protected by the hill from northerly storms. Its prime advantage, however, seems to have been its harbors. The two deep coves on its eastern side, and the broad beach on the west always provided at least one protected beach for boat launching which was so important in the summer marine economy of these people.

The Rattlers Bight site has been disturbed only slightly by natural and contemporary activity. Its several shallow blowouts are small, and evidence of former blowouts, now stabilized, is scarce. Several children's graves lie along the edge of the southern cove. The only surface evidence of a site is a low boulder ring in the center of the beach, and a few scattered flakes of Ramah chert in the blowouts.

Except in the few areas of blowout the cultural deposit is intact. It is covered with a thin vegetation and humus layer varying between 1–2 inches thick. Below this the culture zone extends into the upper leached sands. In the southern and central areas this level is between 2–5 inches thick; in the northern areas tests indicate a deposit as deep as 20 inches (Plate 32). Throughout this zone in all parts of the site were found artifacts, chipping debris, red ocher, and great quantities of charcoal. Calcined faunal remains are present in small quantity.

Preliminary test pits in the site showed evidence of stone structures, features, and different activity areas. Artifacts included a wide variety of domestic debris from food bone to charcoal, ocher, and lithic debris—predominantly Ramah chert and slate flakes. The artifacts recovered, 273 in number and in a 198:74 ratio of chipped to ground tools, include several major classes. Stemmed bifacial and unifacial points dominate the chipped stone assemblage and range from 10–115 mm in length; flake tools complete the remainder of the chipped industry. The ground-slate inventory is more variable, including such classes as stemmed points and knives, bayonets, scrapers, adzes, and gouges. Plummets of carved soapstone and other materials are found. Whetstones and mauls are common. The bone industry, poorly preserved, is at present represented by only one specimen —a barbed leister.

The site is distinguished by its large size and rich deposit of occupation debris. No graves have been found, though it seems likely they exist in the site. The assemblage (Plates 79, 80) is closely related to the Maritime Archaic in Newfoundland and has similarity to the Moorehead complex of the northern New England coast. It is significant in being the first major occupation site of this tradition to be located. Previously only burial stations have been found, and little knowledge of domestic activities exists. Future excavation of the site will provide important information on the day-to-day life in a summer site within the maritime zone. Its physical layout and the fact that it could have been used for a lengthy period suggests that there may be a fairly extensive period of occupation. The site would not have become useless until the sea dropped below the 10-foot contour, drying up the eastern coves.

Designation: Rattlers Bight 1 is the type site for the Rattlers Bight Phase of the Maritime Archaic Tradition.

HOUND POND

One-half mile north of Rattlers Bight 1 is an uplifted basin partially enclosed by hills to the north and east and with rocky outcrops between the basin and the water. The westeren end of the basin has a protected cove, and another exists several hundred yards to the northwest. The basin today contains a small shallow pond, called Hound Pond after a sea bird which nests in shallow holes in the tundra and is often found in the vicinity. During higher sea levels the basin, then emerged, would have had several sheltered coves as well as a permanent freshwater source, and an unobstructed view of the bight. The vegetation today is tundra with a few stunted spruce clumps. Thick peat deposits found in the central areas surrounding the pond indicate that vegetation, including a larger growth of spruce, was once present. In some areas vegetation cover has been disturbed and the past deposits have been exposed to erosion by blowout.

GcBi–8: Hound Pond 1

Hound Pond 1 lies 50 yards northwest of the pond on the northern side of the basin, 34 feet above sea level. A sheer rock wall rises behind the site, in which three test squares were dug. The stratigraphy is confused and presents a problem of interpretation since two cultural components may be represented. In square 1 an upper peat level 2–3 inches thick contained flakes of beach and pink-purple quartzite. Below the peat was a thin sterile deposit of sand, beneath which was a level of silt and clay containing flakes of Ramah chert but no trace of quartzite. In most other areas of the excavation this picture faded and the sterile zone lensed out, mixing the two deposits, although it appeared that while Ramah chert flakes were frequently found in the upper part of the peat, the quartzite flakes were rarely found in the lower levels. No artifacts were found in the isolated levels. It would seem that vertical mixing in the site has resulted from vegetation disturbance, such as tree-throw and blowout. While vertical mixing may have occurred, spatial relationships seem more intact, since concentrations of flakes of different materials tended to cluster tightly.

The collections (Plate 78*e-h*) are not extensive or diagnostic enough to support or disclaim the ambiguous evidence of stratigraphy. Only one point was found—a small one of beach quartzite with a triangular blade and wide parallel-sided stem. The point does not resemble any others found in Groswater Bay, and is very different from the stemmed points of the Sandy Cove and Rattlers Bight 1 sites. Its closest relationship is with points from the David Michelin site (FjCa–19, Plate 45) in North West River. Otherwise the collection consists of point tips and utilized flakes, including a large flake knife of quartzite on a cortex flake. The utilized flakes of quartzite tend to be quite large while those of Ramah chert are small, suggesting a possible distinction between two components on this basis. In addition, the quartzite flakes include a large number of biface thinning flakes absent from the Ramah chert debitage. Further excavation at this site should clarify these problems. Tentatively, however, it seems that a Ramah chert component was followed by one of local materials with possible affiliation with an intermediate period site of the North West River sequence.

Designation: Relationship to the David Michelin complex is suggested for the larger quartzite component; the earlier Ramah chert component is unassigned.

GcBi–9: Hound Pond 2

Southwest of the pond at the rim of the basin another site was discovered. It is located between two rock outcrops west of the brook draining the pond. A sheltered cove probably existed between the rock ridges at the time of occupation. The site lies at 31 feet above sea level. The cultural deposit was in the lower part of the peat level which extended 2–4 inches beneath the tundra vegetation. Cultural material was found also in the upper two inches of sand underlying the peat. A partial ring of stones on the peat-sand junction is probably the remains of a structure. No hearth was found, but the deposit contained large amounts of charcoal and fragments of burnt bone, in addition to red ocher and mica. Three squares were excavated.

The collection (Plate 81) included a small sample of tools of types similar to those found at Rattlers Bight 1. Several varieties of stemmed points of Ramah chert, a micropoint, slate-adze fragments, and a shoulder portion of a stemmed slate point are the most diagnostic pieces. The higher elevation of the site may indicate an earlier date than the Rattlers Bight 1 site.

Designation: Rattlers Bight Phase of the Maritime Archaic Tradition.

GcBi-10: Hound Pond 3

Several flakes of Ramah chert were found in a test pit on the raised beach series 75 yards south of Hound Pond 2. The site is about 20–25 feet above sea level. The only artifact found was a utilized flake.

SHELL ISLAND

GcBi-11: Shell Island 1

East of Winter cove in the mouth of Pottles Bay is a small chain of islands of which Shell Island is the largest (Figure 51). Several decades ago its southern end was mined for mussel-shell deposits which lie several feet thick, and much of the heavy machinery used was abandoned on the site. The northern end of the island has a cove sheltered by small islands and a broad raised beach between two parallel rock ridges. The upper part of the beach is exposed in shallow blowouts; its lower portions are blanketed with tundra vegetation. In the southeastern corner of the cove a site was discovered 14 feet above sea level, which consisted of a circle of rocks partially buried in the turf. Six squares were excavated (Plate 33). It was discovered that the tent ring belonged to a recent occupation, probably within the past hundred years, for which cultural materials included banded cream ware, square nails, and a bent wire can opener key, the latter dating from the latter part of the 19th century. These were found in the upper 2–4 inches of peat. Below this level, and in most areas separated from it by a sterile zone, the peat deposit extended 16–20 inches deeper to a basement of large cobbles and boulders. There was no sandy soil. The prehistoric occupation in the lower part of the deposit included a prodigious amount of chipped and frost-fractured flaking debris, charcoal, and few artifacts; none were diagnostic, consisting only of biface tips and utilized flakes. No ocher was noted. The site appears to have been used as a primarily manufacturing site for biface blanks, inferred from the large quantity of biface blank thinning flakes with high-striking platform angles.

There is a strong likelihood that a Dorset component exists at the site. Several flakes of brown chert, similar to that used (apparently exclusively) by Dorset peoples were found, in addition to a portion of a ground tool of tan slate with two beveled edges and a medial ridge. Such a piece could be found in an assemblage like Rattlers Bight 1; however, the presence of brown chert suggests that a Dorset relationship is most probable.

Designation: Site elevation, raw material, and technology suggest the major prehistoric component probably belongs to the Point Revenge complex; minor components of Groswater Dorset and historic periods are also present.

EAST POMPEY ISLAND

GcBi-12: East Pompey Island 1

East Pompey Island lies a mile south of Winter Cove and Shell Island. A brief reconnaissance was conducted at the northern end of the island, where two rocky coves face Winter Cove and Groswater Bay, respectively. The western cove has an uplifted arm which extends through to the southwestern side of the island. This cove contains a large exposed boulder field in which the remains of three food cache pits were found, all without evidence of cultural affiliation. The elevation of the beaches is above 20 feet. At other sites in Groswater Bay similar structures have been associated with Dorset occupations.

In fact, a Dorset site which was adjacent to a small pond (Plate 34) was found on the plateau, which separates the western and northern coves. Two areas were excavated partially. Ten squares were dug in area 1 (Plate 35), which lay at the brow of the hillside north of the pond, 28 feet above sea level. The greatest amount of remains were found here in a thin deposit overlying a rocky pavement. A second excavation, area 2, was made southwest of the pond at 25 feet above sea level. Fewer tools came from this area, however; the peat deposit was deeper (6–17 inches) with artifacts located in the lower several inches of peat and on the surface of the sandy gravel below. The deposit contained large amounts of wood charcoal, with the grain intact and from logs originally more than 2 inches in diameter. The quantity of charcoal and woody material suggests a former extension of the forest into this area. Besides artifacts and charcoal, red ocher was found in the cultural deposit in both areas 1 and 2. The two sites seem to have been occupied at the same time despite their difference in elevation. The tip of a notched knife recovered from area 2 fit a base found in area 1.

The assemblage from this site (Plates 82, 83) gives a fair representation of the local Dorset variant. Raw materials used were largely brown-green-tan opaque cherts with small amounts of slate, Ramah chert, and quartz crystal. Typical artifacts include: two variants of plano-convex side-notched, square-based points; corner-notched and leaf-shaped bifacial knives; small single side-notched bifacial knives; bifacial side blades; end scrapers with graving spurs; chipped and ground gravers, and utilized graver spalls. The microblade industry is important, with end-hafted stemmed and notched blades commonly used as knives. The ground slate tradition is of lesser importance, including only triangular end scrapers with beveled working edges and adze fragments. This collection increases the small samples from Ticoralak Island and lends significance to the distinctiveness of Groswater Dorset in comparison to Newfoundland Dorset.

Designation: The East Pompey Island site is one of the major defining components of the Groswater Dorset phase and dates 570 ± 160 B.C.

Byron Bay

A reconnaissance was made of the coast facing the Labrador Sea northwest of the Smokey Archipelago. This is a large area exposed to the ocean storms and swell, and very little protection is afforded the waterborne traveler. Near Holton the shore is low with small scattered islands and offshore shoals over which boats may pass without realizing their danger until a swell rises on the submerged rocks, dashing the placid surface in foam and spray. Coastal Labrador has many such dangers, noted by W. B. Cabot (1920) with the adumbration, "Beware of low swells in shoal water on a falling tide."

Beyond Holton the water is deep and navigation safer, but landing spots are few. The coast is a series of broad sandy bays separated by rocky headlands. Usually a stream or river enters the cove through a sandy beach, behind which there exists a protected deepwater lagoon. These provide safe anchorage once attained, but even on calm days the Atlantic swell may break continuously at the mouth of the lagoon, making landing or exit impossible.

The vegetation of the headlands and hillsides is composed of tundra species. Coves have shifting dune fields along their shores, and behind, thick, but stunted spruce forests extend up the stream valleys until at an elevation of several hundred feet forest gives way to tundra. The uplands are excellent winter caribou hunting grounds; in summer the most important resources are fish and birds, both present in quality. North of Holton there is today no permanent occupation on the coast. During the last century, "stationer" fishermen from Newfoundland used to maintain summer fishing camps here, but the only permanent occupation seems to have been a few hardy Eskimo families who have now moved into Hamilton Inlet. Our guide, Charlie Tooktoshina, and his brother Steve are the last of these people with firsthand knowledge of the region.

The Byron Bay area was only briefly surveyed, and many more sites could probably be found, especially on the headlands and near the river mouths. For geographic and environmental reasons, however, the region does not appear to have been heavily occupied in comparison to Hamilton Inlet.

GdBj-1: Halfway Brook 1

A single projectile point was found in a blowout one-half mile up the stream locally called "Halfway Brook." The brook drains into a cove one mile east of Cape Rouge. No other cultural material was found. The specimen (Plate 84*a*) is a convex-base stemmed point of Ramah chert.

Designation: Probably Rattlers Bight Phase of the Maritime Archaic Tradition.

GdBj-2: Tinker Cove

Two miles east of Cape Rouge, a point with low offshore islands provides one of the few sheltered anchorages in the area. The point is backed by low beach ridges, behind which there is a small pond. Seven sod house foundations were found on the point 10–15 feet above sea level. The sod wall remnants were between 1–2 feet high and formed a rectangle with a door on one side and often a stone hearth structure inside. The houses were separate and scattered in random fashion wherever a level stretch of ground was found. None had entrance tunnels. These houses, according to Charlie Tooktoshina, were spring and summer dwellings used by Newfoundland fishermen about 50 years ago. No excavation was attempted.

RED ROCK POINT

Michael River on this part of the coast drains Lake Michael and discharges into a large sandy cove just north of Byron Bay. The river valley is thickly bushed with spruce along its bed; above it is a series of large sand terraces. The river empties into a lagoon with a narrow outlet through a barrier beach into the bay. Surveys up the river were hampered by lack of time and thick forest cover. Most of the sites that once existed on the sand terrace overlooking the lagoon have long since eroded away. Salmon and trout fishing is excellent. Exploration on Red Rock Point resulted in finding several sites.

GeBk–1: Red Rock Point 1

Red Rock Point is an area of small ponds, marsh, scattered spruce growth, and tundra. Ducks are plentiful in the ponds and marshes. A site was discovered around the margins of one of these ponds. Flakes of red quartzite, Ramah chert, quartz, and common quartzite were found, as well as the base of a lavender chert biface blank (Plate 84*b*) and a utilized flake. The site elevation is estimated between 20–25 feet. No excavation was attempted. The lithic complex suggests the site is early, perhaps related to Sandy Cove or upper North West River sites.

GeBk–2: Red Rock Point 2

A small Dorset site was found about a half mile east of GeBk–1 on the raised beaches of a small northward facing cove (Plate 36). The walls of the cove are narrow, its beach, protected. The site location is at the top of the beach, backed by a rock rim, and boat landings could be made from either Byron or Michael bays. During the time of occupation the site would have been on an island with the low duck ponds of today submerged. The site was most likely a hunting station on the rocky headland islands, with low shoals and rocks protruding from the area between this site and GeBk–1. The area would have been ideal for seal hunting.

The site is 31 feet above sea level and lies amidst an area of rocky blowouts. The soil deposit, where present, is only 1–2 inches thick, and the cultural material was found within this zone and on the surface of the sandy gravel below. A charcoal sample was taken from a hearth in the culture level. No evidence of a structure was noted in the six squares excavated.

The artifact sample is small and probably includes most of the material left behind during the site's brief occupation (Plate 84*d-l*). Only a few tool classes are represented: a side-notched bifacial knife, burin-like tools, fragments of a core, a ground slate celt or knife, and several blades. The sample is too small to allow adequate comparison with the Groswater Bay sites; its burin-like tools are more completely ground, and perhaps chronologically later than those from Pompey and Ticoralak islands; but otherwise the collection is similar.

Designation: Late Groswater Dorset Phase.

GeBk–3: Red Rock Point 3

A blowout between GeBk–1 and the southeastern end of Michael Bay contained a bifacial knife made of poor quality chert. A hearth was eroding out of the wall of the blowout, with charcoal in situ, but no flakes were found in the deposit. Association with the artifact therefore could not be determined. The tool —a blank with its tip prepared as a knife (Plate 84*c*) —is too generalized to permit speculation of cultural relationship.

NORTH WEST RIVER ANALYSIS

Methods

The bulk of archeological data from Hamilton Inlet comes from the North West River region in western Lake Melville or from the Narrows and Groswater Bay at the inlet. These two groups of data are best treated as separate sets for which cultural sequences should be determined individually. Not only are the regions environmentally and ecologically distinct, but they also have been culturally separate at times in the past, and are so today. A more practical reason for analyzing them separately is that several of the dating methods employed in sequence building lose their validity if extended too far beyond a particular geographic locus. Of the two sequences the North West River one is presented first since it represents a more complete archeological record and since all of the data comes from the immediate environs of the settlement itself. Here many of the variables used in the dating methods are more tightly controlled than in Groswater Bay. The discussion is broken down into the explication of method, the dating of the sites, the integration of cultural units, and the sequence presentation.

Before proceeding, several problems concerning the nature of the data should be considered. The basic nomadic pattern of occupation in this area resulted in sites being used for brief time intervals, and many camps appear to have been used only for a few days. The small samples from these sites do not give a representative view of material culture, for frequently only a few tools are found, and often the range and variation of those present cannot be determined. Consequently, sites appearing to be culturally distinct may in fact be functionally distinct components of a single culture. Furthermore, preservation is poor. Only lithic remains survive in the forest podsols for more than a century, reducing still more the range of culture visible to the archeologist.

Dating sites from internal evidence is another problem, for in the forest zone, radiocarbon samples are frequently contaminated by forest fires. Charcoal samples are therefore unreliable unless found within a hearth. Bone samples are more reliable, but are not often preserved. Finally, cultural stratigraphy is a rare occurrence in this area and an infrequent aid in dating. The geography of the land has changed constantly during emergence, and locations used in one period are usually abandoned for stations closer to the lower beaches at a later time.

These problems are not without their beneficial aspects. The small size of most campsites and their shifting nature provide the archeologist with single component sites of high integrity which are, in fact, very similar to burials. They are the ideal material with which to determine sequences. The primary task in dating sites and integrating them into cultural units, then, becomes one of piecing together small site units into larger ones, and dating them by using a conjunctive method including radiocarbon, association, internal and external typological relationships, lithic raw material complexes, and relative elevation. The problems with sample preservation and contamination, and external relationships are such that the only technique which can be used consistently for all sites is relative dating by elevation. This provides the basic framework for chronology. The use of several concurrent lines of evidence provides cross-checks which increase the reliability of the method. Each method is discussed in general below.

TERRACE AND BEACH LEVEL CHRONOLOGY

In Hamilton Inlet, dating by relative elevation is based on the fact of postglacial land emergence. The timetable for emergence in Hamilton Inlet has been discussed previously (see pages 24–34). As the land emerged there were topographically controlled changes in geography. Coves developed and disappeared; river mouths became constricted; shores shoaled; islands emerged; and terraces and beaches formed. Man's choice of settlement locations reflected his adaptation to these changing conditions in terms of requirements for protection, travel, and economic resources.

The primary assumption involved in dating by relative elevation is that sites were located at or not far removed from active beaches. As land rose, sites were continuously chosen at lower, more accessible locations. The resultant hypothesis states that older sites will be restricted to higher elevations; conversely, low sites will be of recent date.

The "age-elevation hypothesis," however, must be employed with care. It does not imply a standard correlation, and a variety of cultural, geographical, and geological principles and conditions must be evaluated in each instance of its application.

First of all, it is notoriously difficult to establish without question that a site actually was located at shore-side. Sites are rarely found actually on an active beach, and in a situation of continuous uplift empirical criteria, such as water-rolled artifacts, are not found. Rather, it appears that the use of ethnographic analogy provides a more useful avenue for investigating the validity of the assumption. Here the evidence from the many Indian and Eskimo ethnographic sites visited during the course of the survey points strongly toward association with active beaches. This is particularly true for summer sites, which are almost invariably found only a foot or two above the storm tide line. Where sites were situated on terraces or banks above the water they were always on the terrace closest to the water. Analysis of the terrain and the season of occupation of a site usually makes it possible to identify sites which do not conform to the basic pattern, usually for reasons of protection or lookout functions. The overriding importance of water transportation in the economy seems to explain the preference for shore-side living quarters.

Ethnographic analogy therefore suggests that the age-elevation correlation has a statistical reality. Clearly, the larger the number of related sites found at a given elevation the more reasonable is their association with an active beach immediately below. Secondly, it is realized that this dating method, while restricting old sites to high elevations, does not limit the younger ones from occupation in the same areas; it merely suggests that these sites will be fewer on the average than the shore-side locations.

Several other considerations must be kept in mind. The ideal topography for relative dating would be one in which sites are found on a gently sloping beach, where a small amount of uplift results in a large lateral displacement of sites from their original shore-side locations. A remarkable example of this "horizontal stratigraphy" is seen in the Cape Krusenstern sites (Giddings 1966). Alternatively, where vertical displacement is high and only terraces are found, elevations may be reliable indicators of relative age. However, in an area such as North West River, terraces and raised beaches intermingle, making strict correlation by elevation impossible. In this case, geomorphological conditions of a site must first be analyzed before dating by elevation is employed.

Obviously, in terraced areas, sites must be placed on the terrace top, not on the bank itself. Several hundred yards away the terrace may grade into a series of raised beaches on a slope. Here sites contemporaneous with those on the terrace may be found at slightly lower elevations. Terrace sites may therefore appear to be older when viewed strictly in terms of elevation, while actually being younger than beach slope sites of lower elevations.

These various considerations necessitate the use of as large a site sample as possible in chronological ordering by elevation. The significant fact for a site or group of related sites is the lowest terrace or beach elevation on which any of these is found. By seriating minimum elevations and by restricting the analysis to regions where conditions of uplift have acted similarly on all sites considered, a fairly reliable sequence can be established. Used judiciously, the age-elevation hypothesis can serve as a primary model in the formulation of a relative chronology, which may then be tested in terms of other methods, including radiocarbon and typological dating from external regions, and internal data such as typological relationships between groups of sites, utilization patterns of raw material, and technology.

TYPOLOGICAL DATING

Two types of typological dating are utilized. The first, that of external typological parallels, is of limited use, especially for the interior archeology, since the prehistory of the eastern boreal forest is almost totally unknown. Some similar tool forms can be spotted in the literature; however they have rarely been described in sufficient detail to be of use, and few complexes exist. Furthermore, radiocarbon or even relative dating of these tools and complexes is generally absent.

The second use of typology is for the internal ordering of sites within the regional sequences. Although samples are small from most sites it is sometimes possible to relate a group of sites on the basis of similar tool types. This group, or complex, then becomes a sequence unit within the regional chronology, and is dated by whatever means is available.

RAW MATERIALS AND TECHNOLOGY

The choice of raw materials in stone toolmaking is not a random procedure; it reflects cultural ideals as to what constitutes both ideal and acceptable substitutes in manufacture. Some cultures have utilized only one type of material, others employ a wide range of materials each chosen specifically for its individual flaking, hardness, or textural qualities. Cultural patterning is as evident here as in tool typology. Very often, functional qualities of a given material appear to be less important than tradition and custom, and a material which, to all appearances, is a poor one for stone tools (such as coarse grained quartzite) may be consistently chosen even though functionally more suitable materials could have been found. On the other hand, when an exotic material is considered the ideal and is not locally available, assemblage variability in lithic materials may be the result of a descending rank of preferences for acceptable substitutes. In general, the farther a site is from a source, the more variable the lithic complex, particularly if the site was occupied for more than a short period. It would therefore seem that analysis of the raw material of an assemblage can provide a means of investigating cultural behavior beyond the technological field.

Raw materials and technological processes can be used as a subsidiary method of dating within a regional sequence. Within Hamilton Inlet definite patterns of usage recur in widely separated sites of the same cultural group or tradition. Cherts are not readily available and the raw material selected by different groups often indicates trade and seasonal movements to different areas in which these materials are found. The fact that through time the raw material complexes of different groups changes significantly may be a measure of cultural discontinuity.

Technology can be used in a similar fashion. Flaking techniques as revealed both in artifact manufacture and waste flake typology give indications of standard patterns which are culture-specified. Using the evidence of raw materials and technology it is frequently possible to identify cultures solely from the waste debris at a site. In an area where artifact samples are small this information can be a valuable addition in understanding settlement patterns and culture area boundaries. Within blowout sites on the coast different components of an exposed site may be identified provisionally on this basis, and the presence of a few flakes of a certain material may indicate a site of a specific period in the vicinity. Generally archeologists have tended to ignore lithic waste, even to the point of not collecting it for analysis. This is unfortunate, since it can be a useful source of data, both for tools not recognized as such in the field, and often as the only possible means of reconstructing technological processes, ones which may be as culturally diagnostic as the tools themselves. To date, this type of analysis has only been conducted on core and blade industries. It could equally well be applied to other tools.

Chronology

GEOLOGY AND TERRACE CORRELATION

In order to establish a relative chronology for North West River an analysis of the local geological conditions was made. In particular, it was necessary to measure the various terrace series that exist at the upper end of the river to determine whether they conformed to a single terrace sequence with horizontally concordant elevations, even though individual terraces might be laterally discontinuous. The results of the geological study give a remarkably clear picture of the history of terrace formation in the area.

Terrace elevation data was gathered by running traverses perpendicular from the shore to the highest formation, beginning at the western end of the settlement on Little Lake and proceeding toward the eastern, Lake Melville side. Profiles of two of the traverses—one beginning at shore-side below Stuart Michelin's house and running 030 degrees (magnetic) to the upper Brinex terrace, and another from the BRINEX dock 070 degrees to the upper terrace—are displayed as Figure 54. The results of the entire series is given in Table E.

The highest terraces are found at the western end of the settlement. The John Montague series includes only one terrace, at 80 feet, below which a series of

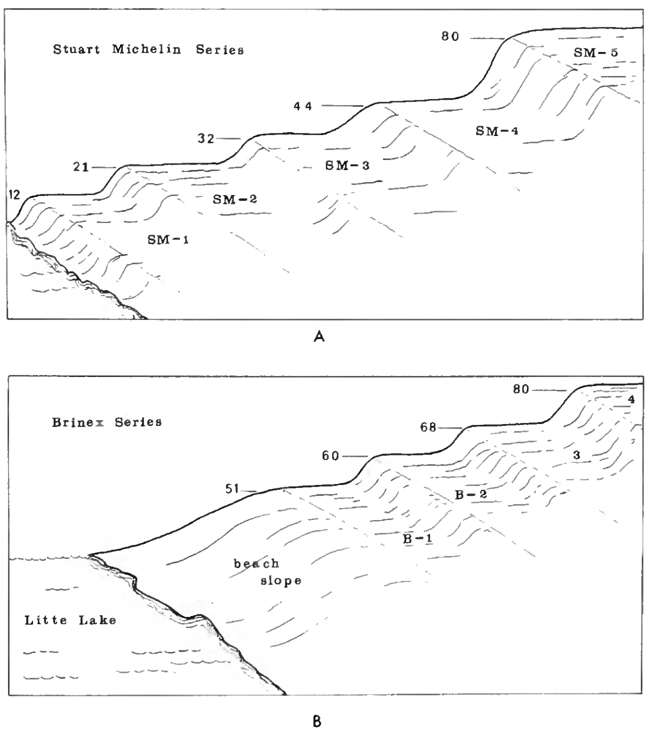


FIGURE 54.—North West River terrace profiles. A, Stuart Michelin Series; B, Brinex Series.

TABLE E.—*Measured terraces at North West River*

Terrace Designation [1]	*Elevation* (feet)	*Lateral Throw* (feet)	*Sites* (FjCa–)[2]
SM–1 (Stuart Michelin house)	12	20	28
SM–2 (Selby Michelin house)	21–28	75	18
SM–3 (Michelin Trailer)	32–35	130	16
SM–4 (Selby Michelin)	44	120	17
SM–5 (Brinex terrace=B–4)	80	extensive	10,38
B–1 (Piloski Garden Site)	51	20	9
B–2 (Radio Shack)	60	25	1,12
B–3 (Cookery and Dining Hall)	68	100	3,4,33
B–4 (Water Tank=SM–5)	80	extensive	10,38
HB–1 (Henry Blake storehouse).	10	30	
HB–2	23	75	20
HB–3 (Henry Blake house)	28	extensive	19,21,22,23
HB–4 (opposite road from HB)	35	extensive	17
SB–1 (Sid Blake store shed)	10	50	
SB–2 (Sid Blake house)	25	extensive	24,25,27
JM–1 (Red Ocher Site)	78	extensive	38

[1] Terrace series: B, Brinex; HB, Henry Blake; JM, John Montague; SB, Sid Blake; SM Stuart Michelin.
[2] Only sites found on the terraces listed are included.

raised beaches slopes to the water. The Brinex series includes a number of terraces at high elevations (80, 68, 60, 51 feet) with a beach slope at lower elevations. The Stuart Michelin series includes the upper Brinex terrace and a terrace sequence at lower elevations (12, 21, 32, 44 feet). The Henry and Sid Blake series includes terraces only at low elevations (10, 23, 28, 35; 10, 25 feet). East of this the land is low, consisting of redeposited moraine sands.

Terrace formation in the North West River area would seem to have been a highly discontinuous process resulting from a variety of forces (primarily wind, current, and tide) acting simultaneously in different ways on different sections of the moraine. In general, the processes involved (1) topographic modification resulting from riverine erosion (terrace cutting) from the upper portions of the western side of the moraine, and (2) redeposition of these materials in lateral deposits along the north shore of North West River east of Hudson's Bay Company. The process is still occurring today, and is lengthening the North West River gut toward Lake Melville.

It is evident from the measurements that the history of terrace formation began along the western margins of the moraine. The presence of marine shells dated at 0335 ± 170 B.P. at the 108-foot elevation across the river suggests that the formation of the highest 80-foot Brinex terrace probably occurred about 3500–4000 years ago. As the moraine rose, terrace formation began to shift eastward, first creating the high terraces

TABLE F.—*North West River terrace correlation*[1]

Elevation (feet)	*JM*	*B*	*SM*	*HB*	*SB*	*Identical geological formation*
78–80	JM–1	B–4	SM–5			*
68	JM–bs[2]	B–3				
60		B–2				
51		B–1				
44			SM–4			
32–35			SM–3	HB–4		*
25–28			SM–bs	HB–3	SB–2	*
23				HB–2		
12			SM–1			
10				HB–1	SB–1	*

[1] Terrace series arranged west to east: JM, John Montague; B, Brinex; SM, Stuart Michelin; HB, Henry Blake; SB, Sid Blake.
[2] bs, beach slope.

in the Brinex series (51–80 feet), and gradually shifting further east forming the Stuart Michelin series (12–40 feet), the Henry Blake series (10–35 feet), the Sid Blake series (10–25 feet), and finally, the lower terraces and beaches of the eastern part of the settlement (Table F). As the axis of cutting shifted eastward through a given location, such as the Brinex series, terrace formation ceased and forces creating a gradual beach slope took over. This process occurred early in the John Montague series, and last in the Hudson's Bay Company area.

Geological processes resulting in terrace formation may have been a strong determinant of prehistoric settlement pattern shifts in the North West River area. In fact, one would suggest that prehistoric settlement shifts should parallel geological history. According to this hypothesis the first sites should be found on the upper terraces on the western side of the moraine. Subsequent settlement should shift to lower, more easterly terraces as these were cut and uplifted. This proposed sequence was tested with archeological data.

SITE SERIATION BY ELEVATION

Table G presents the North West River sites according to elevation above high water. These results confirm the hypothesis, based on geology and proposed association of sites with shore-side occupations, that early sites should be found on the upper terraces and that later sites should move from west to east at progressively lower elevations as these terraces emerged and were cut. This settlement shift is clearly seen in the lack of sites with low elevations from the western part of the area, where terrace formation was early, and the lack of early sites from high elevations on the eastern sequences. The results indicate that the use of a working model based on uplift and geology is justified by archeological data.

RAW MATERIALS COMPLEX AND ELEVATION CORRELATION

Sites related to the same culture tend to have similar patterns of raw material usage, especially when investigated in a small geographic area. It is therefore possible to organize sites by grouping them according to raw material complexes, and expect that these units may have a cultural relationship. Alone, the technique would not distinguish between homologous units which were culturally distinct; however, when used in conjunction with other methods it provides a useful line of evidence.

The lithic components of sites is given in Table H. Five different lithic complexes are evident. These complexes are distinguished on the basis of the frequency of raw material types within each site collection, including artifacts and debitage. Material abbreviations used below are as follows: chert (C), white quartzite (WQ), red quartzite (RQ), quartz (Q), Ramah chert (RC), banded lava (BL). The materials are listed in descending order of frequency. Only sites with reasonably large samples have been used.

Quartz-Quartzite-Chert Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Red Ocher	FjCa–38	WQ. C, RQ	78
Dining Hall	FjCa–4	RQ. Q	68

These sites use predominantly white and red quartzites, with a limited use of quartz and chert. Red ocher is a common trait at these sites. All except chert is locally available.

Chert Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Radio Shack	FjCa–1	C, RQ, (BL, WQ)	60
Piloski Garden	FjCa–9	C, BL, (WQ, RQ)	51
Louis Montague	FjCa–39	C, WQ, RQ	51
Selby Michelin	FjCa–17	C, BL, (Q, RC)	44
Road Site 1	FjCa–13	C, (WQ, RQ)	43
David Michelin	FjCa–19	C, RC, (Q, RQ)	30

Sites of this complex have a very strong predilection for use of opaque cherts, banded cherts, and banded lavas. Only traces of other materials are found in the collections. The cherts do not come from the North West River locality; they are very similar to cherts known geologically from the Seal Lake region (M. Piloski, pers. comm.).

TABLE G.—*North West River site seriation by elevation and terrace*

Site	Designation (FjCa–)	Elevation (feet)	*Terrace Series* [1] (west to east)					
			JM	B	SM	HB	SB	HBC
Tower Road	30	unknown						
Sutton	10	80	JM–1	B–4	SM–5			
Red Ocher	38	78	JM–1	B–4	SM–5			
Cookery	3	68		B–3				
Dining Hall	4	68		B–3				
Bunkhouse	33	68		B–3				
Radio Shack	1	60		B–2				
Test Pit	12	60		B–2				
Piloski Garden	9	51		B–1				
Louis Montague	39	51	JM–bs					
Brinex Steps	5,7	45		B–bs [2]				
Selby Michelin	17	44			SM–4			
Road Site 1	13	43	JM–bs					
Road Site 2	14	43	JM–bs					
Road Bend	8	38		B–bs				
Herb Michelin 1	15	37	JM–bs					
Road Opposite HB	23	32			SM–3	HB–4		
Dance Hall	27	30						
David Michelin	19	30				HB–3		
Michelin trailer	16	30			SM–3			
Graveyard	29	29						bs
Henry Blake 2	21	28				HB–3		
Environs Henry Blake	22	28				HB–3		
Sid Blake	24	25					SB–2	
Sid Blake path	24	25					SB–2	
Selby Michelin basement	18	25			SM–2			
Herb Michelin 2	37	25	JM–bs					
Henry Blake 1	20	23				HB–2		
Ronald Watts	31	20						bs
Sid Blake bank	26	20						
Stuart Michelin	28	12			SM–1			
IGA Ethnographic Camp [3]	36	8						bs

[1] Terrace series arranged west to east: JM, John Montague; B, Brinex; SM, Stuart Michelin; HB, Henry Blake; SB, Sid Blake; HBC, Hudson's Bay Company.
[2] bs, beach slope.
[3] IGA, International Grenfell Association.

White Quartzite Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Cookery	FjCa–3	WQ, (Q, C)	68
Herbert Michelin 1	FjCa–15	WQ, (C)	37
Henry Blake 2	FjCa–21	WQ	28
Sid Blake	FjCa–24	WQ, (RC, BL)	25
Herbert Michelin 2	FjCa–37	WQ	25
Graveyard	FjCa–29	WQ	29

These sites are most common in the 25–30 foot range. They consist almost exclusively of common white quartzite artifacts and debris, with an occasional flake of RC, C, or BL.

Ramah Chert Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Henry Blake 1	FjCa–20	RC, (RQ)	23

Only one site utilizes this material exclusively, while it is frequently present in trace amounts in other sites. So far as known to date, Ramah chert beds are found only in north coastal Labrador (see pages 40–43).

Eclectic Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Brinex Bunkhouse	FjCa–33	C, WQ, RQ, Q, BL	68
Road Site 2	FjCa–14	C, Q, WQ, RQ, RC	43
Selby Michelin Basement	FjCa–18	C, Q, WQ, RQ, BL, RC	25

Sites of the eclectric complex utilize a wide variety of materials. Cherts, quartzites, and quartz are found in about equal proportion. The sites tend to be spread over a wide elevation range. The Selby Michelin site

TABLE H.—*Correlation of North West River sites by raw material* (In percent of total assemblage; x indicates quantities of less than 1 percent.)

Site	*Designation (FjCa–)*	*Elevation (feet)*	*Opaque chert*	*White quartzite*	*Red quartzite*	*Vein quartz*	*Banded lava*	*Baked sediments*	*Basalt*	*Metamorphic*	*Ramah chert*
Red Ocher	38	78	34	50	15	–	–		3	–	
Cookery	3	68	–	86	1	11	–	–	–		–
Dining Hall	4	68		24	60	5	3	5	–	3	
Bunkhouse	33	68	42	33	12	10	2	x	–		–
Radio Shack	1	60	82	7	x	–	–	–	–		x
Piloski Garden	9	51	85	2	x	x	15	–	–	–	x
Louis Montague	39	51	37	37	21		–	–		–	5
Selby Michelin	17	44	1	x	x	–	97	–	–	–	x
Road Site 1	13	43	97	1	1	1	x		–	–	x
Road Site 2	14	43	40	10	18	31	x	–	–	–	1
Herbert Michelin 1	15	37	70	29	–	–	1	–	–		–
David Michelin	19	30	86	x	x		–	–		–	13
Graveyard	29	29		99	–		–	x	–	x	x
Henry Blake 2	21	28	–	99	–	–	–	–		–	1
Sid Blake	24	25		99	–		x	–		–	x
Selby Michelin Base	18	25	71	6	6	13	2	–	–	–	2
Herbert Michelin 2	37	25	x	99		–	–		–		
Henry Blake 1	20	23	–	1	12	–	–	–	–	–	87

had been destroyed and therefore was not examined in situ; there are conflicting reports about its exact location. An elevation of 30 feet might be more reasonable than the conservative figure used here.

CHRONOLOGICAL IMPLICATIONS

The pattern of raw material usage argues strongly for cultural determination (Figure 55). The fact that groups of sites correlate consistently with elevation suggests that culturally determined patterns of usage do indeed exist, and that shifts in material preference through time reflect chronological change. Four material complexes are found, and it is proposed from their respective elevation ranges that they range from early to late in the following order.

The *Quartzite-Quartz-Chert complex* is represented by a small sample of sites in the 68–78 foot range. This group is at the early end of the sequence, and sites with this complex are not found at lower elevations.

The *Chert complex* is a strong unit of six sites found between 30–60 feet. The complex is dominated by the use of opaque cherts; however, a wide variety of other materials are utilized in small amounts. The raw material complex of this group suggests an interior orientation.

A distinctive *White Quartzite complex* (6 sites) is found to cluster below the Chert complex. Four of six sites have elevations between 25–29 feet. Two sites are higher, at 37 and 68 feet. This group has very little evidence of outside contact; their raw materials are almost exclusively of local origin.

The *Ramah Chert complex* is represented in only one site, at a 23-foot elevation. It seems to be definitely later than the preceding complex, and demonstrates a strong preference for exotic material obtainable only by long-distance coastal travel or trade.

A possible fifth complex, designated *Eclectric,* is difficult to place within the sequence indicated for the other complexes. Not only do the elevations of the sites vary considerably and without consistency, but the raw materials themselves look different. It is not possible to suggest a date for this unit, which may be a spurious construct.

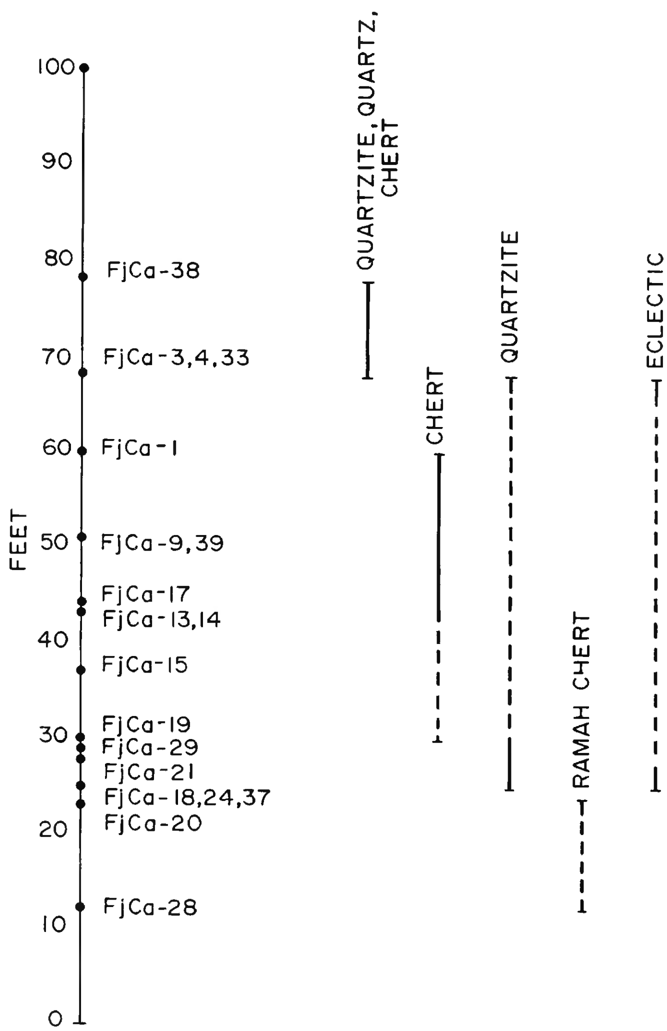


FIGURE 55.—Lithic raw material complexes at North West River seriated with respect to elevation above sea level.

TYPOLOGICAL DATING

Several of the North West River sites have artifacts which can be typologically related to materials further south in eastern Canada and the northeastern United States. Although there are long distances involved, there does appear to be sufficient typological resemblance in specific tools and in assemblages for general chronological relationships to be proposed. It is not my intent to specify rigid correlation between Hamilton Inlet and other areas. Rather the data is used to aid in establishing a relative sequence. I suspect in most cases actual dates for Labrador specimens will show considerable time lag when compared to materials from the south and west.

Radio Shack Site
(FjCa–1)

During the summer of 1971, excavations at the Hound Pond 4 site (GcBi–16) recovered a series of bifaces very similar to the biface bases from FjCa–1. The Hound Pond pieces were associated with a ground slate double-ended celt and an asymmetric knife. Hearth charcoal within this site yielded dates of 1245 ± 120 B.C. and 1145 ± 105 B.C. These dates are within the range estimated for the FjCa–1 site on the basis of site elevation.

Dining Hall Area
(FjCa–4)

Donald Charles collected a large bifacial point from the front of the Brinex terrace (68 feet) midway between the Bunkhouse and the Cookery sites. The point was found broken in three pieces. It is a large, thin biface of white quartzite with a wide blade and tapered flat-bottomed stem (Plate 38*a*; Appendix 3, page 216). I found a similar but not identical point at Thalia Point, northern Labrador, during a brief reconnaissance there in 1969.

These points are related to a variable broad-stemmed point style found along most of the east coast of the United States from South Carolina to Maine. In its southern range they are known as Savannah River points, dating to the second and third millenium B.C. In the northeast United States similar points occur in the Susquehanna Tradition (Ritchie 1969:141–142) at the Snook Kill site with a date of 1470 ± 100 B.C. (Y–1170). The most specific relationship of the Brinex point is with the Mansion Inn type of eastern Massachusetts (Dincauze 1968: 72–76). Mansion Inn points are dated at the Vincent site to 1520 ± 125 B.C. (GX–0568). Dincauze has inspected this specimen and concurs in the identification.

Road Site 2
(FjCa–14)

Two side-notched points (Plate 44*a,b*) from this site suggest some similarity to Meadowood points in New York State, where they are in association with Vinette 1 pottery and date between 1000–600 B.C. (Ritchie 1969:181). The Road Site 2 points are not Meadowood points, however, as they differ in several important attributes, particularly the squared base and high side-notches. A complete specimen of the Labrador type was recovered by Harp (1963:pl. IIk) on the Strait of Belle Isle. There is a continuous distribution of this type in southern Ontario, Quebec, and Labrador, and I have seen similar specimens in collections from northern England and the Maritimes. None of these, however, is dated, although the Batiscan site near Trois Rivieres, Quebec, contains these and other types of points with Vinette 1 pottery and is considered to be a single-component Early Woodland site dating between 1000–800 B.C. (Levesque, Osborne, and Wright 1964). I suspect that the Road Site 2 points are northern variants of the Meadowood type, occurring in roughly the same chronological period. The position of the site in the North West River geological sequence also suggests a date in the first millenium B.C.

Sid Blake Site
(FjCa–24)

The assemblage from this site is related to the Shield Archaic Tradition, characterized by lanceolate bifaces roughly flaked from local quartzite. It is technologically and typologically similar to the Tobique complex of highland New Brunswick (D. Sanger, pers. comm.) and to Shield Archaic sites in interior Quebec (Martijn and Rogers 1969). The tradition, as defined by Wright (1968), exists for several millenia in the boreal forest region of central and eastern Canada, but its dating and regional variations are not yet understood.

Besides these associations, it is possible to suggest a date for the beginning of the North West River sequence on the basis of negative evidence. This is shown by the absence in the sequence of any trace of the Maritime Archaic Tradition which has been dated from burial stations at Port au Choix and Twillingate, Newfoundland, by James Tuck and Donald MacLeod between 2400–1200 B.C. (pers. comm., Tuck and MacLeod). A site of this tradition at Rattlers Bight in Groswater Bay has been dated to 1880 ± 140 B.C. (GSC–1260) and 2070 ± 150 B.C. (GSC–1379).

The lack of Maritime Archaic sites in North West River suggests a date later than 1800 B.C. for the earliest settlements on these terraces. Estimate of the age of the 80-foot terrace, based on the emergence curve for North West River, suggests an origin around 2000 B.C., after which several centuries would have had to pass before occupation of this level could have occurred.

RADIOCARBON DATING

The final evidence to support the North West River cultural sequence comes from two radiocarbon dates (Table B), both of which agree closely with the dates for the sites estimated from their relative elevations and terrace chronology.

Red Ocher Site (FjCa–38)
3090 ± 180 B.P. (GSC–1280)

This site at 78 feet on the high western (JM–1) terrace is dated at 1140 ± 180 B.C. (GSC–1280) from a charcoal sample taken from a hearth several inches below the peat horizon. The range of the date is several centuries younger than the geological estimate but agrees well with the typological evidence for a slightly earlier cultural trace in the Mansion Inn parallel from the Dining Hall area noted above (page 111). This documents that the settlement shift to the recently emerged western terraces occurred shortly after closure of the northern moraine channel about 3500 years ago (Figure 15).

Henry Blake 7 (FjCa–20) 895 ± 105 B.P. (GX–1578)

A date of A.D. 1055 ± 105 (GX–1578) came from a burnt bone sample within a hearth. The site is on the brow of the HB–2 terrace 23 feet above the water.

Cultural Integration

Analysis of the North West River collections reveals the existence of eight units which are believed to represent different chronological periods or cultural groups. This section considers the evidence associating a set of sites in a group and describes them in terms of cultural complexes. Of the eight units, five are dated. The sequence suggested by these dates agree with the relative dating from elevation and raw material usage. There is therefore a large degree of confidence in the presentation of these units in the following chronological order, from most remote to most recent.

TERMINOLOGY

Of the 39 sites recorded for North West River about 17 contain sufficient data for use in determining intersite relationships and cultural assemblages. The units which can be constructed with this data vary considerably in the amount of information they contain. Some units are based on single sites containing only a few tools; from others, a large amount of data is available. In recognition of the varying quantity of information these units are described variously in terms of "phase," "complex," and "component." These terms are hierarchically ordered such that a number of components may constitute a complex, which in turn is of lower order of classification than a phase. The terms indicate the amount of archeological knowledge available for a given cultural period. In no sense are component and complex intended as chronological subdivisions of a phase. They are merely ad hoc analytical units.

The term "phase" is used, after Willey and Phillips (1958), to indicate an assemblage which is chronologically and spatially distinct and can be distinguished from other phases so conceived. Unfortunately phase descriptions in subarctic archeology are necessarily threadbare documents due to problems of preservation and nomadic life. Therefore the procedural definition of phase used here is for a cultural historical unit which can be inferred from the information obtainable from the excavation of a large site which together with a number of smaller related sites gives a reasonably complete picture of the culture involved. It does not purport to be all-inclusive. It merely indicates a degree of confidence in the replication of the constituent elements of an assemblage from one site to another within the same culture, while at the same time being encompassing enough to eliminate phase definitions based on inadequate samples.

The term "complex" is used for a unit for which comprehensive information is lacking, but which constitutes a definite grouping based on a series of related site components for which a relatively large amount of information is known. In fact, the cultural content of the category may be as complete as that for a phase; however in this case either a large type site is unknown or insufficient samples are available to define the range and variation of the assemblage, and the formal procedure of phase definition awaits further information. Parenthetically, it is noted that the term complex is used frequently in this study to refer to casual units of nonhistorical nature as the need arises, and should not be confused with the specific meaning employed here.

"Component" also has two meanings. Traditionally it refers to the basic unit of archeological discovery, the site. Here it is additionally given a culture-historical meaning at the bottom of the integration hierarchy, indicating a unit for which only a limited amount of information is available, and where elevation to the level of "complex" or "phase" is unjustified. Generally this is a site with a small sample but one distinctive enough to indicate it probably represents a separate cultural period. It is usually impossible to determine assemblage variability from these sites, since only a limited portion of the larger assemblage is present.

SITE ASSOCIATIONS

Brinex Complex
(FjCa–33, 38)

Two sites—the Red Ocher (FjCa–38) and the Bunkhouse (FjCa–33)—and a few scattered surface finds provide the data for this complex. The sites are on the 78- and 68-foot terraces at the earlier end of the sequence. The data suggesting their association includes possession of side-notched concave base points, convex-based bifacial knives, and a common use of red ocher (not noted in later North West River sites). The raw material complexes of the two are similar, but the Bunkhouse site is more eclectric, including the use of quartz, and more chert. The small sample from the Red Ocher site makes further association difficult.

Charles Complex
(FjCa–1, 9, 13, 39)

The Charles complex is composed of the Radio Shack (FjCa–1), Piloski Garden (FjCa–9), Road site 1 (FjCa–13), and Louis Montague (FjCa–39) sites, ranging from 43–60 feet elevation. No one site includes the entire assemblage; it has been pieced together from different sites in which a small number of identical tools are found. The association is based on large double-ended scrapers (FjCa–9, 39), large single-ended scrapers (FjCa–9, 13), stemmed snub-nosed end and side scrapers (FjCa–9, 39), and a core and flake industry (FjCa–9, 13). No points were found in FjCa–9, 13, 39, and no scrapers were found in the Radio Shack site (FjCa–1). Nevertheless by proximity, elevation, raw materials, and technology it is likely that the tapered and square base bifaces belong with this unit. The Selby Michelin site probably also belongs with this complex, but the tool sample was too small for positive association.

North West River Phase
(FjCa–15, 21, 24, 29, 37)

Five sites are closely related by typology, raw material, and technology, forming the North West River Phase. Four of the five are between 24–29 feet; the other is at 37 feet. All utilize local white quartzite for their tools. Typological relationships between the sites include small contracted stem points (FjCa–15, 24, 29), lanceolate convex-base bifaces (FjCa–15, 21, 24, 29), and asymmetric bifacial knives (FjCa–15, 24, 29). FjCa–3 may belong to this unit but several anomalous elements preclude its inclusion.

The other units of the North West River sequence are single components which have no other sites closely related to them. All eight phases, complexes, and components of the sequence are presented with relevant elevation and site data in Table I.

The results of the cultural analysis of the North West River sites confirm the relative dating sequence suggested from the geological data. In cases where more than one site can be related typologically, these units fall within a specific elevation range; they also tend to be related by raw materials and technology. The corroboration of the proposed sequence from these lines of evidence, and the radiocarbon dates, provides a firm foundation for the sequence.

TABLE I.—*Cultural units at North West River correlated with elevation*

Cultural Unit and Site	*Designation* (FjCa–)	*Elevation* (feet)	*Sample Size*	*Minimum Elevation* (feet)
PHASES				
1. *North West River Phase*			5	25
Herbert Michelin 1	15	37		
Graveyard	29	29		
Henry Blake 2	21	28		
Henry Michelin 2	37	25		
Sid Blake	24	25		
2. *Sesacit Phase*			1	8
IGA Ethnographic Camp	36	8		
COMPLEXES				
3. *Brinex complex*			2	68
Red Ocher Site	38	78		
Bunkhouse Site	33	68		
4. *Charles complex*			4	43
Radio Shack	1	60		
Piloski Garden	9	51		
Louis Montague	39	51		
Road Site 1	13	43		
COMPONENTS				
5. *Little Lake component*			1	68
Dining Hall Area	4	68		
6. *Road component*			1	43
Road Site 2	14	43		
7. *David Michelin component*			1	30
David Michelin Site	19	30		
8. *Henry Blake component*			1	23
Henry Blake 1	20	23		

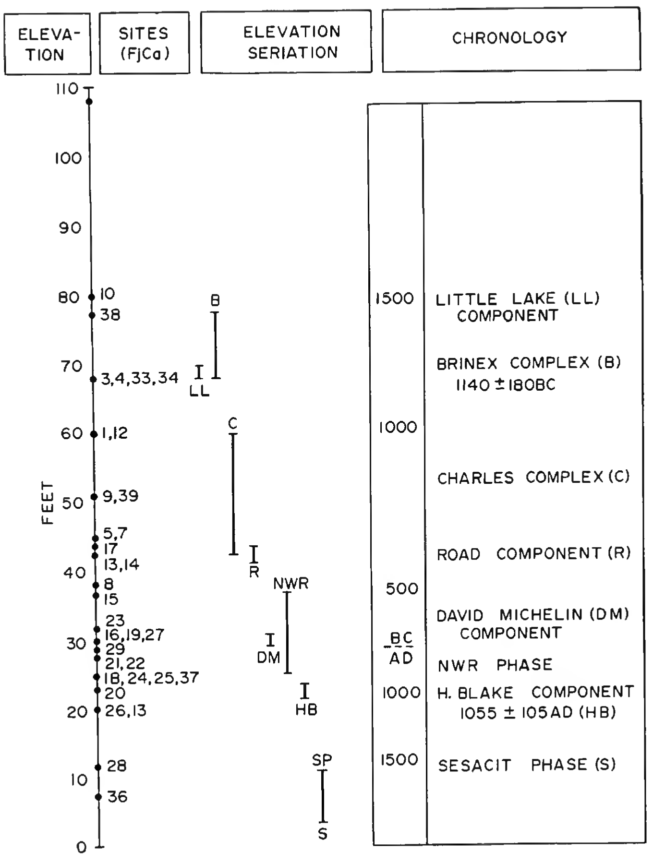


FIGURE 56.—Cultural chronology at North West River. Seriation bars (center) bear culture unit abbreviations.

NORTH WEST RIVER SEQUENCE

The North West River sequence, as reconstructed from the foregoing data, is presented in Figure 56. The sequence covers approximately 3000 years of culture history on the interior of Labrador. At its early end the sequence is cut off by the age of the upper terrace at North West River. It is possible that more extensive sites of the Little Lake component will be found on the 68- to 80-foot terraces. Other sites of the Brinex complex may also exist here. Earlier than 1500 B.C., however, the central part of the moraine was an island, and there would have been little stimulus for settlement here.

Each cultural unit is briefly described below, including the general features of the assemblage. External relationships and functional analysis is not undertaken here (see pages 136–157). The intent is to give an outline of the historical development in the area. Artifact descriptions for each site may be found in Appendix 3; references to constituent sites within the units is given in Table I.

Little Lake Component
(circa 1500 B.C.)

This component is proposed on the basis of a specimen (Plate 38*a*) found on the 68-foot B–3 terrace by Donald Charles and an assemblage from the nearby Cookery site (FjCa–3; Plate 39). The point (see page 216) should date within the horizon for the Mansion Inn and related styles known to the south, between 1200–1600 B.C. Its position within the North West River geological sequence suggests a similar date. Altogether these materials probably represent a brief occupation of the recently emerging North West River terraces following closure of the northern moraine channel.

The Little Lake component probably follows the terminal Maritime Archaic occupation of the interior and seems to mark a significant cultural break from this earlier tradition. The complete lack of Maritime Archaic traces from the North West River terraces suggests that it did not survive in this part of Labrador later than 1500 B.C. It is very likely, however, that sites of the Maritime Archaic exist on the higher elevations of the moraine or on high terraces, in the Naskapi and Churchill valleys.

Although possibly containing an intrusive component from the North West River Phase, this site contains anomalous elements in elevation, raw material, and several artifact types not known from typical North West River Phase sites.

The relationships of this distinctive point style and its cultural complex in Labrador needs to be clarified. Similar points now appear to have a distribution into northern Labrador, and it does not seem plausible that the Dining Hall point was a chance specimen traded in or carried north by other peoples. In addition, the point is made of common quartzite, not exotic material. I believe it represents part of a complex, as yet undefined in Labrador, which closely follows Maritime Archaic and precedes the Brinex complex. The postulation of the Little Lake component reflects this belief.

Brinex Complex
(circa 1200 B.C.)

The first major occupation of the upper terraces (68–78 feet) begins with the Brinex complex, known from the Red Ocher and the Bunkhouse sites. The complex is dated at the Red Ocher site at 1140 ± 180 B.C. (GSC–1280). It includes the use of red ocher in quantity, large and small side-notched points with convex bases and slightly serrated edges; small thin thumbnail scrapers, end scrapers on blade-like flakes, disk-shaped knives, and lanceolate bifaces. Raw materials used include white and red quartzite, chert, and quartz. The use of red ocher in North West River sites was restricted to this complex and was not found at sites from lower elevations. There is no suggestion of large stemmed points in these collections, and it seems probable that there is little or no continuity with the previous Little Lake component.

Charles Complex
(circa 1000 B.C.)

Following the Brinex complex is a cluster of four sites between 43–60 feet which together provide a distinctive assemblage representing the Charles complex, named for the late Mr. Donald Charles who made important collections from some of these sites in the mid-1950s. The assemblage includes lanceolate bifaces with waisted, squared, or slightly tapered bases; scrapers include a varied class with at least three major types: (1) large, oval, single and double-ended scrapers, (2) disk scrapers, and (3) large stemmed end and side scrapers; and extremely large and flat bifacial knives. There is in addition a specialized core and flake industry involving pyramidal cores from which narrow triangular flakes are struck from the core margins toward the apex. The resultant flakes have a patterned quality, are triangular or trapezoidal in cross-section and taper toward their distal ends. They were used as tiny scrapers and knives. The raw materials used in the Charles complex are very different from other North West River cultures—only fine grained cherts and banded lavas are found. In contrast to previous and subsequent periods very little local quartzite or quartz is used.

More information is needed for this interesting complex. The complex seems to represent a break from the previous Brinex complex, which it closely follows in time. An estimated date of about 1000 B.C. is suggested by its limited elevation range between the dated Brinex complex and the proposed typological dating of the Road component.

Road Component
(circa 700 B.C.)

A salvaged collection from bulldozed Road Site 2, 43 feet above Little Lake, is the sole source of data for the Road component. The assemblage includes carefully flaked side-notched squared-based points, narrow end scrapers on thick triangular flakes, bifacial knives, combination flake knife/scraper tools, and flake scrapers. In contrast to the preceding Charles complex a wide variety of raw materials are used: quartz, chert, quartzite, and Ramah chert (the first use of this material in quantity in a North West River site). This seems to indicate some degree of coastal contact. A date of circa 700 B.C. is suggested on the basis of Early Woodland typological parallels and site elevation.

David Michelin Component
(circa 200 B.C.)

The David Michelin component is based on a single site excavated by Mr. Charles at the 30-foot elevation of the HB–3 terrace. The elevation of the site was verified in 1969. The component is based on a fairly large collection, which includes two types of points, a wide-stemmed triangular-bladed variety and a smaller version with a convex blade and pointed stem without shoulders. One of the latter has been manufactured from a flake and is unifacial. The others are bifacial. The assemblage also includes large ovate bifacial knives and a variety of flake scrapers and knives. A specimen collected by MacLeod in North West River in 1967 (FjCa–32:2; Plate 56*c*) came from this area, according to informants. It is a large bifacial blade with flat bottom, parallel sides, and a rounded tip. The raw materials used in the site include banded gray chert, purple chert, white quartzite, and Ramah chert.

The date estimated for the site is based solely on its elevation, which suggests a minimum age of 1500–2000 years. I estimate a date within the period 500–0 B.C. The presence of Ramah chert in the assemblage indicates coastal contact or cultural distribution of the component in those regions.

North West River Phase
(circa A.D. 200)

The North West River Phase is the best known of any of the North West River cultures. It is based on the extensive excavation of the Sid Blake site (FjCa–24), and excavations and collections from four other sites, and possibly a fifth, the Cookery site (FjCa–3). Of the five sites positively associated in the North West River Phase, four are found at elevations between 25–29 feet; the fifth is at 37 feet. The fact that the distribution of archeological materials at the Sid Blake and Henry Blake 2 sites follows the contour of the SB–2/HB–2 (25–28 foot) terrace and are not found on the HB–1 terrace indicates this culture can be reliably associated to the period when the shoreline was between the 24 to 25-foot level.

The North West River Phase has an assemblage with considerable archeological variability. Small points with triangular or convex blades and small constricted stems are found. The most common artifact, however, is the lanceolate form of ovate biface 20–80 mm in length, which is occasionally modified for hafting. Some bi-pointed specimens occur. Bifacial knives are also found. Some are tongue-shaped, teardrop, or oval in form; more distinctive types include asymmetric specimens with diagonal blade edges or blunt tips. Flake knives and scrapers are common. Formal scraper types do not exist in these collections and may be absent from the phase. A large core scraper, however, was found as well as a thick plane-scraper. Hammerstones are present.

The technology involved in this assemblage is extremely simple. The full range of lithic technology is represented by flaking debris from cobble cores to finished tools. The various stages of manufacture are seen in sequential preform varieties as well as in lithic debris as determined from analysis of flake size and thickness, striking platform width and thickness, and platform angle. Little attention was paid to producing a straight, sharp edge on the finished tool. The technology is so distinctive that cultural identifications occasionally can be made from the chipping debris alone.

Another characteristic of the phase is its near exclusive use of locally obtainable materials for tool manufacture. Ninety-nine percent of the lithic material was coarse-grained beach-cobble quartzite. A few flakes of Ramah chert and banded lava were found, and only a single artifact of Ramah chert. While some coastal contact seems to have occurred, the quartzite materials and full range of manufacturing debris and the large size of the primary site indicate a semipermanent camp, undoubtedly a summer occupation to exploit the rich fishing potential of North West River. The other sites from the area do not show such stable and large occupations. The distribution of cultural material in the Sid Blake (Figure 39) and Henry Blake 2 sites supports the claim for occupation by a single group living contemporaneously in three or four nearby areas, or the return of a smaller group seasonally to camp in slightly different areas of the site. Chipping concentrations and tools reconstructed from broken parts support this hypothesis. Further analysis of the cultural and functional aspects of the phase are reserved for a later time (pages 152–155).

The North West River Phase is at present undated. Large amounts of charcoal were found in the site, but none could be isolated from forest fire horizons of the remains of roots and stumps burned by Sid Blake when he cleared the land 30 years ago. One section of the site, in the patch of undisturbed spruce between Sid and Henry Blake's land, is in situ and has not been excavated. A reliable charcoal sample might be found there. Association of the site with the 24-foot beachline suggests an age of 1500–2000 years.

David Sanger has found a comparable assemblage, the Tobique complex, in the highland region of New Brunswick. This complex, which is undated, includes scrapers and side-notched points not found in the North West River Phase. A more directly related assemblage, the Wenopsk complex, from the Mistassini region of south central Quebec is described by Martijn (Martijn and Roges 1969). The Tobique and Wenopsk complexes and the North West River Phase belong to the Shield Archaic Tradition, defined by Wright (1968). Typological variation between these assemblages may result from chronological as well as spatial factors. The presence of the preceding David Michelin component at 30 feet, estimated to date late in the first millenium before Christ, and the radiocarbon-dated Henry Blake site (A.D. 1050 ± 105) only a few feet west of the Sid Blake site at 23 feet supports the geological estimate of dating for the site.

Henry Blake Component
(circa A.D. 1050)

A single site excavated from HB–1 terrace immediately below the Sid Blake and Henry Blake 2 sites yielded a small collection and a radiocarbon date of A.D. 1050 ± 105 (GX–1578), which serve as the data for proposing the seventh cultural unit in the sequence, termed the Henry Blake component. The site was a small encampment with a central hearth. The collection, predominantly of Ramah chert with some red quartzite, included a large corner-notched biface with straight base and convex blade, a flake knife/scraper combination tool, end scrapers on flakes, and other large biface fragments. A typologically similar point, though more side-notched and made from pink chert, was excavated from the Test Pit site (FjCa–12) on the 60-foot B–2 terrace. This seems to have been a stray find and no occupation site was located.

Sesacit Phase
(historic period)

The final cultural unit of the North West River sequence is the Sesacit Phase of the historic Montagnais and Naskapi Indians comprising the North West River band. A large campground of this period exists east of the Grenfell Mission along the low shore of North West River and has not been excavated or tested. Tests at other sites of this phase, such as the Red Wine Portage site (FlCg–1), include metal trade goods, beaver tooth knives, and other materials. The early Montagnais-Naskapi ethnographic collections give a very clear picture of this culture before drastic changes resulted from permanent settlement in communities like North West River, and cessation of the seasonal round and fur trade.

This completes the presentation of the data, lines of reasoning, and description of the cultural units within the North West River sequence. As noted, some of the components and complexes presented need considerable verification from large sites. The early units in particular need work since their samples are small. It is quite possible that lumping of some units may be possible, though the evidence is not available to do so yet. It has therefore seemed best to present the sequence in as finely divided units as possible, since the traditional problem of culture history in Labrador has been the utilization of units which were too broad.

Geological Implications

The dates of sites within the sequence provides a method of checking the North West River uplift curve. It was initially proposed that a constant rate of rise for the past 5000 years could be expected since this has been noted for other curves from Ungava and the Eastern Arctic. The use of a constant slope curve for the area agreed tolerably well with the date of the Henry Blake 1 site (A.D. 1050 ± 105; GX–1578), assuming the site was several feet above water level when occupied.

The dating of the North West River sequence makes it possible to suggest modifications of the constant rate hypothesis. When the sites are plotted for age and elevation (using average dates for complexes which are undated by physical or typological methods) most fall below the constant rate curve (Figure 57), therefore making these sites subject to periodic flooding or complete submergence during their proposed occupations. The fact that 12 of 18 sites dated fall below the curve constitutes strong evidence for downward revision of the curve. This in fact brings it in line with the average elevation and dates of the Crooked River samples.

It therefore seems probable that the curve is accurately set geologically by the Crooked River samples in the 2000 year range and by the North West River sample (GSC–1135) in the 5000 year range, which then includes the archeological sites above water. If this proposed revised curve is correct the constant rate hypothesis cannot be maintained for this area. Rather, uplift on the order of one foot per century is suggested for the past 2000–3000 years, and before this period, between 5000–2500 years, uplift must have been considerably greater, perhaps as much as 2.5–3.0 feet per century, circa 5000 years ago.

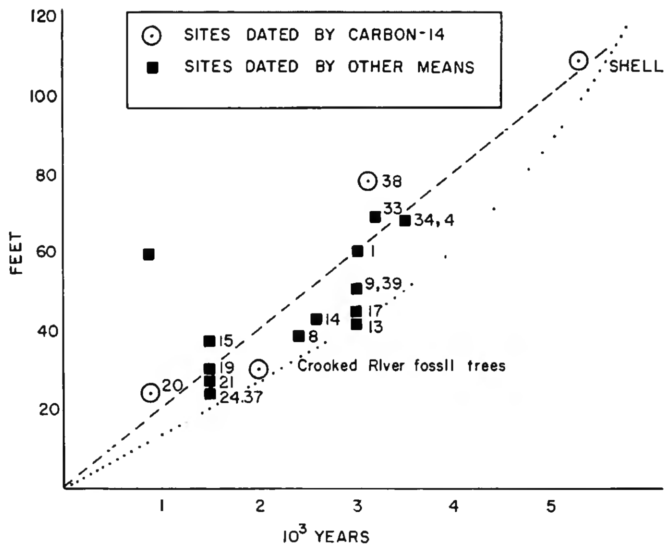


FIGURE 57.—North West River sites plotted according to elevation and age in relation to the local emergence curve.

GROSWATER BAY ANALYSIS

The chronology for the Groswater Bay and Narrows region, like the North West River sequence, is based on a combination of evidence. For the most part the sequence is developed independently from North West River and can therefore be used to check the interior sequence; for some periods, however, independent data is lacking. Here, placement has been made with reference to the interior chronology.

GEOLOGY AND TERRACE CORRELATION

Geological dating by terrace and beachline correlation is not as feasible in Groswater Bay as for North West River. This results from several factors. First there is no large river outlet in the region for a continuous source of sediments to be worked into a single comprehensive chronological series. There is therefore no standard geological key for the region. Rather, post-Pleistocene formations at different elevations have formed at different times in different regions, according to local conditions acting on a particular location. A terrace may form in one location favored by geography, currents, and sediments, after which conditions change and formation ceases, often to commence in another area quite removed from the first. Therefore, geological formations in the bay are not correlative. Synchronous elevations from the Narrows and the outer coast do not date to the same period due to differential uplift between the two areas, although during most recent times these elevations begin to approach chronological identity and can therefore be used as a rough measure of relative age.

A further geological problem is that there has been relatively less uplift here than in western Lake Melville. As noted previously, during the past 5000 years (taking eustatic changes into account) the uplift has been 120 feet in North West River, while the coast has risen only about 30 feet in 4000 years. Sites are therefore sandwiched into the lower elevation terraces and raised beaches with less altitudinal range for seriation. Consequently, the vertical displacement of a site from the active shore becomes more crucial, especially since suitable terraces for habitation are relatively few and those existing have been used for habitation for long periods. For this reason seriation from a series of gradually raised beaches is more reliable than terrace dating, but these sites are scarce also, and are restricted to relatively short chronological periods. Finally, high terraces are commonly used as lookouts and cannot be used for relative dating.

However, these problems in developing a single comprehensive local sequence are at times offset by advantages of isolating formations which were suitable for only short periods of time. As the geography changed, site locations shifted to take advantage of newly emerged beaches or coves, and subsequently were abandoned after further uplift made the local conditions unsuitable. Single component sites, therefore, are common.

SITE SERIATION BY ELEVATION

Notwithstanding problems of altitudinal correlation, site elevations can be useful for developing a relative chronology, particularly when restricted to local areas. Table J presents a site seriation for the Bay and Narrows based on elevation. Sites found within the same location can be reliably seriated and have general validity in terms of the total list as well.

The four sites above 60 feet are not of great age; rather, they are located on the only available terraces in their regions and are also good lookouts. The relative elevation of the remaining sites is more indicative of age. Of particular use is the sequence for the Rattlers Bight-Winter Cove locale. Here, in a small geographic area, are found numerous beaches and terraces which have been used at different times for settlement, and a long range of occupation is evident.

SITE CORRELATION BY LITHIC COMPLEXES

The sites from Groswater Bay may be separated into six groups on the basis of raw material usage. Percentage use of raw materials is given in Table K.

Red Quartzite-Purple Chert-Quartz Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Rigolet Spy	GbBo–1	RQ, Q, PC	72–78
North West Brook 1	GcBk–6	RQ, Q, Orange C.	61
Bluff Head Cove 1	GcBj–1	RQ, Q, PC, Green C.	45
Winter Cove 3	GcBi–3	PC	42

Sites with these materials, particularly those with red quartzite and purple or lavender chert, are confined to the higher elevations in the region. It is tempting to view these sites as old on the basis of elevation. However, they often are situated on the only suitable terrace which happens to be available for habitation or lookout, and their elevation may not be a criterion of age but of local topography.

TABLE J.—*Site seriation by elevation in Groswater Bay*

Site	*Designation*	*Location*	*Elevation* (feet)
Buxo Bank 1	GcBi–6	RB–WC	80
Rigolet Spy Site	GbBo–1	R	72–78
North West Brook 1	GcBk–6	NWB	61
North West Brook 2	GcBk–7	NWB	61
Sandy Cove Sites 1–5	GcBk–1–5	SC	45
Bluff Head Cove 1,2	GcBj–1,2	BHC	45
Winter Cove 3	GcBi–3	RB–WC	42
Ticoralak 4	GbBn–5	T	39
Bluff Head Cove 4	GcBj–3	BHC	34
Hound Pond 1	GcBi–8	RB–WC	34
Hound Pond 2	GcBi–9	RB–WC	31
Red Rock Point 2	GeBk–2	MR	31
Ticoralak 2,6	GbBn–2,8	T	31
Ticoralak 2 East	GbBn–3	T	29
Ticoralak Surface Collection	GbBn–6	T	28
Ticoralak 3	GbBn–4	T	28
East Pompey Island 1	GcBi–12	RB–WC	28
Winter Cove 2	GcBi–2	RB–WC	25
Ticoralak 5	GbBn–7	T	24
Rattlers Bight 1	GcBi–7	RB–WC	22
Winter Cove 1	GcBi–1	RB–WC	15
Shell Island 1	GcBi–11	RB–WC	14
Big Island 1	GbBm–1	BI	9
Winter Cove 4	GcBi–4	RB–WC	8

RB–WC, Rattlers Bight–Winter Cove; R, Rigolet; NWB, North West Brook; T, Ticoralak; BI, Big Island; SC, Sandy Cove; MR, Michael River; BHC, Bluff Head Cove.

TABLE K.—*Correlation of Groswater Bay sites by raw material* (In percent of total assemblage; x indicates quantities less than 1 percent; m indicates considerable presence, unmeasured; parentheses indicate intrusive component.)

Site	*Elevation (feet)*	*Green-brown chert*	*Purple-lavender chert*	*Ramah chert*	*White quartzite*	*Red quartzite*	*Quartz*	*Quartz crystal*	*Gray quartzite*	*Slate*	*Red ocher*
Buxo Bank	80	–	–	–		m	–	–		–	–
Spy site	78	–	77	–	x	12	8	x	–	–	–
NWB–1	61	–	14	–	–	66	20	–	–	–	x
NWB–2	61	–	–	–	–	–	–	–	100	–	
Sandy Cove 1	45	–		m	–	m	m	–	–	x	
Sandy Cove 2	45	–		m	–	m	m	–	–	m	–
Sandy Cove 3	45	–	4	x		25	70	–	–	x	x
Sandy Cove 4	45	–	x	2	–	5	45	–	–	45	x
Sandy Cove 5	45		40	10	–	20	30	–	–	–	
Bluff Head 1	45	20	24	5	–	–	45	–	–		x
Bluff Head 2	45	–	17	60	–	24	–	–	–	–	–
Winter Cove 3	42	–	100	–	–	–	–	–	–	–	
Ticoralak 4	39	98	–	2	–	–	–	–	–	–	
Bluff Head 4	34	–		96	–	–	4	–	–	–	–
Hound Pond 1	34	–		89	11	–	–	–	–	–	–
Hound Pond 2	31	–		99	–	–		–	–	1	–
Red Rock Point 2	31	99	–	x	–	–		–	–	–	–
Ticoralak 2	31	83	–	7	(8)	–		–	–	2	–
Ticoralak 6	31	(x)	–	–	99	x	x	–	–	–	
Ticoralak 2E	29	55	–	–	–	–	–	40	–	5	
Ticoralak SC	28	4	–	–	48	37	11	–	–	–	
Ticoralak 3	28	99	–	1	–	x	x	x	–	x	
East Pompey Island 1	28	96	–	2	–	–		1	–	1	x
Winter Cove 2	25		–	99	–	–		–	–	1	x
Ticoralak 5	24	95	–	x	–	–	–	3	–	x	–
Rattlers Bight 1	22		x	95	–	–	x	–	–	4	x
Winter Cove 1	15	–	–	94	6	–	–	–	–	–	x
Shell Island 1	14	(x)	–	99	–	–		–	–	–	
Big Island 1	9	x	–	99	x	–		–	–	–	
Winter Cove 4	8		–	98	–	–	2	–	–		

Sandy Cove Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Sandy Cove 1	GcBk–1	Q, RQ, S, (RC), RO	45
Sandy Cove 2	GcBk–2	Q, RQ, RC, S, RO	45
Sandy Cove 3	GcBk–3	Q, RQ, PC, S, RC, RO	45
Sandy Cove 4	GcBk–4	Q, S, RQ, RC, PC, RO	45
Sandy Cove 5	GcBk–5	PC, Q, RQ, RC	45

The Sandy Cove complex consists of a cluster of sites which are characterized by the use of large amounts of slate, quartz, red quartzite, and red ochre with lesser amounts of Ramah chert and lavender or dark cherts. These sites are found so far only in the Sandy Cove and Bluff Head Cove areas at above 40-foot elevations.

Dorset Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Ticoralak 4	GbBn–5	G–BC, RC	39
Red Rock Point 2	GeBk–2	G–BC, RC	31
Ticoralak 2	GbBn–2	G–BC, RC, S	31
Ticoralak 2 East	GbBn–3	G–BC, QC, S	29
Ticoralak 3	GbBn–4	G–BC, RC, QC, (WQ, Q)	28
East Pompey Island 1	GcBi–12	G–BC, RC, QC, S, RO	28
Ticoralak 5	GbBn–7	G–BC, QC, RC, S	24
Shell Island 1	GcBi–11	G–BC (RC)	14

The Dorset complex is composed of eight sites utilizing a mottled greenish brown chert as their primary material, with limited use of quartz crystal, slate, and occasionally red ocher. Intrusive components are shown in parentheses. These sites cluster between 24–31 feet in six of eight cases, the exceptions being the Ticoralak 4 site and the Shell Island site with its faint Dorset trace. Greenish brown chert appears to be exclusively associated with Dorset archeology in this region, and for this reason can be used as a valid cultural marker. The stone has an unknown origin, presumably somewhere on the coast.

Rattlers Bight Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Hound Pond 2	GcBi–9	RC, S, RO	31
Winter Cove 2	GcBi–2	RC, S, RO	25
Rattlers Bight 1	GcBi–7	RC, S, RO	22

This group is characterized by the use of Ramah chert, slate and red ocher. The three sites in the group are all found in the Winter Cove-Rattlers Bight area between 22–31 feet.

Ramah Chert Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Shell Island 1	GcBi–11	RC	14
Big Island 1	GbBm–1	RC	9
Winter Cove 4	GcBi–4	RC	8

These sites use only Ramah chert in their lithic industry. Their elevation is consistently low. No red ocher is present. Coastal orientation is suggested by the raw material usage.

White Quartzite Complex

Site	*Designation*	*Materials*	*Elevation (feet)*
Ticoralak 6	GbBn–8	WC (RQ)	31

Only one site utilizes this material exclusively. Other sites such as Hound Pond 1 (34 feet), Sandy Cove 1 (45 feet), and Winter Cove 1 (15 feet) use the material as a component of the site or as part of the assemblage. The elevation range spans 15–45 feet, but no clear beachline association is evident.

CHRONOLOGICAL IMPLICATIONS

Figure 58 presents these groups seriated with respect to elevation. Six chronological positions are suggested on this basis.

The *Red Quartzite-Purple Chert-Quartz complex,* which also includes the use of some red quartzite and quartz, may be at present the earliest evidence of culture in the Groswater Bay region. The raw materials of the group include those of local abundance as well as cherts which seem to come from interior deposits. There is no evidence of extensive coastal occupation for this complex.

The *Sandy Cove complex* represents an early occupation of the region which employs a variety of local materials (especially quartz) as well as Ramah chert and slates which are not found nearby, and which indicate travel or trade. The lack of extensive use of Ramah chert may reflect the limited extent of this culture's distribution on the coast or an incomplete acceptance of this material. Sites of this group have not been found below the 45-foot elevation in Groswater Bay.

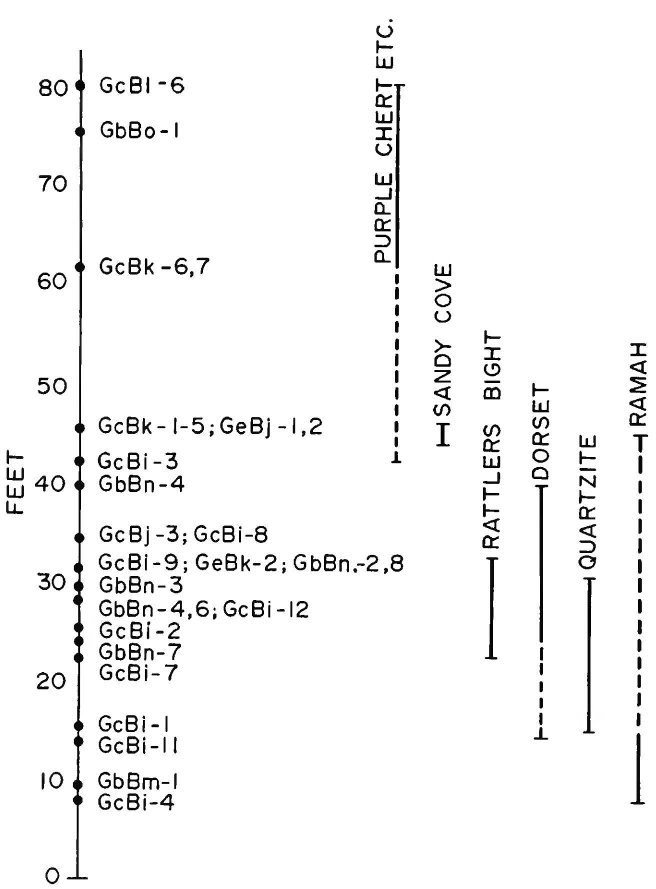


FIGURE 58.—Lithic raw material complexes in Groswater Bay seriated with respect to elevation above sea level.

The *Rattlers Bight complex* of Ramah chert, slate, and red ocher follows the Sandy Cove complex at elevations ranging from 22–31 feet. Culturally, this group evolves from the former, but it has major differences in raw material usage. The replacement of the red quartzite and quartz industries by a chipping industry entirely of Ramah chert indicates a constant supply of this coastal material which is easier to work than either red quartzite or quartz. The dominance of Ramah chert also implies increased population density or cultural integration over that present in the Sandy Cove complex seen by the necessity for strengthened trade networks and greater familiarity and movement on the northern coasts of Labrador.

The *Dorset complex* is chronologically insecure from the evidence of elevation alone since the lowest site found to date is at 24 feet, suggesting its chronological placement before the terminal Rattlers Bight group. However, the presence of the Dorset type of chert and slate as a trace component in the Shell Island 1 site at 14 feet elevation suggests that the elevation data on this group is incomplete and that cultural factors dictated site locations well above the active beaches.

The *White Quartzite complex* is placed after the Dorset group, but its placement also is insecure due to the small nature of the sample. Use of local materials characterizes the group, which is very weakly represented on the coast, and this may indicate a predominantly interior adaptation. In terms of coastal distribution it rates a similar low level of occupation as seen for purple chert complex. The elevation range of the four sites containing this material is between 15–45 feet.

The final prehistoric cultural evidence comes from the *Ramah chert complex* composed of three sites between 8–14 feet. The exclusive use of this coastal material and the large amount of chipping debris in two of the three sites probably indicates a fairly heavy coastal distribution of the group with extensive travel or trade.

TYPOLOGICAL DATING

Typological relationships between the Groswater Bay evidence and dated cultural materials outside of the Hamilton Inlet region provide a means of dating which, in addition, is supplemented by dating derived from the North West River sequence.

Rattlers Bight 1, Hound Pond 2
(GcBi–7, 9)

Typological relationships between this site and Maritime Archaic sites from Newfoundland suggest a possible time range of 2500–1200 B.C. Until larger samples are obtained from Rattlers Bight it will be difficult to make more specific chronological statements based on typology. The tool types which relate the sites are ground slate adzes, axes and gouges, ground slate bayonets and points, and grooved plummets of soapstone. The Newfoundland sites at Twillingate have been dated at 1250 ± 90 B.C. with another (preliminary) date about 1500 B.C. (MacLeod 1967: 10), and at Port au Choix a number of dates exist between 2340 ± 110 B.C. and 1280 ± 220 B.C. (Tuck 1970:116). In addition, typological parallels to the Moorehead complex of Maine suggest dates in the

Ticoralak 2–5, East Pompey Island 1, Red Rock Point 2
(GbBn–2-5, 7; GcBi–12; GeBk–2)

The Dorset materials are related to Dorset culture sites in the Eastern Arctic between 800 B.C. to A.D. 1000. More specifically, graver types suggest that the Groswater Dorset sites are at the early end of that period, preceding the Port au Choix Dorset site in Newfoundland which dates between A.D. 100–600. (Harp and Hughes 1968:43).

Sandy Cove 1
(GcBk–1)

Corner-notched points of Ramah chert from the eastern component of this site are typologically related to two points found by Harp (1963:210) at Blanc Sablon 4 which have been dated to A.D. 690 ± 46 (Harp and Hughes 1968:44). These points appear to be typologically related to ones from Big Island 1, and have general similarity to Middle Woodland points from the Northeast.

Ticoralak Surface Collection
(GbBn–6)

The large corner-notched red quartzite point found at GbBn–6 is typologically identical to the point dated at A.D. 1055 ± 105 (GX–1578) at the Henry Blake 1 site in North West River.

Hound Pond 1
(GcBi–8)

The single complete point from this site appears similar to points from the David Michelin site in the North West River sequence, where they date between 400–0 B.C. (See especially FjCa–19:2; Plate 45*c*).

Winter Cove 1, Sandy Cove 1, Ticoralak 6
(GcBi–1; GcBk–1; GbBn–8)

These sites contain convex-base lanceolate bifaces of white quartzite which can be typologically related to complexes in the interior sequence, such as the North West River Phase, and the Brinex complex. The form is too common to be of much use in typological dating with small samples. At Winter Cove 1 and Sandy Cove 1 the lithic materials do not support a North West River Phase relationship since several different raw materials are present. However, in the case of Ticoralak 6 the association with the North West River Phase is fairly secure on typological, technological, and raw material grounds.

RADIOCARBON DATING
(Table B)

Sandy Cove 4 (GcBk–4) 4810 ± 115 B.P. (SI–877)

A sample of hearth charcoal yielded a date of 2860 ± 115 B.C. The small artifact sample included Ramah chert biface stems similar to those found at other Sandy Cove sites, fragments of chipped quartz tools, and a large amount of chipped and battered slate flakes. A thick deposit of red ocher occurred in the cultural level with scattered charcoal stains as well. The cultural deposit was isolated beneath the overlying peat and humus horizon by a sterile sand level 1–3 inches thick.

Rattlers Bight 1 (GcBi–7) 3830 ± 140 B.P. (GSC–1260)
4020 ± 150 B.P. (GSC–1379)

A sample (GSC–1260) taken from a rich charcoal deposit in a hearth found in square 0 N 35 W yielded a date of 1880 ± 140 B.C. This sample, from the central part of the site 22 feet above sea level, should date the main occupation. A sample from the northern end of the terrace dates slightly earlier, 2070 ± 150 B.C. (GSC–1379). These dates are well within the expected range for the site based on external cultural relationships. They are, however, considerably earlier than expected in terms of geology. It is from these determinations that the low estimate of uplift in outer Groswater Bay is based, and it seems probable therefore, that habitation of the site began immediately after the terrace emerged from the sea; sites occupied earlier would have been located further west in Rattlers Bight (Hound Pond 1) or in Winter Cove.

Hound Pond 4 (GcBi-16) 3195 ± 120 B.P. (SI-927)
3095 ± 105 B.P. (SI-928)

Two samples of scattered hearth charcoal in the cultural level of this site gave dates of 1245 ± 120 B.C. and 1145 ± 105 B.C. This site was discovered and excavated in the 1971 field season and is not described in this report. The dates are significant, however, in that they are associated with an assemblage including large lanceolate, square-based bifaces similar to those from the undated Radio Shack site (FjCa-1) of the Charles complex. The other tools at Hound Pond 4 included asymmetric bifacial knives, flake tools, and a double-ended ground slate celt. Raw materials were red quartzite, purple chert, and white quartzite.

Ticoralak 2 (GbBn-2) 2690 ± 140 B.P. (GSC-1179)

A charcoal sample (GSC-1179) from a hearth in the small Dorset site, Ticoralak 2, dated 740 ± 140 B.C. The tools associated with the date include a large biface blank, a chipped and ground graver, a ground and chipped crescent, and numerous microblades. The site is the highest Dorset site (31 feet) from which a date was obtained. Its early date for Dorset in central Labrador was surprising, but the tool sample is too small to understand its significance in terms of Dorset origins.

Ticoralak 3 (GbBn-4) 2340 ± 140 B.P. (GSC-1217)

A small sample (GSC-1217) of Dorset artifacts came from this site, which gave a date of 390 ± 140 B.C. Besides dating various biface fragments, utilized blades, and ground slate, the sample dates the distinctive type of side-notched point which is characteristic of Dorset in the central coast of Labrador. The site is at 28 feet elevation at the front of a steep terrace slope, and the active beach may have been considerably lower during occupation.

Ticoralak 5 (GbBn-7) 2400 ± 160 B.P. (GSC-1314)

This site, the lowest (24 feet) of any major Dorset occupation known for the region, has a date of 450 ± 160 B.C. (GSC-1314), which is earlier than expected for its elevation. The sample was charcoal and came from a hearth in which Dorset tools and charcoal were mixed. The tools from the site include crude widely side-notched points, side blades, burin-like tools, core fragments and blades. Typologically, the points appear less carefully made, with broader side notches and asymmetric proportions than similar Dorset points from earlier sites, such as East Pompey Island. The elevation and assemblage suggest the site is late in the local Dorset occupation, although it is still within early Dorset range in the Eastern Arctic.

East Pompey Island 1 (GcBi-12)
2520 ± 160 B.P. (GSC-1367)

The East Pompey Island Dorset site produced a composite sample with a date 570 ± 160 B.C. (GSC-1367). Portions of the sample came from areas 1 and 2 whose elevations are, respectively, 28 and 25 feet. These areas are considered contemporaneous occupations since a tool fragment from one area fitted with a broken specimen from the other. The assemblage at the site is similar to the Ticoralak collections, with side-notched and box-based points, eared scrapers, stemmed microblades, side blades, single side-notched knives, and ground-slate tools. Red ocher was also present in small quantities. The date further substantiates the early regional variant of Dorset culture in Groswater Bay.

Red Rock Point 2 (GeBk-2) 2200 ± 120 B.P. (SI-875)

A composite charcoal sample dated 250 ± 120 B.C. The site contained a small number of Dorset artifacts within a very shallow soil profile. This date is the latest for any Dorset site yet excavated in the Hamilton Inlet area and is corroborated by typologically late types of burin-like tools also found there.

Big Island 1 (GbBm-1) 720 ± 130 B.P. (GSC-1196)

A charcoal sample taken from a hearth in square 48S 12E of Big Island 1, 9 feet above sea level, dated A.D. 1230 ± 130 (GSC-1196). The sample was mixed with burnt bone and chipping debris. This hearth was a few feet from a second hearth around which the remains of a tepee structure had fallen. The date is associated with a Ramah chert industry and a series of small corner-notched, convex-based points.

CULTURAL INTEGRATION

The following sites are grouped into cultural units on the basis of typology, raw materials, and elevation. Only the data serving to relate the sites are presented. Single component units are not listed.

Sandy Cove Complex
(GcBk-1-5)

The five sites found in the Sandy Cove area can be reliably related into a single cultural unit. Although large artifact samples are available only from Sandy Cove 2, all five sites are related in elevation and raw materials: quartz, red quartzite, Ramah chert, slate, and red ocher. Sites 1-4 also share stemmed points and ground-slate tools. Much of the slate is badly weathered. In addition, the use of quartz knives, red quartzite knives and scrapers, Ramah chert points and flake tools, and occasionally a lavender or black chert tool, characterizes the assemblage. While there are local differences between these sites which suggest internal chronological variation, they all belong to an earlier period of Maritime Archaic culture than that seen at Rattlers Bight.

Rattlers Bight Phase
(GcBi–2, 7, 9)

This phase is composed of three sites in the Winter Cove-Rattlers Bight area. The sites are related by elevation (22–31 feet), raw materials (Ramah chert, slate, red ocher), and typology. Tapered stemmed points are within the range of those from Sandy Cove but of slightly different styles; ground-slate bayonets, points and woodworking tools also link sites of this phase.

Spy Complex
(GbBo–1, GcBk–6)

Two sites are related by indirect association with sites of the Brinex complex in North West River. The Spy site opposite Rigolet has a very small tool sample, but its end scrapers on blade-like flakes and a small leaf-shaped point blank is reminiscent of one from the Red Ocher site and another from North West Brook 1. In addition, their raw material complexes are similar. The North West Brook 1 site, besides sharing small points, has side-notched convex-base points which are typologically similar to ones in the Brinex complex; convex-base bifaces and thumbnail end scrapers provide further relationships.

Groswater Dorset Phase
(GbBn–2–5, 7; GcBi–12, GeBk–2)

The Groswater Dorset sites form a unified group in terms of raw materials, elevation, and typology. These sites are dated from 740 ± 140 B.C. to 250 ± 120 B.C. Chronological subdivisions may exist within this phase with a possible component at the Shell Island 1 site as the latest example.

Winter Cove Complex
(GcBk–1, GbBn–8, GcBi–1)

One single component site and components of two others are included in this unit. Internal evidence for the association of these sites is weak and relies on the presence of white quartzite and leaf-shaped bifaces. Elevation ranges from 15–45 feet. Ramah chert is occasionally found in these sites. The unit appears related to the North West River Phase, but this association requires further verification.

Point Revenge Complex
(GbBm–1, GbBn–6, GcBk–1 East)

Big Island 1 (Point Revenge) is the focal point of this unit into which the Ticoralak surface collection is also placed. These two sites are related indirectly by their association with the dated Henry Blake 1 site of North West River. Shell Island 1, Winter Cove 4, and Sandy Cove 1 (East) may also prove to be part of the complex.

Ivuktoke Phase
(GaBp–1–3, GbBo–2)

The four early historic Eskimo sites in the Narrows are chronologically sequential winter occupations of the Ivuktoke Eskimos. Variation in the morphology of turf walls, amount of vegetation covering, house size, room numbers, and the length of their entrance passageways support a preliminary statement on their chronological sequence. The common attribute of three houses per site and the internal similarity of each site in terms of house placement and construction argues for basic continuity and for each being a separate, chronologically distinct settlement. The following order of occupation is suggested on the basis of house morphology (Figures 42, 43) and other field data:

GaBp–3: Separate single-roomed house units; round to subrectangular; short entrance passageways; small midden deposit; no enriched vegetation.

GbBo–2: Small subrectangular single-roomed houses; linear arrangement with shared walls; moderately long entrance passageways; heavy vegetation.

GaBp–1: Large rectangular to subrectangular single-roomed houses; extremely long entrance passageways; heavy vegetation cover.

GaBp–2: Rectangular single- and double-roomed houses, moderately long entrance passageways; breakdown of linear house arrangement; very heavy vegetation cover.

Snooks Cove: It is difficult to place this site in the sequence because the Eskimo houses have been partially destroyed; however, Tanner (1944:509) records this cove as the home of Joe Palliser's parents in 1937, and it seems to have been used before that. Reports (Davies 1843, Forbush 1903) speak of a settlement called Karwalla (Caravalla) which was used during the 19th century, but no evidence of this site was noted in a brief reconnaissance in Caravalla Cove in 1968. The term may have been used for what is now called Snooks Cove. No data on house types are available for these settlements, although photographs exist of contemporary dwellings from Northern Labrador taken by William H. Pierce while a member of the William Bradford expedition of 1864 (Peabody Museum of

Archaeology and Ethnology photographic file; see Packard 1885).

This sequence needs verification by further excavation. The small sample of artifacts collected in 1968 is insufficient for precise dating; however, the sequence of house forms suggested here agrees with Bird's sequence from Hopedale (1945:131–135, 179), Schledermann's (1971) from Saglek, and Mathiassen's (1934:170–173) from Disko Bay, West Greenland. Although no precise dating for these changes in Hamilton Inlet is advanced at this time, it is clear that the sequence occurs between A.D. 1550–1900.

GROSWATER BAY SEQUENCE

The foregoing analysis suggests a cultural sequence from Groswater Bay shown in Figure 59, covering approximately 4500 years of prehistory and the early contact period. The early end of the sequence is dated at 2860 ± 115 B.C. Undoubtedly, these excavations and collections do not represent the full range of cultures to be found in the region during this period. New cultures will surely be found, and a great amount of excavation will be necessary before the units here proposed can be fully understood.

The units proposed for the sequence are listed with pertinent data on sites included in Table L. Each unit is described in terms of material culture, dating, and general cultural characteristics in the following section.

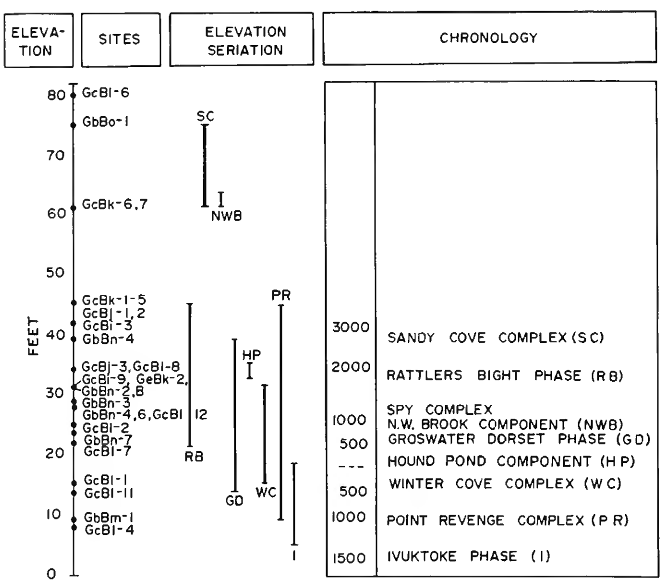


FIGURE 59.—Cultural chronology in Groswater Bay and the Narrows. Seriation bars bear culture unit abbreviations.

Sandy Cove Complex
(circa 2800 B.C.)

The Sandy Cove complex is the first major occupation represented in the Groswater Bay sequence as presently known. The five sites belonging to the complex are all found on the Sandy Cove 45-foot terrace, but are separate sites.

TABLE L.—*Cultural units in Groswater Bay correlated with elevation*

Cultural Unit and Site	*Designation*	*Elevation* (feet)	*Site Totals per Group*	*Minimum Elevation* (feet)
PHASES				
1. *Sandy Cove Phase*			5	45
Sandy Cove 1–5	GcBk–1–5	45		
2. *Rattlers Bight Phase*			3	22
Hound Pond 2	GcBi–9	31		
Winter Cove 2	GcBi–2	25		
Rattlers Bight 1	GcBi–7	22		
3. *Groswater Phase*			8	14
Ticoralak 4	GbBn–5	39		
Ticoralak 2	GbBn–2	31		
Red Rock Point 2	GeBk–2	31		
Ticoralak 2 East	GbBn–3	29		
E. Pompey Is. 1	GcBi–12	29		
Ticoralak 3	GbBn–4	28		
Ticoralak 5	GbBn–7	24		
Shell Island 1	GcBi–11	14		
(Ticoralak meat pits)		(ca. 15–40)		
4. *Ivuktoke Phase* (Neo-Eskimo)			4	15
Eskimo Island 1	GaBp–1	25		
Eskimo Island 2	GaBp–2	20		
Eskimo Island 3	GaBp–3	15–20		
Palliser Point 1	GbBo–2	15		
COMPLEXES				
5. *Winter Cove complex*			3	15
Sandy Cove 1	GcBk–1	45		
Ticoralak 6	GbBn–8	31		
Winter Cove 1	GcBi-1	15		
6. *Point Revenge complex*			2	9
Ticoralak	GbBn–6	31		
Big Island 1	GbBm–1	9		
7. *Spy complex*			2	61
Northwest Brook 1	GcBk–6	61		
Rigolet Spy	GbBo–1	75		
COMPONENTS				
8. *North West Brook 2 component*			1	61
North West Brook 2	GcBk–7	61		
9. *Hound Pond 1 component*			1	34
Hound Pond 1	GcBi–8	34		

The tool assemblage from these related but perhaps chronologically slightly separated sites is dominated by a variety of tapered stem points usually made from Ramah chert. The smaller points have leaf-shaped blades and long tapered stems; many are made on flakes retouched only at their margins. Larger points tend to have broader triangular blades and shorter stems. No "micropoints" have been found in the assemblage. Red quartzite is used for flake tools (Ramah chert also in small quantities) and occasional biface knives. Stemmed and leaf-shaped quartz bifaces occur. No formal scraper tools are found. The ground-stone industry is poorly represented, and is limited presently to ground-slate celts and a few bifacially ground knives and points. A single chipped red quartzite axe was recovered. The raw materials used in this complex are predominantly of local origin—quartz and red quartzite; however, the use of Ramah chert, slate, and red ocher indicates trade or movement beyond Groswater Bay.

The site distribution along the front of the 45-foot terrace indicates a settlement pattern of small camps which were used seasonally by small groups of people. The light scattering of cultural material argues for infrequent and transient occupation, and the interpretation that the area was not used during the winter is supported by the lack of evidence for winter houses and the scarcity of hearths. A prime advantage of the Sandy Cove area during the summer is its position as one of the best protected regions from the standpoint of marine hunting of any contemporary site in eastern Groswater Bay.

While there is suggestion of time difference between the sites, they clearly belong to a period within the Maritime Archaic Tradition preceding that of the Rattlers Bight Phase. It appears likely on the basis of a lack of typological comparisons that the complex dates before the Port au Choix Maritime Archaic site for which the earliest date at present is 2340 ± 110 B.C. A date for the Sandy Cove Phase of 2800 B.C. supports this view.

Rattlers Bight Phase
(circa 2000 B.C.)

The Sandy Cove complex apparently evolves into the Rattlers Bight Phase, named from the type site, Rattlers Bight 1 (GcBi–7). Although an intermediate stage between the Sandy Cove and Rattlers Bight phases may be found somewhere in Groswater Bay at elevation ranges between 25 and 35 feet, there appears to be a direct line of continuity in the evolution process between them. Many of the tool types remain essentially the same with only attribute modifications. The major changes are in the raw materials: Ramah chert completely replaces quartz, red quartzites, and other cherts in the chipped-stone industry, and ground slate seems to play a more important role in the technology. The site which defines the phase is the largest of any site discovered in Hamilton Inlet.

The tool assemblage is still dominated by a stemmed point tradition in which bifacial and unifacial points, flake points, and micropoints are common. Flake scrapers and knives are used, but no formal scrapers occur, nor any specialized tools for cutting or grooving bone, which is preserved in small quantities when calcined. A barbed leister of antler was the only preserved artifact of bone. The ground stone industry includes stemmed slate points and knives, bayonets, gouges, axes, and adzes. Two types of plummet are found: a knobbed variety which is pecked, and a polished type of soapstone which is grooved or perforated. Whetstones, grindstones, and mauls are common.

Faunal analysis from sites of this phase indicates that black bear, beaver, otter, seal, and goldeneye duck were hunted. This points to a summer occupation and to the adaptation to coastal marine resources, as well as inland species. The presence of beaver, black bear, and otter from sites now within the tundra zone suggest a period in which the forest may have extended east to these sites. Further evidence for this is found in the large masses of wood charcoal and heavy woodworking tools.

The Rattlers Bight 1 site appears to have been occupied soon after the emergence of the 22-foot tombolo beach. As such, it represents a shift of sites of the Sandy Cove complex eastward into the marine zone as suitable occupation areas became available. The large size of the site and its concentrated remains indicate an intensity of cultural activity unlike other sites in Groswater Bay, suggesting a relatively permanent summer base camp used by a fairly large group of individuals. The site probably represents a late phase of the Maritime Archaic in central Labrador, a time when it was participating in a Ramah chert trade which extended south into the Maritime provinces and New England.

Spy Complex
(circa 1200 B.C.)

The third unit in the Groswater Bay sequence is termed the Spy complex and is composed of two sites, the Rigolet Spy site and North West Brook 1. These sites give only a limited view of the tool assemblage, which includes side-notched concave-base points, small leaf-shaped points, larger convex-based bifaces, end scrapers on blade-like flakes, thumbnail scrapers, and a variety of flake tools. The raw materials used are quartz, red quartzite, and opaque cherts. Although the site elevations are high, they are not truly indicative of great age, since typologically the unit seems closely related to the Brinex complex of the North West River sequence. It should therefore date around 1200 B.C. as suggested by the date from the Red Ocher site.

In contrast to the Rattlers Bight Phase, sites of this complex are small and seem to indicate a summer adaptation to seasonal marine resources like birds and fish, while seal may have been taken in small numbers. Site location and distribution indicates a less efficient maritime adaptation than seen for Maritime Archaic Tradition sites.

North West Brook Component
(circa 1000 B.C.)

A small single component site at North West Brook (GcBk–7) provides the evidence for a coastal distribution of the Charles complex, provisionally dated about 1000 B.C. This site contained large-stemmed scrapers, disk scrapers, and a convex-based biface. The scraper types have not been found in any other sites and they seem to be valid cultural indicators for this period. As with the previous unit, the North West Brook component appears to be a small summer coastal site of a culture with a predominantly interior adaptation. The milky gray quartzite used on the site is not known elsewhere from either coastal or interior sites.

Groswater Dorset Phase
(circa 800–200 B.C.)

The fifth unit in the sequence is the Groswater Dorset Phase. This unit represents one of the larger and more stable occupations of the bay, for which collections come from seven sites on Ticoralak Island, East Pompey Island, and Red Rock Point. Although some of the samples are very small, they give an indication of the nature of this local Dorset variant.

The tool assemblage for this phase clearly derives from the Arctic Small Tool Tradition (Irving 1957: 47) employing microblade, biface, and ground-stone industries. No bone was preserved in the sites. The dominant tool is a class of side-notched plano-convex end blades of which three basic varieties occur: a small type about 20 mm in length, another about 30 mm in size, and a large "box-based" type 40–50 mm long. Found with these points are large and small lunate side blades, corner-notched or stemmed bifacial knives, single side-notched knives, cores, and stemmed, notched microblades. End scrapers are often found and generally have pronounced graving spurs. Two types of burin-like tools occur as frequently as points. These are chipped and ground and have asymmetrically notched bases and tabular blades prepared both laterally and distally as bone-cutting tools. In addition their ground lateral edge is used for the removal of thin, linear spalls in the fashion of the Arctic Small Tool burin spall industry. These spalls are found to be utilized, presumably for gouging holes in bone. A ground-slate industry is present in low frequency. To date, only tabular scrapers, adze edge fragments, and fragments of knives have been found.

The raw materials typically used in the Groswater Dorset Phase are a fine-grained green-brown-tan mottled chert (known only from coastal sites and only in Dorset culture), and minute quantities of Ramah chert, quartz crystal, slate, and, occasionally, red ocher.

The sites found during the survey are all summer camps with restricted tool inventories and samples. Domestic tools like soapstone vessel fragments and scrapers are rare or absent; by contrast, hunting and fabrication tools are commonly found. Winter sites have not yet been located, and will probably be found in the heavily forested margins of the Narrows. The Groswater Dorset Phase at present represents only the seasonal summer adaptation of a culture which presumably inhabited the coastal regions throughout the year, unlike the Indian cultures which preceded and followed it.

Groswater Dorset is quite distinctive from other Dorset variants in the Eastern Arctic and Subarctic. Chronologically early, between 800–200 B.C., it seems to represent an initial movement south from northern Labrador where a localized evolution from pre-Dorset to Dorset may have taken place. However, it is possible that late pre-Dorset will be found in the central coast region of Labrador. While sharing many underlying similarities with other Dorset cultures of Newfoundland, Labrador, and Hudson Strait, Groswater Dorset has a distinct regional cast, most evident in its projectile point styles and its lack of the common triangular "tip-fluted" point and other features usually found in the Dorset tradition. A major problem remains in searching for continuities between Labrador and Newfoundland Dorset, which must be seen as deriving through a stage similar to that of Groswater Dorset. If they exist these late sites have not yet been found in Hamilton Inlet. In any case, it is doubtful that Dorset sites later than A.D. 1 will be found here because of the occupation of the coast at that time by Indian peoples.

Hound Pond Component
(circa 100 B.C.)

The later component of the Hound Pond 1 site in Rattlers Bight may indicate a summer coastal camp of a culture related to the David Michelin component. The stemmed point found here is typologically close to those from North West River; however, firm relationship cannot be established. Its tentative placement indicates an occupation closely following the Dorset period about the time of Christ.

Winter Cove Complex
(circa A.D. 200)

The presence of several sites containing white quartzite assemblages characterized by convex-based bifaces and quantities of flaking debris similar to the North West River (Shield Archaic) Phase suggests the presence in Groswater Bay of a seasonal adaptation to coastal resources of this basically interior culture. Although samples are small, and only three sites have produced these materials (often in mixed components, as at Sandy Cove 1), the flaking style and raw material is not commonly used exclusively by other cultures in the bay, and an identification with the North West River Phase is advanced. Its chronological position following the Hound Pond component and preceding the Point Revenge complex is based on a minimum elevation of 15 feet at the Winter Cove 1 site and its position in the North West River sequence. The largest site of the complex was found on Ticoralak Island adjacent to the Dorset sites at 31 feet. The occasional presence of Ramah chert at these sites, as at North West River, gives some indication of coastal movement and cultural distribution.

Point Revenge Complex
(circa A.D. 1100)

The last prehistoric unit in the sequence is the Point Revenge complex, at present composed of only two components between 9–31 feet: Big Island 1 and the Ticoralak Surface Collection. Big Island 1 is the major component of the complex, whose assemblage consists of small convex-base, corner-notched points with asymmetric notches, flake scrapers and knives, and large corner-notched spear points with flat bases. The complex is associated with the dated Henry Blake 1 site in North West River.

It is possible but not yet demonstrably proven that the points from Sandy Cove 1 East belong to an early period of the Point Revenge complex. These points are not identical to the Big Island specimens, being flat based and sometimes manufactured unifacially on flakes. It is possible that a larger sample from dated sites of this complex would include these specimens as well. Points very similar to the Sandy Cove 1 points have been found at Blanc Sablon 4 (Harp 1963:210) and these have been dated at A.D. 690 ± 46 (P–686; Harp and Hughes 1968:44). This suggests an early beginning of the Point Revenge complex in the central and southern Labrador area. Later styles of points developed convex bases and deeper corner notching, although the large spear points retained flat bases.

Also not yet included in the Point Revenge complex, but perhaps present in unexcavated sites, are more deeply corner-notched flat-based points such as those found in what seem to be Montagnais contact sites in southern Labrador and Quebec excavated by René Levèsque (pers. comm.) of the Archeological Society of Sherbrooke. These points appear to be in the same cultural tradition, and it is likely that future work will link the entire series described above in a single cultural tradition beginning in Labrador about A.D. 500 after the termination of the North West River Shield Archaic and lasting into historic Montagnais-Naspaki. It would appear from the date of the Point Revenge complex and its location in central Labrador that it may represent the ancestors of the present Naskapi Indians. Further data contributing to this supposition will probably be found in future work in the Shell Island and Winter Cove 4 sites.

These sites seem to represent a well-established summer coastal adaptation by a people who appear to be new arrivals in Labrador. The culture lasts at least several centuries and probably until the contact horizon. The consistent use of Ramah chert indicates the extent of coastal adaptation and movement, and the relatively heavy occupation of the coast during the summer season suggests that sites of the Point Revenge complex may have been occupied at the time of the Norse visits.

Ivuktoke Phase
(circa A.D. 1500–1850)

The Ivuktoke Phase is the final aboriginal occupation of the coast prior to extensive European acculturation. Four chronologically sequential semisubterranean village sites belong to the phase, and each village contains substantial social, demographic, and technological data for the early centuries of contact.

A very incomplete archeological picture of this period has been obtained from a few exploratory test pits in middens and houses. Historic artifacts are found in all of them; no prehistoric site of this culture has yet been found in the region, and it is doubted that such sites exist. Typical finds include whale bone sled runners, harpoon foreshafts, knife handles, bone toggles and pins, musket balls, brick, ceramics, soapstone vessels, iron tools, seal and whaleskin remnants, and other materials.

Besides the winter houses in the Narrows, the settlement pattern (Figures 28, 30) of the Ivuktoke Phase includes spring and summer sites on islands in Groswater Bay from which sealing, whaling, fishing, and bird hunting expeditions were undertaken. Stone grave cairns are frequently found in the area. In addition, stone shelters such as those atop Pompey Island may have been used by the Ivuktoke Eskimos for the winter caribou hunt, which was also pursued in the Mealy Mountains.

The assemblage, though scarcely known yet, resembles that of the Hopedale area, described by Bird (1945). Here, also, a lack of prehistoric Labrador Eskimo sites was noted, as well as the absence of early sites of this culture on the coast south of Hamilton Inlet. It thus appears that the Ivuktoke Eskimo arrived in Groswater Bay after A.D. 1500 as part of a very rapid and dramatic expansion down the coast of Labrador, ultimately reaching the Gulf of St. Lawrence. This is a crucial period for which a great amount of research is needed and for which a tremendous body of data exists.

GEOLOGICAL IMPLICATIONS

Figure 60 shows sites in Groswater Bay and the Narrows plotted according to age and elevation. When compared with the uplift curves for the two areas it is seen that a very close agreement between sites and active beaches exists, with all of the sites in the Narrows or on Ticoralak Island falling on the dry side of the curve for that area. Only GbBn–7 (Ticoralak 5) falls below the curve. These data support and lend credence to the curve determined from the Eskimo Island shell date.

Sites from the outer bay generally fall below the curve for the Narrows but above the maximal slope of the curve determined from the date of the Rattlers Bight site, which must have been occupied shortly after emergence of the tombolo bar. Here the data is less conclusive, for the dating of archeological sites and cultural affinity of several is unknown. In addition, geological samples are needed to corroborate the uplift estimate based on archeological data.

The fact that the Dorset site at East Pompey Island (GcBi–12) is well above the curve indicates a cultural preference for high elevations. The discovery of Dorset traces in the Shell Island site (GcBi–11) seems to be a more reliable indicator of the true age of the Dorset occupation in this area.

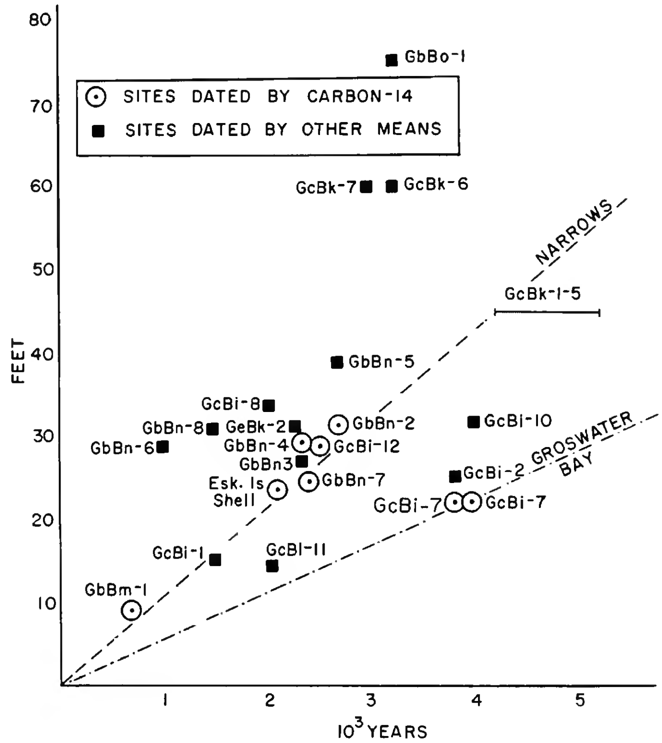


FIGURE 60.—Sites in the Narrows and Groswater Bay plotted according to elevation and age relative to the geological emergence curve from these areas, based on radiocarbon determinations, typology, and relationship to the North West River sequence.

CULTURAL TRADITIONS OF LABRADOR

Regional Integration

This section presents a brief summary of the culture history of Hamilton Inlet and integrates the regional sequences for western Lake Melville and Groswater Bay into a single space-time chart. No attempt is made to undertake detailed analysis of external relationships, although the culture history for the Far Northeast, New England, and the Arctic has been important in interpreting the Hamilton Inlet data and in organizing it into cultural traditions extending beyond Labrador itself. The more immediate purpose of integration is to provide a basis for analyzing problems of cultural ecology, determining culture area boundaries, and discussing the relationships between the various cultures inhabiting the inlet.

Within the proposed area chronology (Figure 61) there are 12 cultural units of which 10 are archeologically and culturally distinct. Six of these are found in both the interior and coastal sequences, two are limited exclusively to the coastal regions as presently known, and two are limited to the interior. These regionally distinct cultural distributions occur twice, most recently in the Ivuktoke-Sesacit early historic period, and earlier during the occupations of the Groswater Dorset and Road component periods. During the other six periods the culture-area distributions include both coastal and interior zones. Of the 10 culturally distinct units, two—Groswater Dorset and Ivuktoke—are Eskimo in affiliation, and the remaining 8 are Indian.

Cultural Traditions of Hamilton Inlet

Four distinct cultural traditions can be recognized in the Hamilton Inlet sequence. These include two northern Eskimo cultures—Dorset and Labrador Eskimo—and at least two Indian traditions, the Maritime Archaic of the eastern seaboard, and the Shield Archaic Tradition of the Canadian boreal forest.

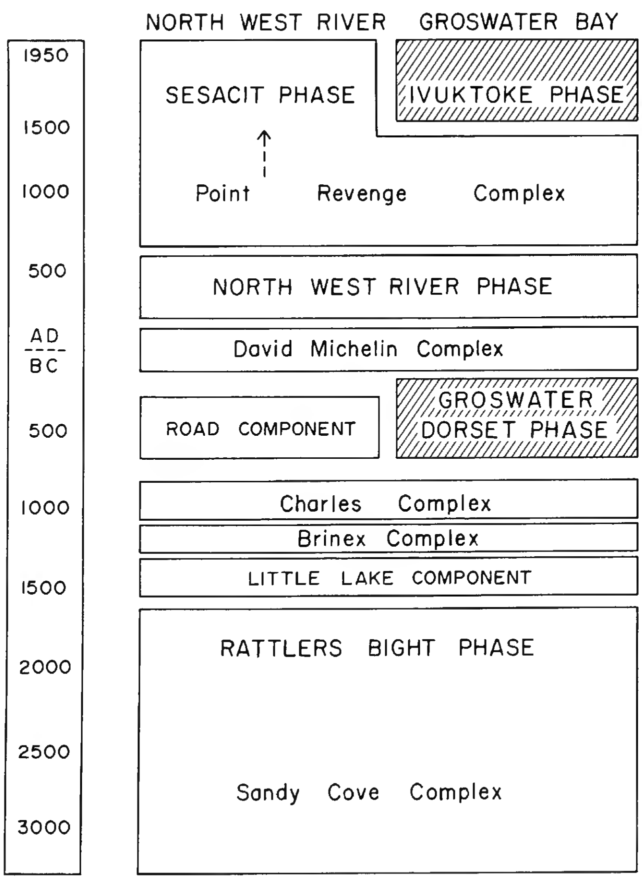


FIGURE 61.—Cultural sequence in Hamilton Inlet, Labrador. Indian cultures shown in white; Eskimo cultures in hachure.

Maritime Archaic Tradition

The Sandy Cove and Rattlers Bight Phases are part of the Maritime Archaic Tradition, one of the earliest cultures of the Far Northeast. The idea of a Maritime Archaic culture first originated with Douglas Byers (1959:255) and has been reintroduced by James A. Tuck (1970) to subsume a tradition which is most clearly seen in the elaborate burial complexes of the second and third millenium B.C. of northern New England, the lower St. Lawrence region, and the Maritime Provinces, including Labrador. This culture, which includes several regional and chronological variants, includes a stemmed-point tradition in the north and various types of notched and stemmed points in its southern distribution, has an elaborate ground slate industry of gouges, adzes, slate points and knives, and an equally elaborate (but rarely preserved) bone industry, seen best in the Port au Choix cemetery (Tuck 1970). The best-known sites of this tradition are cemeteries, and very little information on domestic activities is available. Maritime summer occupation and exploitation was ritually and economically important in this culture, while winter adaptations seem to have included interior elk, moose, and caribou hunting.

Very little is known about Maritime Archaic origins. At present the earliest cultures apparently related to Maritime Archaic are the Vergennes of the lower St. Lawrence region, most recently described by Ritchie (1968). Vergennes, dating between 3500–2800 B.C. appears to predate other Laurentian phases (Brewertown, Vosburg, Frontenac) and while sharing certain point styles has a distinctive ground slate industry not present in these other cultures. I believe it is best to think of Vergennes as fairly distinct from these other phases (Fitzhugh 1969b). As added emphasis to Vergennes' distinctiveness, Ritchie (1968:4) is now thinking of Vergennes as the "classic Laurention" culture.

In my view, the roots of Maritime Archaic culture will be found in an interior cultural tradition of the third and fourth millenia B.C., characterized by stemmed points, an incipient ground slate technology, and a well-developed bone industry. Scattered finds in New England include many of the components of this early complex, including gouges, ulus, and early stemmed projectile-point forms. Most importantly, recent excavations at the Neville site in Manchester, New Hampshire (Dena Dincauze, pers. comm.), include stemmed points dating in the sixth millenium B.C. underlying levels containing many of the elements which I believe will be found in the proto-Maritime Archaic complex. However, until these complexes and their chronological and spatial relationships are clarified I am inclined to see the later Maritime Archaic cultures as more closely resembling Vergennes, albeit with different point forms. Present data suggest that Maritime Archaic origins predate Vergennes, and that when Vergennes culture existed in the lower St. Lawrence valley, Maritime Archaic culture was already becoming established in more northerly and easterly regions in the maritime zone. According to this hypothetical view Maritime Archaic would have arisen from a pre-Vergennes complex containing a stemmed-point tradition and incipient ground-slate and bone industries during the period 4500–3500 B.C. in the lower St. Lawrence region. During postglacial withdrawal of marine influence in this area, proto-Maritime Archaic evolved from an interior hunting culture into one that became increasingly adapted to the efficient seasonal exploitation of maritime resources, including sea mammals and fish. Coastal summer occupation and exploitation gradually became a focal point of the culture, which also retained its earlier winter interior hunting pattern. Subsequently, this culture spread eastward into the Gulf of St. Lawrence, Newfoundland and Labrador, the Maritimes, and into northern New England where it is archeologically best known during the period between 2500–1200 B.C.

Evidence to substantiate an early Maritime Archaic culture in Labrador is minimal at present. Harp's (1963:252) early component of the Boreal Archaic included stemmed points, and his early Labrador dates of 3600–4300 B.C. (samples P–687, 688, 691; Harp and Hughes 1968:44), while not associated with the suggested early points, do indicate the presence of man when the proposed developments were taking place. Dating and a more complete cultural inventory from the Sandy Cove complex will help to clarify these developments in the third millenium B.C.

At present, the Maritime Archaic Tradition in Labrador seems to have occupied both interior and coast from sometime before 2500 B.C. until 1500 B.C. This culture, of which two complexes are known from Groswater Bay, extended as far north as Saglek and Ramah Bays, where two components are dated at 4530 ± 105 B.P. and 3890 ± 110 B.P. (Tuck, pers. comm.). Traces of Maritime Archaic culture have been found in northern Quebec at Indian House Lake within a five-day canoe ride from Hudson Strait, and also on the Labrador coast north of Nain. Coinciding with the period of northern forest extension in the Climatic Optimum, the Maritime Archaic cultures of northeastern North America spread about 1200 miles from southern New England to the tree limit in northern Labrador and Ungava. These cultures, with distinct variation, can best be seen as a huge interaction sphere in which the most dramatic evidence of contact between them is the finding of stemmed points of Ramah chert (typologically identical to Rattlers Bight specimens) in burials of the Moorehead complex of Maine, which are in complexes that do not themselves contain many stemmed points.

Arctic Small Tool Tradition

The next distinct cultural tradition to be found in Hamilton Inlet is the Dorset culture subtradition of Arctic Small Tool Tradition, appearing as the Groswater Dorset Phase fairly early in the first millenium B.C. as a new southern movement of a culture already fully transformed into Dorset. Earlier Arctic Small Tool Tradition cultures have not been found this far south in Labrador, but are known on the coast north of Nain (Fitzhugh 1969c: 33). In some features, such as the near absence of microblades, pre-Dorset here resembles Greenland *Sarqaq* more than it does Canadian pre-Dorset. The relationship between pre-Dorset and Maritime Archaic in northern Labrador is unclear, except that Maritime Archaic disappearance coincides with the arrival of deteriorating climate conditions and an advancing Arctic Small Tool Tradition culture, dated at Thalia Point 2 to 1710 ± 140 B.C. (GSC–1264), and in Saglek to 3830 ± 115 B.P. and 2715 ± 130 B.P. (Tuck, pers. comm.)

Pre-Dorset and Maritime Archaic relationships in northern Labrador now emerge as one of the major problems in the prehistory of the far Northeast. Certain dating, distributional, and typological questions will remain paramount until a larger amount of data from the northern Labrador region have accumulated.

The Dorset period of the Arctic Small Tool continuum seems to last about 500 years on the central Labrador coast, to which it moves from northern Labrador after evolving into Dorset. It disappears in Groswater Bay apparently about the time it first turns up in Newfoundland, where it lasts until considerably later, as if on an island refuge. In general terms the Dorset culture is an Eskimo culture with highly developed mesolithic types of chipped stone and bone industries, and with an arctic-adapted sea mammal and winter ice-hunting technology which enabled them to subsist in the marine tundra zone throughout the year, although interior caribou hunting was an important adjunct to their adaptation. In terms of basic adaptation, Dorset culture is similar to the more recent Thule, or neo-Eskimo tradition, with the exception of the latter's whale-hunting specialization. The distribution of Dorset culture in eastern North America extends from Cornwallis Island to Greenland, southern Hudson Bay and Newfoundland. In Hamilton Inlet, it seems to have been strictly a coastal culture, with no sites known west of the Narrows.

Shield Archaic Tradition

The Shield Archaic is the third clearly discernible cultural tradition of central Labrador. This tradition, recently recognized and defined by James V. Wright 1968:57), is an Indian culture of the Canadian boreal forest, which is culturally distinct from Laurentian and apparently extends east from the central Barren Grounds around southern Hudson Bay into Ontario, Quebec, Newfoundland-Labrador, and into the Maritimes (Figure 62). The Shield Archaic is a very generalized interior hunting culture of the boreal forest relying on fish, birds, and especially caribou or moose, and with an elementary social organization and low population density. Sites of this tradition are usually small and seem to represent the remains of short-term occupations by nuclear family or extended family groups. The tool assemblage is also generalized, including roughly made bifaces with lanceolate, stemmed, or notched forms, asymmetric knives, scrapers, and other basic tools. The raw material commonly used was quartzite or other locally available coarse-grained rock. Bone tools probably played an important role in the technology as they did for the ethnographic peoples of this region, but they are rarely preserved in sites.

The Shield Archaic representative in Hamilton Inlet, the North West River Phase, is very similar to Wright's definition of the tradition with the exception of the lack of notched points and formal scraper tools. This may be due to regional or chronological variation, or sampling problems. Other Shield Archaic sites in eastern Canada include those from central Quebec (E. Rogers and M. Rogers 1948, 1950; Rogers and Bradley 1953; Martijn and Rogers 1969) and the New Brunswick Highlands (David Sanger, pers.

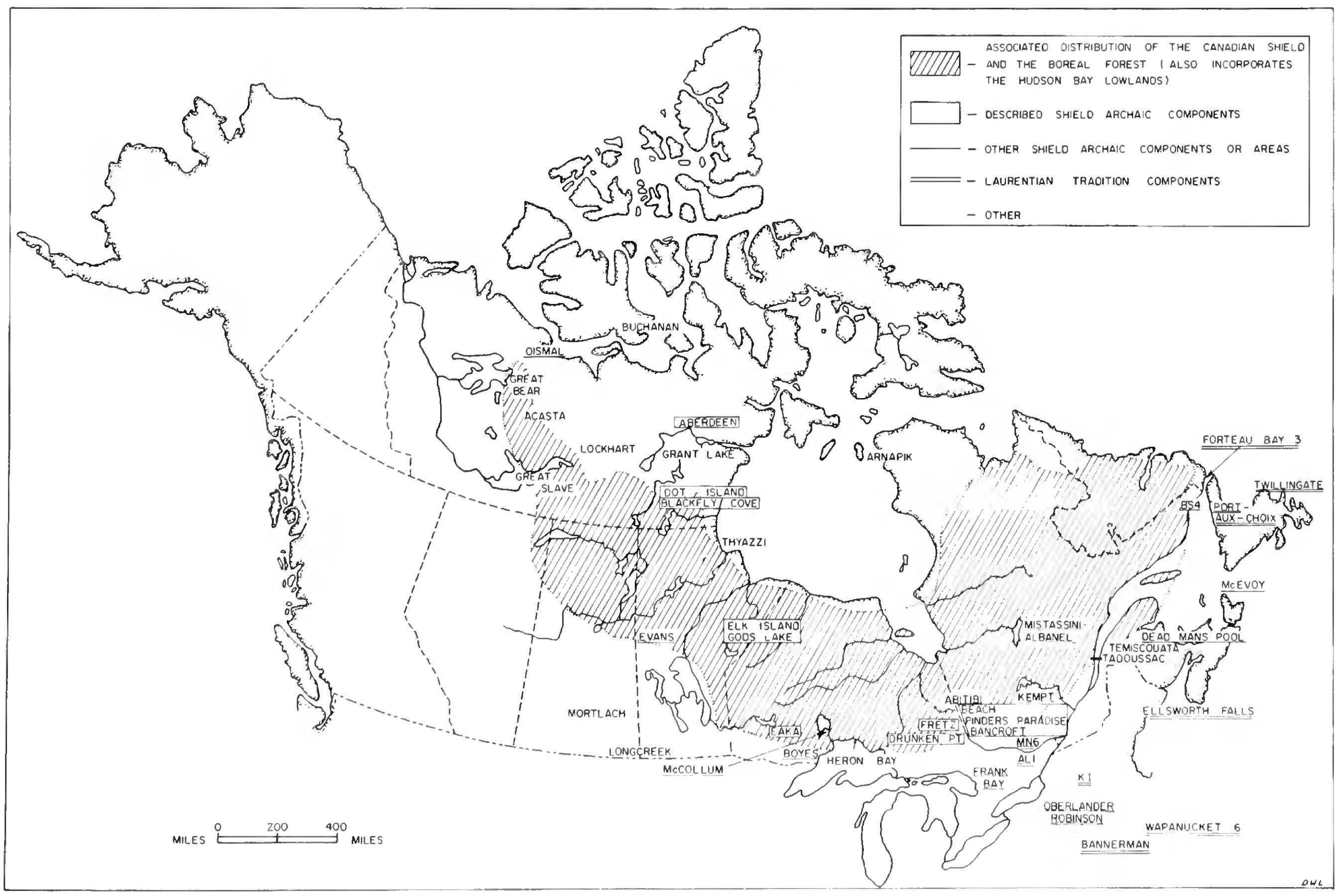


FIGURE 62.—Distribution of Shield Archaic culture in the boreal forest. (Courtesy of James V. Wright)

comm.). Shield Archaic sites similar to the North West River Phase are known from southern Labrador (Peabody Museum collections, Plate 86) and Newfoundland.

The dating of the tradition is presently unclear. Wright (1968:57, 1970:43) sees typological similarity between some Shield Archaic lanceolate points and late Plano manifestations of the Barren Grounds and northern Canadian Plains, such as at the Acasta Lake site, dated to 5020 ± 360 B.C. (I–3957) described by Noble (1971). To me, however, the similarities do not yet warrant cultural affinity of this antiquity, for the typological relationships are not yet clear and the earliest date of an acknowledged Shield Archaic site presently available is 1075 ± 90 B.C. from House Structure 1 at the Aberdeen Lake site (S–506, James Wright, pers. comm.). In general agreement are the dates from the Shield Archaic site of Elk Island (GdKn–1) of 810 ± 240 B.C. and 880 ± 210 B.C. (GaK–1860, 1861, respectively; Wright 1970:39). Wright (1968:60) has also suggested that the Mattawan stratum of the Frank Bay site (Ridley 1954) may be Shield Archaic. The Mattawan complex dates to 970 ± 300 B.C. (M–363) according to Byers (1959:253). The North West River Phase dates to the early centuries A.D.

Although the North West River Phase is the only very close relative of the Shield Archaic, other Hamilton Inlet complexes (Brinex, Charles, David Michelin) may possibly be part of this tradition. However, they are not here included as the evidence is far from convincing, for they seem quite distinct in a historical and typological sense from *classic* Shield Archaic, such as that from the Aberdeen Lake. Closely following the Dorset and David Michelin periods, the Elk Island site (Wright 1970), and possibly the Wenopsk complex (Martijn and Rogers 1969), the Shield Archaic of Hamilton Inlet seems to be predominantly a tradition of the interior, and if interpreted narrowly it occupies only a short period in this area, where it is preceded and followed by cultures whose typology and technology are quite different. I therefore remain to be convinced of Wright's broad interpretation for the tradition which includes most of the prehistoric cultural assemblages presently known from the eastern boreal forest, even though in his original sense the term refers as much to internal unity of the collections as to their distinction from something they are not, i.e. Laurentian Archaic. These two cross-cutting definitions tend to obscure the merits of the very useful Shield Archaic proposal. Both conditions can be satisfied, however, if the term is not used too broadly.

Thule Tradition

The fourth cultural tradition which is clearly represented in the Hamilton Inlet data is the Thule Tradition, sometimes called the Neo-Eskimo Tradition. This culture, whose roots lie in the North Alaskan and Bering Sea Eskimo cultures, migrated into the Eastern Arctic and Greenland between 900–1000 A.D. (W. E. Taylor 1963) in a tour-de-force practically unparalleled in extent and swiftness of movement in known aboriginal culture migrations. This dramatic expansion seems to have been made possible by new ecological conditions (McGhee 1970), the development of a whale-hunting technology, dog traction, and new social forms enabling Thule peoples to take advantage of resources previously untapped by the resident Dorset peoples of the east. Arriving among the Dorset territory, Thule peoples seem to have borrowed certain indigenous culture traits and perhaps even assimilated or acculturated the resident Dorset populations in some instances (W. E. Taylor 1959b; Fitzhugh 1968). In addition, it is now reasonably demonstrated that the Thule peoples evolved, although with considerable culture change and some population movements, into the ethnographic Eskimos.

Classic Thule culture as defined by Mathiassen (1927) however, is unknown from the central Labrador coast, although its presence in northern Labrador may be established (Schledermann 1971). Eskimo peoples of Thule ancestry do not seem to have moved down the Labrador coast until after 1500 A.D., arriving in regions south of Nain soon after the first European settlers arrived in southern Labrador. Excavations by Junius Bird in the Hopedale area (1945: 178, 179) and my own observations and excavations in Hamilton Inlet confirm the fact of their recent arrival, first suggested by Gosling (1910:166). The earliest sites in these areas are always associated with historic trade articles. In fact, a combination of climatic deterioration and incentive to acquire European goods seems to have acted concurrently in their southern movement. In Hamilton Inlet this population has been called Ivuktoke Eskimo.

The Ivuktoke Eskimo specialized in hunting whale and walrus. Whalebone (baleen) was a valuable commodity traded with the Europeans, as noted by Cartwright (1972). The success of the Eskimo Island settlements in taking whales has already been mentioned (page 55), and whalebone figures prominently in the materials recovered in test excavations on the island. In addition, faunal remains of caribou, fox, and seal are common in the middens. Artifacts include a wide range of hunting and domestic tools, many adapted or locally manufactured from European raw materials.

Although the sample is small, the collections are similar to those recovered by Bird from the Hopedale excavations.

The presence in the Narrows of four Ivuktoke winter settlements, well preserved and with substantial middens, provides a wealth of data pertaining to the fascinating period of early demography and acculturation of these people. Excavations here in the chronologically sequential settlements and related summer camps and graves in eastern Lake Melville and Groswater Bay could provide an important source of information for a period which is almost completely undocumented in central and southern Labrador. The records of the Moravian missions of northern Labrador (Kleivan 1966; G. Taylor 1968, 1970) provide valuable comparative material for demographic and social analysis. Among the more interesting theoretical questions would be studies of the dynamics of population expansion and migrant communities, the effect of white trading and missionary influence on social organization, value orientations, house form, and settlement and community patterns.

A further important point of research lies in Eskimo relationships with the Montagnais-Naskapi Indians. Conflict between these groups has been noted as resulting from the recent Eskimo preemption of the Indian summer coastal hunting territories and Eskimo incursions into the Indian winter caribou hunting grounds in the Mealies. In addition, more peaceful, or practical contact seems to have occurred, resulting in Indian adoption of many Eskimo traits; indirectly (Rogers 1964) and by trade (A. Podalinski, pers. comm.).

These four traditions, however, account for only part of the Hamilton Inlet sequence; seven cultural units remain unassigned to larger traditions. These include the Sesacit and Point Revenge cultures, the David Michelin component, the Road component, the Charles and Brinex complexes, and the Little Lake component.

Of these, the Little Lake component seems stylistically related to the late Archaic stemmed-point tradition of the eastern United States seaboard, and especially to the Watertown Phase in Massachusetts. This relationship seems to be on the level of a horizon style, i.e., the spread of a diagnostic point type. This in itself does not indicate necessarily a full cultural tradition in the anthropological sense of the term, and many disparate cultures may have been involved which shared common stylistic features but whose cultural-ecological and historical traditions may have been divergent.

The Charles and Brinex complexes and the David Michelin component do not appear to fit into any presently known cultural tradition, though they have affinities to other materials of the western boreal forests. At present it is best not to place them within the Shield Archaic Tradition until cultural continuities and variation within this tradition are better understood. There seems, however, to be a distinct resemblance between the Charles complex and the Mattawan complex of the Frank Bay site (Ridley 1954). The dating of the Mattawan stratum at 970 ± 300 B.C. (Byers 1959:253) corresponds well with dating of the Charles complex in the North West River sequence at about 1000 B.C.

The Road component and Point Revenge complex have typological relationships with Woodland cultures to the south, excepting association with agriculture and ceramics. The dating of these units is consistent with these relationships. Road Site points, typologically similar to Meadowood points, are not, however, identical. Their distribution north of the St. Lawrence suggests style trends across several ecological zones, perhaps involving basically similar cultures, but ones whose cultural relationships are not presently understood. Undoubtedly, we are seeing in this case as in others, style diffusions throughout broad geographic areas and numerous ecological zones of cultures with considerable regional variation in assemblages and economies.

The Point Revenge complex fairly clearly represents a northern movement of new peoples from the south, following the occupation of the North West River Phase Shield Archaic peoples of the western boreal forest. This new influx probably originated south of the St. Lawrence following middle Woodland times. After arrival in Labrador and Newfoundland these people were affected by infusions of new ideas and to some extent peoples drifting into the peninsula from the south. Gradually, a transition into the ethnographic Montagnais and Naskapi occurred, and in the Hamilton Inlet region, to the Sesacit band. The late appearance of Eskimo on the central Labrador coast may be due in part to occupation of those regions by Indians.

Hamilton Inlet Chronology

Several disparate comments on the Hamilton Inlet chronology are included here since they contribute to the discussion in subsequent chapters. They are intended merely as brief observations and are not fully developed at this time.

Culture Areas, Natural Areas, and Eskimo-Indian Contacts

Perusal of the space-time chart (Figure 61) shows that there is little, if any, evidence to support claims of synchronous overlapping cultural ranges within the inlet. In fact, this possibility seems extremely limited precisely because of the general cultural uniformity of the area at any given time during most of its known prehistory. There are only two periods when different cultures inhabited the interior and coastal regions simultaneously. The first of these occurred during the Dorset period early in the first millenium B.C. when the Road site component and possibly the David Michelin component occupied the interior. In this regard it is significant that no site related to the Road site component (circa 600 B.C.) has been found in the Dorset area on the coast, while at either end of the Dorset occupation there is evidence of the Charles complex (circa 1000 B.C.) and the David Michelin component (circa 200 B.C.) If, in fact, the Road site component was restricted to the interior, some degree of coastal contact is suggested by the presence of a small amount of Ramah chert in the site. At present, however, the possibility of overlapping zones of exploitation is purely speculative since there is not enough known of the precise dating and distribution of interior sites. If overlapping ranges did occur during this time they are likely to have been during brief summer sojourns of interior peoples on the coast, or in the caribou hunting grounds in late summer or midwinter. The fact that the Naskapi occasionally came out to the Eskimo-occupied coast in central Labrador in periods of interior starvation suggests that similar phenomena may have occurred in the past.

The second period of spatial cultural discontinuity occurred during the early historic and ethnographic times, with the Ivuktoke and Sesacit occupations. For this period there is considerable evidence of overlapping exploitation zones in the Mealy Mountains and Double Mer.

Only during these two periods of Eskimo occupation do cultural and natural areas coincide. Otherwise, Indian culture distributions generally encompassed both the boreal forest and tundra marine environments. Furthermore, the periods of correspondence between cultural and natural areas resulted from historic movements of Eskimo cultures, not from long-standing evolutionary trends of culture-ecological divergence. It would appear, then, that ecological diversity between these zones was of lesser importance in culture history than their close proximity to one another, the narrowness of the tundra strip, and the continuity between them of major faunal resources such as seal, caribou, birds, and fish.

An additional point might be made regarding the oft-spoken problem of Eskimo-Indian contacts (Hoffman 1952; Meldgaard 1960, 1962). The two periods of possible contact between Eskimos and Indians in Hamilton Inlet occurred during the Dorset and Ivuktoke occupations. That the Dorset culture was well adapted to life along the fringe of the subarctic forest has been demonstrated by the numbers of sites now recorded for southern Labrador and Newfoundland. This adaptation seems to account for much that is distinctive among these Dorset populations. During this period in central Labrador, there was an Indian culture, the Road component (and possibly the David Michelin component) which shares with Dorset only a single typological similarity. This is the square-based, parallel-sided, side-notched point. The Dorset points of Groswater Bay are exclusively limited to this type, although they tend to be plano-convex in cross-section, and appear to be harpoon end blades. The type which conforms most closely to the larger, symmetrically thinned bifacial points from the Road site is not yet known in the Groswater Dorset collections, though it is present in pre-Dorset collections from northern Labrador, and from Newfoundland Dorset (Harp 1964:45). Beyond this apparently fortuitous parallel there appear to be no important historical contacts between Dorset and contemporary Indian cultures. In addition, I see no trace of similarity between Dorset culture and earlier Indian cultures such as the Brinex and Charles complexes.

Eskimo-Indian contact in the early historic period appears more likely, as previously mentioned, but cannot be explored here. The spectre of prehistoric Eskimo-Indian contact has now shifted to the pre-Dorset-Maritime Archaic time level, with a probable geographic focus in northern Labrador.

Cultural Continuity and Change

One of the major theoretical problems resulting from this sequence is the interpretation of the cause of marked cultural discontinuity among the Indian cultures of Labrador. Continuity apparently applies in only two cases, between the Sandy Cove and Rattlers Bight Phases and between Point Revenge and ethnographic Indian. In the latter case, continuity is inferred and not adequately demonstrated from the Hamilton Inlet data. During the other eight periods of transition the evidence at hand points toward distinct cultural breaks in each case. Since it is unlikely that rapid culture evolution can account for these typologically dissimilar groups, it is logical to assume that they result primarily from the movement of peoples, and secondarily, of ideas. The ecological basis for culture change is considered at a later point (pages 167–180).

Ethnic Identification

Four problems of ethnic identification exist in Newfoundland and Labrador. These involve the archeological identity and relationships of the Montagnais and Naskapi Indians, the Newfoundland Beothuk, the Labrador Eskimo, and the Skraelings. While not discussed in detail here, several comments may be made on the basis of the Hamilton Inlet data.

First of all, there is no doubt that the ancestors of the Labrador Eskimo and Ivuktoke peoples are the Thule culture, although the detailed explication of this transition and the areas in which it occurred remains to be worked out in northern Labrador and Ungava.

Similarly, it appears a reasonable assumption that, if not the Montagnais, then at least the Naskapi are rooted in the cultures of southern Labrador, Quebec, and perhaps the Maritimes and are related archeologically to cultures similar to the Point Revenge complex. At present this link, also, remains to be forged, although very suggestive data supporting the transition exist in early contact sites excavated by René Levèsque in southern Quebec.

Conclusive data are yet to come before the proposed continuity between the three suggested subunits of the Point Revenge complex can be firmly established. A new culture apparently arrived in Labrador by 650 A.D. and replaced the former Shield Archaic occupants of the region. The stone technology of the new people was completely different from their predecessors. Ramah chert, rather than quartzites were consistently chosen as the basic raw material, at least in the Hamilton Inlet region. In addition, tool typology changed drastically. Corner-notched points of several varieties replaced crude lanceolate bifaces and small stemmed points. Different types of flake tools were employed. Both cultures, however, appear to have had well-developed bone industries if the simplicity of stone tool industry is any indication of increased importance of bone technology. Changes in settlement pattern and summer adaptation also were apparent. The Point Revenge complex includes an important summer maritime adaption which is not as important in the preceding Shield Archaic culture. Their consistent use of Ramah chert also indicates the extent of coastal movement of these people. All of these changes—in technology, raw materials, typology, settlement pattern and adaptation—suggest a clear break in the culture history of the region, after which there is strong evidence for cultural continuity through the contact period. On this basis I would suggest that with the introduction of this new culture, we have clear evidence of a new people. Using the direct historical approach it is possible to trace Montagnais-Naskapi culture, and presumably the Algonkian language, back at least to A.D. 1000, and probably to A.D. 500 in this region. The earlier Shield Archaic culture was quite distinct from this people's culture. Whether or not they spoke Algonkian may be determined, among other things, by archeological research southwest and west of Hudson Bay.

Beothuk identity is more obscure. It appears now, however, that the linguistic and ethnographic affiliations of this extinct race are not as anomalous as they once seemed. Recent linguistic analyses have re-affirmed convincing Algonkian ties (J. Hewson, pers. comm.), and current archeological investigation at the Bloody Point site on Red Indian Lake, Newfoundland by H. E. Devereux of the University of Alberta in Calgary would seem to relate the latest prehistoric cultures of Newfoundland with a culture similar to the Point Revenge complex of Hamilton Inlet. It therefore seems likely, both from the Hamilton Inlet and Newfoundland evidence, that the Beothuk and Point Revenge complex will share Algonkian linguistic affiliation.

Finally, there remains the Skraeling problem. These natives at Newfoundland and Labrador, contacted and partially described in the Norse Vinland sagas, have been variously identified as Dorset Eskimo (Bird 1945:181), or both Eskimo and Indian (Jones 1968:299; Meldgaard, pers. comm.). It now appears from evidence in Hamilton Inlet (where at English River it is supposed that Thorvald Eriksson was killed), that the sole occupants of both coast and interior at this time (circa 1000 A.D.) were the Point Revenge peoples. The Point Revenge complex has been radiocarbon-dated to A.D. 1050 ± 105 and A.D. 1230 ± 130. In this area Dorset peoples must now be removed from consideration. It is to the Point Revenge Algonkians that we must look for contact with the Norse, not the Dorsets, Thule, or others, at least on the Labrador coast.

A fascinating piece of evidence supporting this theory comes from the find of a small point of Ramah chert excavated from the Sandnes churchyard at the Greenland Western Settlement in 1930 (Meldgaard 1961::371). This point, apparently brought back to Greenland by Norse visitors to Labrador, is typologically similar to a point found by Meldgaard at North West River in 1956, and also compares favorably with points of the Point Revenge and related assemblages.

Cultural Patterns and Human Ecology

CULTURAL CONFIGURATIONS

Methods

The first two parts of this study have dealt with the environment, its regional ecology, raw material sources, ethnography, and the descriptive details of archeology and cultural chronology. This section departs from this descriptive approach and deals with the data in a primarily nonhistorical way, based on functional analysis of assemblages, sites, and settlement patterns. Subsistence-settlement systems are defined for each of the archeological units, and cultural-ecological adaptation types and processes are abstracted from the data. The final section of the report concerns the application of ethnographic and ecological models to explain these relationships in both historic and prehistoric times.

Before it is possible to understand the general aspects of cultural ecology of a region it is necessary to understand the particular adaptations of individual cultures and how these adaptations changed through time. One of the best methods for studying cultural adaptations is through their subsistence-settlement systems (see pages 7–11). To arrive at an understanding of such a system the component subsystems and the interrelationships between them must be investigated. What is sought is the *"inner* coherence in terms of the large structuralizing principles," which Kluckhohn (1941:126) calls the "cultural configuration."

In archeology, as in ethnology, cultural configurations do not exist at the level of the data and must be inferred from the patterns and forms which are the objectification of behavior. As has been argued by W. W. Taylor (1948) the best way to formulate such a study of prehistoric cultures is through a conjunctive approach. In the Hamilton Inlet case this method is used with the addition of an environmental perspective.

The attempt in this analysis is to view cultures as paleoethnographic entities and to analyze the archeological data in terms of existing ethnographic categories when at all possible. However, since many ethnographic categories are not available to the archeologist, it is necessary to concentrate on a number of core features in the analysis, as both Steward (1955) and Kluckhohn (1941) recognized. The core features used in Hamilton Inlet from which subsistence-settlement systems are defined include technology, economy, seasonality, settlement pattern and type, social groupings, and functional activities. The lack of precise chronological control for each of the systems and the lack of synchroneity of various sites in a settlement system is not a severe problem in this analysis. Given the patterned nature of cultural systems and seasonal rounds it is possible to reliably reconstruct the basic subsistence-settlement system of a society from incomplete data. This type of analysis is similar to one recently completed on the Riverton culture (Winters 1969).

In this analysis the study of raw materials and lithic attributes are primary sources of information. Raw material usage patterns provide data on settlement patterns and seasonal movements of groups since the selection of these materials depends on a graded series of preferences and standardized norms of acceptability. The frequency and types of stone used within an assemblage may be determined by spatial or functional factors, or both (MacDonald 1968:128; Wilmsen 1968). The comparison of raw materials from different sites within the same culture complex help reveal many of the factors behind stone selection and add greatly to a configurational analysis. Lithic analysis also provide data on manufacturing techniques (Crabtree 1968), and tool and site function (Semenov 1964; Binford and Binford 1966; Winters 1969:135). The duration of occupancy of a site can be studied by ratios of finished, broken, or unfinished tool, and lithic waste material.

The following analytical categories are used in the analysis.

Technology

A major part of a society's adaptation is based on its technology. A brief discussion is therefore made of the various functional classes of tools and the individual industries used by a culture. Unfortunately, the limitations of this type of analysis, especially when bone tools are not preserved, is severe and inferences drawn are relatively generalized.

Economy and Seasonality

The interpretation of economy is based on tools, faunal evidence within sites, and prediction of probable resources available from contemporary geography and ecology, as well as paleoenvironmental conditions.

Assemblage Analysis

The functional categories of tools from all sites within a cultural unit are presented in frequency distributions, and interpretation concerning the various activities performed on a site is deduced. This serves to distinguish between habitation and domestic sites, hunting sites, special activity sites, and others.

Settlement Analysis

SETTLEMENT TYPE.—The settlement type used here is similar to that used by Winters, and to the types defined by Campbell (1968) for the Tuluaqmiut Eskimos of northern Alaska. These are particularly useful for hunting and gathering peoples with a nomadic seasonal round. Both Winters' and Campbell's types are defined on the basis of general activities and social-group constitution. Their classifications are well suited to most archeological analyses because they are based largely on the size of the site which is relatively easy to determine from survey data. The classification is nonspecific for resources and can be used cross-culturally.

However, within a region it is desirable to define settlement types on the basis of more specific data. As noted previously (p. 8), no two cultures have identical subsistence settlement systems even though their settlement patterns may be very similar. To understand specific cultural adaptations, functional analysis of settlements has to be refined enough to include note of the distinctions between, for instance, Ivuktoke and Dorset settlement systems which, though similar in terms of geography, connote important differences in social and subsistence adaptations. In addition, cultures may occupy the same areas during the same periods of the year by relying on different resources. Here, the Indian use of Groswater Bay during most of the Hamilton Inlet sequence is a case in point. It is entirely different in terms of adaptation type from that of Dorset and Ivuktoke peoples. In other words, to achieve a refined and meaningful cultural-ecological analysis, subsistence factors (economy, technology, seasonality) must be considered.

Restricting a settlement type, as does Winters (1969) to the physical layout of a site—its size, arrangement of dwellings, features, and other physical details—I propose the following settlement types for use in Hamilton Inlet as shown in Table M. These are different from "settlement systems" as they do not incorporate subsistence adaptations within their definition. These types are not culturally specific, but are based on ethnographic data and can be employed in comparing different cultures.

SOCIAL GROUP CLASSIFICATION.—The description of a culture-specific subsistence-settlement system should include, besides a discussion of settlement types and economic adaptations, a consideration of social group-

TABLE M.—*Settlement type classification*

Type	*Description*
1. Gathering Site	Site where a local or regional band will tend to gather as a complete unit once or twice a year. Archeologically identified as a large site used by a large number of people during a particular season.
2. Base Camp	Several families occupying a site for an extended period. Utilized as the central focus of activities in a resource area during a portion of the season. Identified as similar to Type 1, but smaller, with less evidence of religious and social activity.
3. Exploitation Camp, intensive	Intensive occupation by a family or extended family for several weeks of hunting or fishing activity. Generally recognized archeologically as a single dwelling with a considerable amount of domestic debris. Wide range of activities represented in the assemblage.
4. Exploitation Camp, light	Brief occupation of a site by a family engaged in food-gathering or hunting. Usually a single dwelling or merely a hearth surrounded with a small amount of debris. Smaller range of activities present.
5. Bivouac	Transient camp occupied overnight or for a few days, with minimal range of activities, few structures or tools.
6. Specialized Camp, internal	Specialized activity camps within the band territory, e.g. quarries, chipping stations, religious site, etc. Recognized by functionally specialized remains or structures.
7. Specialized Camp, external	Specialized activity sites outside of the band territory. Tend to be trading or procurement sites.

TABLE N.—*Social group classification*

Group	*Description*
Household	The basic social group composed of the nuclear family or extended family, found together throughout most of the year. The basic exploitation unit. (Settlement Types 3–5; see Table M.)
Household group	Two or more households operating as a single unit for hunting or fishing activities which cannot be efficiently conducted by a single household. Usually composed of closely related families. (Settlement Type 2; see Table M.)
Local band	A fluid unit which is the largest social group with face-to-face contact at some point during the yearly round. Corresponds to Rappaport's "local population." (Settlement Type 1; see Table M.)
Regional band	A group larger than the local band which may consist of two or more local bands inhabiting a geographic area of considerable size. Corresponds to Rappaport's "regional population," and may comprise the gene pool of a local band.
Area population	Largest population unit of related societies or bands within a culturally defined area. The Naskapi would represent one such area population.
Activity group	A social unit cross cutting household and household group, and defined by specific functional activities. Corresponds to specialized activity settlements. (Settlement Types 6, 7; see Table M.)

ings involved at various stages of the seasonal round. The groupings in Table N are proposed as the most typical social units of settlement for the Hamilton Inlet area. They are adapted from discussions of social groupings by Helm (1969) and Rappaport (1969) and are correlated with settlement typology.

SPATIAL CLASSIFICATION.—The spatial classification used in this analysis is shown in Table O. It includes a combination of cultural and ecological concepts and represents only an initial attempt at arriving at new spatial concepts in ecological studies in anthropology. It is suggested, however, that they may prove more useful for archeological studies than the Willey and Phillips scheme (1958) which is based on formal similarities within artifact assemblages. The classification given here is primarily aimed at hunting and gathering cultures.

Functional Analysis of Culture Units

Sandy Cove Complex
(circa 2800 B.C.)

Sites: Sandy Cove 1–5, Bluff Head Cove 1(?), 4

Sites of the Sandy Cove complex are presently known only from Sandy Cove and nearby Bluff Head. They represent a distinct regional and chronological group of sites in the early Maritime Archaic occupation of Groswater Bay. Most of the data for the complex come from controlled surface collections in the blowout sites of Sandy Cove 1 and 2. The only extensive excavation was at Sandy Cove 3. Other sites were only tested.

TECHNOLOGY.—The technology preserved in these sites consists of lithic tools only. The complex utilizes both ground and chipped-stone industries, in which the ratio of chipped to ground tools averages about 10:1. The chipped industry employs a wide range of raw materials. Ramah chert is used almost exclusively for points, while knives and flake tools are made from either quartz or red quartzite. The most common finds are tapered stem points of several varieties. The larger points appear to have served as projectiles for hunting large game, certainly caribou, and perhaps marine mammals. The smaller points include

TABLE O.—*Spatial classification*

Area	*Description*
Resource area	Defined culturally as an area in which there exists a material of economic importance to a particular culture. It may be small and spatially discrete, as a stone quarry, or geographically large, as a caribou hunting area. The unit may cross cut the microenvironment when the resource considered is not bound by these zones.
Microenvironment	A minimal ecological unit of the environment usually with a distinct faunal and floral signature. When defined in terms of culture it may be a small portion of a local environment. Cultural adaptations are generally geared to exploit the microenvironment including its varied resources, rather than individual resource areas since in the microenvironment there are several resources available.
Local band territory	Territory inhabited by the local band during its seasonal round. It may consist of one or more ecosystems, since more than one culture or band may inhabit the same ecosystem if they are adapted to different resources, e.g., liveyere and Eskimo; trapper and Indian. Corresponds to Rappaport's "immediate environment."
Non-immediate environment	Designates the area outside the local band territory which may be occupied by other bands with whom trade or some other form of contact is maintained. In some cases utilization of this area may occur without contact with its inhabitants.
Culture area	Designates the territory occupied by culturally related regional bands, i.e., the Naskapi culture area. It is sometimes used loosely in Hamilton Inlet to refer to the boundary between two different cultures.

stemmed unifacial flake points and a small bifacial series, both of which probably functioned as tips for smaller projectiles. Some of these may also have served as knives; however, knives were most commonly made from locally obtained vein quartz. The flaking debris of this material is the most characteristic feature of the Sandy Cove sites. The material is very crystalline and large quantities must be broken up before the better, less crystalline, portions of the material can be obtained. Flake tools of quartz, Ramah chert, and red quartzite form the third class of chipped tools. No specialized tools were produced for bone or hide working. Apparently, these needs were filled by stone flakes or bone tools.

The ground-stone industry is poorly represented. The few tools which were found belong to a class of heavy implements: axes and adzes. A single chipped axe occurred. The grinding technology seen in the few tools found was not highly developed. Celts were initially flaked and then roughly pecked into shape, after which generally only the bit ends were polished. Gouges probably belong with this tool kit but were not found. A few bifacial knives or point fragments were found, showing that the ground-stone industry extended beyond the woodworking range. It seems probable that this technology was adapted to the extensive use of wooden products, certainly including firewood preparation and probably dugout canoe manufacture.

Red ocher is common in these sites and may have served a practical function as an abrasive compound in the slate technology.

ECONOMY.—There is no direct indication of the type of economy in the Sandy Cove sites, but it is probable that many of the species utilized in the Maritime Archaic Rattlers Bight Phase also were important here. All of these include seal, bear, duck, beaver, and otter. All of these animals are readily available in the area today with the exception of beaver and otter. Pollen and paleoclimatic studies indicate that during the Sandy Cove occupation the forest was thicker in the coastal zone than it is today. There is a possibility that walrus were hunted by the Sandy Cove people. Walrus remains were found close to the Bluff Head Cove 4 site, and though not being positively associated, its presence is suggestive. Other economic resources of the area which were probably used include caribou and fish. The geographic location and lack of evidence for winter occupation suggest that the Sandy Cove sites were occupied during the summer season.

ASSEMBLAGE ANALYSIS (Table P).—With the exception of Sandy Cove 2 these sites do not have samples sufficient for reliable statements to be made concerning functional activities. It is apparent, however, that the larger sites have a high frequency of points when compared to many Hamilton Inlet cultures. These points are all stemmed and made from Ramah chert. Some of the "points" may also have served as knives. The celts in Sandy Cove 1 are all heavily worn and appear to have been discarded after use. Flake scrapers and knives constitute about half of the assemblage in the larger sites, indicating domestic and manufacturing activities. The low frequency of ground-slate tools (about 0.05 in the large Sandy Cove 2 site) may indicate limited use of slate. It may also be a function of differential weathering, for many of the slate flakes found were highly weathered. Only in one site (Sandy Cove 4) did slate debitage constitute a large portion of the debris.

SETTLEMENT PATTERN (Figure 63).—Within the Sandy Cove area and at Bluff Head the evidence points toward small brief summer settlements (Types 3, 4 in the settlement classification, see page 137) by small groups of people. The Sandy Cove 3 site seems to be a typical example of these occupations. It consisted of a single hearth surrounded by scattered debris of red quartzite, quartz, and small quantities of Ramah chert. Few tools were found, and there was no evidence of a structure. The site was probably occupied for a week or two. This pattern seems typical of the concentrations of chipping debris and tools found on the large Sandy Cove terrace site. Here, six clusters have been defined by surface collecting and plotting all chipping concentrations and tools (Figure 49). Characteristically, clusters are 5–15 feet in di-

TABLE P.—*Sandy Cove complex assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Biface*	*Knife*	*Utilized Flake*	*Celt*	*Other*	*Total Tools*
Sandy Cove 1	.14(1)	–	.14(1)	–	.72(5)	–	7
Sandy Cove 2, 2E	.42(28)		.16(10)	.34(22)	–	.08(5)	65
Sandy Cove 3	.12(2)	.06(1)	.06(1)	.47(8)	.12(2)	.17(3)	17
Sandy Cove 4	–	.17(2)		.50(6)	–	.33(4)	12
Sandy Cove 5	–			1.00(1)	–	–	1
Bluff Head 4	1.00(2)	–		–	–	–	2

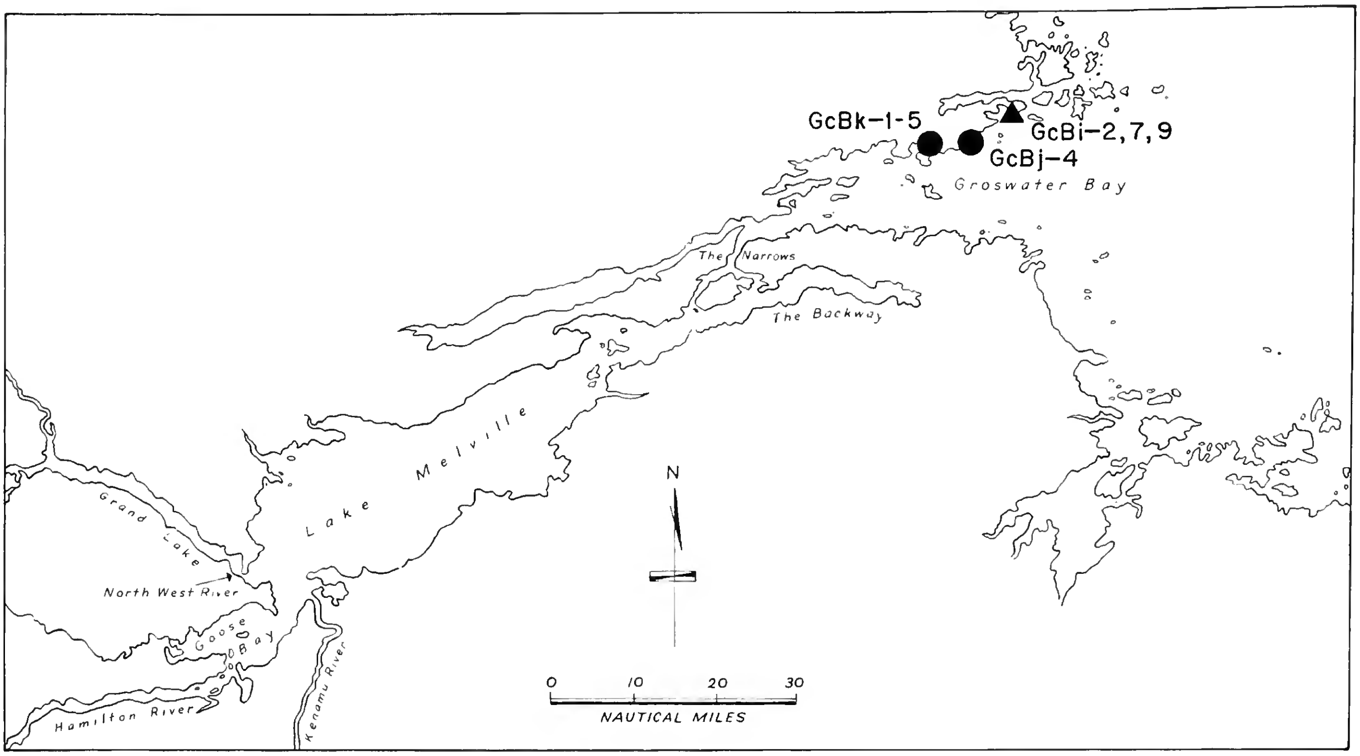


FIGURE 63.—Distribution of Maritime Archaic sites in Hamilton Inlet, circa 2800-1800 B.C. Sandy Cove complex sites (GcBk-1-5, GcBj-4) and Rattlers Bight Phase (GcBi-2, 7, 9).

ameter and contain red quartzite, quartz, Ramah chert, and occasionally slate debitage. Stemmed points or fragments, quartz knives, and utilized flakes were found in each cluster. No hearth structures or other stone formations occurred on this site; however, test excavations in Sandy Cove 2a revealed heavy concentrations of charcoal and red ocher associated with cultural material. These individual clusters probably represent a minimum of six different occupations. Sandy Cove 4 and 5 appear to be similar sites, and tests showed that many more occupations occur along the front of the 45-foot terrace.

From these data it seems reasonable to suggest a fairly light settlement intensity for the Sandy Cove complex sites. Small groups apparently settled here for brief periods, perhaps to hunt marine mammals and other game, and returned frequently to the area from year to year. These sites would be classified as Type 4 in the settlement classification.

SUBSISTENCE-SETTLEMENT SYSTEM.—The amount of data available for reconstructing cultural configurations of the Sandy Cove complex is minimal. The geographic distribution of the sites known is limited to the Sandy Cove and Bluff Head locale, and none have been found in Lake Melville. It would appear, however, that the lack of interior sites is the result of survey problems related to geological uplift and changing geography on the interior, for the sites which might have been occupied by Sandy Cove peoples would be relatively inaccessible today. In any case, traces of Maritime Archaic culture have been found by MacLeod (pers. comm.) in the Michikamau area, and by the author at Indian House Lake, Quebec. It seems likely that the limited coastal distribution of this culture will eventually be broadened to include much of the coastal and interior environment. Indeed, the Tower Road site on the North West River moraine contained flakes of red quartzite and metamorphosed slate which suggest a possibility of a site of this tradition here. No winter sites have been found on the coast.

This supposition is made more reasonable by the lack of other early cultural evidence for Labrador which might exclude Maritime Archaic from the interior. It is doubtful that at this time separate coastal and interior cultures existed in Labrador. During the time of occupation by these people Lake Melville was a more marine body than it is today. Not only was the Backway open to the sea, but marine influence extended west into the lower Churchill and Naskapi River valleys. Such an extension of marine conditions into Lake Melville and the boreal forest would have made separate occupations by different cultures–one adapted to the coast, the other to the interior—difficult.

The seasonal round suggested by this settlement pattern is one in which winter activities included a generalized interior caribou hunting adaptation similar to the Naskapi. During the spring these groups moved to the coastal regions where they occupied relatively small, semipermanent sites and developed an increasingly specialized marine hunting adaptation (probably including by this time toggling harpoon technology) including such large marine mammals as walrus and seal. Fish and birds were undoubtedly important resources, and large game was used as well. However, at least at Sandy Cove small groups were involved, and the intensity of these occupations would seem to have been low. During the late summer these groups presumably would have moved back into the interior caribou territory.

The subsistence-settlement system for the Sandy Cove Maritime Archaic peoples probably involved a dual adaptation with relatively great seasonal contrast. On the one hand, there was an unspecialized interior winter caribou adaptation by small, flexible groups of hunters; on the other hand, the summer coastal adaptation was increasingly oriented to the hunting of marine fauna by fairly small groups of people. The settlement pattern suggests that the technology of sea mammal exploitation probably was developing toward specialized hunting techniques which were similar in many ways to those used in Eskimo culture.

There seems to be a good possibility that the Sandy Cove complex represents an early stage of adaptation to the central Labrador area. This is seen in the use of local red quartzite and quartz materials for domestic tools and limitation of Ramah chert mainly for projectile points. Perhaps adequate means of procurement of this material had not yet been systematized and it was therefore used sparingly. However, a developmental hypothesis does not exclude the possibility that this usage pattern resulted from historical or selection factors and was not related to the difficulty in obtaining Ramah chert. Nevertheless, it is a fact that later Maritime Archaic cultures in this area used fewer local materials, and increasingly depended on Ramah chert. In this light, the settlement pattern, intensity of occupation, and raw material complex suggest a cultural pattern intermediate between the more limited use of marine resources characteristic of the later Indian cultures of the area and the efficient marine exploitation of the Rattlers Bight Phase.

Rattlers Bight Phase
(circa 2000 B.C.)

Sites: Rattlers Bight 1, Winter Cove 2, Hound Pond 2

Most of the data for the Rattlers Bight Phase comes from the excavated collections of the Rattlers Bight site. The other sites were tested only briefly. All sites come from the Rattlers Bight-Winter Cove area.

TECHNOLOGY.—As at Sandy Cove, data on technology comes from chipped- and ground-stone industries. Some calcined bone is preserved, but the only tool recovered was a barbed leister. The chipped-stone technology utilizes Ramah chert exclusively. The flaked-tool inventory includes two classes of artifacts: stemmed points and utilized flakes. Bifacial flaking is used for all points over 25 mm, while those under that size are generally made from marginally retouched flakes. These small points appear to have been used to tip arrows; the smallest perhaps was used in bird hunting. Larger specimens seem to have served a variety of functions, some as knives, others as projectile or lance tips.

The second class of chipped tools—utilized flakes—is an amorphous group with little consistency of form. Flake knives and scrapers are common, and appear to have been fashioned or used for a specific task and then discarded. As at Sandy Cove, no formal scraper types occur in the assemblage.

Although a bone industry appears to have been important in Maritime Archaic sites, no tools specifically designed for the purpose of working bone have been found. Apparently, this work was done with bifaces, or more likely, snapped flakes, and flake scrapers. A few snapped flakes were found which may have been used for cutting bone.

Ramah chert was used sparingly at Rattlers Bight and Hound Pond. The few flakes found were mostly small bifacial sharpening flakes. When larger flakes were found, they invariably had been utilized. This conservative use of material, however, did not extend to Winter Cove 2, which had large amounts of flaking debris. Still, the total quantity in weight of debitage was small.

A wide range of ground-slate tools was found. In part, these included heavy woodworking tools, such as gouges, axes, and adzes. No complete specimens were found, but the workmanship is considerably better than that of the Sandy Cove specimens and typologically slightly different. In addition, slate points, knives, and bayonets occur. The bayonets may have served as lances for large land or sea animals. Numerous whetstones indicate stone grinding, which may have been assisted by red ocher, also used heavily and produced on the site. Bottom fishing is suggested by pecked and ground plummets.

One, of soapstone, is perforated and grooved, necessitating gouging tools.

ECONOMY.—Faunal remains from Rattlers Bight 1 and Hound Pond 2 include harbor or ring seal, black bear, beaver, otter, and goldeneye duck as the identifiable species. The total amount of faunal material preserved is small, and undoubtedly other animals were economically important. Fishing is indicated by the leister and plummets. There is, therefore, substantial evidence for a summer occupation.

ASSEMBLAGE ANALYSIS (Table Q).—As at Sandy Cove, the tool assemblage from these sites indicates a relatively high proportion of points. Unlike the earlier complex, however, the Rattlers Bight Phase does not include a "knife" class, and this function presumably has been absorbed in the stemmed points and flake tools. The biface category consists of midsections, probably of stemmed points. To some extent slate tools also were used as knives.

Small game hunting appears to have been very important; 15 of 23 points are "micropoints" suitable for birds or fish. Domestic and manufacturing activities are indicated by the large number of flake tools, while the heavy slate tools are probably for woodworking.

SETTLEMENT PATTERN (Figure 63).—Each of these sites represents a different settlement type. Winter Cove 2 is a small camp and manufacturing station as suggested by the large amount of lithic debris, (tool/flake ratio of 1:120), hearth rocks, charcoal, and presence of ocher. It is classed as a Type 4 settlement.

More information is available for Hound Pond 2. The site appears to be small, 15–20 feet in diameter. Here the tool/flake ratio is 1:25, and the tool types indicate activities ranging from hunting, to woodworking, and domestic pursuits. Considerable bone, charcoal, and ocher were deposited during the occupation, which may have lasted several weeks. This site is classed Type 3, with a longer and more extensive occupation than Winter Cove 2.

In contrast to these sites, Rattlers Bight 1 (Figure 52) is a large occupation site over 500 feet long, with cultural material distributed extensively in deposits between 3–24 inches deep. Spatial distributions of materials do not at present reveal any tendency for clustering into activity, social, or chronologically distinguishable units, except that there tends to be more slate and larger points in the northern areas. Otherwise, tool types are scattered fairly evenly, with individual squares containing between 10–20 tools and 25–400 flakes. The tool/flake ratio is very low (1:14), and suggests heavy domestic use with primary manufacturing of bifaces away from the site, perhaps at quarries or intermediate production sites. Extensive deposits of charcoal and red ocher are usually found together mixed with calcined food bone in hearths, which occur several per five-foot excavation square, and are often associated with flat rock slabs. While features are numerous, structures are not. Only one boulder ring exists on the surface, and within the excavated areas only slab rock and small cobbles occur. Individual structures must certainly exist, but they will have to be revealed through broad lateral excavation and material distributions.

The Rattlers Bight site is characterized by a wide range of domestic, fabrication, maintenance, and hunting activities. As a settlement it appears to have been occupied heavily for a considerable period of time, very likely by larger social aggregates than those seen either at Sandy Cove or the other Rattlers Bight Phase sites. The extensive size and indications of intense occupation suggest that this is a summer base camp (Type 2.).

SUBSISTENCE-SETTLEMENT SYSTEM.—The data reveal a subsistence-settlement system for the Rattlers Bight Phase which is considerably different from the Sandy Cove complex, though in basic outline, the two configurations are similar. Both appear to alternate between a winter interior caribou hunting pattern and a summer coastal adaptation. The summer adaptation is seen as a combination of land hunting and a more specialized adaptation to marine game, including fish, migratory birds, and sea mammals. In addition, the berry harvest would have been an important part of the late summer diet.

The settlement pattern for the summer occupation of the coast includes the seasonally repeated use of the large central base camp at Rattlers Bight, probably occupied more or less permanently by several

TABLE Q.—*Rattlers Bight Phase assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Biface*	*Utilized Flake*	*Knife*	*Gouge/ Celt*	*Other*	*Tools Total*	*Debitage*
Rattlers Bight 1	.22(60)	.05(12)	.45(125)	.04(10)	.02(5)	.22(61)	273	3984
Hound Pond 2	.56(12)	.09(2)	.13(3)		.04(1)	.18(4)	22	504
Winter Cove 2	.20(2)	.10(1)	.60(6)	–	–	.10(1)	10	1185

families during the summer while hunting expeditions occasionally moved to nearby areas for a few weeks and then returned to the base camp. The geographic setting of these camps, and particularly Rattlers Bight, indicates the primary importance of a sea-based economy. Not only did the local topography of the Rattlers Bight site insure a safe harbor, but the shift of the summer settlement pattern eastward into the more maritime zone from former occupation areas to the west seems to dramatize the more intensive marine adaptation of the Rattlers Bight Phase.

During this phase it would also appear that increasingly sedentary summer settlement and perhaps population expansion occurred, probably as a result of the more specialized marine hunting technology which is hypothesized to contribute to the settlement shift. Undoubtedly, summer coastal settlement included important nonsubsistence activities such as trade. This site woud appear to have been a major trade link in the southern movement of Ramah chert. The scarcity of this material in the previous Sandy Cove complex suggests that the importance of Ramah chert trade did not develop until after the Sandy Cove occupation.

The immediate environment of the Rattlers Bight Phase is somewhat open to question. That its summer settlement and marine adaptation was almost identical to Dorset and Ivuktoke seems certain. However, the winter range apparently diverged from the Eskimo pattern by the lack of a winter ice-hunting technology. At least, no winter sites of this culture have been found in the coastal areas; but neither have any been found in Hamilton Inlet for Dorset Eskimo. Presumably, Dorset winter sites will be found in the forested areas in the Narrows, where site survey is difficult. In any event, it seems most likely that winter Maritime Archaic (including both Sandy Cove and Rattlers Bight peoples) will be found on the interior. Since traces of Maritime Archaic are known from these regions, and since there is as yet no comparative data from other areas to indicate an Eskimo type of winter life on the coast, we should probably assume that the immediate environment of these cultures included both zones. Their basic subsistence-settlement system would therefore have included a relatively great divergence both in terms of economic adaptation and geographic location between the "Indian" type of winter hunting pattern, and the "Eskimo" type of summer coastal occupation. In this sense, the Rattlers Bight, and perhaps Sandy Cove, cultures represent, in economic adaptation, a system intermediate between those more typical of both Eskimo and Indian cultures. In developmental terms, such an adaptation would be very close to what one would expect to find for proto-Eskimo cultures.

The investigation of similarly marine-adapted cultures, including Eskimo, Maritime Archaic, northern Scandinavian *Skiferkultur,* and early north Pacific cultures from the point of view of ecological relationships between technology, environment, and settlement would be an extremely rewarding cross-cultural archeological study. Why, for instance, do all contain ground-slate technologies? What are the concomitant social and ceremonial results of such adaptations? These, and other questions, could be studied and related to culture-ecological theory.

Brinex Complex
(circa 1300 B.C.)

Sites: Red Ocher, Brinex Bunkhouse, North West Brook 1, Rigolet Spy

Two sites of this complex are located in North West River; one was found in the Narrows, and one at the head of Pottles Bay. Only one site (Red Ocher) was excavated during the survey. The others were surface collections or excavated by Mr. Charles. Contextural control for this complex is weak.

TECHNOLOGY.—The Brinex complex is dominated by a bifacial tool industry of projectile points and knives. The points are of two types, both side-notched with convex bases. The larger would appear to have been used as lance, spear, or dart tips, while the smaller points may have been arrowheads. Knives are also of two varieties: large lanceolate and small triangular in form. Both were probably hafted. In addition, a variety of flake and disk-shaped knives are found. Scrapers include thumbnail types and elongate forms on thin flakes; also, there are end scrapers on blade-like flakes. A single drill was found.

The chipped-stone industry is well controlled. Points tend to have sharp serrated edges with little edge retouch. Cobble cores are used for obtaining preform flakes. No consistency is noted in the preference of raw materials. Chert, red quartzite, white quartzite, and quartz are commonly interchanged for tool types. The possibility of a core and blade industry is suggested by end scrapers on blade-like flakes, but no cores or reject blades were found.

A grinding technology is used for the production of red ocher which heavily stains the soils of these sites. However, the use of grinding is not transferred to the chipped-stone industry. Bone is not preserved.

In general, the Brinex complex seems characterized by a fairly extensive and diversified lithic industry. Although bone was undoubtedly important, the major classes of hunting, domestic, and fabrication tools seem to have been made of stone.

TABLE R.—*Brinex complex assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	Point	Biface	Knife	Blank	Scraper	Other	Total Tools	Debitage
Bunkhouse	.04(1)	.16(4)	.04(1)	.12(3)	.20(5)	.44(11)	25	–
Red Ocher	.25(2)	.25(2)	–	.12(1)	–	.38(3)	8	242
Rigolet Spy	–	.11(1)	.11(1)	–	.22(2)	.56(5)	9	–
North West Brook 1	.17(5)	.13(4)	.04(1)	.04(1)	.17(5)	.45(13)	29	–

ECONOMY.—No faunal remains were preserved, and it is therefore necessary to base reconstructions of economy on geographic and ecological grounds. These, unfortunately, are sufficient only to indicate general economic potentials, and do not give specific evidence. Sites in the North West River area would seem to have made primary use of its fish and small game resources; large numbers of caribou would not be found in this area. The Rigolet Spy and North West Brook sites might also have been used for hunting seals, small game, birds, and fish.

There is no direct evidence of seasonality. However, the geographic location of sites and their inferred economies suggest summer occupations.

ASSEMBLAGE ANALYSIS (Table R).—Sites of this complex show significant variation in their assemblages, which is partly the result of site size, length of occupation, and sampling. All of the sites except Rigolet have a wide variety of functional tool classes indicating a minimal amount of hunting activity and relatively more domestic functions, including probably hide working and fabrication. Such underrepresentation of hunting activities is typical of occupation sites where hunting activities are conducted away from the living areas; however, it may also result from a predominance of fishing over hunting activities.

SETTLEMENT PATTERN (Figure 64).—Intensity of occupation varies between the sites. The Red Ocher site apparently was occupied briefly. Few tools or chipping remains were deposited. A small group seems to have been involved. It is classed as a Type 4 settlement. The Brinex Bunkhouse and North West Brook sites were more substantial occupations,

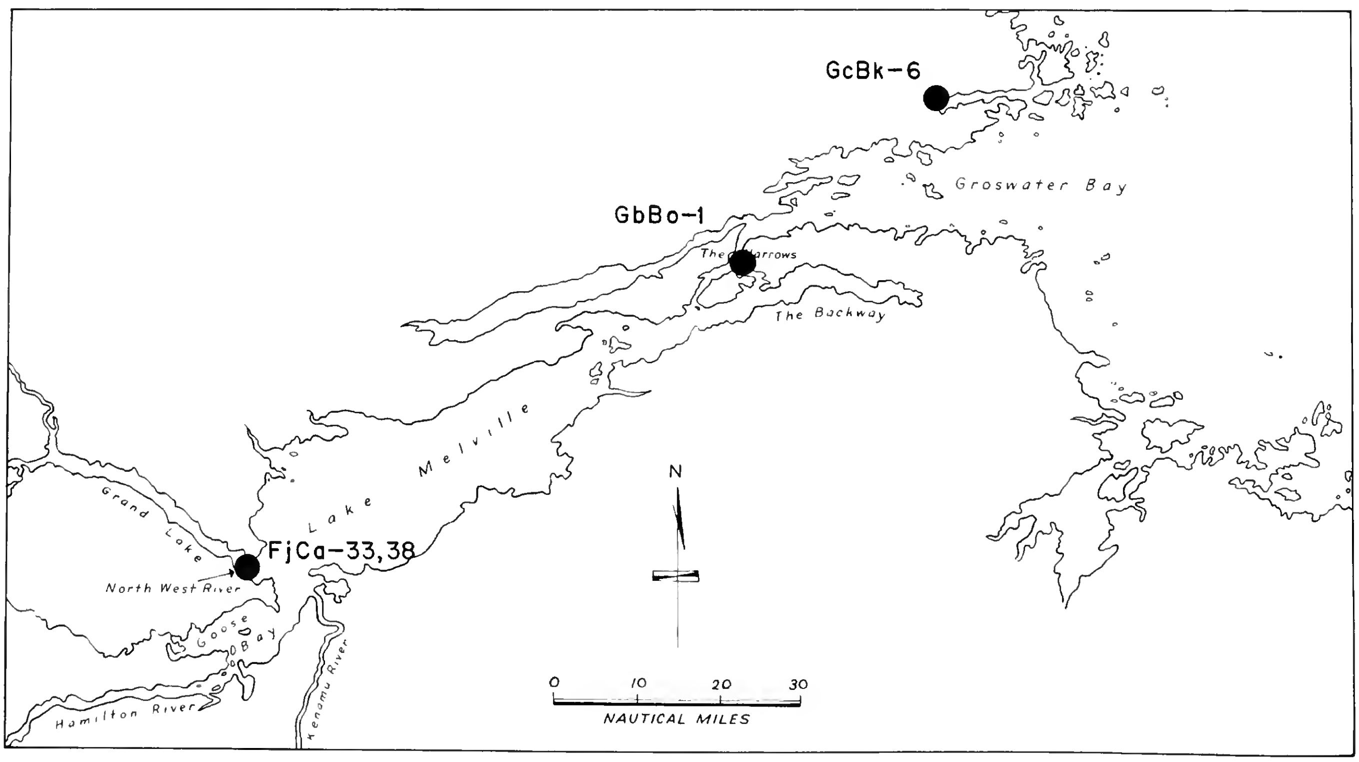


FIGURE 64.—Distribution of Brinex complex sites in Hamilton Inlet, circa 1200 B.C.

probably serving as living areas for several weeks or more, and incorporating a wide range of activities. They seem to be Type 3 settlements. All of these appear to have been primarily fishing and hunting sites.

The Rigolet Spy site may have been used by larger groups and for longer periods. The site, judging from the remaining materials, was probably used for a number of years. It may have served as a base camp for larger groups, although this cannot be established. In any case, its intensity of occupation was greater than that for the other sites. A Type 3 settlement is suggested.

SUBSISTENCE-SETTLEMENT SYSTEM.—Brinex complex sites are distributed throughout the interior and coastal environments. The subsistence-settlement system seems to have been generalized hunting and fishing with a winter adaptation to interior caribou resources and a summer adaptation to coastal game, including small animals, birds, and fish. Winter sites, presumably located in the upland plateau in the manner of the ethnographic Sesacit pattern, are absent from the coast and shores of Lake Melville, to which the small groups returned in the summer. There, they spent some time in the North West River area and in Pottles Bay, as well as possibly gathering in a larger group in the Narrows.

This basically interior adaptation is emphasized by the use of interior chert. The fact that chert plays a subordinate role to local materials in summer coastal sites may support the hypothesis for a geographic displacement of the annual cycle toward the coastal environment during this season. However, the lack of extensive knowledge or coastal familiarity is suggested by the lack of Ramah chert commonly found in coastal sites.

Charles Complex
(circa 1000 B.C.)

Sites: Radio Shack, Piloski Garden, Louis Montague, Road Site 1, North West Brook 2

TECHNOLOGY.—The technology of Charles complex sites includes both bifacial and unifacial industries using cherts predominantly, but occasionally banded lavas. Red ocher has not been found in these sites. The tool assemblage is heavily skewed away from hunting tools, and emphasizes domestic implements: lanceolate biface blanks, large bifacial knives, large unifacial scrapers, and flake tools. The biface industry is well developed and the finished tools are finely made. The larger bifaces are characterized by a broad flat flaking technique. The technique of removing large flat flakes for biface and scraper blanks is common. In addition, there is a distinctive core and flake industry for the production of thin triangular flakes, similar in cross-section to prismatic blades. These flakes have been used as small knives and scrapers. The bone industry was not preserved.

The flaking debris is extensive and ranges from large flat thinning flakes to tiny edge retouch and sharpening flakes. Chronologically preceding Dorset culture origins, the Charles complex lithic industry is very different, including the liberal use of chert and the large character of much of the flaking. Dorset and Charles blade traditions are entirely dissimilar, as in the general typology of their respective assemblages.

ECONOMY.—It would appear that the economy of the Charles complex is similar to that of the Brinex group. Again, inference must be based on the tools, and the geographic location of the sites at excellent fishing locations. The absence of hunting tools may be a sampling problem or the result of faulty identification of the bifaces and knives of the Radio Shack site. Alternately, bone may have been used for projectile tips, as in Naskapi culture. It is probable that some hunting was undertaken from these sites.

Likewise, there is no firm evidence for seasonality, except the lack of any structure suggesting winter dwellings or site locations in ideal summer fishing areas.

ASSEMBLAGE ANALYSIS (Table S).—The assemblages from these sites do not seem indicative of a cross-section of a "typical" collection. Taken together, the North West River sites begin to represent a full complement of tools, and this may indicate that there is some unknown functional relationship between them. Unfortunately, with the exception of the Louis Montague site, all the North West River Charles sites had been disturbed and their existing collections may not represent their original condition.

In particular, the possibility of contemporaneity between these sites is suggested by the distribution of finds within them. Three sites (Piloski Garden, Road Site 1, and Louis Montague) contained similar types of large scrapers. The core and flake industry linked the Road site and Piloski Garden site. Finally there was a large cache of scrapers in the Piloski Garden sites while the Radio Shack contained only bifaces. There seems to be a possibility that the scrapers and points had ceremonial significance, perhaps with burials. The scraper cache is possibly an indication of this (though other tools and chipping debris were found in the same area), and the highly fragmented nature of the bifaces suggests ceremonial activity also. It would, therefore, seem possible that the Piloski Garden, Radio Shack, and Road sites were occupied at the same time. Further substantiation might be the near complete lack of anything but utilized flakes

TABLE S.—*Charles complex assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Bifaces*	*Scrapers*	*Utilized Flake*	*Core*	*Total Tools*	*Debitage*
Radio Shack	.05(1)	.85(20)	.05(1)	.05(1)	–	23	–
Piloski Garden	–	.03(1)	.35(12)	.64(22)	–	35	808
Louis Montague	–	.09(1)	.46(5)	.36(4)	.09(1)	11	126
Road Site 1	–	.03(1)	.03(1)	.91(33)	.03(1)	37	3622
North West Brook 2	–	.14(1)	.72(5)	.14(1)	–	7	–

from the large collection of debris from the Road site. This might be explained by the removal of artifacts from this primary manufacturing area for use elsewhere.

In terms of individual sites, 90 percent of the Radio Shack site consisted of bifaces while in the Piloski Garden site 97 percent were scrapers and utilized flakes. The Louis Montague site contained 82 percent scraping tools; Road site 1, 94 percent; and North West Brook 2, 86 percent. The lack of bifaces and projectile points is difficult to explain. Primary emphasis in all of these sites seems to have been on domestic activities, especially hide working and fabrication. Bone was very likely important. From this evidence it would seem that fishing activities, utilizing bone or other perishable tools, were the primary means of subsistence.

SETTLEMENT PATTERN (Figure 65).—Assuming that settlement at the Road, Piloski Garden, and Radio Shack sites was contemporaneous there is evidence for two different settlement types. Fairly intensive activity is suggested for the Road site by its great amount of flaking debris. Here the tool/flake ratio is about 1:100. At the Piloski Garden site it is in excess of 1:40 (Charles did not save all the flakes). No estimate is possible for the Radio Shack site or North West Brook 2. The Montague site, however, is 1:10. Road Site 1 and possibly the Piloski Garden and Radio Shack sites seem to represent fishing camps inhabited by small groups for probably several weeks during the summer. They constitute Type 3 settlements. The Louis Montague and North West Brook sites seem to have been shorter occupations by small groups which left behind fewer remains. Type 4

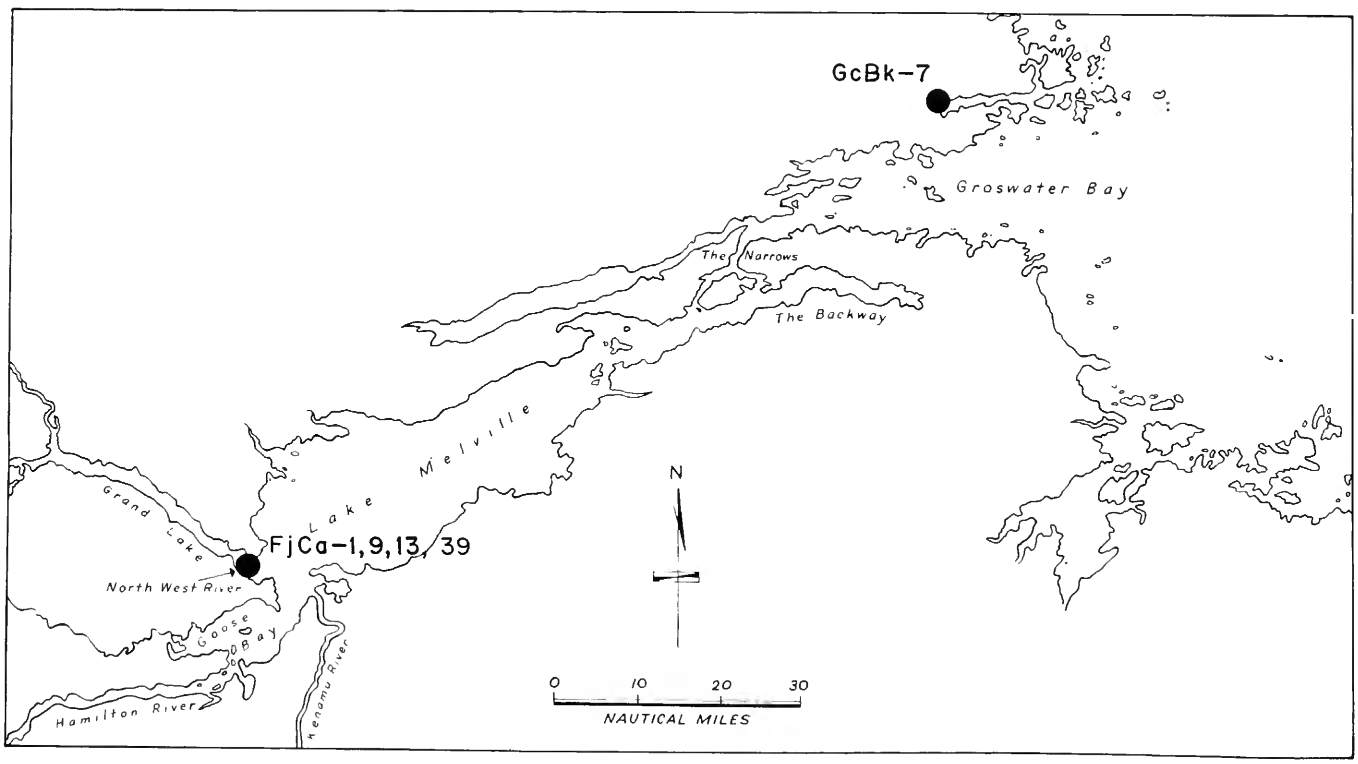


FIGURE 65.—Distribution of Charles complex sites in Hamilton Inlet, circa 1000 B.C.

settlements are suggested. No structures were found in any of these sites to indicate the type of dwelling employed.

SUBSISTENCE-SETTLEMENT SYSTEM.—In general, it appears that the basic cultural configuration of the Charles complex is similar to that of the Brinex complex which it resembles in most ways other than typology and technology. Geographically, their site distributions are coincident. The basic adaptation would appear to be a generalized interior hunting and fishing economy with emphasis during the summer fishing on locations around Lake Melville and Groswater Bay. Sites on the coast are comparatively rare, whereas they are more common within Lake Melville, perhaps indicating an interior orientation of the seasonal round. In addition, the near exclusive use of interior chert as a raw material strengthens the interior aspect of their adaptation. On the coast (North West Brook 2) a very inferior material is used. Given the low intensity of coastal adaptation in the Charles complex, it appears reasonable to hypothesize that the backbone of their winter economy was caribou, which was pursued from interior camps west of the Narrows. During the summer, groups moved to the rivermouth locales to fish. At both ends of the cycle it appears that the economic unit was small. There is as yet no archeological evidence for larger aggregates. It seems likely that such gatherings did occur and would probably have taken place in the Seal Lake or Michikamau region, also the areas from which the cherts could be obtained. After the gatherings, the band fragmented again and at least some of the component groups seem to have passed through and spent time at North West River.

Road Component
(circa 700 B.C.)

Site: Road Site 2

TECHNOLOGY.—The tool sample and total available information for this component is meager, and very few comments may be made. The important features of its technology are its distinction from the preceding Charles "macro-tool" complex. Most artifacts in Road Site 2 are smaller, and in this site there is no evidence of extensive use of chert or of the technique of broad, flat flaking. Thin, side-notched points are carefully made; scrapers are made from radially removed triangular flakes of chert. Raw materials include cherts, fine-grained volcanics, quartz, quartzites, and Ramah chert. No consistency in the use of these materials was evident. There was no evidence for a core and flake or blade technology.

ECONOMY.—There is no direct evidence concerning economic pursuits. As with the other cultures, small game hunting and fishing would seem to have been primary activities in this area. Summer is the probable season of occupation.

ASSEMBLAGE ANALYSIS (Table T).—Unlike Charles complex sites, the Road Site 2 assemblage is comparatively well balanced in terms of major functional classes. The incidence of hunting tools may, however, not be an adequate measure, since both specimens are broken just above the notches as though they had been utilized as knives. In general, the assemblage seems to indicate domestic activities.

SETTLEMENT PATTERN (Figure 66).—Very little settlement data is available since the site was salvaged from a bulldozer heap, and no other site relating to this unit was found in the inlet. Road Site 2 appears to have been a summer fishing camp, occupied once for a relatively brief period, and abandoned. Only a minimal amount of flaking debris and few tools accumulated during its brief period of use. Type 4 camp is indicated.

SUBSISTENCE-SETTLEMENT SYSTEM.—The cultural distribution of this group is limited to a single site at North West River. Interior distribution is suggested from the use of interior chert, but the presence of Ramah chert suggests possible coastal contact. The basic adaptation was probably similar to the Brinex and Charles complexes, with interior hunting during the winter, and fishing and small game hunting during the summer. Groups were probably small and occupations brief.

Without a larger sample it is impossible to be sure of the culture area utilized. At present, its distribution is similar to Sesacit. However, coastal sites may be found in Hamilton Inlet. During this period, the Groswater Dorset occupied the coast. Beyond the possibility that Ramah chert was traded from Eskimo to Indian there appears to be no evidence for contact. Harp (1963, pl. IIk) has found a point of the same type as at Road Site 2 on the

TABLE T.—*Road component assemblage*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Biface*	*Scraper*	*Utilized Flake*	*Tool Totals*	*Debitage*
Road Site 2............	.08(2)	.08(2)	.24(6)	.60(14)	24	826

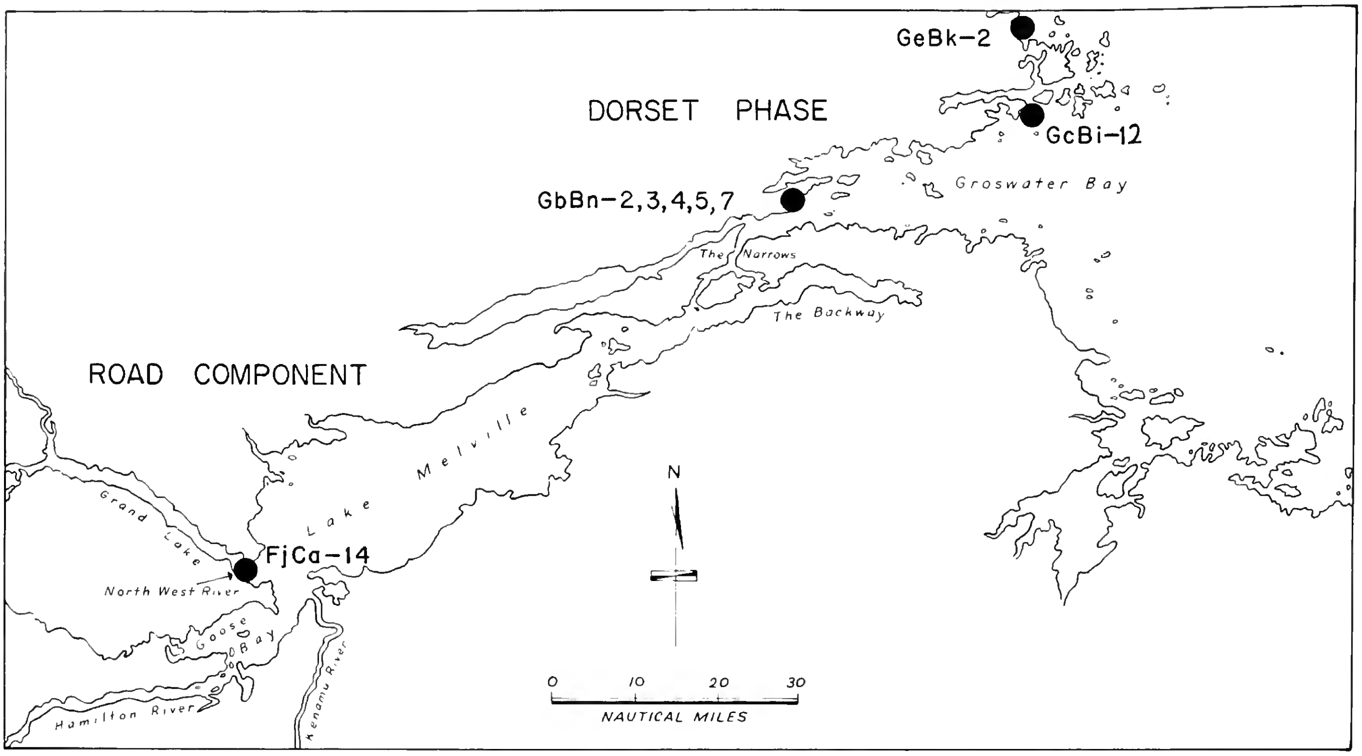


FIGURE 66.—Distribution of Groswater Dorset Phase and Road component sites in Hamilton Inlet, circa 500 B.C.

coast of southern Labrador. It is possible that at this time Dorset did not occupy the southern Labrador coast, and that the typical Indian coastal-interior cycle obtained for the Road component-like there. Further north, its culture area may have been displaced from the coast by Dorset culture.

Groswater Dorset Phase
(800–200 B.C.)

Sites: East Pompey Island 1, Ticoralak 2–5, 7, Red Rock Point 2

Groswater Dorset is represented by seven sites. East Pompey Island, and Ticoralak 3 and 5 have the largest collections. These sites present a relatively complete assemblage for local Dorset, albeit one with internal chronological variation, and lacking in bone preservation.

TECHNOLOGY.—This Dorset assemblage is a late member of the Arctic Small Tool Tradition and the general features of its technology are relatively well known. They have been described in detail in Newfoundland (Harp 1964), northern Ungava (W. Taylor 1968), Southampton Island (Collins 1956 a, b; 1957), and Greenland (Larsen and Meldgaard 1958; Mathiassen 1958).

The entire lithic industry is microlithic, and extremely varied in terms of the numbers of specific functional and typological tool types. Several different lithic industries exist. The bifacial industry is highly refined, with fine flaking techniques and utilizing excellent quality cherts as the primary raw material. Occasionally quartz crystal or Ramah chert is used (both less than .01 of the assemblage). The bifacial industry seems to be based on the use of flakes rather than blades for blanks. However, some of the smaller bifaces may originate from blades. No evidence for such a process was noted in the Groswater Dorset Phase, but small side-notched points from pre-Dorset complexes in northern Labrador seem to have been made from blades, and the possibility cannot be excluded for Groswater Dorset. These bifacial tools include small, medium, and large side-notched plano-convex points. While the small variety may have functioned as arrow points, the medium and large points probably were harpoon end blades, very likely for seal and walrus, respectively. The importance of summer seal hunting seems demonstrated by the large number of intermediate size, typologically similar points.

Other bifacial tools are side blades, corner-notched and single side-notched knives, and burin-like tools. The side blades were probably used as lance and side-knife insets. The corner-notched knives were general end-hafted cutting tools; the single-side notched knives were probably used as short knives hafted in an inset groove and lashed at the side end of a short-handled wood or bone haft (Collins 1956a: 84). The burin-like tools were also probably side-hafted, as their notches are asymmetric with longer spurs on the side from which the force was applied when utilizing the tool. These specialized bone-carving tools served multiple functions as knives, grooving tools, and perforators. The lateral edges were chipped and subsequently ground to a beveled edge for whittling bone or wood; the distal apex of the tool served to cut grooves; and the spalls removed with a burin blow along the lateral edge from the apex were used for cutting and gouging holes. One of the most common functions of these spalls was probably for cutting rectangular shaft sockets and gouging holes in Dorset harpoon heads.

The microblade industry comprises the largest proportion of the assemblage. The few fragmentary cores found do not indicate with assurance whether more than one type of core is used. The most complete specimen is a tabular piece with a sharply angled striking platform and blade removals along the narrow side of the rectangular tablet. Blades with flat facets on one edge indicate that thin tabular cores were fairly common. Blade widths vary from about 5–15 mm. Many rejects are found. The utilized specimens were usually snapped distally and proximally and were commonly hafted in similar fashion to the single side-notched knives. In this case they were notched on one side and bear utilization evidence along that edge and very frequently at the corner of the blade opposite the hafted end. Some blades were end-hafted. These were stemmed and have constricted edges or two to four small bilateral notches. Other blades appear to have been used without hafting.

The slate industry is not well represented. Flakes of ground slate are fairly common and are often identifiable as adze flakes. No complete adze was found. Presumably, adzes would be used for bone or wood-working. Other slate tools found include small triangular beveled-edge scrapers and facetted ridged knives or knife-scrapers (Harp 1964: pl. 17). Slate is not commonly used in the early Dorset culture of Groswater Bay.

Other relevant aspects of the Dorset technology include the use of red ocher and the predominance of casual flake tools for scrapers. Only two formal chipped scrapers were found. In both cases they were large, unifacial, and had pronounced graving spurs at either side of the working edge. The process of grinding chert, which includes most of the points and all of the burin-like tools, is accomplished with quartz grindstones. They may also be used in the slate industry.

Economy.—To date, Groswater Dorset sites have not yielded any faunal remains. Their economy, however, is undoubtedly similar to Dorset culture elsewhere, and included winter sealing and caribou hunting, spring and fall seal and walrus hunts, summer egg-collecting, bird hunting, and berry collecting; a late summer caribou hunt probably occurred. The pattern in Hamilton Inlet must have been very similar to that known for the Ivuktoke Eskimo, excepting whale hunting.

The projectile points from these sites would appear to have been used for hunting small land game and birds, seal, and possibly walrus. Site location and absence of winter structures suggest that the sites were summer occupations.

Assemblage analysis (Table U).—Only three of these assemblages are complete enough to suggest meaningful frequency variations in different tool classes. While all tool types are not treated here, certain features of the collections seem to represent consistent trends. First of all, the functional variety of the assemblages is evident as compared to Indian collections. Secondly, at least 50 percent of the larger collections consists of microblades, of which less than a quarter are utilized. Utilized flakes, most of them scrapers, comprise about 20 percent of the assemblages; points, bifaces, knives, side blades, and burin-

Table U.—*Groswater Dorset Phase assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Knife/ Biface*	*Side Blade*	*End Scraper*	*Burin-like Tool*	*Micro-blade*	*Utilized Flake*	*Other*	*Total Tools*	*Debitage*
East Pompey Island	.02(10)	.03(14)	.01(3)	.01(2)	.01(5)	.52(220)	.35(149)	.05(22)	425	5520
Ticoralak 5	.03(3)	.04(4)	.04(4)	–	.04(4)	.63(69)	.17(19)	.05(5)	108	856
Ticoralak 3	.04(3)	.15(11)	–	.01(1)	–	.45(35)	.27(21)	.08(6)	77	1261
Red Rock Point 2	–	.19(5)		–	.11(3)	.47(12)	.18(5)	.05(1)	26	–
Ticoralak 2E	–	.14(1)		–	–	.72(5)		.14(1)	7	6
Ticoralak 2	–	.14(3)	–	–	.04(1)	.68(14)		.14(3)	21	51
Ticoralak 4		–	–	.25(1)	–	.75(3)	–	–	4	30

like tools are infrequently found and occur in about equal proportions.

The collections from East Pompey Island, Ticoralak 3 and 5 indicate that they clearly are habitation sites at which a wide variety of activities took place over a considerable period of time. The other sites were used for shorter periods and show a limited number of activities.

SETTLEMENT PATTERN (Figure 66).—These Dorset sites range from the eastern to the western end of Groswater Bay. Apparently, the summer settlements utilized both inner and outer coastal zones, though perhaps at different periods for different resources. The sites have variations which seem to indicate difference in site function and intensity of occupation.

The East Pompey Island site is the largest settlement. Occupying both sides of a small freshwater pond, it was obviously a domestic settlement at which a wide range of activities took place, from hunting to manufacturing of stone and bone tools, skin working, and others. No definite structures could be discerned. The tight spatial clustering of remains indicates that the occupation was intensive and by a small group, probably during a single season. The site is a Type 3 settlement.

Ticoralak 3 and 5 are domestic occupations similar to East Pompey Island. They were used less intensively and for shorter periods, but their assemblages indicate various hunting, domestic, and fabrication activities. Hearths are present in each, and larger rocks may relate to structures, possibly skin tents; but their specific form could not be determined. A similar lack of obvious living structures was noted at the Southampton Island T–1 Dorset site (Collins, pers. comm.). These camps are Type 4 settlements from which sealing in the Ticoralak Bight was probably the most important activity.

Red Rock Point 2 is a small camp occupying an exposed position on a seaward island during its use. The limited number of tools and their types suggest that the site was used by a group of hunters waiting for seals to appear in the nearby shallows between the mainland and the island. Alternatively, it may have been a small family camp, occupied briefly durin the sealing season. It is here classified as a Type 4 settlement.

Ticoralak 2, 2East, and 4 seem to be transient campsites used by small groups for very short periods. They contain few tools, usually a microblade or two and another tool type, a hearth and a possible tent ring. They also may have been used by a small group of hunters, or by a larger group as a bivouac. Type 5 settlements are suggested.

Further evidence supporting these classifications comes from the tool/flake ratios of the sites. The larger and more intensively occupied sites tend to have lower ratios (East Pompey Island = 1:15, Ticoralak–5 = 1:8, Ticoralak–3 = 1:18), while the small briefer occupations have higher ratios (Red Rock Point 2 = 1:16, Ticoralak 2E = 1:1, Ticoralak 2 = 1:2, Ticoralak 4 = 1:8). In general, also, the longer the occupation the higher the frequency of broken tools.

While the summer settlement pattern appears to be contained in Groswater Bay, there is as yet no evidence of winter occupations for this culture. Relying on Dorset data from elsewhere, one would suggest that the winter quarters should be found within the Narrows. Although no sites have been found here, they probably exist, and the settlement pattern will probably be proven to coincide with that of the Ivuktoke Eskimo. There is no evidence for Dorset occupation of western Lake Melville. The North West River sequence, spanning the chronological period of Dorset occupation, does not include any trace of this culture.

SUBSISTENCE-SETTLEMENT SYSTEM.—It is suggested that the Groswater Dorset subsistence-settlement system closely approximates that of the Ivuktoke Eskimo in terms of local culture area and seasonal round. Both had marine-oriented economies and occupied only the Groswater Bay and Narrows regions of Hamilton Inlet, leaving the forested interior to the Indians. Both presumably occupied the Narrows during the winter and dispersed in the bay during the summer season. Both utilized a wide variety of land animals, especially caribou, and both utilized a specialized sea mammal hunting technology which included winter ice-hunting at seal breathing holes, in the open water of the Narrows, and at the sina.

In other respects the Dorset subsistence-settlement system diverged from the Ivuktoke pattern. The Dorset lacked the whale hunting specialization, the dog sled, and the more cohesive and integrated social and community organization which characterized Ivuktoke culture. Dorset winter sites were undoubtedly larger and more stable than their summer camps, but they could not have approached the population density of Ivuktoke communities, and the dwellings were most likely single family houses for four to eight people, rather than for 25 or 30. Groswater Bay and the Narrows seem to have supported an Ivuktoke population of 75–100 individuals. It is unlikely that during the Dorset occupation the population exceeded 40–50.

On the other hand, Dorset summer sites are smaller and seem to reflect a less intensive settlement pattern and exploitation than the summer coastal adaptation of the Rattlers Bight Phase. In fact, the Dorset adaptation seems to have enabled them to spend the winter in the marine zone, but without whale hunting it limited their population to a level below that of the Rattlers Bight and Ivuktoke cultures. The fact that Indian peoples occupied the interior may also have had important effects on the Dorset occupation, in particular on its early disappearance from this region.

The extent of Dorset communication and movement along the coast is difficult to assess, since the source of the mottled green-brown chert is not known. However, a source in the Aillik or Cape Harrison region is likely, and other evidence of northern contact is seen in the use of small amounts of Ramah chert. This material, which is widely used by Dorset culture in northern Labrador, is rarely found in Groswater Dorset. This does not necessarily mean a lack of contact with northern Dorset, since it may result from preference for the more local material.

David Michelin Complex
(circa 100 B.C.)

Sites: David Michelin, Hound Pond 1

TECHNOLOGY.—As with other prehistoric sites in Hamilton Inlet, the evidence for technological adaptations in the David Michelin complex comes solely from lithic remains. These include an assemblage of stemmed points, large bifacial knives, and a variety of scrapers and utilized flakes. The technology includes the use of interior cherts, Ramah chert, quartzite, and quartz. The bifacial industry includes techniques for the removal of large flat thinning flakes, much the same as in the Charles complex. Biface thinning flakes are common in the debitage. Points are generally bifacial, although a single unifacial point was found, as well as many unifacial scrapers and flake tools.

ECONOMY.—The economy of the David Michelin site is probably similar to other sites from North West River, presumably primarily a fishing location. Hunting, however, is indicated also. A summer occupation is suggested. The Hound Pond site suggests a summer occupation also, with the possible addition of marine resources, such as seal and water fowl, as well as fish and small game.

ASSEMBLAGE ANALYSIS (Table V).—In comparison to other sites from North West River, the David Michelin site has a relatively high proportion of points and bifaces in comparison to scraping tools and flake tools. The bifacial portion of the assemblage is 57 percent. The fact that domestic tools are less frequent than usual may reflect the collection techniques used on the site, which was excavated by Mr. Charles.

SETTLEMENT PATTERN (Figure 67).—The David Michelin site would appear to be a habitation site used for at least part of a summer season. The concentration of materials, both tool and debitage, suggests a considerable amount of activity on the part of a small group. Biface manufacture appears to have been important from the numbers of bifaces and thinning flakes found. The occupation persisted for some time as inferred from the necessity of manufacturing two of the six points from quartzite. Points seem more commonly to have been made from chert or Ramah chert. Apparently, these materials had been expended during the course of occupation, requiring the use of inferior materials as replacements. This settlement is classified as Type 3.

The Hound Pond settlement appears to be a short occupation by a small group for a considerably shorter period than at the David Michelin site. Though the site has only been tested, the scarcity of tools seems to warrant its classification as a Type 4 or 5 settlement.

SUBSISTENCE-SETTLEMENT SYSTEM.—The David Michelin complex seems to represent the type of subsistence-settlement system and cultural distribution which characterizes the Brinex and Charles complexes, basically winter-adapted to the interior caribou resources with summer utilization of coastal-riverine fish, small game, and birds. There is a strong possibility that limited use of sea mammals, especially seals, may have been made during the summer sojourn on the outer coast. Interior cherts seem to suggest the culture's basically interior type of adaptation; however, Ramah chert is present in small quantities also.

TABLE V.—*David Michelin complex assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Biface*	*Blank*	*Knife*	*Scraper*	*Utilized Flake*	*Total Tools*	*Debitage*
David Michelin	.19(6)	.29(10)	.02(1)	.07(2)	.10(3)	.33(10)	32	233
Hound Pond 1 (qtzte. component only)	.20(1)	–	–	.20(1)	–	.60(3)	5	247

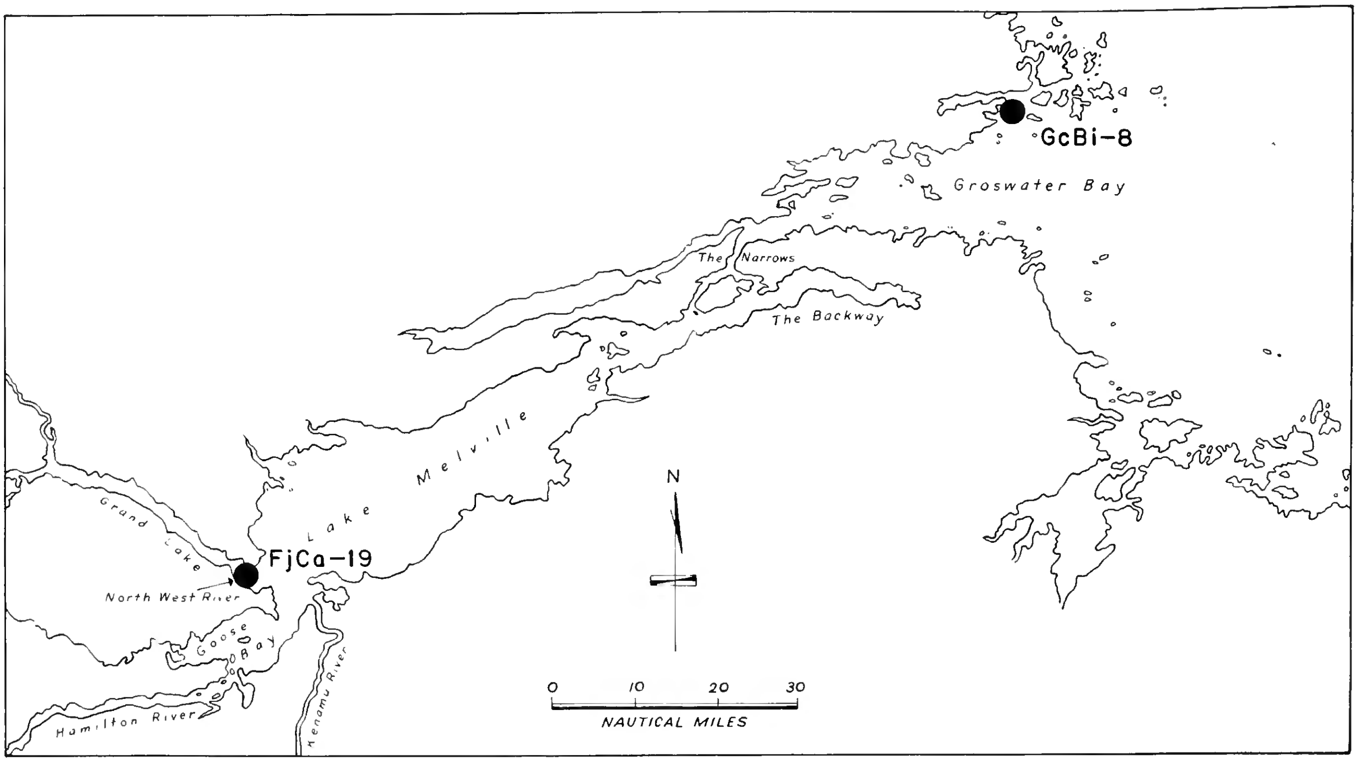


FIGURE 67.—Distribution of David Michelin complex sites in Hamilton Inlet, circa 200 B.C.

North West River Phase
(circa A.D. 200)

Sites: Sid Blake, Henry Blake 2, Graveyard, Herbert Michelin 1, Herbert Michelin, 2, Ticoralak 6, Winter Cove 1, Sandy Cove 1.

TECHNOLOGY.—The lithic technology of sites of the North West River Phase is remarkable in its consistency and simplicity. It is basically a bifacial industry utilizing local quartzite for the production of roughly finished, often poorly made tools—most commonly lanceolate, ovate, and asymmetric knives and small stemmed points. Casual flake tools, by-products of the biface industry, are often used as scrapers, but no formal class of prepared scraping tools exists. Within the various tool classes there is considerable typological variation.

The lithic debris of this simple industry is characterized by fairly large thick flakes which tend to have wide striking platforms, pronounced bulbs, and short lengths. Thinning flakes occur rarely and cannot easily be recognized as such since preform edges tend not to be carefully prepared, but remain sinuous until the final process of preparation. The lithic debris from the Sid Blake site contains the full range of production wastage, from the initial quartzite cobble cores to the finished product. This process can be followed by the presence of numerous production blanks and preforms in various stages of completion. Broken or rejected preforms occur frequently enough to suggest that stone knapping was not a developed art with these people. Undoubtedly, limitations exist in the material; however, the crudeness of the lithic technology, and especially the lack of suitable tools for hide working, suggests that a bone technology was used extensively, as in the Montagnais and Naskapi cultures. No bone tools were preserved, however.

ECONOMY.—Variations in economy are suggested by several of the sites within this phase. The largest site, the Sid Blake site, seems to be a fishing site with very little evidence of hunting in its preserved technology. This is also true of the other four sites of this phase in North West River. Ticoralak 6, however, is situated at a rather poor fishing location, but one which has been traditionally known for seal and duck hunting. A piece of what is probably charred seal fat was found in this site. Other sites in Groswater Bay may have been used for seal hunting too, but it is probable that seal was of secondary importance to fish, birds, and land game.

As with other sites on the coast, the North West River Phase sites seem to be summer occupations.

ASSEMBLAGE ANALYSIS (Table W).—It is difficult to speak reliably about functional analyses of these assemblages except in the case of the Sid Blake site.

TABLE W.—*North West River Phase assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	Point	Biface	Asymmetrical Knife	Blank	Utilized Flake	Other	Total Tools	Debitage
Sid Blake	.01(2)	.16(22)	.02(4)	.13(18)	.34(46)	.34(46)	138	10,000
Herbert Michelin 1	.11(1)	.22(2)	.11(1)	–	.56(5)	–	9	242
Herbert Michelin 2	–	.17(1)	–	–	.66(4)	.17(1)	6	555
Henry Blake 2	–	1.00(2)	–	–	–	–	2	242
Graveyard	.25(1)	.25(1)	.25(1)	.25(1)	–	–	4	3,366
Ticoralak 6	.14(1)	.39(2)	–	–	.57(4)	–	7	1,529
Winter Cove 1	–	.50(2)	–	.25(1)	.25(1)	–	4	150
Sandy Cove 1	–	1.00(1)			–		1	

The others were only sampled (or salvaged), and adequate samples do not exist.

Certain general features seem to characterize the collections. First of all, there is a definite scarcity of projectiles and blades; secondly, there is no formal class of scrapers suitable for hide working; finally, there is a very high frequency of lanceolate bifaces (many of them functionally identifiable as knives) and a frequent occurrence of asymmetric knives. The few points found were never broken. At the Sid Blake site approximately 50 percent of the finished bifaces were broken. This seems definitely to indicate activities other than hunting. Flake tools reflect other domestic and fabrication activities, including probably rough hide working and woodworking. These tool types would seem to suggest extensive maintenance activities associated with fishing.

SETTLEMENT PATTERN (Figure 68).—At the Sid Blake and Henry Blake 2 sites, excavation revealed information on settlement pattern and occupation intensity. The settlement pattern in this area (Figure 39) is marked by four distinct concentrations of living debris, varying from 10–20 feet in diameter, and separated from each other by approximately 10–30 feet. Two of these concentrations (Sid Blake North and South) were extensively excavated; the other two

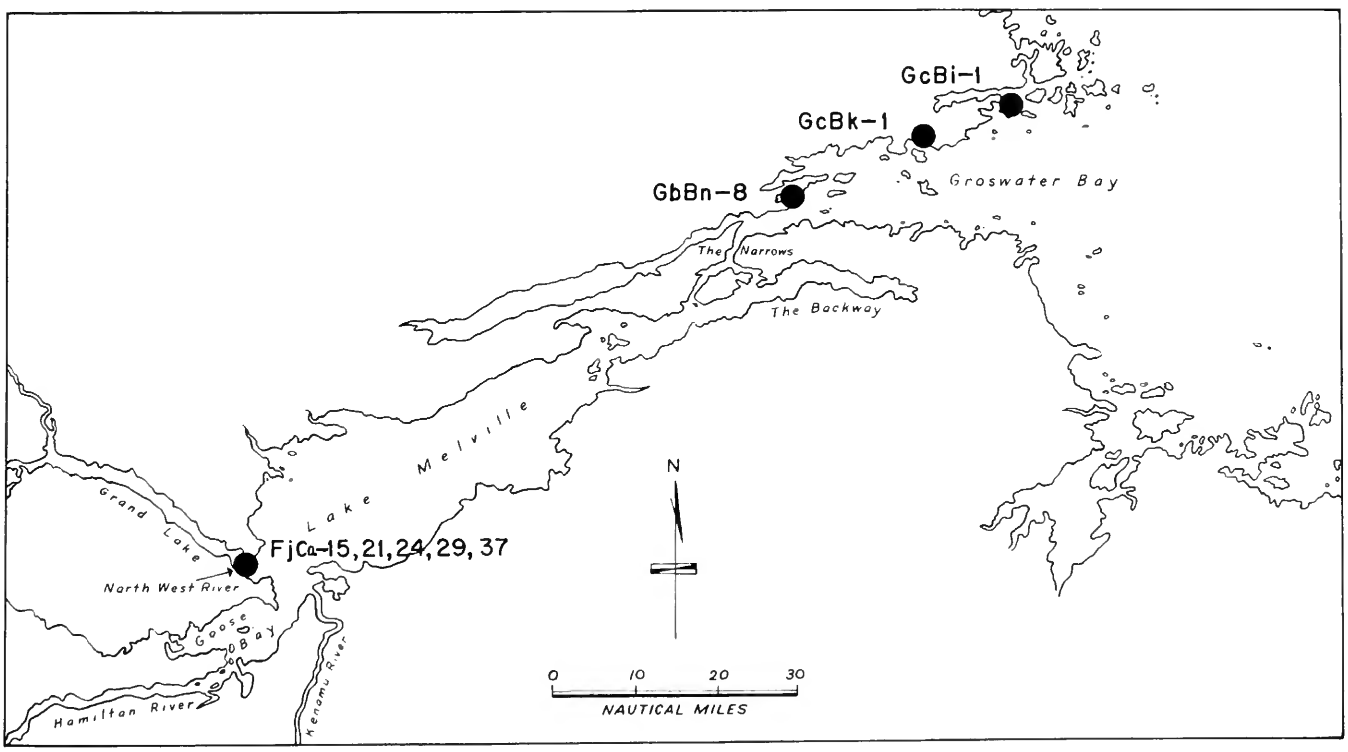


FIGURE 68.—Distribution of North West River Phase sites in Hamilton Inlet, circa A.D. 200.

(Sid Blake West and Henry Blake 2) were only tested.

The four concentrations follow the contour of the 25-foot beachline in this area. This beach begins at the front of the Sid Blake 2 terrace and runs approximately north and west crossing first the Sid Blake (south) excavation, then the Sid Blake (north) and the test-pitted western area, and proceeds toward the Henry Blake 2 site. When the water was slightly below the 25-foot contour a shallow bight existed in the area of the Henry Blake 2 terrace today in which the river current would have eddied, creating a natural cove. Apparently, the North West River Phase sites were situated around the edge of the cove, which explains why no remains of this culture have been found in the extensively tested Henry Blake 2 Terrace area. This also allows one to give a precise geological date for the occupation.

The four settlements around the cove may or may not have been inhabited simultaneously. If they were simultaneous occupations they would presumably represent individual tent sites or occupation areas of four social units, such as nuclear or extended families. In this case, the entire site would be a large multifamily settlement engaged in relatively permanent fishing activity.

There are no data, however, to substantiate this hypothesis. No broken tools are shared by the parts presently excavated. In fact, it appears unlikely that the occupations were contemporary, since such a large settlement would be unique in the area and it is doubtful that the local resources could support the population. Rather, the site areas probably represent four occupations occurring sequentially over a period of years in which an extended family group returned occasionally to the area. Other sites in North West River seem to have resulted from similar use.

The intensity of occupation of the North West River Phase sites can be seen from the absolute artifact and flake numbers and the tool/flake ratio: Sid Blake (1:700), Herbert Michelin 1 (1:4), Herbert Michelin 2 (1:90), Graveyard (1:900), Henry Blake 2 (1:120), Winter Cove 1 (1:40). Although these figures are not truly representative due to previous disturbance, uncontrolled excavations, or small samples, it appears generally valid that the more intensively used sites, such as the Sid Blake and Graveyard sites have lower tool/flake ratios, as well as greater absolute numbers of both tools and flakes. Although it is not always true, the smaller and more briefly occupied sites have higher tool/flake ratios and fewer remains. Another measure of the intensity of occupation at these sites is the frequency of finished tools that are broken. Over 50 percent of the Sid Blake site bifaces are broken. In addition, it has been noted that the nature of manufacturing debris can provide data on occupation intensity. Once again, the Sid Blake site contains a full range of production waste from primary core to preform and finished tool. Smaller occupations are generally characterized by more homogeneous debitage and usually only finished tools.

An attempt was made to define occupation areas within the Sid Blake site. The excavated remains unfortunately do not present a clear picture of structures, features, or activity areas. Numerous pits contained charcoal and cultural material, but these could not be isolated as being definitely of aboriginal origin, as they may have been the result of recent land-clearing operations. Only one probable hearth was located. The distribution of rock, likewise, did not outline probable structures, except that they tended to be found peripheral to the clusters of cultural material. No traces of post-molds existed.

The distribution of artifacts and flakes provides some information on activities. Tools tended not to be found within the heaviest areas of flake concentration, many of which were probably the result of manufacturing individual tools. Usually broken artifacts that could be fitted together came from the same or adjacent squares, but this was not always the case. Some tools were carried to another part of the site before being discarded. As often as not the tools found in the central areas of chip concentration were broken, some during the process of manufacture; but frequently those peripheral to the site center were complete, indicating loss in a less-used portion of the living area. In general, however, the spatial analysis of the data provides one with little insight concerning the internal structure of the site and the activities performed. Most of the tools were evenly scattered. Indeed, the actual habitation area may lie in an area of less concentrated remains as yet unexcavated. Finally, it should be acknowledged that the major excavation area was also the most prominent location along the shore during the time of occupation of these sites, and its remains may have resulted from the accumulated activities of several consecutive occupations.

The data suggest three types of settlement for these sites. The Sid Blake and Graveyard sites were probably relatively permanent summer fishing sites, with little hunting indicated (Type 3). The Herbert Michelin, Henry Blake, and Winter Cove sites were used apparently by smaller groups and for shorter periods (Type 4). Economically, they were similar, with the addition of sealing as a likely activity on the coast. The Sandy Cove site consists only of a surface find, and was only a transient occupation (Type 5).

Subsistence-settlement system.—The settlement distribution of the North West River Phase indicates that their seasonal round included both interior and coastal zones. During the winter, interior caribou hunting was probably the mainstay of the economy, and during the summer months fishing was the major activity. It appears that spring settlements moved from the interior hunting grounds to the large lakes and rivers. North West River was one such location which was used actively over a considerable period of time. The settlement system also included use of coastal environments for short periods during the summer. Besides small mammals and fish, seals and birds were taken. But coastal occupation seems to have been light, and by August groups moved back into the interior. The presence of small amounts of Ramah chert in North West River sites strengthens the evidence for coastal movements of these people.

The economy of the North West River Phase seems to have included a strong seasonal dichotomy between winter hunting and summer fishing activities. In the shore-side and riverine summer camps very little hunting is suggested. This pattern replicates that of the Sesacit Indians, whose area, however, did not include the coastal environment.

Point Revenge Complex
(circa A.D. 1000)

Sites: Henry Blake 1, Big Island 1, Ticoralak Surface Collection [possibly Shell Island 1, Winter Cove 4, Sandy Cove 1 East]

Sites of this complex are found throughout Hamilton Inlet. However, the total collections are small, and only two excavated sites have produced diagnostic artifacts. Other collections come from the surface, or are from sites which are assigned to this group on the basis of typological similarities and other data. The probable inclusion, upon further excavation, of Shell Island and Winter Cove 4, within the broader Point Revenge "culture" is the justification for including them within this analysis. The bulk of the information comes from the excavated sites, which were also radiocarbon-dated.

TECHNOLOGY.—The lithic technology of the Point Revenge complex includes both bifacial and unifacial industries in which the major material is Ramah chert. Red quartzite is also utilized. At present, two types of points have been found; one type is a large corner-notched projectile tip probably used as arrowheads and knives. Side and end scrapers are made on unifacial flakes and are retouched only along the used margins of the flake.

Production debris includes a large proportion of biface edge thinning flakes. These flakes are usually large and flat, with fairly wide striking platforms and ground edges. Between each successive preform thinning operation, the edges were ground smooth to distribute the force of the blow more evenly, creating a broad flat flaking technique and carefully thinned finished tools. Small points were made from thinner flakes. At the Sandy Cove site some of the points remained unifacial. At the Big Island site bifacial flaking was used.

ECONOMY.—Small amounts of bone were preserved in the hearths of the Henry Blake 1 and Big Island 1 sites. From the North West River area this indicates only that unidentifiable small mammals were hunted, most likely in conjunction with fish.

The data for Big Island are more specific. Here there were remains of small mammals and black bear, indicating a summer occupation at the site. The Henry Blake 1 site was probably also occupied during the summer. Although no trace of seal was found at Big Island, it is likely that the coastal economy included this species and fish and birds as well.

ASSEMBLAGE ANALYSIS (Table X).—Both the faunal and assemblage evidence from the two major sites of this complex indicate the importance of hunting activity. Domestic tools also occur in large numbers. It is possible that the hunting emphasis results from the use of the same tool types for both knives and points.

SETTLEMENT PATTERN (Figure 69).—The sites at North West River, Big Island, Sandy Cove, and Winter Cove contained structural remains. Circular rings of small boulders were found enclosing the

TABLE X.—*Point Revenge complex assemblages*
(In percent of total assemblage; numbers in parentheses indicate sample size.)

Site	*Point*	*Biface*	*Scraper*	*Utilized Flake*	*Other*	*Total Tools*	*Debitage*
Henry Blake 1	.10(1)	.40(4)	.20(2)	.30(3)	–	10	344
Big Island 1	.33(5)	.06(1)	.06(1)	.55(8)		15	815
Sandy Cove 1 East	.57(8)		.07(1)	.36(5)		14	(not collected)
Ticoralak 6	.11(1)	–	–	.67(6)	.22(2)	9	130
Shell Island 1		.10(4)	–	.90(38)		42	5000 grams
Winter Cove 4	–	.29(2)	–	.71(5)	–	7	581

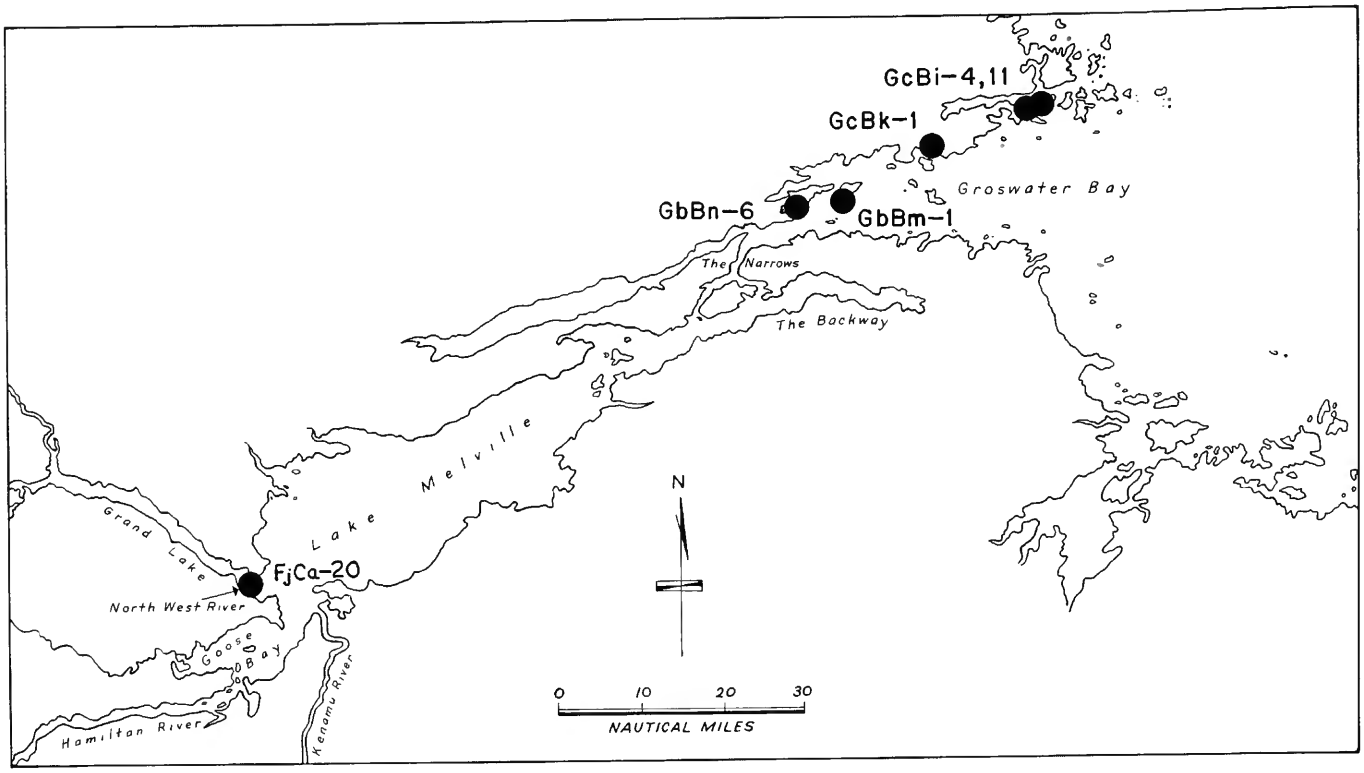


FIGURE 69.—Distribution of Point Revenge complex and related sites in Hamilton Inlet, circa A.D. 700–1500.

cultural debris at Sandy and Winter Coves, while at Big Island the partially preserved remains of a tepee pole dwelling were found collapsed around a central hearth. This dwelling seems to have been similar to ones used by Naskapi. The Big Island dwelling was about 12 feet in diameter. A second dwelling may have existed in area A, but the remains have decayed in the thinner soil cover there.

The Henry Blake site contained only the remains of a hearth, similar to that at Big Island. Both hearths are about 12–18 inches in diameter, and are made of a circular ring of small boulders.

The intensity of occupation in these sites varies. The Henry Blake site was used apparently for a brief period, and few tools and debris accumulated. Chipping remains consist of small flakes probably resulting from maintenance activities, and very little actual manufacturing of tools was done. A Type 4 camp is indicated. A similar situation obtained at the Big Island site, although the occupation seems to have been for a longer period and by a slightly larger group (Type 3). The trend toward increased activity continues with three to four individual structures at the Winter Cove 4 site, only one of which has been sampled (Type 3 settlement). At both Big Island and Winter Cove domestic activities are indicated, and occupations may have lasted several weeks or longer.

The Shell Island site was used primarily as a biface manufacturing station. The huge amount of biface production debris and the fact that much of it retains the flat cortex surface of the original source bed suggest that the site was used as a preliminary chipping station for the production of blanks and finished tools. This pattern would seem to explain the lack of primary production debris from other sites of the complex. It is classed as Type 6, specialized activity site. Finally, Ticoralak 6 seems to be a transient site (Type 5).

SUBSISTENCE-SETTLEMENT SYSTEM.—The subsistence-settlement system of the Point Revenge complex would appear to represent another example of a basic interior winter hunting and summer coastal hunting and fishing culture characteristic of the Indian occupations of the inlet. In this case, however, we have substantiation for the importance of fishing. This is probably the characteristic pattern for the coastal occupations by other groups as well.

Peoples of the Point Revenge complex, however, seem to have occupied the coastal regions more heavily than earlier cultures, and their sites are more numerous and larger. Their near-exclusive use of Ramah chert is an added indication of this pre-

TABLE Y.—*Archeological settlement types in Hamilton Inlet*[1]

Archeological Unit	Type 1: *Gathering Site*	Type 2: *Base Camp*	Type 3: *Intensive Exploitation Camp*	Type 4: *Light Exploitation Camp*	Type 5: *Bivouac*	Type 6: *Specialized Activity Within Band Territory*[2]
Sesacit Phase	Michikamau	Kenamu River		(Many examples from field surveys)		
Ivuktoke Phase	Eskimo Island	Ticoralak, Big Black Island				
Point Revenge complex			Big Island 1 Winter Cove 4	Henry Blake 1	Ticoralak 6	Shell Island 1
North West River Phase			Sid Blake	Herbert Michelin 1, 2 Henry Blake 2 Winter Cove 1	Sandy Cove 1	
David Michelin complex			David Michelin East Pompey Island	Hound Pond 2 Ticoralak 3, 5	Ticoralak 2, 2E, 4	
Groswater Dorset Phase				Red Rock 2		
Road component				Road Site 2		
Charles complex			Piloski Road Site 1 Radio	Louis Montague North West Brook 2		
Brinex complex			Bunkhouse North West Brook 1 Rigolet Spy	Red Ocher		
Sandy Cove complex			Sandy Cove 1–5	Bluff Head Cove 1–4		
Rattlers Bight Phase		Rattlers Bight 1	Hound Pond 2	Winter Cove 2		

[1] Types described in Table M.
[2] No Type 7: Specialized Activity Band Territory recognized in Hamilton Inlet.

dilection. However, interior occupation west of Lake Melville is also evident from the find of a pink chert point similar to a Point Revenge type at the Test Pit site in North West River. These interior areas were probably occupied during the winter caribou hunting season, after which groups moved down the rivers, stopping briefly at North West River before moving on to the coast.

During the summer around A.D. 1000 a group of these Indians seem to have been living near English River. They were no doubt surprised to find Thorvald Eriksson's craft exploring the bay, and subsequently mortally wounded its skipper. Sites such as these would probably have been occupied during the July salmon runs, after which a move to the coast for cod, trout, seal, berries, and other game would have occurred.

The appearance of strong coastal orientation in this culture may result from the lengthy occupation (from about A.D. 700–1500) during which numerous coastal sites were occupied, even though their actual adaptation may not have differed much from that of preceding cultures whose occupation spans were shorter. However, the island location of the sites and the use of Ramah chert supports the argument of considerable coastal economic adaptation.

COMPARISONS OF SUBSISTENCE-SETTLEMENT SYSTEMS

Models

SESACIT MODEL

The Sesacit subsistence-settlement system has been discussed previously (pages 49–51). It is characterized by a seasonal round entailing fall and winter hunting in small family groups in the interior, a spring gathering on the large interior lakes, a dispersal and movement to river mouths in Lake Melville in the summer for fishing, and a return to the interior hunting economy in the fall. The ethnographic settlement types (page 137) include: spring gathering site (Type 1), dispersed summer fishing sites (Type 2), fall hunting sites (Type 3), winter caribou hunting camps (Type 4), and transient or bivouac camps (Type 5). The settlement distribution (Figure 26) shows that the band territory was confined to the interior regions and the western end of Lake Melville. The Sesacit subsistence-settlement system is shown schematically in Figure 24. This type of system represents a basic, generalized interior adaptation which, owing to the harsh environment, permits relatively few alternative adaptations.

IVUKTOKE MODEL

The Ivuktoke model represents a cultural adaptation restricted largely to the marine zone, utilizing specialized technology for the harvest of marine mammals and a more generalized adaptation for procuring land game, fish, and birds. The seasonal round is shown in Figure 27, and the settlement distribution in Figure 30. Six different ethnographic settlement types have been defined (page 137); large permanent winter communities (Type 1), winter ice-house settlements (Type 2), spring and fall sealing camps at the sina (Type 3), summer gathering sites (Type 4), summer fishing and sealing sites (Type 5), and bivouac camps (Type 6). The settlement system is illustrated schematically in Figure 28.

MONTAGNAIS MODEL

The Montagnais of southern Labrador and Quebec present a third ethnographic model which is useful in interpreting the Hamilton Inlet data. Here, winter adaptations are similar to the Sesacit pattern with interior caribou hunting as the dominant activity. However, summer patterns vary, for the Montagnais then move to the coast to fish and hunt seals. Their cultural distribution therefore spans both interior and coastal zones, and the importance of marine animals in the summer economy is great, although the basic adaptation still remains an interior one.

Prehistoric Subsistence-Settlement System Types

An analysis of each of the archeological cultures of Hamilton Inlet reveals that four basic subsistence-settlement system varieties have dominated cultural adaptations during the past 4500 years. These are termed Interior, Modified Interior, Interior-Maritime, and Modified-Maritime. These systems, and the dominant modifications of each system, are described below. A summary is given in Table Z.

INTERIOR SYSTEM

The Interior subsistence-settlement system (Table Z:1) has as its major characteristics an interior settlement pattern and a generalized technology adapted to fishing and hunting in the boreal forest. The mainstay of the winter economy is caribou; in the summer, fish. Without both of these human life would not be possible. The best description of the Interior type of system is seen in the reconstruction of the Sesacit pattern. The only other cultural unit in the Hamilton Inlet sequence which appears to conform to this

TABLE Z.—*Hamilton Inlet subsistence-settlement system types*

Type and System	*Description*
1. INTERIOR (Sesacit Phase, Road component)	Interior-restricted sss[1]; caribou winter economy on interior, lake and river fishing during summer. Generalized interior adaptation.
2. MODIFIED-INTERIOR	Interior-coastal sss: Generalized interior adaptation; limited to generalized coastal adaptation. Winter caribou hunting on interior; summer lake and coastal hunting and fishing.
2a. Brinex, Charles complexes	Limited coastal adaptation in summer. Generalized winter caribou economy on interior.
2b. North West River Phase, David Michelin complex	Generalized coastal adaptation including semi-permanent camps for small game, fish, birds, seal.
2c. Point Revenge complex	Generalized coastal adaptation with more intensive use of marine environment. Larger social groups; use of Ramah chert.
3. INTERIOR-MARITIME	Interior-coastal sss: Generalized winter adaptation, specialized coastal adaptation during summer.
3a. Sandy Cove complex	Seasonally specialized coastal adaptation, but with small coastal settlements. Limited trade and use of Ramah chert.
3b. Rattlers Bight Phase	Specialized seasonal adaptation to coast with semi-permanent summer occupation of large base camp. Trade in Ramah chert.
4. MODIFIED-MARITIME	Coastal-restricted sss: Specialized coastal adaptation to marine resources. Some use of coastal land resources.
4a. Groswater Dorset Phase	Specialized technology for seal and walrus. Small population. Semi-sedentary.
4b. Ivuktoke Phase	Specialized technology for seal, walrus, and whale. Large winter communities. Dog sled and umiak transport.

[1] sss, subsistence-settlement system.

pattern is the Road component, although the David Michelin complex may also have used an interior system at some point when Dorset culture occupied the coast.

The salient features of the Interior type have been previously discussed and do not need detailed elaboration here. Briefly, it consists of a seasonal round alternating between the interior caribou hunting territory and river-mouth fishing stations along the shores of Lake Melville. North West River was one such fishing locality. The Churchill, Kenamu, Kenemich, English, Mulligan, and Sebaskachu rivers would also have been used. Large spring gatherings of the band were probably held, as for Sesacit, on the larger interior lakes soon after break-up in May. After fishing ended in the fall the move away from the shores of Lake Melville began, and caribou became the major food source. Social groups throughout most of the year consisted of one or two extended families. Social organization was probably minimal, with principles of band organization loosely structured around the family. Dwellings were simple, ritual important, and life often one of hardship and privation. Nomadism and flexibility in social groups would have been enforced by the harsh conditions of the environment. Periodic starvation may have been a reality of life. Figure 24 illustrates the typical subsistence-settlement system of this type.

MODIFIED-INTERIOR SYSTEMS

Archeological and ethnographic data suggest the importance of a Modified-Interior type of subsistence-settlement system (Table Z:2). The ethnographic parallel comes from the Montagnais of southern Labrador and Quebec. This system, which has three main variants in the Hamilton Inlet sequence, is typified by a winter interior caribou hunting economy with a summer adaptation to the coast. The Brinex, Charles, David Michelin, North West River, and Point Revenge units utilized this type of system. They seem similar in basic adaptation to the Interior type in terms of winter hunting, social, demographic, and other patterns, although this is only a supposition based on knowledge of interior ecology and ethnographic analogy. They differ only in their summer use of coastal resources. Coastal activities appear to be the result of transference of interior adaptations from interior game to coastal resources. As such, the Modified-Interior type of adaptation involves the seasonal use of a rich environment without specialized techniques for utilizing its full range of resources. Three variants of this system are seen in the data.

Brinex and Charles Systems
(Table Z:2a)

These cultures appear to have similar hunting and fishing technologies and settlement systems. Their occupations at North West River and North West Brook were confined to Type 3 and 4 settlements, occupied briefly by small family groups. Fishing and small game hunting appear to have been the major economic activities at these sites.

North West River and David Michelin Systems
(Table Z:2b)

The North West River Phase represents a slightly different system in which relatively more emphasis was placed on large, semisedentary fishing at North West River (and probably other) river-mouth areas. The settlement distribution also extended into the marine zone where resource utilization seems to have been similar to that of the 2a type system, i.e., coastal extension of a basically interior-adapted technology for species with continuous distributions between the two zones. In this case, however, there is evidence for seal hunting as well. This variant applies to an interior-adapted culture that maximizes the available resources in both interior and coastal regions without greatly altering either its technology or settlement system. The David Michelin complex is included in this group on the basis of its fairly extensive use of Ramah chert.

Point Revenge System
(Table Z:2c)

The third variant is the Point Revenge system. Here we note similarities in the importance of summer fishing and game with the use of generalized interior technology for utilizing summer coastal resources. However, the large number of sites, their increased intensity of occupation, larger groupings, and the dominance of Ramah chert suggest a greater degree of adaptation to the coast than seen in the other two variants. It suggests a system similar to the other variants but making fuller use of the coast for longer periods during the summer, and with more intensive utilization of marine fauna.

INTERIOR-MARITIME SYSTEMS

The Interior-Marine subsistence-settlement (Table Z:3) is the third of the major adaptive types in the Hamilton Inlet sequence. This system, like the Modified-Interior type, also is split between winter interior and summer coastal adaptations. However, in this case, the coastal economy is of greater significance than in the other interior types and plays a dominant role in the culture. Two varieties of the Interior-Maritime system are seen in the Hamilton Inlet. Both are Maritime Archaic cultures: the Sandy Cove complex and the Rattlers Bight Phase.

The "immediate environment" (band territory) of the Maritime Archaic peoples of the Inlet includes both coast and interior. The heaviest concentration of settlement, however, appears to be on the coast, where summer habitation, at least in the "classic" Rattlers Bight Phase is largely base camps for several months. At present winter patterns can be suggested only on the basis of negative evidence, ethnographic analogy, and ecological potential. Here it is likely that a pattern simliar to the Sesacit type would be found, involving perhaps larger groups of hunters and communal caribou drives. However, the environs of Hamilton Inlet and the surrounding plateau are not suitable for the interception of large caribou herds because there are no standard migration patterns and few geographic barriers to concentrate the generally dispersed woodland caribou. The interception of large herds is a common feature of Barren Ground caribou hunting patterns north of Lake Michikamau, but this would be north of the immediate environment of the Hamilton Inlet peoples. Thus, it is unlikely that the Maritime Archaic peoples of the inlet had permanent winter camps. They probably hunted in fairly small, flexible groups in different parts of the inlet, and, rather than holding large spring gatherings on the interior lakes, they journeyed to the coast where larger communities formed during the summer season. The trend through the Sandy Cove to Rattlers Bight periods was to intensify the size and stability of these summer settlements, indicating a development of social and technological forms increasingly oriented to the marine habitat. During this period also, trade and coastal movement increased.

Sandy Cove System
(Table Z:3a)

The earliest Maritime Archaic adaptation known for Hamilton Inlet is seen in the Sandy Cove system. It is characterized by large numbers of Type 3 and 4 summer settlements in the marine regions of the bay. During occupation, however, the tree line extended at least this far east, and a tundra life is not indicated for these people. Although it is not yet demonstrated, I suspect that during the Sandy Cove occupation the summer economy was split between land and sea hunting, with a preference for the latter, particularly fish, migratory birds, seal, and possibly walrus.

Most indicative of summer maritime adaptation is the settlement pattern, which indicates a clear preference for coastal habitation in greater density than sites of other interior-adapted peoples of the inlet. The pattern most closely approaching Sandy Cove was the Point Revenge adaptation, although these sites were more sporadic and generally smaller than the Sandy Cove sites. It is suggested that the Sandy Cove coastal adaptation was a summer maritime one which was in the process of developing toward the more intensified pattern seen in the later Rattlers Bight Phase, where major changes in settlement pattern and perhaps technology occur. The less permanent settlements and the raw materials of the Sandy Cove complex suggest a more localized, less specialized type of adaptation than during the following Rattlers Bight period. In addition, the Type 3 and 4 settlements probably are similar to the small group, nomadic winter hunting settlement pattern that is postulated here for both Sandy Cove and Rattlers Bight cultures.

Rattlers Bight System
(Table Z:3b)

Through time it appears that developments toward increasingly specialized adaptation to the marine habitat occurred in the Sandy Cove system. These developments, which may or may not have originated in Hamilton Inlet, strongly affected the summer settlement and exploitation patterns and probably did not alter the basic winter interior hunting subsistence. Summer occupations grew in size and shifted further seaward from Sandy Cove into the Rattlers Bight-Winter Cove area, the last outpost of the mainland. This settlement shift was made possible after 2000 B.C. by the geological emergence of an ideal site with sheltered harbors and excellent marine hunting and fishing grounds.

The large summer base camp at Rattlers Bight appears to have been used as a major base camp (Type 2) for summer exploitation of the marine zone. The settlement size, its technology, and faunal remains document intensification of the summer marine economy. The site is also located at the intersection of the sheltered water routes which may have been important in the Ramah chert trade. The increase in social integration noted from the Rattlers Bight settlement and the switch to dependence on Ramah chert from the previous mixture of local material probably indicates the growing importance of trade and long range contact during Rattlers Bight times.

At this time a fairly strong dichotomy is postulated to have developed between the generalized winter interior economy and the summer marine adaptation, which utilized an Eskimo type of technology but apparently without the winter ice-hunting techniques necessary for year-round occupation of the coast. In a wooded environment the development of an ice-hunting technology could have been achieved rapidly, resulting in more stable year-round settlement on the coast and loss of the hazardous caribou specialization during the winter; but there is no evidence that this occurred. Failure to make this adaptation may have invited disaster, for by 1500 B.C., dramatic changes of some sort swiftly brought an end to the Maritime Archaic occupation of Hamilton Inlet. These changes, in fact, may have been triggered by climatic changes which hit Maritime Archaic culture at its ecological Achilles' heel, its reliance on the interior winter caribou hunt. However, a cultural explanation, perhaps influenced by climate and ecology is more likely, since this period signals major cultural changes throughout the entire Northeast.

MODIFIED-MARITIME SYSTEMS

The final subsistence-settlement system seen in the Hamilton Inlet data is the Eskimo, or Modified-Maritime system (Table Z:4), characterized by a coastal settlement pattern and year-round adaptation to marine fauna. Winter ice-hunting techniques are used as well as open-water sealing in the Narrows. Caribou hunting is an important source of clothing and a secondary source of food, but this hunting is done in the coastal environment and not deep in the interior. Fish, migratory birds, berries, and small game are also important seasonally. Sea mammals play the dominant role in the economy throughout the year. Sina hunting for seal and walrus was important during the winter, and use was undoubtedly made of the fall and spring harp seal migrations. The settlement pattern common to Modified-Maritime systems involved large, relatively permanent winter settlements in the Narrows and smaller, seminomadic summer occupations in eastern Lake Melville and Groswater Bay. Two types of modified-maritime adaptations are seen in Hamilton Inlet.

Dorset System
(Table Z:4a)

The Dorset culture of Hamilton Inlet is distinguished by its generalized adaptation to marine fauna, using ice-hunting and toggling harpoon technology for year-round exploitation of seal and walrus. Caribou, birds, and fish were also important. Winter occupation of the Narrows is probable, but large permanent settlements such as those of the Ivuktoke may not have been used. Summer sites in Groswater Bay include settlement types 3, 4, and 5. No large summer base camps or seasonal gathering sites have been found. The population seems to have been fairly low, perhaps between 30–50 individuals. Trade with northern Dorset cultures is indicated by small amounts of Ramah chert. The small size of Dorset sites suggest that the family was the most common settlement unit, and group cohesion was likely to have been moderately strong. Group fragmentation occurred seasonally following break-up of the winter settlements.

Ivuktoke System
(Table Z:4b)

The Ivuktoke variety of the Modified-Maritime system is similar to the Dorset type in settlement-pattern distribution and in most aspects of technology and seasonal round. Major differences occur, however, in four areas: whale-hunting specialization, transportation, settlement types, and social organization. Whale hunting not only provided a new resource base, but served as an impetus for social integration through group-hunting techniques and community living. Large extended families between 25–30 members became the basic social units of the band, which tended to inhabit a single semipermanent settlement during the early winter months. Although the village usually would disperse in midwinter, the large extended family groups remained together throughout most of the year. These factors seem to have been important in the cultural expansion from northern Labrador and expropriation of coastal territory formerly used seasonally by Indian peoples of the Point Revenge culture. The fact that they were not in direct competition for winter hunting grounds probably facilitated this movement.

Adaptation Types

This discussion of subsistence-settlement systems in Hamilton Inlet supports environmental data for the distinction between interior and coastal environments and shows that the basic types of adaptation in prehistory have corresponded closely to this dichotomy. The coastal adaptation shows considerable variety of possible subsistence bases and technologies. The interior adaptations, on the other hand, are restricted in variety to a single type for the environment surrounding Hamilton Inlet, although a second type is possible in northern Labrador-Quebec.

COASTAL ADAPTATIONS

Three different coastal adaptations were used at various times during the prehistory of the inlet. These are termed "limited," "generalized," and "specialized" coastal adaptations. These types make different use of the resources and microenvironments of the marine, tundra, and tundra-transitional zones. Various technologies and settlement patterns have been suggested, of which those used for land game and birds seem to be fairly simple or generalized hunting techniques. Those adapted to sea hunting and fishing are more specially designed for the different requirements of these enterprises.

Limited Coastal Adaptation

This adaptation is characterized by small game hunting, and inshore fishing. The technology is a simple, generalized one including such tools as bow and arrow, spear, dart, bolas, leister, gorge, hook, and possibly the net. This technology and the accompanying settlement pattern of small, shifting camps and small social groups is at heart an interior pattern which has been transferred to the coast without much modification. The movement to the coast for these resources is a relatively simple alteration of the interior cycle which may not have required substantial cultural innovation or adaptive "tension." The fact that in Hamilton Inlet the forest fringe stretches into the marine zone and many species have continuous distributions between them facilitates this seasonal adaptation, as it does also in other areas of central and southern Labrador. On the coast, life with this adaptation would have continued much in the pattern of the interior.

Generalized Coastal Adaptation

Generalized coastal adaptation is similar to the limited coastal adaptation in that it too is basically a coastal extension of interior settlement patterns and technologies. However, this type represents a slightly more complete use of coastal resources, some of which are either not available or not used on the interior, such as seal. A different technology, perhaps harpoons, and certainly different hunting strategies are involved. Coastal sites tend to be occupied longer and by larger groups. It is anticipated that the generalized type of adaptation often grows out of the limited type as more familiarity with the coastal environment is gained by interior peoples. An example of this is seen in the Point Revenge complex.

Specialized Coastal Adaptation

There are three variants of this type, depending on the degree of specialization in technology and resources involved. Two of these are year-round adaptations; one is seasonal. The Ivuktoke represents the most specialized of the year-round type with whale hunting and other sea mammal specializations, including semi-sedentary settlement patterns. The Dorset type is less specialized, without whale hunting or dog-sled travel, and with less permanent settlement. The Maritime Archaic is the third type, a seasonal adaptation of relatively great specialization toward sea hunting and fishing. In the Maritime Archaic type fairly permanent summer quarters were occupied in the outer coastal environment. These three types make extensive use of the marine environment and have technologies and settlement patterns adapted specifically to these areas. The more specialized of these technologies are of little use on the interior. While all three engage in varying degrees of interior winter hunting their coastal technology has developed independently and has not been simply transferred from interior adaptation types. It is the result of a long process of adaptation to the marine environment. Strangely, there is no evidence that shellfish *(Mytilus edulis, Mya arenaria)* were ever utilized, except in the Ivuktoke case.

INTERIOR ADAPTATIONS

Two types of interior adaptations are noted for Labrador-Quebec: generalized and specialized. Of these, only the generalized type is found in Hamilton Inlet.

Generalized Interior Adaptation

The Sesacit (Montagnais) type of interior adaptation is based on the hunting of a wide variety of animals, birds, and fish. Most of these resources are available only seasonally and in low biomass concentration. The technology uses an equally wide variety of methods, including simple projectiles, drives, fences, snares and deadfalls; most of the methods are of common use and do not need technological specialization, such as that required for efficient sea mammal hunting. This type of generalized adaptation is used for total exploitation of a biologically low production environment like the boreal forest. Fishing is a year-round activity, but it is stressed in the summer since ice thicknesses preclude efficient winter fishing. Caribou is the staff of winter life. The Hamilton Inlet interior requires this type of adaptation.

Specialized Interior Adaptation

Specialized interior adaptation is known in Labrador-Quebec only for the northern tundra and forest-tundra territories occupied by the Naskapi. While fish, small game, and birds were important, the entire economy was built around the slaughter of the Barren Ground caribou which were intercepted annually in their migration cycle. The inability of this environment for supporting human life without caribou is a proven fact. The Naskapi caribou specialization capitalized on these herds, but in the process gave themselves an extremely unstable economic base. In years of plenty there was feast; but famine struck when caribou were scarce. This type of adaptation has played an important role in the prehistory of Labrador-Quebec and will be discussed further (pages 180–185).

Subsistence-Settlement Shifts in Hamilton Inlet

Figure 70 shows the chronological shifts in subsistence-settlement system types which have been used in Hamilton Inlet during the period covered by this survey.

The first occupation of the area probably predates the Sandy Cove Maritime Archaic but has not yet been discovered. However, with the Sandy Cove complex we seem to have a culture with a generalized interior winter economy dominated by caribou hunting, and very likely an increasingly specialized summer marine adaptation including sea mammal hunting. Little or no trade is indicated and settlements are of Types 3 and 4. Therefore, in the first well-represented cultural complex of the inlet, sometime predating 2500 B.C., there is an Interior-Maritime (3a) type of subsistence-settlement system with a fairly strong distinction between two different seasonal patterns. The Sandy Cove complex developed into the Rattlers Bight Phase, although the two may be linked by an as yet unknown intermediate stage. By this time the dichotomy between coastal and interior patterns of this classic Interior-Maritime system had reached its peak (variant 3b), with generalized interior caribou hunting patterns and a highly specialized summer marine adaptation from a large base camp in the outer coastal zone. Population increased and trade was important to the north and south.

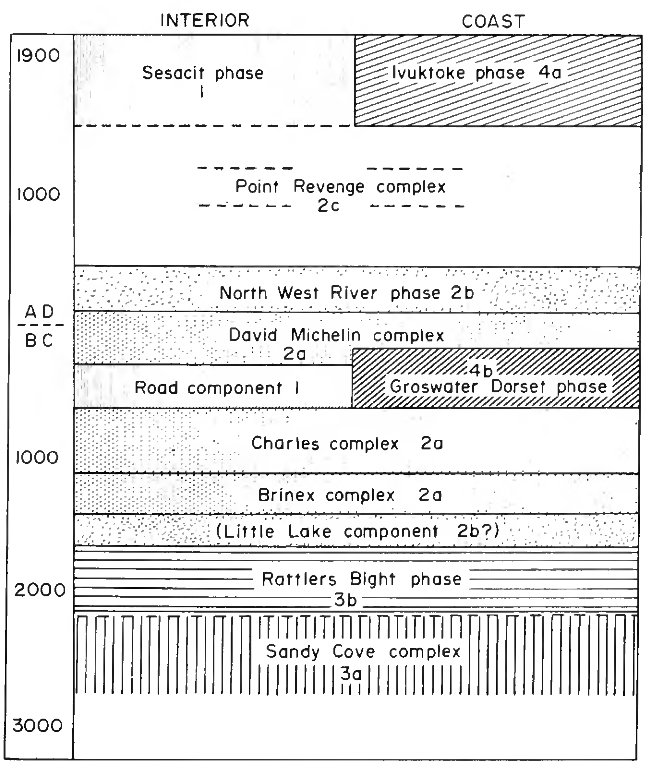


FIGURE 70.—Chronological shifts in subsistence-settlement systems.

An abrupt end in the Maritime Archaic Tradition occurred about the middle of the second millenium B.C. Shortly after this time there are traces of the Little Lake component, a unit sparsely represented by finds from North West River and Thalia Point, northern Labrador. This unit, stylistically related to the eastern seaboard Susquehanna style horizon, is postulated to have occupied both interior and coastal zones with a Modified-Interior (2a) type of system, presumably with generalized interior and limited coastal adaptations. The occupation appears to have been brief. It presents a major break in a long-standing historical tradition and an equally distinct change in subsistence-settlement adaptation.

Following the Little Lake component there is a succession of two historically and stylistically different cultures whose adaptations are of the Modified-Interior (2a) type with predominantly generalized interior and limited coastal adaptations. They are largely represented by interior sites and sporadic, small coastal occupations. They span the period between 1200–800 B.C. and seem to be remarkably short-lived, given their stylistic divergence. In a subsistence-settlement system they are more or less similar to the preceding Little Lake component.

About 800 B.C. the Dorset culture moved into the Hamilton Inlet region to occupy the coast at the same time that a different interior group, the Road component, appeared on the interior. The contemporaneity of these movements is not documented. The Dorset subsistence-settlement system was a Modified-Marine (4b) type with settlement restricted to the coast and a fully Eskimo way of life. The Road component seems to have been confined to the interior, like the Sesacit Indians, due to Dorset presence on the coast. The Road component system is similar to the Sesacit Interior (1) type and emphasized generalized interior and lake/riverine hunting and fishing.

The David Michelin complex follows the Road component. Once again the Modified-Interior (2b) type of subsistence-settlement system existed in both interior and coastal zones, perhaps overlapping in the early period with Dorset. This unit has a similar system to the North West River Phase with generalized interior and coastal adaptations. Its coastal settlements and Ramah chert raise questions regarding its relationship with late Dorset culture. A possibility of trade, overlapping exploitation zones, and a role in the demise of local Dorset culture is suggested.

The succession of Modified-Interior cultures again occurs about A.D. 200–300 with the appearance of the North West River Shield Archaic Phase. These people, with a Modified-Interior (2b) type of subsistence-settlement system, had a generalized interior and coastal system emphasizing semi-sedentary summer fishing and probably sealing on the coast and in Lake Melville.

After A.D. 500 the final interior culture, Point Revenge, appears and would seem to persist until contact time. Point Revenge represents a 2c-subtype of Modified-Interior system with generalized interior hunting and fishing and intensified summer occupation of the coast. About A.D. 1500 the Ivuktoke Eskimo appear from the north, displacing the Point Revenge culture west and forcing them to adopt a generalized Interior (Type 1) pattern. The denial of their summer territory probably caused a substantial readjustment of the Point Revenge system. Their withdrawal coincided with the introduction of European influence and deteriorating climate. The newly arrived Ivuktoke culture had a Modified Maritime (4A) type of system with a highly specialized coastal adaptation.

Adaptive Processes

An analysis of the foregoing subsistence-settlement systems reveals the operation of three processes of adaptation throughout the period covered in the sequence. These processes relate to the use of microenvironments and are culturally determined. They are not inherent in the biophysical world. The processes are microenvironmental reduction, expansion, and restriction. The first two are essentially culture-ecological; the third is, in this case, historical.

MICROENVIRONMENTAL REDUCTION

Coe and Flannery (1964:654) introduced this concept in referring to the trend toward cultural reduction in the number and spacing of the microenvironments exploited by a given community during the development of settled village life. This process involved the increasingly specialized exploitation of a single or several closely related microenvironments, thus enabling a culture to reduce the necessity for nomadic life and to turn its energy toward non-economic pursuits.

Reduction seems to have occurred in the Naskapi culture of northern Labrador-Quebec interior. Here, specialization on a single resource dominated the economy with important social, settlement, and demographic consequences. However, as noted previously, such resource specialization can also be inherently unstable.

In the archeological evidence only the Maritime Archaic cultures clearly demonstrate the reduction process. The data show that this may have occurred between the Sandy Cove and Rattlers Bight Phases during the summer coastal adaptation. In the Sandy Cove period, the settlement pattern suggests that the summer exploitation pattern was a generalized one with sites occupied briefly by small groups. Later, during the transition into Rattlers Bight, the tendency toward larger, more stable summer settlements may result from the gradual adaptation to a new environment. If so, this implies that Maritime Archaic arrived in central Labrador with a less maritime-adapted summer pattern and evolved toward increasing use of the sea in Labrador. There is no data as yet to suggest how or where this development occurred. This important question will have to await new data. Of prime consideration is the date of the Sandy Cove complex (circa 2800 B.C.) and information on cultures of the Gulf of St. Lawrence of the same period.

There is a possibility that microenvironmental reduction occurred in the later Point Revenge culture. This is suggested by the larger size of the later sites and their location in the outer portion of the bay. Unfortunately, there is no data on which to posit any reduction for the winter adaptations of the Indian cultures.

MICROENVIRONMENTAL EXPANSION

Microenvironmental expansion is not generally encountered in the archeological record since the general trend of cultural development in most areas proceeded in the other direction. Expansion involves an increase in the number and spacing of environments utilized and is accompanied by a more generalized, wide-ranging economy and usually a technology which is simple and can be used in all resource areas.

The result of expansion in cultural terms is a necessity for increased mobility between zones, for small flexible social groupings, limited material culture, and brief occupation of sites. It implies a fairly stable adaptation, since a wide variety of resources are used. The process of expansion in Hamilton Inlet occurred at least twice, first with the initial peopling of the area, and later after the Dorset period when the coast became open to Indian cultures. It also may have characterized to some degree the initial adaptation of the coast of some of the interior cultures, if these represented new arrivals. The process seems to have occurred initially with an adaptation to the coastal game which occurred both on the interior and coast and which could be hunted with the interior technology. Later, more specialized technology might evolve. Eventually, it might be expected that expansion would result in seasonal microenvironmental reduction as in Maritime Archaic.

MICROENVIRONMENTAL RESTRICTION

The third process, microenvironmental restriction, is the result of historical or environmental influence which forces a limitation of the territory normally used during a culture's seasonal round. This might be caused by the expropriation of land by another group, as in the Ivuktoke-Sesacit case, or from forest fire. As a result, the culture is required to subsist on only part of its former subsistence base and to utilize alternative patterns. At first, restriction would probably result in a reduction of the carrying capacity at the former subsistence level, and the culture would be forced to increase technological efficiency, reduce population, or disperse settlements.

Table AA depicts a hypothetical culture-ecological development for the Hamilton Inlet region, based on the processes discussed above. The first stage of the model begins with the entrance of a culture into the Hamilton Inlet area from the interior. Microenvironmental expansion into the inlet occurs. The subsistence-settlement system would be a basic Interior type, and the way of life would be similar to the Sesacit pattern.

In stage 2 this interior culture would expand into the coastal environment during the summer, transplanting the interior adaptation to coastal resources which had continuous distributions in both environments, i.e., caribou, fox, black bear, fish, migratory birds. This stage is represented by the Brinex, Charles, North West River, and David Michelin complexes with 2a and 2b Modified-Interior adaptations (Table Z).

Stage 3 represents a summer microenvironmental reduction on the coast, with more maritime specialization and the addition of new resources which do not have continuous coastal-interior distributions. Several possible adaptation variants exist, including the Modified-Interior (2c) type and the Interior-Maritime (3a and 3b) systems suggested for Point Revenge,

TABLE AA.—*Hypothetical culture-ecological development in Hamilton Inlet*

Process	*Subsistence-Settlement types* [1]	*Remarks*
Entry	1. Interior	New culture enters western Hamilton Inlet from interior, with interior-adapted culture (Road component)
Microenvironmental Expansion	2a. Modified-Interior	Interior culture expands into coastal zone for summer, using interior technology and subsistence patterns on continuously distributed species between coast and interior. (Brinex, Charles, David Michelin complexes)
Microenvironmental Reduction	2c. Modified-Interior	Culture begins seasonal specialization on coastal resources, developing new technology and sss.[2] (Point Revenge complex)
	3a. Interior-Maritime	Strong seasonal round dichotomy develops between interior winter and coastal summer patterns. Increasing specialization on marine sea mammals. (Sandy Cove complex)
	3b. Interior-Maritime	Intensified summer coastal adaptation with large, stable sites. Culmination of Indian marine specialization. (Rattlers Bight Phase)
	4a. Modified-Maritime	Year-round adaptation to coastal resources. Eskimo type of culture. Lacks whale hunting specialization. (Groswater Dorset Phase)
	4b. Modified-Maritime	Year-round coastal occupation utilizing all marine sea mammals, including whale. Culmination of Eskimo type of adaptation. (Ivuktoke Phase)
Microenvironmental Restriction	1. Interior	Culture once again restricted to interior environment by culture-historic forces, e.g., arrival of new culture on the coast (Sesacit Phase). Return to interior pattern.
Extinction, Assimilation, Continuation		Interior-restricted culture dies, continues on, or becomes assimilated into new culture with arrival of new ideas and/or people.

[1] See Table Z for description of types (p. 158).
[2] sss, subsistence-settlement system.

Sandy Cove, and Rattlers Bight. Increased specialization from the 3b variant would result in an Eskimo Modified-Marine type of adaptation with year-round occupation of the coast.

Stage 4 represents the case of microenvironmental restriction from cultural or natural cause, in which the Modified-Interior type of culture is limited to the interior zone alone, and assumes a pattern as seen in Stage 1 again. In Stage 5 the interior-restricted culture is subject to environmental or cultural stress (see pages 170–172), resulting in extinction, assimilation, or no change.

All of these processes have undoubtedly operated to some extent during the prehistory of Hamilton Inlet. However, I do not mean to suggest that the processes of expansion, reduction, restriction, and extinction represent the life-cycle of each or any of the archeological units discussed. Some cultures surely arrived in the area with these processes already in motion or completed. In addition, although this is the logical sequence in theory, there is no reason why the developmental process could not be interrupted, reversed, or arranged in some other order to fit particular historical circumstances. My intent has been only to isolate those processes which have operated in Hamilton Inlet and to suggest a model which might then be tested with other data. More complete information might suggest alterations of this scheme or the addition of other processes at work in the development of subsistence-settlement systems through time.

Summary

The most striking feature of the culture-history and subsistence types of the inlet is the dominance of the sequence by Indian cultures. The time depth of Indian occupation extends back at least 5000 years with apparently fairly continuous occupation throughout that time. During most of this period Indian cultures utilized both coastal and interior environments, a pattern interrupted only twice, briefly, once for about 700 years during the Dorset occupation, and more recently with the arrival of the Ivuktoke Eskimo. The culture history of the inlet is therefore predominantly an Indian prehistory.

It appears that during this period environmental conditions between the interior and coastal regions were not significant ecological barriers to the Indian cultures that regularly made seasonal use of the marine zones much as they had done further south. This seems to be due to the interior ecology and the extension of the forest further into the marine zone than it presently extends, during most of this prehistoric period. Therefore, in the past there was stronger ecological continuity between coast and interior in terms of land flora and fauna than today. However, this condition does not mean a lessening of marine influence in the inlet, coincident with forest extension eastward since the two variables, climate and hydrography, affect local conditions independently. Actually, marine influence has been steadily decreasing in the inlet through time. This has resulted in a greater ecological dichotomy between coastal tundra and marine zones as opposed to interior boreal regions today—a condition that apparently cannot be extended into the past.

The periods when Indian cultures did not occupy the coast can be attributed to the expropriation of this area by Dorset or Ivuktoke peoples moving in from the north. During these periods the coincidence of cultural and ecological boundaries is therefore seen as resulting from historical movements of people primarily adapted to different environments; it is not the result of diametrically opposed ecological zones requiring different forms of adaptations. The suitability of a number of adaptations to the coastal environment has been shown. By contrast, there is a definite limitation on the types of adaptations available for life on the interior.

The interplay between culture-historical and culture-ecological factors in the prehistory of the inlet is evident throughout the sequence. Heretofore, only historical questions have been considered. Ecological explanations will be discussed on pages 167–180. It appears, however, that in both historic and stylistic terms there has been a remarkable amount of culture change on the interior. At the same time the summary of subsistence adaptations shows that throughout this historical change of cultures, at least the summer types of subsistence-settlement systems which were utilized varied only slightly. Only one type of interior subsistence adaptation is postulated for the Indian cultures: the generalized type of winter caribou hunting adaptation. With the exception of the Maritime Archaic and the historical restriction of Sesacit and Road component to the Interior type of system, Indian cultures have utilized one of three variations of the Modified-Interior pattern. While culture-historical factors have been important in introducing new cultures, ideas, and populations into the Hamilton Inlet area, the similarity in the basic way of life pursued by these different groups has been primarily conditioned, if not determined by the ecology and environment.

Three major breaks occur in the sequence. The first is with the termination of the Maritime Archaic occupation. The appearance of the Little Lake component represents a dramatic change in subsistence-settlement system, including different settlement pattern, technology, and stylistic factors. This seems to indicate a population and cultural replacement with little, if any, continuity between the two. Following this, the sequence of Indian cultures shows a remarkable stylistic variety, which may indicate population replacements, albeit ones with relatively similar subsistence-settlement systems. The restriction of the immediate environment (band territory) to the interior in the Sesacit and Road component periods does not represent a major change except in culture area and settlement pattern.

The only other major breaks are during the Dorset and Ivuktoke arrivals. These represent totally new patterns of adaptation to the coastal zones.

Given the general Indian summer adaptation to the coast, there appears to be a tendency in the sequence for cultures to become increasingly efficient in exploiting marine resources. This occurs within the Maritime Archaic between the Sandy Cove complex and the Rattlers Bight Phase, possibly during the North West River Phase, and apparently during the time of Point Revenge culture. This process seems to have occurred in those cultures whose occupations in the area was lengthy, and does not occur for those cultures only briefly inhabiting the inlet, such as Brinex, Charles, and David Michelin. The reasons for increasing exploitation of marine fauna, apparently correlated partially with duration of occupancy, is a logical consequence of increased familiarity and adaptation. Those cultures without adequate time on the coast did not proceed as far in this direction as others and merely transferred their interior adaptation to the coast without innovation or modification.

A final note regarding subsistence-settlement system studies is that the data from Hamilton Inlet show the great flexibility and adaptive nature of these systems to changing conditions of the cultural and natural environment. For instance, the Road component in Hamilton Inlet apparently has an Interior type of system due mostly to the presence of Dorset on the coast, while in southern Labrador and Quebec sites of this culture are frequently found on the coast. The same situation occurs with the Montagnais, Sesacit, and Gulf of St. Lawrence groups—the Sesacit restricted to the interior while their southern relative had a Modified-Interior type of adaptation. Also, Point Revenge originally had a Modified-Interior type between A.D. 700–1500, at which time they lost their coastal range to the Ivuktoke Eskimo and adopted an Interior type without substantial technological change or cultural alteration.

These examples demonstrate that changes which result in important alterations of the subsistence-settlement system may not be accompanied by major technological or stylistic innovation. Archeological study of material culture is not sufficient to recognize these major changes in adaptation. This fact emphasizes the importance of archeological studies of specific subsistence-settlement systems in geographically confined regions. The major point is that subsistence-settlement systems are adaptive and are tuned to specific environmental and cultural conditions. It is therefore improper to generalize these regionally relevant patterns to other regions even when there is otherwise complete cultural continuity. It is the study of individualized adaptations which will result in the understanding of regional sequences and developments which will then serve as the foundations for more comprehensive work over larger areas.

This summary has considered the major events and facts of subsistence-settlement shifts in Hamilton Inlet. It raises many questions from the data, such as the causes of subsistence-settlement system continuity among Indian cultures, and the reasons for lack of culture-historical continuity on the interior, for the early arrival and departure of Groswater Dorset, for the northern extension of Maritime Archaic, and others. The remainder of this report is devoted to the exploration of these problems.

TERRESTRIAL AND MARINE ECOLOGY

Until now there has been no attempt to consider the Hamilton Inlet data in terms of broad ecological factors and their possible influence on culture-history. This section and the following one seek to explain several questions arising from the fragmentation of the sequence and cultural diversity by introducing a discussion of animal ecology, ethnographic models, and comparative archeological data. The aim of this presentation is to achieve a working understanding of the forces which dominate human life in this environment and which are of sufficient generality as to contribute to the development of cross-cultural regularities which Steward (1955) has enjoined anthropologists to search for.

General Ecology

A search for the underlying structural features of animal ecology in the Labrador-Quebec peninsula is presented in this section. The discussion includes a general description of the structural ecology of various life-zones and of specific food sources for man.

One of the major ecological themes stressed throughout this paper has been environmental variability and its effects on cultural adaptations. The chief causes of ecological variability in Labrador-Quebec are elevation (temperature), moisture, exposure, and marine influence. These factors are the primary determinants of the three major phytogeographic zones—the boreal forest, forest-tundra, and tundra—which with the inclusion of the marine-tundra zone, comprise the four life zones of the peninsula. In Hamilton Inlet all of these zones impinge upon one another. The boreal zone is found at the western end of Lake Melville, the forest-tundra north of the inlet, the tundra on the Mealy Mountains, and the marine-tundra in outer Groswater Bay. Since the forest-tundra is mainly a transition zone we will here be speaking primarily of the boreal forest, tundra, and marine-tundra.

TUNDRA

These three zones share some features, but in general they differ greatly in species present, food chains structures, and ecological limiting factors. The tundra is ecologically the simplest of the three zones. It has a low species diversity index, severe climatic limiting factors, and low biological production throughout most of the year. During the summer months production is raised substantially for a brief period during which it supports large numbers of migratory birds as well as its year-round population. Tundra food chains are short and often consist of only three trophic levels. Most important for man is the chain leading from (1) lichens and mosses, to (2) grazers such as caribou and musk ox, and (3) predators such as wolves and man. The plant-lemming-fox chain is another of the basic energy cycles. In this area of low species diversity, where few species exist together in a trophic level and where food sources tend to be specialized, there are few food alternatives. Under such conditions and with harsh environmental limiting conditions and predation, tundra food chains tend to be unstable and are subject to periodic population fluctuations. To account for this, species have adopted biological mechanisms to avoid extinction, including high reproduction rates, rapid growth, and migratory behavior patterns (Odum 1963). The classic example of predator-prey cycles and population oscillation is the lemming-fox cycle investigated by C. S. Elton (1942) from the Hudson's Bay Company fur-return records and journals. Similar cycles have been proposed for caribou under predation by wolves and man.

BOREAL FOREST

The boreal forest shares many features of the tundra ecological structures. Its podsols contain few soil organisms to support lower trophic-level life, and its food chains are correspondingly short, with few food alternatives and strong limiting factors, especially forest fires. In addition, the forest limits production of primary plant material, and the major food sources of man tend to be dispersed, either solitary, such as the moose, or occurring in small groups, such as woodland caribou. Seral climax is important in providing habitats with deciduous trees and shrubs on which many animals feed, and fire is crucial in maintaining these mircoenvironments. Seasonal periodicity of climate is strong, as in the tundra, and population oscillation is frequent. In the boreal zone the snowshoe hare-lynx cycle shows population fluctuations similar to the lemming-fox cycle of the tundra.

FIRE ECOLOGY

Besides the severe climatic limiting factors on animal life in the tundra and boreal forest, the importance of fire on seral succession in the boreal forest and on the long-term destruction of the most important primary food sources—mosses and lichens—cannot be underrated. The boreal and tundra zones are both subject to fire by natural cause and human hand. In the boreal forest this is usually by lightning igniting dry lichens on the forest floor, and on the tundra fire may be caused by lightning or, in regions of limestone, by the magnifying effect of sunlight through quartz crystals found in outcropping deposits. Tundra fires are recorded for northern Ungava by Banfield (Banfield and Tener 1958) in which lichens and mosses were destroyed for very long periods before recolonization occurred. In the boreal forest, the effect of fire has been greater and has been noted since the earliest descriptions of the land. Hind (1863:208) and Low (1896) mention the fire-devastated regions of southern Labrador and Quebec, and these reports are strengthened by the reports of Elton (1942:300) and Tanner (1944:401). During the early periods of exploration between 10–20 percent of the boreal forests of the south seem to have been either burning or had burned within 50–75 years. Hare (1959: map 1) shows the huge extent of burn areas today, even with major fire-control programs in effect. These burns have drastic effects on tundra and boreal ecology. Scotter (1964), in investigating the significance of fire in the destruction of caribou winter feeding grounds in northern Saskatchewan, noted the importance of fire in population fluctuation and migratory behavior. His studies showed that in this area lichen re-growth following fire took 30–100 years, during which the burn areas were uninhabitable by caribou. In 1953 Harper (1964:38) visited a burn in the Knob Lake area of central Labrador-Quebec seven years after a fire and noted that "dense lifeless mats of *Cladonia*" had hindered new growth, and only a few mosses, dwarf birch, and berry plants had recolonized.

MARINE ECOLOGY

In contrast to the tundra and boreal environments the marine environment has a high diversity of organisms, long food chains, and complex ecological structures providing feedback and regulatory mechanisms to dampen population fluctuations (Odum, 1963; W. H. Drury, pers. comm.). In the marine ecosystem, food chains may include a half dozen trophic levels with many alternative sources of food available at each level. Hydrographic conditions tend to be more stable than land climate, and population stability is enhanced. Dunbar (1960) considers the evolution of stability of arctic marine environments a result of natural selection toward slower growth, longer maturation, and migratory behavior—clearly a different set of conditions than noted for the tundra and boreal habitat. All of these factors tend to dampen, not enhance, population fluctuation in the oceans. Although Dunbar's theory of adaptation at the level of the ecosystem is not accepted by all biologists, it appears that the arctic marine environment, of which the Labrador Current is an extension, has a wide range of higher organisms of great importance to many species occupying top positions in the food chains. Most important, of course, are whale, walrus, seal (four species), and polar bear, while fish also tend to be fairly stable (Worthington and Dickie, comments in LeCren and Holdgate 1962:368–370). The larger species are subject to complex regulation and have only small population oscillations. Their migratory behavior enables them to utilize a large geographic area, so that under regional ecological catastrophe repopulation of depleted area occurs rapidly, unlike in interior environments.

This preliminary discussion should point out the growing distinction between the terrestrial and marine habitats. First of all, terrestrial species structure is simple, with few species involved, while marine structure is more diverse and complexly organized. Secondly, terrestrial food chains in tundra and boreal zones are short, with direct relationships between plants and caribou, while marine chains are long, with many alternate food sources available at each trophic level should a primary supply fail. Interrelationships between levels are less direct. Thirdly, limiting factors (Liebig's Law of the Minimum) oscillate dramatically and, therefore, operate strongly and directly on tundra and boreal food chains and, with relatively less strength, on marine chains. Finally, these differences result in dramatic terrestrial population fluctuations, while marine populations tend to be more stable and predictable through time.

Population Oscillation

From the standpoint of human ecology population fluctuation emerges as the major limiting factor for man, since in this environment he is clearly a predator. Cycle and fluctuation theory is a little-known field full of ardent speculation and vehement hypothesis and counter-hypothesis, which has been in the past plagued by a dearth of accurate data and a large number of single-cause explanations. Today, with the aid of mathematical models and better data and analytical procedures biologists are again becoming interested in population theory. Some of the developments are reviewed here.

Most of the early work on cycles stemmed from Elton's (1942) classic study of voles, mice, and lemmings in northern Labrador-Quebec. His conclusion led him to believe that the regular four-year lemming-fox cycle resulted from a predator-prey oscillation. These cycles often appear so regular that they were attributed to astronomical events. Other cycles with longer periods suggested correlation with sunspots, or the indirect effect of sunspots through climate (Vibe 1967). Pitelka (1957), studying lemmings at Point Barrow, concluded that oscillations were caused by internal biological factors, such as reproduction rates combined with ensuing depletion of food resources, while predation and astronomical factors were of secondary importance.

Detailed study of higher organisms has not yet been attempted. However, these studies reveal some of the basic variables of population control. These include biological, social, and environmental variables, of which most prominant are individual biological rhythms, reproduction rates, species-population structure, food supply, predation, interspecies social behavior, environment, and climatic conditions. Those factors most important in fluctuations of one species are not necessarily those which affect others. In general, the more complex the relationship, the more feedback received and the less dramatic the oscillation. The problem comes in isolating the controlling factors, since these may be important in terms of human ecology.

The basic theory of population oscillation and community stability has been considered by Slobodkin (1961) and MacArthur (1955). Quoting from Slobodkin (1961:157)

> If we consider stability in a community to be defined as a function of a change of the total standing crop of all the species in the community, we would expect stability to be higher in a system in which two competing species are both preyed upon by one predator than in a system in which the predator is so specialized that it preys on only one species.... Under a given level of predation, stability in the three-species community would be expected to be maximal when the predator divides its efforts evenly among the two prey species.... To the degree that their prey species still fluctuates with environmental change, the predator population will fluctuate unless it has alternative sources of food supply. Stability will therefore be expected to increase with the number of energy paths available to the predator.

MacArthur provides a similar theoretical model in which the greater the number of food paths open to a particular species, the greater will be the stability of that species. Similarity, overall community stability is enhanced proportionally to the increase in the number of species that can maintain steady-state population levels. In addition, this food-path model implies the achievement of similar stability either with a large number of species eating restricted diets (as in the northern marine zone and the tropics) or a small number of omnivorous species. MacArthur (955:535) concludes that "where there is a small number of species (e.g., in arctic regions) the stability condition is hard or impossible to achieve; species have to eat a wide diet and a wide number of trophic levels (compared to number of species) is expected. If the number of species is too small, even this will not assure stability, and, as in the Arctic, populations will vary considerably." A similar correlation between high-species diversity and community stability is noted by Hutchinson (1959). Figure 71 demonstrates this concept.

The study of ecological diversity and stability is a topic now receiving considerable attention from ecologists and biologists, and a number of major publications and symposiums recently have been devoted to the subject. The most important of these have considered productivity and conservation in northern circumpolar lands (Fuller and Kevan 1970), diversity and stability in ecological systems (Brookhaven National Labratory 1969), marine food chains (Steele 1970), and subarctic ecology (UNESCO 1970). Each of these conference volumes contains important papers dealing with the structural ecology of marine and terrestrial habitats. The picture which is now

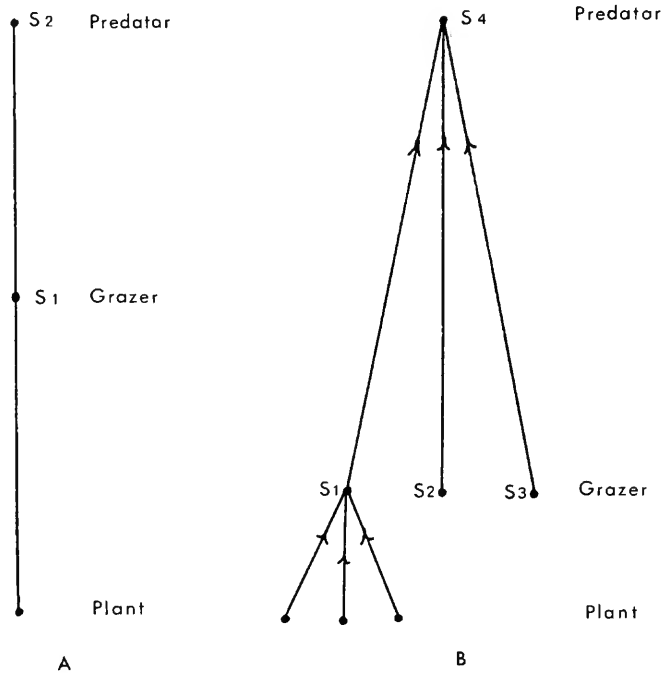


FIGURE 71.—Food path and population stability diagrams. A, Unstable condition of two species eating specialized diets. B, Enhanced stability of several species eating wide diets within the food chain.

emerging is, of course, far more complex than represented here. However, this recent work supports the earlier theories of Slobodkin, MacArthur, Margalef, and others and provides an enormous amount of new theory and data useful to the anthropologist. Theoretical explanations are useful, and the growing dichotomy between the unstable, species-limited interior environment and the more stable, species-rich marine environment is easily documented. However, we would be reminded of Vayda's and Rappaport's (1968:494) cautionary remarks (see p. 8) about the necessity of considering human *populations* as the basic ecological element in cultural ecology, and not cultures, which do not eat, drink, reproduce, and die. Similarly, men do not eat ecosystems; they eat animals or plants. We must, therefore, turn to consider the biology of several of the most important species essential for human survival in Labrador-Quebec.

Interior Resource Fluctuation

BARREN GROUND CARIBOU
(Rangifer caribou caboti)

The Barren ground caribou is absolutely essential for human survival in the tundra, as it provides the major year-round source of clothing, meat, fat, and sinews. Population fluctuations of this animal therefore, could prove potentially disasterous for man. One does not have to search far for documentary evidence for at least local fluctuation. The most recent and drastic of these population reductions occurred in the winter of 1916–1917 and is recorded by W. D. Strong (1930b). During that winter a starving group of Naskapi Indians appeared on the coast with news that the annual caribou migration had failed to appear at Indian House Lake, that few caribou were to be found anywhere on the interior, and that none had grouped in herds as formerly. Strong also reported a bad year during 1927–1928, at the time of his field work there, when the Indians would have starved had it not been for the whole-sale slaughter of a small herd of caribou. Other periods of caribou scarcity and Indian starvation are recorded in the Moravian *Periodical Accounts,* by C. S. Elton (1942), and others. From these reports the winters of 1858, 1883, 1888, 1892, and 1905 produced Indian starvations. Elton (1942:399) reports that during the 1892 winter approximately 200 Indians starved in northern Ungava.

Early explanations for winters of scarcity have ranged from Indian pyromania or wasteful hunting to angry caribou gods and simple migration changes. Recent studies reveal more complex causation. In particular, the behavioral studies of the Barren Ground caribou by Banfield and Tener (1958), Pruitt (1960), Scotter (1964), and Kelsall (1968) add to our understanding. These animals spend the spring and summer in the tundra feeding and calving in small groups. During the fall and winter they band into huge herds whose migrations south toward the forest are led by a few of the older males. The herd follows the lead animals blindly, and if the leader is killed they mill about aimlessly. The animals feed almost exclusively on ground lichens which in Labrador are reported as being the most luxuriant in North America or Europe (Hustich 1951). Food production is therefore not the cause of fluctuation. During the winter the animals feed through the snow, a task for which they are peculiarly adapted, by digging small "feeding craters" down to the lichens. This behavior pattern, a vital adaptation in caribou evolution, resulted in the Micmac term *Xalibou,* meaning "shoveller" (Banfield 1961). The use of feeding craters, however, tends to harden the surrounding snow, which is also enhanced by extreme cold and wind, to the point where the caribou can no longer break through the crust (Pruitt 1960). By the time a certain number of craters has been dug per acre, the herd is forced to move on to softer snow. Pruitt finds that these movements account for much of the daily migration of the herd. Snow conditions and topography also influence the major migrations. During the spring the Barren Ground herd move out of the forest fringes ahead of the spring thaw to avoid the hard crust that develops at this time, hindering foraging and travel. This is also a prime hunting time for man, since the animals are immobilized and cannot escape.

The prevalence of fire has already been documented. Fire, which destroys vast tracts of lichen fields, and winter icing, therefore, are important limiting factors in caribou population. Both, individually or combined, can cause massive caribou starvation, especially during the winter months when the herds are large and require rich feeding grounds. If the herd moves into a burned area it may starve before it can find food. Likewise, mild wet winters, such as occurred increasingly between 1900–1917 (Elton 1942:376), result in icing of the feeding grounds, making it impossible for the animals to dig through to their food. A general climatic warming would synchronize both factors, resulting in the increased incidence of summer fires and winter icing. Furthermore, boreal ecologists have postulated a long-term fire cycle in the subarctic occurring perhaps every 200–300 years, during which massive portions of the vegetation are consumed and do not regenerate for 50–100 years.

Here, then, we find two important variables controlling populations in the winter bottleneck. Large herds must have extensive forage, and the larger the herd the greater the migration. Encountering large burned tracts, herds this size could rapidly starve. Given these strictures and predation, migratory behavior may actually hasten a population crash. Similar limiting conditions have been described by Christian Vibe (1967) for Greenland caribou and musk ox. The extinction of the entire Belcher Island herd about 1897 resulted from winter icing according to Eskimos (Elton 1942).

A final possible cause of population fluctuation and migration change exists in the emerging knowledge about caribou social behavior. Kelsall (1968) and Espmark (1970) note the importance of learned behavior and social hierarchies in herding and migration behavior. These studies show that the alteration of a herd's social structure or normal migration pattern can cause a breakdown of the leadership by dominant males which appears crucial in initiating and maintaining the migration pattern. It seems conceivable that stress by climate or heavy predation may therefore affect migration behavior through these channels, eventually causing destructive fragmentation of the herd and population decline. This has already been noted to occur in small herds when the leader is killed, and Indians were well aware of this and used it as a hunting technique.

In summary, the possible causes of caribou fluctuation in Labrador-Quebec include fire and winter icing, as well as disease, and natural and human predation. It is unlikely that natural predation alone could cause caribou population to crash (Krantz 1970), and there is no evidence of causation by disease. Human predation might conceivably have an effect, given the Indian's tendency to slaughter whole herds, as noted by Strong (1930b) and G. Henriksen (per. comm.), especially when animals are scarce, and when a hard ice crust which will support a man but not a caribou facilitates human movement and hunting. Rather, it seems that the primary cause of population fluctuation is the natural result of climatic and environmental factors. Beyond this, predation and migratory changes make the animals so scarce for the Indians that human starvation results. Labrador, one of the southernmost of the tundra habitats, has a tendency to be hit hardest by winter icing, and its peninsular geography retards the repopulation from outside caribou herds. It may take over a hundred years for the animals to fully reinstate themselves.

WOODLAND CARIBOU
(Rangifer caribou sylvestris)

The woodland caribou inhabits the boreal forest and forest-tundra zones and is the prime food source of the Montagnais Indians. The animal is larger than the Barren Ground caribou and less gregarious. It lives in the forests in small groups of 10–15 animals, eating in bogs and swales in the summer and on the upland plateau regions during the winter (Banfield 1961). Its range is known to have been as far south as Penobscot Bay, Maine, and northern New Hampshire and Vermont as late as the early 19th century, but today it is considerably north of this. To the west, its range stretches across the northern Great Lakes to British Columbia and north to the plains or barren grounds. In Labrador-Quebec it is usually restricted to the woodland zones but has on occasion been seen mingling with Barren Ground caribou on the tundra (Shelford and Olson 1935; Banfield 1961: 84).

The behavior of the woodland caribou makes it impossible to hunt en masse as is done in the North. Since there are no standard migration patterns annual interception is impossible, and more individualized hunting techniques must be used.

Similar limiting conditions affect woodland caribou as affect their northern relatives. Wolf predation is more serious in the forest, however, and the fire hazard is greater. Winter icing occurs, but as the animals forage in small groups it is less likely that large numbers of animals would be affected. Human predation is also less effective at reducing populations in the forest. In sum, the woodland caribou is subject to population fluctuation, but its behavior and habitat probably tend to dampen the effects of depression, resulting in smaller oscillations than those seen for the Barren Ground caribou.

MUSK-OX
(Ovibos moschatos)

Musk-ox have not been reported for the Labrador-Quebec peninsula in present or past times. Since these animals are even more sensitive to winter icing than caribou and are presently restricted to the dry, northernmost regions of the Arctic, it is doubtful that they could have survived in the subarctic climate of the peninsula. Their extreme intolerance of these conditions has resulted in several local extinctions and repopulations during wet and dry climatic phases in Greenland, according to Christian Vibe (1967).

SMALL GAME

Most of the other interior food sources are of lesser significance, and very little data are available on their population stabilities and their effects on man. During the seasonal bottlenecks of freeze-up and break-up, small game may mean the difference between starvation or survival. During other seasons as well, it is likely that small game, though a dispersed food supply, probably contributed more to daily consumption than is generally recognized (Lee and DeVore 1968:7). Unfortunately, there is no data on population fluctuation for interior fish, but it can probably be assumed that their numbers are fairly constant. Rabbit, porcupine, fox, and birds do fluctuate, but little is known of the parameters or limiting factors. Rabbit and fox probably fluctuate in a predator-prey relationship as do lemmings and foxes.

Population fluctuation of game birds has been recognized for some time and is possibly an important factor in human ecology in Labrador since ptarmigan is an alternate food source during the winter. Recent studies on partridge and grouse (Blank and Ash 1962) point out the necessity of maintaining large yearly broods to maintain high population levels of these short-lived birds. The incubation and immediate post-hatch periods are critical times when climatic or predator factors may result in mass destruction of an age-grade. Vibe (1967:151) correlates population crashes of ptarmigan with 11-year sunspot cycles, and their peaks with cold, dry winters.

Dillon Wallace (1905; 1907:128) described accurately the resource potential of the environment west of Lake Melville in the boreal forest and on the Michikamau plateau and George River valley. Most characteristic is the absolute lifelessness of much of the forest country, and the spottiness of game in other parts. While the plateau seems to have been fairly well endowed, it, too, could become suddenly devoid of life, often without warning. The ability of man to cope with these unpredictable changes is minimal. Survival depended on a detailed knowledge of vast territories and the ways and signs of the game. Beyond a certain point survival was the handmaiden of chance. Such a stark view of interior ecology is reflected in the following quote from Strong (1930b: 1–2):

> Like all northern regions, Labrador is subject to periodic fluctuations in the abundance of animal life, and the winter of 1927–1928 marked a very low ebb in the number of all species, resident as well as migratory. The country was lifeless beyond description, and it was not at all unusual to travel fifty or sixty miles a day in the utterly uninhabited interior and not see a single bird or animal track, let alone any living creature. In spite of constant hunting, only two snowshoe rabbits and no arctic hares were killed by the Indians. Willow ptarmigan, rock ptarmigan, and spruce grouse were likewise very scarce, and the fur-bearers, as would be expected, were very rare. This lifelessness extended to the birds of prey, small birds of all sorts, squirrels and mice. Needless to say, the Indians were terribly pressed for food, and if several small herds of caribou had not been encountered, in addition to the trout secured in nets under the ice, many of these people would have starved to death. These periods of want are of frequent occurrence in Labrador, and the mortality from starvation among the Indians who live in the peninsula is still quite high. Formerly, when there were no trading stations and the hostile Eskimo prevented access to the coast, their sufferings at such times were even more extreme.

Coastal Resource Fluctuation

A small amount of the data can be presented on population fluctuations in the marine zone for the major species: seal, walrus, polar bear, whales, and fish. Caribou are also present in the marine-tundra regions, where its population is controlled by the same factors as on the interior.

SEALS

Five species of seal inhabit the Eastern Arctic. These are the bearded seal *(Erignathus barbatus)*, hooded seal *(Crystophora cristata)*, ring seal *(Phoca hispida)*, harbor seal *(Phoca vitulina)*, and harp seal *(Pagophilus groenlandicus)*. Of these, the harbor, ring, and harp seals are most abundant in Labrador. Owing to their importance in Eskimo and white economy considerable study has been given to the biology and populations of these pinnipeds. The most useful studies are those of Mansfield (1963), Sergeant (1965), McLaren (1958a, b, 1961, 1962), and Templemann, et al. (1957).

The harbor seal is the most common seal of southern Labrador, and its heaviest concentration is in the Hamilton Inlet region (Figure 72). The harbor seal is extremely adaptive in a number of environments. Its diet is eclectic and comes from a number of trophic levels and species. Its most common habitats are estuaries and fast-moving, open water areas; it is not usually associated with ice. Unlike the harp seal, it is a sedentary species, and seems able to sustain fairly large annual kills without becoming locally depleted (Bigg 1969:29).

The ring seal ("jar") is less common in central and southern Labrador, being a more northerly species and the staple of the northern Eskimo (Figure 73). This seal is also sedentary. Its feeding habits are broad, and large populations have been noted to inhabit apparently low production areas while being absent in many areas of plentiful food. An explanation for this fact has been proposed by McLaren (1961) in a hypothesis which relates ring seal-population density with geographic factors rather than food supply. According to this theory, the reproductive success of the ring seal depends on the length of maturation time available to the young seals before ice break-up forces them to leave their birth lairs in the land-fast ice. Since ice break-up is retarded by being more firmly anchored to the shore on indented coasts, seals born in these regions have a selective advantage over seals forced prematurely to survive on their own upon ice break-up on less indented coasts. Therefore, a measure of the irregularity of a coast will provide a means of estimating the population of seals inhabiting the area. MacLaren (1962:182) concludes that "equilibrium populations of ringed seals are not determined trophically or through compensatory mortality but through reproduction, by the amount of and quality of land-fast ice."

The third species of seal common to the Labrador coast is the harp, or bedlamer, seal. Unlike the others, the harp is a gregarious, migratory animal whose distribution includes the entire Eastern Arctic (Figure 74). It breeds in large colonies on the pack ice of the Labrador "front" during the winter and spring and spends the summer in Greenland and northern Hudson Bay. Twice yearly its migrations take it past the Labrador coast—southward in the fall, northward in the spring. Its diet is less eclectic than either ring or harbor seal and includes cod, capelin, herring, squid, and plaice. The predictability of the migration and practice of whelping in large numbers on the pack-ice off Newfoundland and Labrador has made the harp seal an easy target for shipborne hunters.

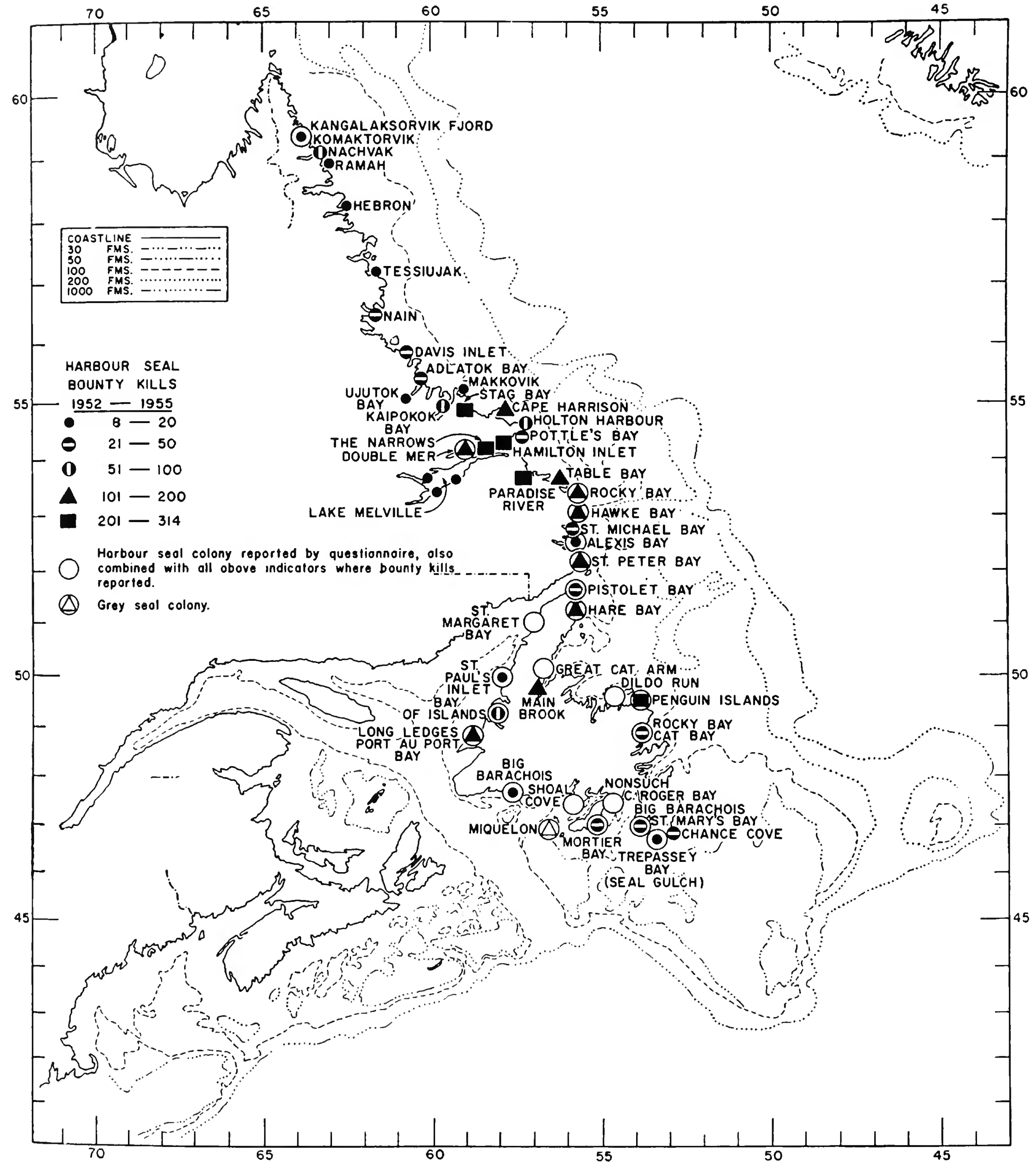


FIGURE 72.—Harbor seal distribution in the Newfoundland and Labrador areas, including a gray seal colony on Miquelon Island. (After Templeman, Squires, and Fleming 1957: fig. 23.)

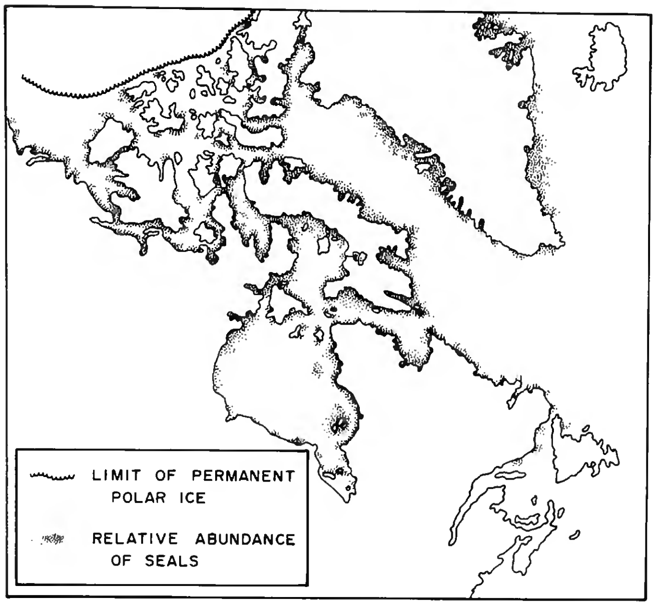


FIGURE 73.—Distribution and relative abundance of Ring seals in the eastern Canadian arctic. (After Mansfield 1963:21)

Population estimates for annual harvests of ring, harbor, and harp seals are difficult to obtain. Estimates of the harp population in 1951 exceeded 3,000,000, and during the 1950s the herds suffered annual losses to hunters of nearly 282,000 (Mansfield 1963:13). More inclusive records are those of J. S. Coleman (1937) for the Newfoundland seal fishery, which included both harp and hooded seal. These figures indicate a fairly stable population under heavy predation with only minor fluctuations. Many of the variations probably reflect weather and ice hindrance of hunting operations more than they do actual seal fluctuations. There have been oscillations in the harp seal population on the Labrador coast in the past 100 years, caused by periods of heavy hunting from ships, but those have not been large enough to interfere with coastal hunting. The ring seal can be hunted out locally, but is buffered by the availability of the seasonally abundant harp seal (Sergeant, pers. comm.)

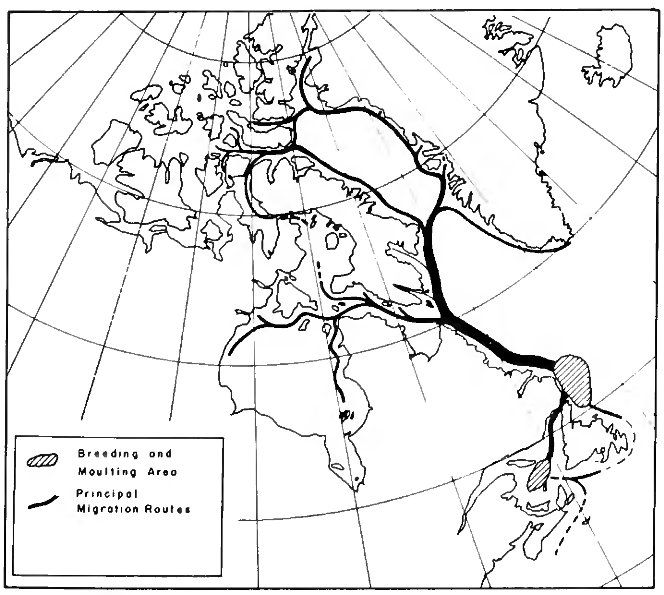


FIGURE 74.—Migration routes and breeding grounds of the Harp seal. (After Mansfield 1963:12)

McLaren (1962:177) feels that ring seal populations are fairly stable, and are presently underexploited in some areas, particularly with the recent trend toward nucleated settlement in the North, and that under these conditions their populations will be controlled by ice conditions. The controlling factor of ice seems important not only in survival of the young seals, but also affects the distribution of the adults. Christian Vibe's (1967) detailed study of seal fluctuation in Greenland emphasizes the climatic control of ice-pack distribution (by current and wind) at different times during the year, and he sees this as a major factor in local availability of seals. Certain portions of the coast may be rich in seals when ice-pack is present, but under different current and climatic conditions they will be absent. He correlates the disappearance of Sarqaq and Dorset cultures from the west coast of Greenland with climate changes and withdrawal of pack ice from these regions. Vibe's conclusions are provocative, relating and correlating major ecological changes with climate and sunspot cycles, and his work is a major contribution to northern marine and terrestrial ecology. While his specific causative agents may be open to question, his relationships between fauna and pack-ice movement, winter-icing phenomena, and others are most interesting. Population movements resulting from pack-ice movements may be important in the local availability of seals in a given region. Whether they are as important for faunal distributions in Labrador as they are for the complex hydrographic area of West Greenland remains to be seen. In any case, the seal returns do not suggest major fluctuations, but longer term records including periods of extension or curtailment of the current pack-ice distribution would probably show important effects on the Labrador coast seal population.

Finally, in assessing the stability of seals it should be pointed out that seals have few natural predators. Killer whale, walrus, and occasionally polar bear have been known to kill seals (Loughrey 1959:51), but these are relatively rare occurrences. Rather, it seems that seals will move away from a region when walrus or polar bear appear, and while their availability to the hunter may decrease (Freeman 1967) the overall population numbers vary slightly, and repopulation of a region can occur swiftly with the departure of the intruder. In addition, seals can survive for long periods without food, and regularly do so at certain periods in their cycle. Harps, for instance, may fast for 2–2½ months during the breeding season without damage. A blubber layer consisting of up to 40 percent of the total body weight provides maximum insurance from starvation.

The early histories and records are another source data on seal fluctuations. These do not record massive seal failures, although caribou scarcity is frequently mentioned. Occasionally, reference is made to a "lean" seal year in the Moravian *Periodic Accounts,* as at Nain in 1845–1846 and 1911–1912, Okak in 1865–1866, Davis Inlet 1888–1889, and Makkovik in 1911–1912 (Elton 1942). Other scarcities are reported, including Cartwright's (1792) mention of a seal failure at Charles Harbor, southern Labrador. In general, however, seal populations cannot be said to "crash." Seal scarcity is rarely cited as resulting in Eskimo starvation. Rather, lean seal years on the coast can be seen as causing increased nucleation of Eskimo settlements under Moravian influence, and the lack of sufficient local resources for larger populations.

In sum, seal population fluctuations appear to be small, and when fluctuations do occur they usually are locally restricted and do not affect the total biomass of the group. They are nearly omnivorous, and the three most important species for Labrador are adapted to different marine conditions of ice and open water so that it is unlikely that a population crash could affect all species across the board. Seals conform well to MacArthur's theoretical model of stability in which a few species eat a diet from numerous trophic levels. Given such stability the major controlling factor is climate and ice conditions, neither of which would seem to introduce instability into the seal population, though they definitely affect their distributions and their accessibility to the hunter.

WALRUS
(Odobenus rosmarus)

The Eskimo name for Hamilton Inlet, *Ivuktoke,* meaning place of the walrus, attests to the presence of this sea mammal in Groswater Bay. It is a gregarious animal, often found in large herds (up to several thousand), whose habitat once included much of the eastern Arctic and subarctic waters, including the Gulf of St. Lawrence, where Cartier found them in 1535. Gosling (1910) states that they were destroyed in the Magdalen Islands about 1789 by the Americans and soon after that were driven north. Today they are rarely found south of Hudson Strait. Occasionally an animal drifts south along the Labrador on the pack.

Walruses are migratory bottom feeders, which subsist primarily on shellfish. Bulls, however, are known occasionally to eat seal. Bearded and ring seals usually leave an area when walruses appear (Loughrey 1959: 51). In addition, they have few predators. Polar bears may attack young walruses, and often they will cause a herd of walrus to panic, but only man is an efficient predator of full-grown adults.

Three factors affect the distribution of walrus. They need hauling-out places on rocky islands in the summer or on ice flows in winter. They prefer to stay close to the ice pack, and they tend to winter along the shore lead. When these conditions are met in one region walruses may become frequent inhabitants, and the ease with which they can be hunted may result in their becoming an important food source for man. Little data is available on their population fluctuation. As with seal, availability varies more than population fluctuation (Freeman 1970). Availability is dependent more on local ice conditions and climate than on biomass reduction, except under human predation. On Southampton Island about 200 walruses are killed annually without seriously reducing the herd in that area (Loughrey 1959:101). It may be significant that both Dorset and early Labrador Eskimo southern extensions into the Gulf of St. Lawrence coincided geographically with the distribution of walrus.

POLAR BEAR
(Ursus maritimus)

Research on the polar bear is just beginning. This highly migratory solitary animal feeds primarily on fish and seal. Its distribution is pan-Arctic and it is rarely found for from the ice pack. Early records show that polar bears, like walrus, were plentiful along the Labrador coast where they drifted south on the pack. As the pack melted and dispersed in the spring, the bears moved to the river mouths for fish and often remained through the salmon season before migrating north. Cartwright (1792) once found a half-dozen polar bears and an equal number of black bears salmon fishing at the Eagle River in Cartwright Bay. Today, the polar bear is infrequently seen on the coast, but two or three are generally spotted each year. They are more common in northern Labrador.

Polar bear populations seem to be fairly stable, and their availability varies with pack-ice conditions. Their solitary migratory behavior makes them less important as a food source for man than either seal or walrus; however, their presence in an area often has deleterious effects on the availability of these primary food sources.

WHALE

Several species of whale inhabit the Labrador waters. Those most common today are the smaller varieties: the minke whale (grampus) and white whale (beluga). Both of these mammals occur in groups, or pods, and can be driven with small boats into coves and shallows where they are speared, harpooned, or become stranded on the falling tide. They frequent river and estuary mouths and swift-water channels. Belugas are presently found only in northern Labrador, and their southern limit is set largely by water temperature (Sergeant 1962). In colder periods their distribution would have been further south than today (Beverton and Lee 1965:91). The minke whale is common all along the coast. Large whales, such as the blue, the humpback, sei, and sperm, were common on the Labrador coast until the expansion of the whaling industry in the 19th century (Templeman 1966, Sergeant 1961). Although the larger whales were not hunted until the arrival of the early Labrador Eskimo around A.D. 1500 stranded whales may have been utilized by earlier peoples. The Hamilton Inlet Narrows were known in the early historic period as an excellent whaling location.

FISH AND MIGRATORY BIRDS

The other major ecological components of the marine environment are fish and migratory birds. The most important fish are capelin, cod, salmon, and trout (Figure 75). Fisheries studies tend to show long-term population stability for demersal fishes, such as cod, haddock, halibut, capelin, and plaice, while salmon and sea trout are subject to more fluctuation. A recent survey of fishery resources of the eastern Arctic (Dunbar 1970a) demonstrates the high productivity and sustained yield potential of the rich subarctic waters of Labrador. The effects of climatic change on these populations appears to be small in comparison to fishes of Greenland, due to the buffering effect of the Labrador Current.

Likewise, migratory birds, especially geese and duck, are consistently plentiful on the coast, where they are found in heaviest concentration in spring and summer. Arctic ocean birds are known not to have large population oscillations. They lay few eggs and have greater mobility than most southern ocean birds, thus increasing energy conservation within the species while reducing population instability (Dunbar 1960).

This review of the marine environment reveals the presence of a large, stable resource base composed of a large number of animals (seals primarily) eating a wide diet from several trophic levels, and a smaller number of animals (though significantly important for man) eating more restricted diets (walrus, polar bear, whale). In addition, demersal and migratory fishes provide a steady source of potential food. These conditions seem to be the result of the evolution of the Arctic marine ecosystem. Dunbar (1959:57) remarks upon the large number of pan-Arctic species with wide distribution in the subarctic, boreal, and arctic zones which indicate a northward dispersal since Pleistocene times, but observes: "Overall, however, the rule has been upheld that the special temperature conditions of the north have kept down the numbers of successful immigrants, while allowing them to build up and maintain very large specific populations."

Among marine vertebrates in these regions, the mammals, which are independent of temperature conditions, have dominated the lower food chains at the expense of the fishes, due to the latter's less successful utilization of the invertebrate resources. As one proceeds south on the Labrador coast this situation begins to change, and fish start to take dominance from the mammals. This edge-effect ac-

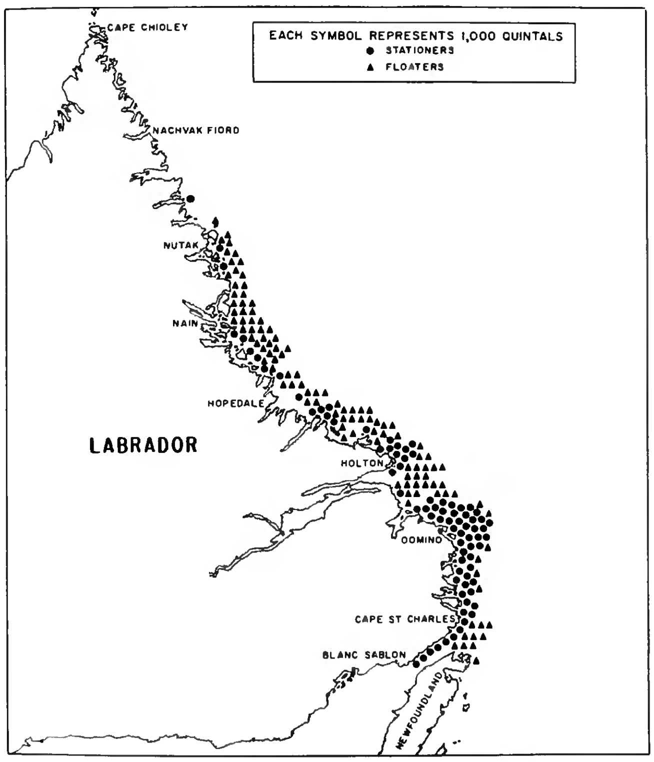


FIGURE 75.—Locations of capture of inshore cod in Labrador by stationers (shore-based fishermen) and floaters (schooner-based fishermen) in 1949. (After Templeman 1966: fig. 21)

counts in part for the rich marine resources of Labrador.

The arctic marine stability model is supported also from paleoecological data presented by J. L. Davies (1958:101), who feels that the distribution of past and present northern marine vertebrates and their adaptations and feeding habits suggest long, stable ecological relationships between species, to the extent that the present ecological models can be reliably projected into the past. The confirmation of this suggestion would be a break-through of major import in northern ecological research. Unfortunately, there is at present very little data on this subject, and apparently few specialists are interested in the problem. According to Davies' hypothesis, climate would presumably be the most important controlling factor, and interspecific relations would be of secondary importance.

Terrestrial and Marine Ecological Models

Although the relatively greater predictability of marine ecosystems has been demonstrated from ecological theory as well as from field data and is supported by Dunbar (1960:133; 1970c) for the present period and J. L. Davies (1958) for at least the recent past, it would be incorrect to state that the northern marine system is in a steady-state equilibrium. In fact, marine biologists are only now beginning to appreciate the amount of fluctuation that occurs. They are occasionally subject to serious population oscillation, since lags and overproduction in some populations occur readily, leading to local extinction and community breakdown (Dunbar 1970b:530). The data which show these variations clearly, however, come from Nansen Sound in the Far North and do not appear fully applicable to more southern and subarctic environments, where regional population fluctuation and movements are more common than extinction or biomass reduction. In this case, availability changes and human populations must either move with the displaced species or be able to accommodate the changes by shifting exploitation to the predator or dominant species. The latter technique seems to have been used by most Eskimo populations.

Regional fluctuation also occurs as a result of climatic and hydrographic factors, as has been demonstrated by Vibe in Greenland for seal, whale, and polar bear. The well-known northern extension of the cod fishery into Baffin Bay in the 1920s and its subsequent withdrawal in recent decades adds further proof of the effects of hydrographic warming—in this case the result of a general climatic amelioration (Beverton and Lee 1965). These rather slight climatic changes can have far-reaching effects in northern waters, where currents can produce feast or famine with relatively minor shifts in the physical conditions. It is therefore necessary to investigate the effects of these controlling factors in the Labrador area.

These effects would seem to be influential in altering the conditions of the Labrador coast, which is buffered by the marine environment of the Labrador Current. The major alteration here would be the southern extension of the pack ice which would undoubtedly result in a change in the present ecological conditions. This, in fact, has been observed in the past. For instance, the Moravian and Newfoundland records show southern extension of the ice pack around 1860, during which the fur returns from southern Labrador and Newfoundland showed a large increase in the numbers of northern animals such as polar bear, walrus, seals, and white fox (Elton 1942:433, quoting G. Robinson 1897) Since sea ice is very sensitive to slight temperature changes, the cold environment of the Labrador Current would tend to multiply this effect, resulting in a large southern dispersion from a small northern ice extension. Such an extension would cause ecological compression with increased marine biological activity along the Labrador coast, northern Newfoundland, and the Gulf of St. Lawrence. East and south of this its effects would be swiftly terminated by the Gulf Stream. Such a theoretical compression situation has in fact been suggested by J. L. Davies (1958:98) from his paleoecological study of the Pleistocene geography and distribution of northern pinnipeds. Although Davies was not speaking specifically of Labrador, his theoretical model would seem to apply to this area very well. Carrying Davies' speculation further, during the hypsithermal, with temperatures perhaps slightly higher than today, one would expect a withdrawal of pack ice from the southern regions, which would result in a more northerly distribution of polar bear, walrus, and seal. However, in this case the Labrador Current would tend to diminish the effect of pack-ice reduction, thus lessening the ecological effects of climatic amelioration in the Labrador marine environment.

With these data, it is then possible to propose an ecological model for the marine environment of Labrador, based on the above conclusions of ecosystem and species-population stability, and Davies' ideas about ecosystem compression. This model assumes, correctly I believe, that the present distribution of marine mammals is closely associated with the distribution of pack ice, and that the ice distribution today reflects the contemporary temperature regime, which is slightly on the warm side of the major oscillation cycle. During cold periods, southern extension of the pack into southern Labrador, Newfoundland, and the St. Lawrence Gulf would result in ecological compression and increased arctic marine biological activity; during warmer periods than today, the annual pack extension would be less concentrated and present for shorter periods of the year. Ecological expansion and a decreased concentration of marine resources would result. During such times the large sea mammal populations would be concentrated in the northern Labrador regions, and their presence in the south would be diminished. According to this model, the Labrador coast is a buffer zone in which the Labrador Current multiplies the beneficial effects (in terms of marine biological productivity) of climatic cooling, while diminishing the dispersive effects of warming trends.

This review of terrestrial and marine ecology is by no means complete or sufficiently comprehensive, and further work will have to be done on the problem of ecological fluctuation. However, the results, though tentative, are suggestive of a major difference in the structural ecology of the terrestrial and marine habitats of this Arctic-Subarctic transition zone.

TERRESTRIAL MODEL (Figure 76).—On the one hand, the interior ecology (including tundra, forest-tundra, and forest) is dominated by relatively few species of which one—the caribou—is present in overwhelming proportion in comparison to other species and is also the primary food source for man. Food chains

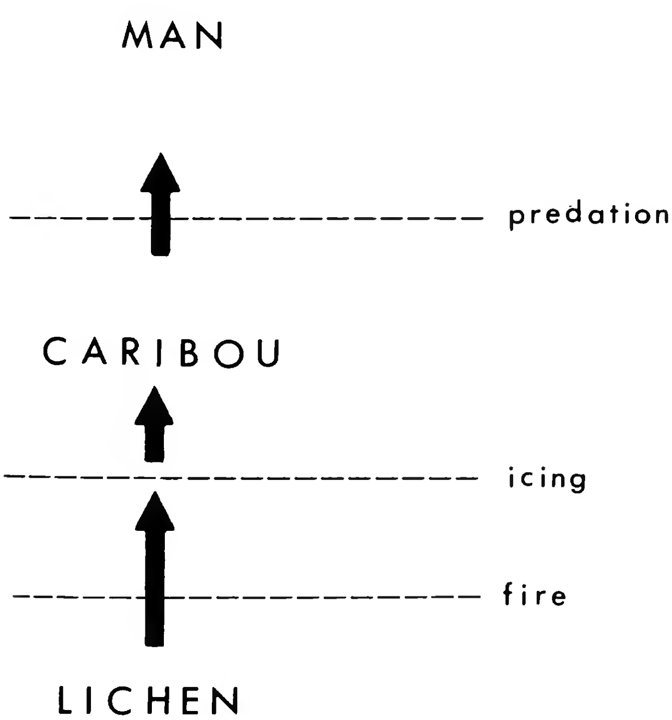


FIGURE 76.—Basic interior food chain used by man, showing the destabilizing effects of natural and cultural phenomena.

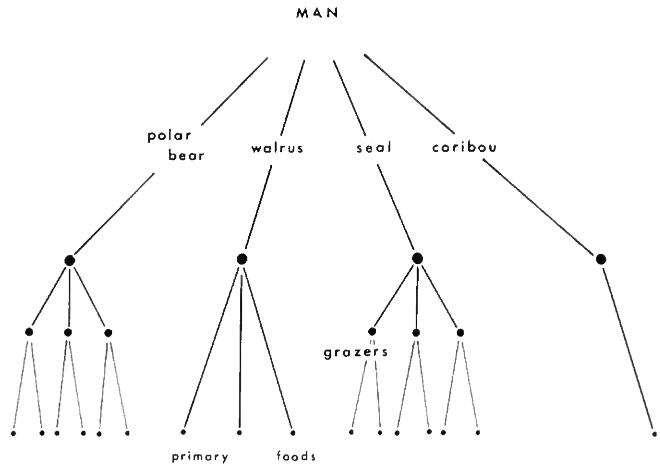


FIGURE 77.—Coastal food chains utilized by man. Ecological complexity and diversity provide alternate resources and enhance population stability.

are short and the basic trophic level, that of lichens and mosses on which the caribou depend, are subject to periodic and extensive destruction or winter icing. Other animal and fish species are important for man as emergency food, but are incapable of sustaining life for long periods of time. The interior ecology therefore is characterized by lack of diversity in the upper trophic levels with highly seasonal and dispersed alternate resources, and an inherently destabilizing condition of fires and winter icing. During periods of low fire, which would also tend to occur with cooler climatic phases, caribou can thrive, and ptarmigan would also tend to be plentiful. However, during warmer periods, the incidence of fires would be likely to increase, as would the incidence of icing. These periods are more likely to result in ecological collapse. In particular, this model suggests that cultural stability is threatened during these periods; further, that the tendency for cultural instability is increased proportionally with the specialization of caribou hunting. Variations in the behavior and hunting pattern required for utilizing woodland versus Barren Ground caribou suggest that instability also increases geographically from south to north in the peninsula. See Feit (1969) for a discussion of the role of fire ecology on ethnographic Indian populations of the Mistassini region.

MARINE MODEL (Figure 77).—The data on marine ecology suggest an entirely different predictive model for marine-oriented exploitation. Here the ecological structure is complex, with many species and trophic levels, and with diets ranging from specialized (walrus) to omnivorous (seal). Food chains are long and have extensive feedback mechanisms. Population fluctuation within this system is slight, and ecological disasters comparable to massive fires on the interior (or Peruvian "red tides") do not occur. Changes in the system occur slowly, and the migratory behavior of most species important for man enables adaptation to these changes as they occur.

Besides species diversity and ecological predictability in the marine environment, the marine coastal zone is frequented by caribou, and other terrestrial animals of importance to man (fox, beaver, otter, black bear). Coastal adaptations may therefore partake of both maritime and terrestrial resources, utilizing one as an alternate should the other fail. We have already seen how Eskimo populations have developed multiple strategies for alternate resources in Hamilton Inlet.

The effect of climatic change on the marine stability model is to shift pack ice and arctic species to the south, increasing their concentration in central and southern Labrador during cool periods, while reducing concentration and restricting pack ice to northern Labrador during climatic warm periods. During these warm periods many of the arctic sea mammals would be restricted to northern Labrador and would not be found in large numbers in the south. These shifts would also affect the distribution of temperature-sensitive fish populations.

This model suggests a relatively stable resource base for cultures with maritime-oriented economies capable of exploiting the rich sea mammal population of the coast. The more specialized the adaptation in this case, the more stable the economic base. The environment also permits a stable summer adaptation to the coast. These conditions tend to draw interior people toward seasonal adaptation to the coast. Without a full-time coastal adaptation, however, these cultures still remain subject to the stringent and unstable conditions of the interior winter. This type of adaptation seems to have characterized the Maritime Archaic culture.

CULTURAL MODELS

The Naskapi Ethnographic Model

An ethnographic test for the interior ecological model can be found in the Naskapi Indian group, the little-known caribou hunters of northern Labrador. The Naskapi have never been studied adequately. Turner's report (1894) is the only monograph on these people, but it is inadequate for many purposes, and does not include detailed descriptions of Naskapi life in their traditional habitat. Brief descriptions of Naskapi in their Indian House Lake hunting grounds comes from travelers who passed through this region between 1900–1910 (M. B. Ellis 1908, D. Wallace 1907, W. B. Cabot 1920). More recent discussion is found in Tanner (1944) and a summary by E. S. Rogers (1969). The only new field work on the dying traditional culture of the Naskapi (Davis Inlet band) has been recently undertaken by Georg Henriksen (1969) of the University of Bergen, Norway, and by Alika Podalinsky Webber of Toronto. The Ft. Chimo band has now been moved to Schefferville for employment in the iron mines.

The status of the Naskapi with respect to more southern Indian groups has long been a point of discussion. Linguistically and in material culture they are closely related to Montagnais, and less similar to the Eastern Cree of southeastern coast of Hudson Bay and James Bay. The Cree are assumed to have recently spread from west to east around the bay margins to their present position. Originally, the distinction between Montagnais and Naskapi seemed clear: Montagnais referred to their uncouth northern neighbors as *Naskapi,* meaning "unclean," while the latter referred to themselves as *Nenenot,* the "true people." Early ethnography by Speck, Hallowell, and Strong, however, emphasized the cultural and social similarities between the two groups and tended to see them as a single culture—Montagnais-Naskapi—with regional variation due to environmental conditions. Occasionally, Naskapi would be found in Montagnais villages on the Gulf of St. Lawrence trading, visiting, and sometimes marrying, and Montagnais were often found hunting in the northern part of the peninsula (Ellis 1908:156).

On the other hand, recent data tend to support a social, biological, and perhaps cultural distinction between the two groups. Mailhot and Michaud (1965) stress the high proportion of marriages between the North West River and Sept Isles bands, while the Davis Inlet band had more marriage alliance with Ft. Chimo and the Ungava Indians. Ties between the North West River and Davis Inlet bands existed but were weaker. In general, the material culture of the Naskapi is more similar to Eastern Cree than to Naskapi, although the Naskapi tongue is closer to Montagnais. Henriksen (pers. comm.) claims that the

Davis Inlet Naskapi sometimes use witchcraft against the Eastern Cree while not using this tactic with the Montagnais.

Physical studies of the Montagnais and Naskapi were initially conducted by Hallowell (1929) who concluded that the two groups could not be separated on the basis of anthropometrical data. W. D. Strong also studied them, and his data were analyzed and published by T. D. Stewart (1939). Recent genetic studies supply new data to the problem (Blumberg et al. 1964, 1967). This work, which considered the possibility of mixture between the samples (and constructed pedigrees for most of the subjects), concluded that there were important differences between Montagnais and Naskapi gene pools in albumin, blood groups (especially MNS and Rh), and transferrins. Blumberg, et al. (1967:77) state that the Naskapi and Montagnais populations (n = 203, 132) "appear to be sufficiently different from each other to be considered as separate populations for genetic studies." Relationships between the two groups and Cree are less clear. A perusal of the comparative data between the three (Blumberg et al. 1964: table 5) shows that while the Naskapi gene pool is isolated from Montagnais in MNS and Fy^a genes, in both these and the Rh system it is closer to Cree than Montagnais. In fact, Cree tends to be intermediate between Montagnais and Naskapi. This tentative suggestion of closer relationship to Cree than to Montagnais is contradicted by the linguistic evidence.

The Naskapi seem to have numbered about 800–1500 in the past. This population was split into a half dozen bands numbering about 100 individuals each. The Indian House Lake band is the only one for which a reasonable amount of data exist. This band would gather at Indian House Lake during the summer and early fall to hunt caribou when the annual migration crossed the lake. Hubbard (Ellis 1908) and Wallace (1907) encountered the band here in 1905. Here they would wait for the arrival of the caribou herds from the west, and slaughter them from canoe as they swam across the lake. Hundreds of animals could be killed in a single day at the height of the season. Cabot describes such a hunt by Naskapi on Lake Mistinipi east of Indian House during the summer of 1906. Here he watched the canoe hunters spear 1200–1500 caribou in two weeks (Cabot 1920:239). Piles of antlers and marrow bones were stacked in windrows around the sites. Early explorers often encountered the remains of camps and piles of antler and bone in the George River valley. "Uncle John" Michelin, one of the most experienced bushmen in Labrador, recalls seeing similar antler piles on the upper George River many years ago.

If the fall hunt was successful the band would remain together for the winter, living on the store of food; if not, it would break up into smaller groups of 20–25 and scatter over the country to hunt caribou on foot or to fish through the ice, a difficult task in midwinter. If caribou could not be found, the chances of survival for these small groups were poor, as the historical records show. In the spring, as the ice melted, game once more became plentiful and the groups would gather to fish during the early summer and prepare again for the fall hunt.

The Naskapi developed a specialized adaptation to the annual caribou migration. Although other resources were available seasonally, none provided the necessities of life given by the caribou, and none could be stored in large enough quantity for the winter. The caribou yielded clothing, sinew, fat, meat, and other materials upon which the Naskapi depended. The practice of waiting for the migration to appear at strategic locales insured the Indians of making a large kill when the animals appeared. It also meant almost sure starvation for the entire band if they did not, for by September, freeze-up begins on the plateau, fish seek deep water, birds fly south, and food becomes almost impossible to find.

The Naskapi had developed the only possible adaptation to these conditions in the barrens. Given a large number of caribou and predictable migration patterns, this specialized, largely single-resource economy provided a stable life with large communities, social activity throughout most of the year, and only occasional periods of anxiety. In fact, the Naskapi intensive adaptation to caribou permitted a more stable life than the Montagnais pattern of more generalized hunting in the forest, where the caribou herds were small and difficult to find and to hunt, especially without fire-arms. In the north guns were less efficient than spears since the animals could be killed in the water. The introduction of rifles in the 19th and 20th centuries, therefore, cannot be cited as cause for caribou decimation.

The advantage of the specialized pattern is supported by evidence that by 1900 Montagnais groups began to move north into the upper George River valley to utilize the caribou migrations formerly monopolized by the Naskapi. In 1905 Mrs. Hubbard's party encountered a band of Montagnais camped at Resolution Lake only three days' paddle above an Indian House Lake Naskapi band (Ellis 1908:156). The caribou migration had started in this area, and the description of the milling animals swimming back and forth across the lake and swarming on the shores and hillsides provides a poignant picture of a large migration. Traveling on, Mrs. Hubbard passed through a vast stretch of desolate burned land between Cabot Lake and upper Indian House Lake. In upper Indian House Lake she encountered the Naskapi band, camped anxiously without caribou, which they feared might by-pass them. When Mrs. Hubbard asked why the Naskapi did not move upstream to intercept the migration they replied they could not hunt there because "it is not our country" (Ellis 1908: 172).

This statement appears to be a case of band territoriality, which although not restricting the movements of individuals for purposes of trade and other functions, applied to the hunting territory of regional bands, and in this case might be adhered to to the point of starvation. Under such conditions of stress, territoriality might be conceputalized to a greater degree than customary in bountiful times. However, it would be helpful to have more data in this case, as other interpretations are possible.

This occurrence seems to be the result of a Montagnais population drift north into the Barren grounds. Earlier, a similar movement from the south probably resulted in the origin of the Naskapi year-round occupation of the Barren grounds. According to Rogers (1969:40), "Previously, it is thought, they [the Naskapi] spent only a few months each summer and fall within the area [the Barren Grounds] seeking caribou and then followed the herds south to the more wooded regions where the hunters and their families spent the winter." Later, after their initial move north, the establishment of the Hudson's Bay post at Ft. Chimo in 1830 encouraged the Indians to remain trapping throughout the year in the north.

Whether the result of contact phenomena or a natural inclination for greater emphasis on caribou, the northern drift of the Naskapi is supported by archeological and ethnographic data for the period following 1900. In 1905, Hubbard and Wallace found the Naskapi at the upper end of Indian House Lake. By the time Cabot visited the Naskapi in 1910 they were camped at a settlement called *Tshinutivish*, about one-third the distance down the lake. J. Rousseau (1948), conducting a vegetation survey in 1947, encountered many Naskapi camps on the lower portions of Indian House Lake, and cited evidence of a gradually northern movement from 1900–1947 during which the Indians abandoned the skin tent for the canvas tent and the stone hearth for the iron camp stove. In addition, he found that a population decline accompanied the northern drift. At the site where Mrs. Hubbard found the Naskapi, Rousseau noted 30 lodge remains, while at the other end of the lake only 5 were found, dating to about 1930. The last Naskapi were known to have withdrawn from Indian House Lake in 1945. Archeological reconnaissance by a field party led for the author by G. Conrad (1970) briefly investigated an area near *Tshinutivish* and encountered large historic period settlements with stone hearths and circular caribou skin dwellings. The lack of earlier camps suggested the recent arrival of the Naskapi in this area, supporting Rousseau's conclusions. Finally, linguistic data has previously been cited to support an original Naskapi homeland further south in the forest, based on relic vocabulary. The fact that Naskapi occasionally traveled south, however, tends to weaken the significance of the linguistic evidence.

In the fall of 1916 the annual caribou migration failed to appear at Indian House Lake, and few if any caribou could be found in the once teeming barrens. During the winter many Naskapi starved, and those who could, traveled to the trading post at Voisey Bay, near Davis Inlet, for assistance. The mass migrations ceased and the Indians never again took up permanent residence on the interior. Rather, they settled on the coast and hunted during the winter in the Lake Mistastin area and spent the summer fishing and hunting on the coast. Even here, winter hardship was still encountered, as noted by W. D. Strong (1930b). The winter of 1928–1929 was particularly bad. The caribou remained scarce, and, in 1950, the Banfield and Tener (1958) survey sounded the alarm with a warning of possible extinction of the Barren Ground caribou (see page 21). Immediate hunting regulations were issued, and recently the population has risen dramatically.

The cause of caribou scarcity during the past 50–75 years seems to result from a multiplicity of factors, including Indian overkill, forest and tundra fires, and winter icing. Which, if any, were triggering factors cannot be determined. It is known, however, that the Naskapi slaughtered excessive numbers of caribou in the late 1800s and early 1900s. Dillon Wallace (1907:153) records the remains of the carnage seen in 1905:

> The George River all the way down to this point had been in past years a veritable slaughter house. There were great piles of caribou antlers (the barren-ground caribou or reindeer), sometimes as many as two or three hundred pairs in a single pile, where the Indians had speared the animals in the river, and everywhere along the banks were scattered dry bones. Abandoned camps, and some of them large ones and not very old, were distributed at frequent intervals, though we saw no more of the Indians themselves.

The fact that slaughters actually took place is documented. Cabot reports the massacre of over 1000 caribou in two weeks at Lake Mistastin, and Turner reported the Naskapi technique of wounding the animals in the water so that they could swim to shore but would soon collapse. Some, however, escaped to die elsewhere or were swept downstream and lost. Even from the killed animals the Naskapi often took only the tongue and the back sinews, leaving the carcasses piled (apparently not cached) on the river bank. Many of these were never utilized, and were carried off by wolves or rotted on the spot. Combined with natural disaster, such as fire and icing, this wasteful hunting procedure might trigger a population crash. With the decimation of the caribou, Naskapi starvation and population decline, and the semipermanent settlement on the coast, it would seem likely that the Indians would quickly adapt to their new conditions, and would readily take up the rich coastal resources during their summer settlement.

This apparently did not happen. Coastal game was integrated very slowly into the Naskapi way of life which until the present day retained its almost exclusive orientation toward the interior. Henriksen (1969:5) states that Naskapi culture remained "intimately bound up with the traditional world of the interior. Their dominant values and their ideas about the distribution of economic goods, ritual life, and patterns of leadership is closely tied up with their life as hunters of the caribou." The reluctance to adapt to the new environment and utilize seal, cod, and other species resulted largely from their lack of means of integrating these new foods and the more individualized hunting or fishing techniques involved into a society in which interior ritual pervades all aspects of the food-getting, preparation, and sharing process. Each of the interior species hunted by the Indians has an elaborate and distinct ritual associated with its preparation and distribution within the community, and the disposal of the bones is performed according to ritual prescriptions as well. Leadership and prestige is derived from this ritual complex toward interior foods. These rituals and means of social integration, however, do not exist for the coastal game. Without ritual incorporation in the values of society there has been little incentive to utilize the new resources. Prestige is not gained by hunting seal or codfishing, and, consequently, at every opportunity the group turns toward the interior, to the system it knows and understands and to which the values and goals of society are addressed.

The Naskapi reluctance to integrate the coastal resources into their cultural fabric shows clearly the influence that cultural values exert over strict economic and ecological efficiency. This is an important point to recognize, since in the study of cultural adaptations in Hamilton Inlet we have had to concern ourselves almost exclusively with technological and economic issues. The Naskapi case, which is also influenced by acculturation phenomena, demonstrates the necessity for values transformation before coastal resources can be used, at least in this one case. The fact that the coast may be available to a people of the interior does not insure that it will be used, and a considerable period of time may elapse before its potential economic value can be integrated and incorporated into the traditional values of an interior society. This may mean, for instance, that following the Dorset period, it may take an interior culture some time to familiarize itself with the coast to the point of developing a formalized adaptation there, even seasonally. Even so, the ideal of the caribou hunter, which seems strongly inculcated into the value structure of interior peoples, may result in a culture's failure to maximize the use of its environment, even to the point that starvation is an acceptable risk. This point has been mentioned because the archeologist tends to overlook ideological factors in his analysis of cultural subsistence-settlement system even though they may play a crucial role in the development of new adaptations or the continuance of traditional ways.

The importance of consideration of nontechnological aspects in understanding a culture's relationship to its environment is demonstrated by the practice of divination. Vayda, Leeds, and Smith, in their research on highland peoples of New Guinea, have suggested that religious and ideological factors, ones generally thought to be furthest removed from subsistence matters, may in fact play a vital regulatory role in a cultural-ecological relationship. In this case, an apparently ritual slaughter of pigs (which was understood by the natives to be purely a religious act) is seen as an important regulatory mechanism for reducing the number of fast-breeding animals which would otherwise endanger the pig population by over-exploiting its food resources (Vayda and Rappaport 1968:495).

A similar ritual method of insuring the stability of a culture's adaptation has been suggested for the Naskapi. An extensive study of the Naskapi practice of caribou shoulder-blade diviniation has been made (Speck 1935), which stresses its strictly ideological basis. Divination is used by the Naskapi to determine the location of game resources, and the process involves scorching a caribou shoulder blade until it cracks and spots appear. These are then interpreted for caribou signs and hunting routes. O. K. Moore (1957) has proposed a culture-ecological explanation for this custom. According to this theory, the divination process randomizes the choice of hunting sites, insuring hunting success about as often as failure, thereby resulting in the preservation of the caribou resources which might otherwise be annihilated by more efficient hunting methods.

A detailed analysis of this explanation will not be undertaken here. It would seem, however, that the interpretation is suspect from several angles, most conclusively by the fact that hunting failure often meant death, and it is doubtful that in this environment randomizing hunting practices are culturally viable. Moore's suggestion is in any case an interesting speculation on the possible culture-ecological interpretation of ritual. Ritual food sharing, also important in Naskapi culture, is a more clear example of the culture's adaptation to an environment in which group survival necessitates ecological and social leveling mechanisms (Henriksen 1969).

In sum, this discussion has pointed out some of the demographic, social, and ecological aspects of the Naskapi adaptation. But more importantly for the archeological analysis, it has shown an ethnographic case of caribou specialization in an environment that is subject to periodic ecological collapse. We have suggested that the Naskapi arrived recently in the northern barrens and grew increasingly reliant on a single major food source, which, when abundant, provided most of the necessities of life, even in this harsh environment. The initial Naskapi movement north was probably only a general population drift, perhaps resulting in part from the Montagnais moving eastward into the Naskapi former territories in central and southern Labrador and Quebec. It is also probable that the availability of caribou in large numbers in the north served as an added stimulus for this drift, and an increasingly specialized type of adaptation was made during the 18th century. At first this involved only summer hunting in the barren grounds with a winter return to the forest; but by 1850–1900 year-round settlement in the barren grounds seemed fully established. At this time a large population expansion seems to have occurred, as shown by the proliferation of the Indian House Lake sites. In fact, it seems that the hunting attraction was great enough to induce Montagnais bands to move north for a late summer hunt before returning to the forest as the Naskapi before had done.

These developments—specialized caribou adaptation, year-round settlement in the north, and population expansion—set the stage for the disasters that occurred sporadically in the 19th century, but which did not become widespread until the migrations failed after 1916. Many Naskapi starved on the interior, and those that survived did so partly because they came to the coast posts for aid. In aboriginal times, devastation probably would have been more complete. Furthermore, I suggest that the Naskapi adaptation, and particularly the wasteful hunting tactics, was actually a dysfunctional adaptation to the conditions of the northern environment. It is inconceivable that this is the result of a long-term adjustment to northern caribou resources. Rather, it suggests along with other data that the Naskapi were recent arrivals in the north who continued to use hunting methods adapted to the less gregarious woodland caribou, where mass slaughter was necessary and did not endanger the ecological balance. In the north this practice could not long be endured, either by the overly specialized Indians, or by the caribou populations, subject as they were to both ecological and human limitation.

On the basis of the foregoing ecological and ethnographic analysis, I propose that this type of phenomena not only occurred in the Naskapi case, but was a fairly common occurrence in the prehistory of the Labrador-Quebec peninsula. While cultural extinction need not have occurred frequently, ecological bottlenecks would periodically reduce the population, possibly precipitating general cultural weakening or even extinction. This process might be enhanced if external pressure were exerted on the southern boundaries of their territories. Undoubtedly, the fatalism with which many Indians in the boreal zone regard survival is fostered in part by the conditions of the life of anxiety that they lead and plays a role in this process. The case of the Naskapi band that would not travel upstream to intercept the migration may be an example of the interplay between psychological forces and group territoriality.

The Montagnais move into the north would seem to represent the beginning of a second cycle of settlement and specialized adaptation, once again potentially leading toward eventual extinction. The peninsula geography of northern Labrador-Quebec with the possibility of interior population and cultural replacement from the south and gradual removal in the north creates a situation that could be regarded as a funnel to extinction. Once a move into this environment has been made by a southern interior culture, the jaws of the Labrador-Quebec trap begin to close inexorably.

Culture-Historical Models

DEVELOPMENTAL MODEL

The first of four possible culture-historical models which may be of use in interpreting the Hamilton Inlet sequence is the developmental or in situ model. This model views culture change in Labrador as a gradual adaptation and development by a single population without meaningful external influence.

There would seem to be only two instances for which the developmental model serves as a possible explanation. The development of the Maritime Archaic cultures (Sandy Cove and Rattlers Bight) is the best example. Here there is definite continuity over a considerable period of time, during which there were changes in lithic usage, stylistic attributes, and subsistence adaptation. Whether these changes were initiated in the Hamilton Inlet area or were part of a larger developmental sphere cannot be said at present.

The second case of development seems to be in the Point Revenge culture. Here, two, and possibly three, dated phases occur—one represented by the Sandy Cove 1 East component and Harp's Blanc Sablon finds that are dated to A.D. 690 ± 46, a second (the Point Revenge complex) seen in the Big Island 1 and Henry Blake 1 sites, dated about A.D. 1100, and a final phase seen in René Levèsque's contact period sites in southern Quebec. It seems reasonable to suggest that the Point Revenge material is proto-Naskapi, while Levèsque's sites may be Montagnais. During this period it may be possible to use the direct historical approach to trace Algonkian prehistory back from contact times to about A.D. 600 in Labrador-Quebec. At this point there is a distinct break in cultural tradition and it is not yet possible archeologically to trace Algonkian developments back further in this area. This does not mean that earlier inhabitants were not Algonkian speakers; it merely means that linguistic affiliation cannot be recognized from the archeological evidence.

MIGRATION MODEL

The second possibility is that the cultures of Labrador-Quebec originated as separate migrations with new peoples and different cultural complexes. These cultures, however, would probably have had similar adaptations.

The clearest evidence of culture change by migration is in the Dorset and Ivuktoke periods. Here there was undoubtedly a move into the coastal region of Hamilton Inlet from northern Labrador which introduced an entirely different culture into this area. The migration model also seems to be the best explanation for much of the culture change along the Indian populations. Given the short span of time between complexes it is difficult to postulate a developmental model. Following Maritime Archaic, the Little Lake, Brinex, Charles, Road, David Michelin, North West River, and Point Revenge complexes are all distinct from one another, and there is presently no basis on which to suggest cultural continuity between them. Larger samples, however, may change this picture.

DIFFUSION MODEL

A third possibility is that culture change on the interior is the result not of population change but diffusion of new ideas from the south. Given the high mobility of interior cultures, the diffusion model might account for some new ideas being introduced; however, if this happened one would expect these to be introduced as individual traits which would then be grafted onto resident complexes. This does not appear to have happened. Complexes are quite distinct stylistically, and the lack of continuity necessary for a diffusion explanation constitutes sufficient evidence for disregarding the proposal as the major source of culture change.

PULSATION MODEL

The Naskapi case presented above is an instructive ethnographic example of a culture-ecological pattern which, I believe, has been important in the prehistory of the entire Labrador-Quebec peninsula. The Naskapi and Montagnais data from the northern regions show a complete cycle of northward population drift, increasingly specialized adaptation, population expansion, year-round occupation of the forest-tundra and tundra, ecological collapse, depopulation, and repopulation by another group (Figure 78). The cycle then presumably repeats itself.

This process, which has been shown to be based on the fundamental instability of interior caribou ecology, gives rise to a "suction" hypothesis for Labrador-Quebec prehisory. According to this theory the interior prehistory of the peninsula can be viewed as

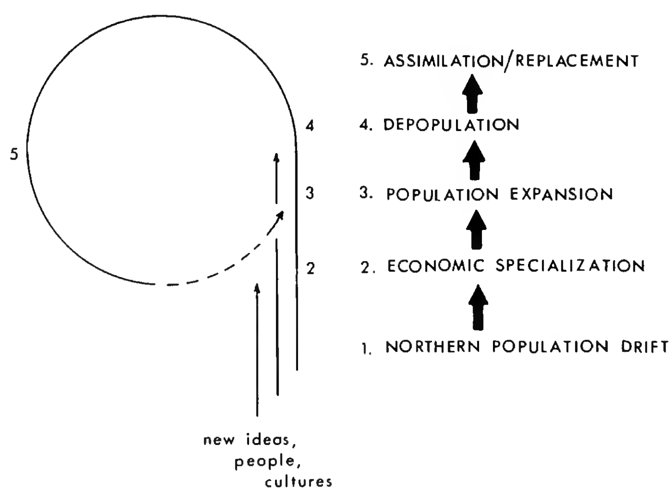


FIGURE 78.—Population cycling in Labrador-Quebec.

a funnel into which southern cultures are drawn north toward the rich caribou hunting grounds, where they are in time extinguished or decimated by ecological catastrophe. The model provides population expansion into the southern portions as a result of either hunting attraction, internal population pressure, or cultural movements (as between the Iroquois and Montagnais). These peoples, already adapted to life in the boreal forest, would move into the peninsula as did the Montagnais or Cree forcing the previous residents of the south into more northern distributions. Two types of adaptations result: one, in the south retains a fairly generalized woodland caribou hunting economy; the other, the northern culture, may retain a generalized interior hunting economy, but probably develops a more specialized adaptation to the mass Barren Ground caribou migrations.

Depopulation of the peninsula proceeds in two ways. The Naskapi case illustrates one type, in which a specialized adaptation to the northern caribou herds results in starvation and possible extinction in years of ecological collapse. Although alternative foods in the north exist, there is a tendency for population crashes to affect all species, as noted by Cabot (1920) and Strong (1930b:1). The ecological bottleneck is therefore tight and it is possible that in a single bad year an entire population could be annihilated. In addition, since the causes of ecological collapse are primarily climatic (affected secondarily perhaps by dysfunctional adaptation of recent southern peoples to new ecological conditions) there is a tendency for bad years to occur together and not to be isolated occurrences. The result is a long string of difficult years which may initially weaken a population and through time extinguish it. Even isolated climatic conditions, such as a single bad winter, or a single storm, can have far-reaching biological consequences (Crisp 1965:63). Such a process would probably result in population "holes" developing within a cultural distribution. The holes could grow larger until bands tended to become isolates. Once intercommunication between bands became restricted one can imagine the regional population's resistance to environmental pressure would drop rapidly. In addition, psychological factors might reduce the vitality of a group once it became aware of the trend.

Depopulation need not occur only under the conditions of the northern tundra environment. Climatic conditions which would cause a caribou failure in the north would also affect woodland caribou, although with less regularity since the animal herds in the forest are smaller and icing less severe. However, fire could be more important in the forest than in the tundra. For this reason, I do not believe that massive starvation would frequently occur in the forest environment; rather, individual cases would be expected, but the "holes" thus created would be easily and rapidly filled by repopulation from the surrounding territory.

This flexible pulsation model has within it the potential for fairly rapid and drastic culture change. Within a few years a thriving culture with many regional bands could be reduced to isolated groups struggling (and perhaps failing) to survive. Under conditions of demographic instability and after environmental conditions improved, a new population moving into the empty niche might adapt to these conditions much as a new population does under the founder principle in biology. Regional specialization might become established easily under environmental selection. People moving into the peninsula might carry a very different culture from their predecessor, or they might belong to a closely related culture. The sequence from Naskapi to Montagnais demonstrates the latter case of successive related cultures. Should they be succeeded by Eastern Cree moving east from the Hudson Bay coast, a third, more distant, relative would be introduced.

An important point, however, is that these movements (Figure 79) need not be viewed as waves of migration but in most cases as culture drift resulting from gradual population expansion, cumulative shifts of hunting grounds, and regional differentiation of

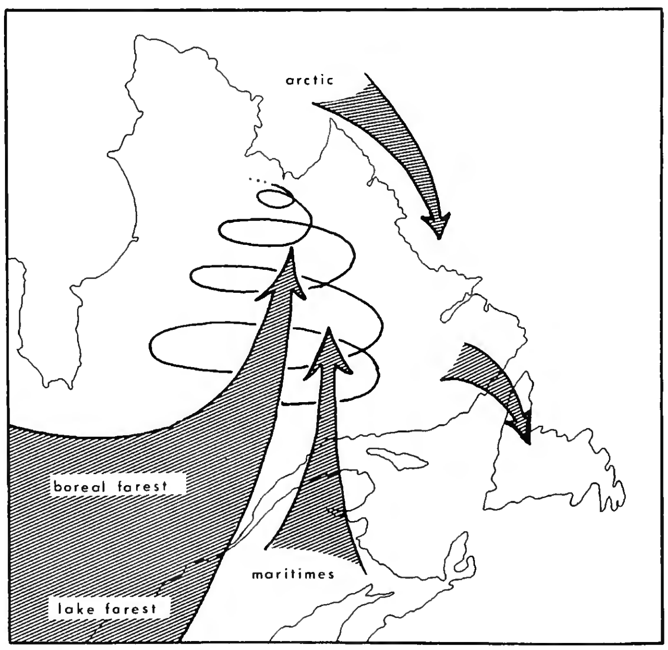


FIGURE 79.—Culture drift and population movements into Labrador-Quebec.

subsistence-settlement patterns. In areas where mobility is great, where individuals are personally familiar with land outside their band territory, these cultural movements within relatively similar habitats are not difficult to envision. Within a single cultural tradition, such as that partially represented by the Point Revenge culture, considerable culture change could occur from population drift. At other times similar population movements might result in more extensive culture change, or complete breaks.

All of these models, with the exception of the diffusion model, are useful in the interpretation of the archeological evidence. The migration model is useful in explaining the lack of continuity in most of the archeological complexes. The developmental model explains the relationship within the Maritime Archaic and Point Revenge cultures. However, only the pulsation model relates these cultures to ecological conditions and provides a mechanism by which cultural replacement can occur for peninsular, subarctic interior populations.

It is interesting to note the congruence of this model, which is based on ethnographic dāta to one developed by Slobodkin and Sanders (1969:91) from theoretical ecology. In this model the authors reject the term "stability" in referring to ecological communities and prefer the more relative concept of "predictability," a notion that is equally advisable for anthropological studies. Three conclusions are drawn:

1. Low environmental predictability dictates to some degree the properties of animals living in such areas.
2. Species in low predictability areas will be subject to more probable extinction and less probable speciation than species in high predictability areas.
3. Invasion of low predictability areas by species from high predictability areas is less probable than the reverse process. When it occurs it may be expected to eliminate other populations in the low predictability area. Invasion from low predictability areas into high predictability areas is typically prevented by competition, but when it occurs it is less likely to eliminate a resident population. Invasions of high predictability areas are likely to be in response to pertubations in the environments' immediate past resulting in the underexploitation of resources or space.

When these theoretical statements are applied to the anthropological data from interior Labrador their agreement is remarkable in that these cultures appear to have behaved in a totally predictable fashion, the influence of the environment having been so strong as to almost override cultural considerations. In this case the environmental limiting factors have resulted in human populations adapting in ways more typical of animal populations. The cultural shield seems to have been insignificant in the long run. Further, the conformity of ethnographic events with theoretical ecology provides some assurance that prehistoric cultures at least in interior Labrador can be analyzed by similar methods. Under these harsh environmental conditions cultural reconstruction and predictability may be more valid than in areas where ecological predictability is greater and cultural considerations assume increasing importance over environmental ones.

In stressing the importance of environmental causes of culture change I do not mean to exclude other factors from consideration. Historical conditions have been shown to apply to the displacement of the resident Indian summer settlement patterns at the time of southern movement of Dorset and Labrador Eskimo. The northern drift of the Naskapi was also probably influenced by the prospects of trade in Ungava Bay. Finally, the eastern movement of Montagnais and northern move of Naskapi cannot be disassociated from events further south. Such conditions will always apply in culture history. I am suggesting, however, that there is an inherent tendency for environmental stress and periodic depopulation on the interior and that this created an opportunity for accelerated culture change by the northern drift of new peoples and ideas from the relatively more populated regions to the south and west.

CULTURAL DYNAMICS IN LABRADOR-QUEBEC

With the foregoing models as guidelines and with consideration of the climatic and ecological conditions on the interior and coast, a series of propositions may be advanced concerning cultural development in the Labrador-Quebec peninsula. These propositions emerge from the study of culture history in Hamilton Inlet, as well as from particular ecological conditions of the peninsula and more general ecological theory. As such, they may be considered both explanatory and predictive.

Interior Culture Dynamics

PROPOSITION 1.—Interior cultures (or ideas) have always entered the peninsula from the south and west, where they will be found at an earlier date than in northern Labrador-Quebec.

This proposition needs little comment and is not a new idea (see, for example, Sapir 1916:11–12). It is important for the culture history of the peninsula that these introductions can originate from three different ecological zones, the Canadian boreal forest, the mixed deciduous Lake Forest zone, and the northeastern Maritime zone. At this point it appears that the varied prehistory of the peninsula is a result of this diverse external input rather than the indigenous cultural development of a single population.

PROPOSITION 2.—Ecological instability (unpredictability), and therefore cultural instability, is greatest in the northern part of the peninsula and diminishes toward the south. The degree of ecological control over culture can be represented as a cline which gradually increases in strength from south to north. The effects of instability will therefore be felt first among northern interior populations, and later and to a lesser degree by those to the south.

This proposition is documented in the ethnographic literature for the Naskapi of northern Labrador-Quebec. During the decline of the caribou herds in the late 19th and early 20th centuries the northern bands were affected most severely. The Montagnais, who at that time were moving into the northern regions to utilize the herds, did not suffer as much for they were not overextended. In terms of archeological data there is as yet insufficient evidence to test this proposition. However, a comparison of the cultural complexes from Hamilton Inlet with those of cultures south of the peninsula shows a more discontinuous cultural development in the north which would appear to be the result of cultural extinction.

PROPOSITION 3.—The effect of climatic change is likely to be great on the ecology and cultures of the peninsula. Interior cultures are basically adapted to the forest. Cultural distributions on the interior are therefore likely to correlate with climatic shifts which result in a north or south movement of the forest-tundra boundary. The effect of climate is also to be expected in fluctuations of the caribou populations. Warm periods with dry summers and wet winters probably result in increased ecological and cultural instability; cold periods with damp summers and dry winters should promote ecological and cultural stability.

This proposition is complex and needs to be considered in some detail. It has been shown (pages 13–14) that the interior of the Labrador-Quebec peninsula is a marginal meteorological area in which deglaciation occurred several thousand years later than elsewhere on the North American continent. In addition, pollen studies from Labrador and the Central Barren Grounds (pages 19–21) have demonstrated extensive movements of the forest-tundra boundary during the past several thousand years. The northern movement of the forest to Ungava Bay appears related to the northern extension of Maritime Archaic culture into northern Labrador and Quebec beyond the present limit of the forest. Unfortunately at present, we have no information regarding the distribution of Indian cultures during the colder periods following 1700 B.C. or during the period 600–100 B.C. It seems likely that complexes such as the Road component and the David Michelin complex will not be found in northern Labrador.

At present paleoclimate research results are not sufficiently detailed to allow really meaningful correlations with culture history. Suggested correlations, however, are shown in Figure 80, but these are based largely on paleotemperature. Although precipitation has been studied for some areas in the Eastern Arctic and subarctic it is very difficult to generalize this information, for standard correlations between moisture and temperature do not exist, and no moisture studies have been done for Hamilton Inlet specifically. As Vibe has shown (1967, 1970:115) the amount and season of precipitation is as important in understanding caribou fluctuations as temperature and wind variations in controlling the summer fire and winter-icing hazard. While these dangers are accented in warm periods, a warm/wet period with maximal rainfall in the summer will reduce the fire hazard greatly increasing the danger of winter icing. In a warm/dry period both hazards are probably increased. Likewise, cool/dry periods may result in greater danger from fires than icing, and cool/wet periods are less likely to cause either fires or icing.

The effect of moisture is less important on the marine environment. Here temperature is the most important variable in determining the movements of the pack ice. However, peoples adapted to the coast also utilize interior resources, and it is not sufficient to consider ecological changes in the marine zone alone.

In short, there is a great need for more research on the climate of the North before a full assessment of its effects, particularly its effects on interior cultures, can be made. Here, the use of meteorological models such as those proposed by Bryson (1966), Bryson and Wendland (1967), Lamb, Lewis, and Woodroffe (1966), and Barry (1959, 1966) may prove valuable. However, important evidence will come from careful botanical and palynological studies, and further work in archeology.

PERIOD	CLIMATE	DATE	INTERIOR	COAST
VIII	Little Ice Age Colder oscillations Forest retreat	1900 1500	SESACIT PHASE POINT REVENGE COMPLEX	IVUKTOKE PHASE POINT REVENGE COMPLEX
VII	Second northern forest maximum Continued warm Forest moves north	1000	POINT REVENGE COMPLEX	POINT REVENGE COMPLEX
VI	Cool episode but not cold Sharp warming trend Dry	500 AD -0-	NORTH WEST RIVER PHASE	NORTH WEST RIVER PHASE
V	Prolonged cold and wet	BC 500	DAVID MICHELIN COMPLEX ROAD COMPONENT	GROSWATER DORSET PHASE
IV	Cooling continues Wetter		CHARLES COMPLEX	CHARLES COMPLEX
III	Gradual cooling Wet Cooling begins Widespread forest retreat	1000 1500	BRINEX COMPLEX LITTLE LAKE COMPONENT	BRINEX COMPLEX LITTLE LAKE COMPONENT
II	Maximum northern extension of forest Oscillations Generally warm Cooling Warm and dry	2000 2500	RATTLERS BIGHT PHASE SANDY COVE COMPLEX	RATTLERS BIGHT PHASE SANDY COVE COMPLEX

FIGURE 80.—Climatic trends and culture history in Hamilton Inlet, Labrador.

Despite the shortcomings of the evidence there appear to be significant correlations between culture, environment, and climate. In the first place, the Hamilton Inlet data tend to support the hypothesis of cultural instability for interior caribou hunting cultures. Unfortunately, due to the lack of coastal cultures in the region throughout the sequence it is impossible to compare the interior sequence with that of a nearby culture adapted to the marine coastal environment. However, during the 2000-year period between 1700 B.C. to A.D. 500 a total of seven different interior acheological complexes have been recognized for which there appear to be little if any evidence for continuity. During the same period in the Eastern Arctic only two cultures (one population), pre-Dorset and Dorset, are found. Overall, the Indian archeology appears to be punctuated by more dramatic culture change, with few periods of cultural transition or development.

With tentative verification of the main hypothesis, it is possible to next consider the effects of climate change on interior cultural stability. It has been proposed that warm periods are likely to be characterized by greater cultural instability, and colder periods by relatively more stability. Unfortunately, at present the available data is insufficient for more than general indications. Especially problematic is the effect of precipitation in cool and warm climatic periods. During the span of prehistory covered in this survey, the temperatures have in general been higher than those of today. Two periods of pronounced cold occurred, one between about 1700–1400 B.C. and the other between 600–100 B.C. The first of these periods immediately followed the Maritime Archaic occupation and the later period corresponds with the Dorset occupation. In addition a period of temperature oscillation occurred with increasingly colder cycles after A.D. 1100. According to theory these periods should be ones of greater cultural stability than the warmer periods. Unfortunately, however, there seems to be no simple correlation between these cold periods and interior cultural stability, for the greatest amount of culture change occurs between about 1700 B.C. and A.D. 500, during which a variety of climatic regimes occurred. Considerably more work will have to be done before the effect of climate on interior cultures can be determined.

Proposition 4.—Cultures with specialized interior adaptations to caribou resources are subject to greater ecological control than those with more generalized adaptations. Specialized populations with few alternate resources are likely to fluctuate in a predator-prey relationship with large population expansions and periodic drastic reductions. Cultures with more generalized interior hunting adaptations and those with more diversified resources will be less subject to marked environmentally induced fluctuations.

Once again the evidence supporting this proposition comes from ethnography. It has been shown that the Naskapi developed an extreme specialization to mass slaughter of migrating caribou herds and that this adaptation necessitated a reduction of mobility and dispersion of bands in the manner typified by the Montagnais of southern and central Labrador-Quebec. The concentration of large population units for the mass hunt often occurred in areas where few other alternate resources were available, and aberrations in the time of appearance of the herd injected a further element of uncertainty. In addition, it appears that to some extent territorial rights to certain hunting areas were recognized. Under these circumstances the failure of the caribou herd to appear or its delayed appearance had serious consequences for the Indians. By contrast, the more generalized hunting patterns of the Montagnais and the broader resource base of the southern forests buffered them from the effects of caribou fluctuation. Unfortunately the applicability of this model to the prehistoric past can only be inferred from the discontinuity of styles and assemblages of the archeological record.

Proposition 5.—Interior cultures with summer coastal adaptations are likely to be more stable than those restricted to interior resources only. Interior cultures with specialized summer coastal adaptations are likely to have greater cultural stability than those with generalized coastal adaptations.

Ethnographic and archeological evidence support both tenets of this proposition. The antagonism between the Montagnais Indians and the Labrador Eskimos seem to have resulted from the loss of the Indians' important summer coastal fishing territory. The Montagnais of southern Labrador who retained their summer fishing grounds were not subject to the privation endured by either the Sesacit or the Barren Ground Naskapi who had lost this resource. Archeologically, the Rattlers Bight and Point Revenge cultures which made extensive use of the coastal environment in the summer appear to have had greater cultural stability (i.e., longer occupations) than other Indian groups. Those cultures with Interior-Maritime (3a, 3b) type of adaptation were among the more stable Indian cultures. Modified-Interior (2c) adaptations were slightly less stable, and Interior or Modified-Interior (2a, 2b) type adaptations were least stable. It may be that the latter groups did not last long enough to adjust to the coastal environment, although sampling problems may contribute to this view. In general, specialized adaptations to the coastal summer environment were more successful than generalized adaptations due to the stability and abundance of the resources during this season.

PROPOSITION 6.—There is, finally, a tendency for interior cultures to gradually adapt toward increasing utilization of summer marine resources and to develop a dual winter interior and summer coastal pattern.

The validity of this proposition is demonstrated by the increasingly important summer coastal adaptations of the Maritime Archaic from the Sandy Cove complex to the Rattlers Bight Phase, and by the parallel development during the Point Revenge occupation. The latter case, however, is not well documented at present. The dual cycle is an important feature of Algonkian culture throughout the coastal Northeast and eastern Canada. In Hamilton Inlet the extension of the marine ecology into Lake Melville facilitated this process.

Coastal Culture Dynamics

PROPOSITION 7.—Marine ecological conditions tend to be more stable than interior conditions. Cultures adapted to arctic marine fauna are likely to be characterized by greater stability through time than predominantly interior-adapted cultures.

The complete testing of this proposition is not possible with Hamilton Inlet data since Eskimo cultures inhabited this region for only brief intervals, and cultural stability cannot be determined from such limited occupations. However, there appears to be ample evidence for cultural continuity for northern Eskimo populations between 2000 B.C. to A.D. 1200 (Arctic Small Tool Tradition) at Igloolik (Meldgaard 1960) and from A.D. 1000 to the present in the neo-Eskimo tradition. During the entire known period of prehistory in these areas only two population influxes need to be postulated. It would appear, then, that the arctic maritime adaptation is indeed a stable economic base in comparison to subarctic interior economy.

PROPOSITION 8.—Cultures with a year-round coastal adaptation are likely to be more stable than those with a partial or seasonal coastal adaptation. In addition, the wider the range of marine species utilized by a coastal culture, the greater its stability.

The fact that the Eskimo occupations of Hamilton Inlet and that almost all the Eskimo cultures of the eastern and central Arctic lived on the coast throughout the year demonstrates the validity of this proposition. Only the Caribou Eskimos and some Eskimo groups of Alaska have utilized extensively a dual interior-coastal cycle, although for most Eskimos caribou hunting and fishing were often undertaken on the interior during the summer for brief periods. In terms of the breadth of Eskimo marine economies it might be tempting to see the Thule economy as being more stable than that of Dorset because of their use of whales. However, there is insufficient data on hand to support this view. The lack of whale hunting obviously was not a limiting factor in Dorset and pre-Dorset culture as their 3000 years occupation of the eastern Arctic demonstrates. It may, however, have been a factor in their competition with Thule culture around A.D. 1000.

PROPOSITION 9.—The effects of climatic shift on marine ecology in Labrador is marked and results in changes of faunal distributions but does not usually cause major marine population fluctuations. During cold periods there is an increase in the speed of the Irminger Current and also in the Labrador Current, and the winter pack-ice distribution shifts further south along Labrador and Newfoundland, bringing with it arctic marine fauna. During warm periods the currents are weak and pack ice and fauna tend to be restricted to northern Labrador. This extension of the arctic environment south in cold periods may result in a southern movement of arctic-adapted cultures. During warm periods these cultures would tend to be restricted to northern Labrador.

This part of the marine ecological model is more amenable to analysis with the Hamilton Inlet data, which, in fact, correspond closely with the prediction in three cases: pre-Dorset, Dorset, and Ivuktoke.

During the warm period before 2000 B.C. Maritime Archaic culture expanded into northern Labrador-Quebec along with the northern extension of the forest. On the Labrador coast this movement extended at least as far as Saglek and Ramah. The subsequent withdrawal of this culture from northern Labrador seems related to the withdrawal of the forest, and appearance from the north of the first pre-Dorset immigrants during a general climatic deterioration which set in after 2000 B.C. By about 1700 B.C. pre-Dorset culture had moved south to Nain (radiocarbon date GSC–1264 from Thalia Point 2). About this time Maritime Archaic culture in central and northern Labrador seems to have ended, although in Newfoundland it may last as late as 1200 B.C. The pre-Dorset extension and the Maritime Archaic retreat in northern Labrador corresponds with climatic cooling, with the advance of southern pack ice, and with a slow forest retreat.

The pre-Dorset movement may also have included a brief extension into the central and southern Labrador coast. The data for such a movement is weak and rests on several surface collected artifacts bearing strong resemblance to pre-Dorset points. These include one point found at Sandy Cove (Plate 73*f*) and a specimen recovered by Harp (1963: pl VIII) at Diable 1. The lack of diagnostic materials such as burins and larger samples precludes their positive identification as pre-Dorset tools. However, this suggested movement would not be unusual in terms of environmental conditions, since during the period between 1700–1500 B.C. the southern extension of northern ice conditions would have facilitated it. The possibility that such a pre-Dorset extension may have contributed to the demise of Maritime Archaic is an important question for future research.

A second, and clear, case of northern cultural expansion occurred during the Dorset period and also coincides with climatic deterioration. Following 1000 B.C. a cooling trend set in, which by about 700 B.C. became colder than today and culminated in a cold maxima between 500–100 B.C. Following 100 B.C. a sharp warming trend began. The appearance of the first Dorset sites in Hamilton Inlet about 750 B.C. corresponds closely with the onset of this cooling trend. The distinctiveness of Groswater Dorset is perhaps the result of its early movement south during the period of the supposed pre-Dorset to Dorset transition. By at least 200 B.C. the Dorset occupation of Groswater Bay seems to have ended, also coinciding with a period of climatic amelioration.

The Dorset occupation of central Labrador presents a very interesting problem. As we have seen, the central and southern Labrador coastal tundra and marine zone is a very narrow strip backed by forest a few miles inland. A coastal culture, such as Dorset, with a limited use of interior territory would result in a linear culture distribution along a coast that was in the past important as a seasonal hunting and fishing territory of the Indians. It is therefore probable that when Dorset moved out of northern Labrador into the south two conditions may have existed: (1) either this occurred during a temporary hiatus of Indian occupation, or (2) Dorset summarily preempted these territories, as did the Thule Eskimos two millenia later. Whichever of the two possibilities obtained, it can also be expected that Dorset expansion south from Nain to Hamilton Inlet could have occurred without serious opposition from the Indians, for the central Labrador coast is deeply indented and has numerous island skerries which would have buffered contact between the Dorsets and Indians. In fact, Dorset occupation would normally be confined to the outer coast, whereas the Indian summer use would characteristically have been restricted to the heads of the deep bays and river mouths. The same geographical condition exists in Hamilton Inlet. Coastal resources used by most Indians are available in Lake Melville, and the loss of hunting grounds in Groswater Bay would not constitute a serious threat to survival. A parallel situation occurred during the Labrador Eskimo occupation of the coast with Naskapi on the interior.

South of Hamilton Inlet, however, the coastal geography changes radically. There is no island skerry or transition zone resulting in a westward extension of the tundra environment into the interior. Here, to utilize the most important coastal resources such as seal, salmon, cod, and birds one must physically occupy the coast. Coexistence could not be possible, and ecological compression would result in confrontation between interior and maritime peoples.

I believe that the lack of early Dorset culture in Newfoundland is a result of their taking longer to expand south of Hamilton Inlet because of Indian resistance in these regions. Dorset may not have reached Newfoundland until the time of Christ, judging from the scarcity of Groswater Bay types of side-notched points and other early tool types there and the lack of early radiocarbon dates. The florescence of Newfoundland Dorset occurred after the beginning of the Christian era. Most dates fall between 100–600 A.D. as do those from Port Au Choix (Harp and Hughes 1968:43). It is doubtful that an Indian culture coexisted for long on the island with Dorset, which lasted until about A.D. 500 or later. Previous inhabitants had presumably either been exterminated, moved off the island, or disappeared more ignomineously.

If one envisions a Dorset culture distribution along a thin strip of coast from northern Labrador to Newfoundland in the early centuries B.C., with Indian cultures on the Labrador interior, the instability of the cultural geography becomes immediately apparent, especially in southern Labrador. The extension of Dorset distribution seems to have been made possible by a cool climatic period between 500–100 B.C. The staking out of the southern boundary was facilitated by the huge harp seal fishery which remained after the warming trend following 100 B.C. caused the withdrawal of some northern marine resources from the island. With the onset of a warm climatic period there would very likely have been increased pressure from the Indian cultures of central and southern Labrador needing a relief valve on the coast to break this Dorset barrier and reestablish a summer coastal adaptation.

At this point I believe Dorset culture was overextended on the southern coast and a combination of climate change and Indian pressure caused the distribution to split. If Indian pressure was a factor, the Dorsets probably had a tactical disadvantage in the struggle. Their unfamiliarity with interior life and the highly mobile ways of the Indian, and their own tendency for more settled life, particularly in winter would have made them an easy target for Indian attack, much as the Eskimo Island inhabitants were at a later date. However, the Dorsets probably lacked large winter settlements and highly integrated social structure, and their bands were undoubtedly smaller than Ivuktoke bands. With a larger population pool on which to draw and being more mobile on the interior, it is conceivable that the Indians could have made it difficult for the southern Labrador Dorset to maintain a continuous distribution. By the time of Christ the Dorset distribution apparently divided into a northern and southern segment, and Indian cultures again moved into the central coastal regions during the summer. In Hamilton Inlet these people seem to have been part of the David Michelin complex. Soon after, the North West River Shield Archaic appeared there and on the southern Labrador coast (Harp 1963: pl. VIIg, h; Plate 86 [Peabody Museum Collections]). In Northern Labrador, Dorset continued on for several centuries; in Newfoundland it lasted at least until A.D. 600 as an isolated Dorset refuge from the main northern distribution.

This is the second time Newfoundland seems to have acted as a cultural refuge, the first being with the persistence of Maritime Archaic. If this is correct, then it is probable that Shield Archaic (i.e., the relative of the North West River Phase) will not be found on the island, and that following the Dorset occupation the early phase of the Point Revenge peoples were the next culture to move across the Strait of Belle Isle. The Beothuk descendants of Point Revenge-related people are perhaps the final aboriginal example of the refuge history of the island.

One further note might be mentioned regarding the Dorset occupation in central and southern Labrador. It has been noted that the Groswater Dorset assemblage is a distinctly regional variant which does not fit well into the typology of Dorset collections from Newfoundland or those from northern Labrador, including the Sornborger, Bryant, and Knutson collections (see Appendix E). All of these collections contain large numbers of triangular "tip-fluted" points as well as double side-notched knives, completely ground burin-like tools and other specimens. The distribution of these classic Dorset types on either side of Hamilton Inlet raises questions as to how the Groswater Dorset culture fits into the larger framework of Labrador Dorset prehistory. It has been suggested above that Groswater Dorset appeared from the north about 700 B.C. and that its movement south of Hamilton Inlet to Newfoundland may have occurred several centuries later due to Indian occupation of the southern coast. If so, this does not explain the typological evolution from Groswater Dorset to the Newfoundland variety, which appears more closely related to northern Labrador Dorset. At this point one can only speculate as to the dynamics of the actual occurrence. However, it may be that Groswater Dorset was not the progenitor of Newfoundland Dorset and that a more recent movement of Dorsets south from northern Labrador was responsible for implanting this culture in southern Labrador and Newfoundland.

The final case of cultural movements in the marine zone occurred with the arrival of Ivuktoke Eskimo in Hamilton Inlet about A.D. 1500. Once again this movement corresponds to a gradually cooling climate which caused the northern Labrador marine hunting grounds to be extended south to their previous distribution. At this time similar climatic effects may have resulted in Eskimo movements into the interior on the North Alaska coast (Nunamiut) and in the Central Barren Grounds (Caribou Eskimo). In Labrador this movement, which reached the Gulf of St. Lawrence in the early 1500s and may also have been inspired by desire to trade with the Europeans, occurred rapidly despite resistance by the Indian occupants of the interior. Given climatic cooling after A.D. 1000, it would seem that the one reason for the lateness of this Eskimo movement is that the central coast was occupied by the Point Revenge Algonkians.

PROPOSITION 10.—Warm periods result in a northern extension of the forest on the coast. During these times it is likely that Indian culture shifted north as it would also on the interior.

In the absence of Eskimo occupation of the coast it can be shown that the Maritime Archaic culture moved north at least as far as Saglek on the coast of northern Labrador and Indian House Lake on the interior of Quebec, and it is likely that the distribution extended as far as Hudson Strait and Ungava Bay. On the Labrador coast Maritime Archaic may have extended beyond the tree line during the summer months. However, during the succeeding period of climatic deterioration Maritime Archaic retreated down the Labrador coast, maintaining itself in Newfoundland until possibly 1200 B.C.

PROPOSITION 11.—Finally, culture change among arctic-adapted peoples is more likely to be seen in shifts of cultural distributions than in changes in cultural complexes or population size. The gradual effects of ecological change are such that adjustments can be made by migration or by shifting the economic focus to new or secondary species.

Ethnographic work among Eskimos suggests that settlement shifts or exploitation of new species is a tactic frequently used in the northern environment either as a result of short-term changes such as the disappearance of seals from areas invaded by polar bears or walruses, or from long-term changes resulting from ice movement or current shifts. While extinction cannot yet be ruled out in the archeological evidence it does not appear to have been as important in Eskimo as in Indian prehistory, at least in Labrador-Quebec. Nevertheless, the disappearance of Groswater Dorset about 200 B.C. and of Newfoundland Dorset after about A.D. 600 suggests possible extinction. Likewise, the profound ecological changes which Vibe postulates for Greenland and the present archeological data from that area lead to extinction as a possible explanation for culture changes in certain areas. It would appear that the central Canadian Arctic has been more stable than either Greenland or Labrador, by virtue of its nuclear, rather than linear, cultural geography.

This completes the analysis of cultural movements and change in the marine zone, and the results of the investigation may be summarized:

1. It appears that interior ecological structures tend to be unstable and that cultures depending primarily on caribou resources are themselves subject to periodic fluctuation or extinction. The Indian prehistory of the Labrador-Quebec peninsula has a large number of different cultures occurring within a relatively brief period of time. Part of the cause of cultural variation may result from the ability of populations to move into the peninsula from three geographically and environmentally distinct zones—the Canadian Shield, the Lake Forest zone, and the New England-Canadian Maritimes region.

2. There is insufficient ecological and cultural data from the interior to test the hypothesis that interior culture change will be faster in warm/dry periods than in cool/wet periods. Although there is some support from the fact that the greatest period of change occurs during a relatively warm period between 1500 B.C. and A.D. 1000, cool/wet periods are too short in duration to test the theory of increased stability during these times.

3. In the marine environment there is evidence from the Eastern Arctic to suggest that cultural stability is characteristic of an Eskimo type of adaptation to marine fauna with its diversity and relatively stable faunal populations, viz. Bering Sea. The lack of continuous occupation of the Labrador coast by Eskimos precludes the direct testing of the hypothesis in the subarctic area.

4. The evidence of pre-Dorset, Dorset, and neo-Eskimo movements in Labrador suggests strongly that they are related to the extension of the northern arctic marine habitat into southern zones via the Labrador Current in periods of climatic cooling. In the Dorset (and possibly pre-Dorset) case, there appears to be a cessation of occupation in the central coast regions with withdrawal of arctic marine influence to northern Labrador during warm periods, followed by resumption of Indian seasonal occupation of the southern coastal regions.

This discussion has considered correlations between climate and culture and the mehanisms through which climatic influence operates. In pointing out the associations I do not mean to exclude other contributory factors in culture change. Historical and internal cultural factors have been mentioned as being important in many cases, and the emphasis on climate and ecological structures should not be construed as indicating my commitment to these over other factors. To a large extent this particular emphasis has been forced by the lack of culture historical information in the Gulf and lower St. Lawrence region. In the absence of external comparative materials it has been tempting to turn toward ecological and predictive models for cultural development in the Labrador-Quebec peninsula. It may be that these models will have to be altered considerably in the future. However, for the present they have been useful in identifying environmental factors which seem to have been of overriding importance in culture dynamics in the area. These problems will have to be researched further in the northern regions and cross-cultural evidence will have to be employed if the propositions advanced here are to prove useful beyond the specific geographical and ecological conditions of the Labrador-Quebec peninsula. I believe they will, though with lesser clarity perhaps. The culture sequence of the Central Barren Grounds (Harp 1961, Irving 1968) suggests similar environmental control in a marginal subarctic-arctic region, and there should be other areas, such as Scandinavia and northern Siberia, where these suggestions could be tested.

Summary

Geological evidence suggests that deglaciation freed the Labrador coast of ice by 9–10,000 years ago. Final wastage on the interior did not occur until about 5500 years ago. At present the earliest evidence of man on the coast is about 4000 B.C., at a time when ice still persisted on the interior. In Hamilton Inlet archeological and geological data show that during the postglacial era isostatic rebound has resulted in significant topographic and ecological changes which

affected settlement and adaptation patterns. These shifts have been most pronounced on the interior, where uplift has been over 100 feet during the past 5000 years. In the Narrows, uplift has resulted in shoaling of the underwater sill which controls the entry of arctic marine water from the Labrador Current into Lake Melville. During the early periods marine influence extended far up the drowned valleys of the Churchill and Naskapi rivers. Ocean conditions prevailed at North West River which, at 5000 B.P., was an offshore island. Many species presently excluded from the lake, such as some seals, walrus, whale, cod, and others, were very likely present. As the sill at the Narrows rose, Lake Melville became progressively more lacustrine due to the establishment of a hydrographic halocline and thermocline as fresh water influx from the interior lake plateau began to dominate the lake, reducing biological activity in its waters. By contrast, the Narrows and Groswater Bay remained in marine fauna.

Terrestrial ecology has remained relatively unaffected by these hydrographic changes. For at least the past 5000 years the inlet has been a transition zone between the boreal forest and the arctic-chilled strip of coastal tundra. Minor shifts in the forest boundary between the Narrows and eastern Groswater Bay have occurred, with the easternmost extension encompassing the Rattlers Bight area during the Maritime Archaic period about 2000 B.C., which also coincides with the climatic optimum. Another expansion of the forest took place about A.D. 1000, this time coinciding with the Point Revenge Indian occupation. It is significant that both extensions occurred during periods of important Indian adaptations to the coastal environment, when the forest was brought into closer proximity to marine resources. Throughout the period since 5000 B.P. there is no evidence to suggest significant changes of land species, such as caribou or bear. These, and some other species, are continuously distributed throughout the forest and transitional tundra and provide important links between these zones for man.

INDIAN PREHISTORY

The Indian prehistory (Figure 61) of the inlet has been defined in greatest detail from the North West River sequence which begins about 1500 B.C. Evidence for earlier Indian cultures comes from Groswater Bay where two distinct components of the Maritime Archaic Tradition have been found. The Sandy Cove complex is the earlier of the two and is dated at circa 2800 B.C. A later component is the Rattlers Bight Phase, circa 2000–1800 B.C. Rattlers Bight is the end result of a progressively more intensified seasonal adaptation to marine resources and is a phase which has strong cultural and trade relationships with Newfoundland and northern New England. The Maritime Archaic Tradition ends in Hamilton Inlet about 1600 B.C. although it persists longer in Newfoundland.

Following the Maritime Archaic there is a cultural break, and a long series of predominantly interior Indian cultures begins. The first of these, the Little Lake component, is typologically related with the Late Archaic of southern New England, where it dates between 1500–1200 B.C. in the Watertown Phase. In Hamilton Inlet it is dated geologically about 1400 B.C. Following Little Lake there are, in succession, six cultural units with little evidence of typological similarity between them. These are the Brinex complex (ca. 1200 B.C.), Charles complex (ca. 1000 B.C.), Road component (ca. 700 B.C.), David Michelin complex (ca. 200 B.C.), North West River Phase (ca. A.D. 200), Point Revenge complex (ca. A.D. 1000), and the historic Sesacit Phase. With the exception of the Road component and the North West River Phase (Shield Archaic) few of these units have clear external relationships. All units except the Road component and Sesacit Phase have coastal sites in Groswater Bay, but only Point Revenge and Maritime Archaic of the Indian cultures have extensive coastal adaptations.

This interior sequence is characterized by distinct stylistic and assemblage discontinuity between each cultural unit. Population movements and drift are suggested as being important in culture change. The Point Revenge culture appears to be linked with proto-Naskapi and can be traced stylistically from contact sites back to about A.D. 600, at which point there is a clear break in the sequence following the Shield Archaic. This boundary is the limit to which the direct historic approach can be applied in tracing back the Algonkian prehistory of the inlet. The Beothuk culture of Newfoundland appears to be a rather distinctive and perhaps archaic variant of the Point Revenge complex. The presence of Point Revenge on both interior and coast around A.D. 1000 indicates that the Skraelings encountered by the Vikings, at least in this area of Labrador, were Indians of Algonkian linguistic affiliation.

ESKIMO PREHISTORY

The first inhabitants of the Hamilton Inlet coastal environment were not Eskimo but Maritime Archaic Indians or Indians of an as yet unidentified earlier culture. No definite evidence of an early Arctic Small Tool Tradition culture has yet been found this far south in Labrador. Following 1600 B.C. a succession of small Indian sites of cultures paralleling the interior sequence utilized the coast seasonally until about 800 B.C., when the Dorset Eskimo cultures moved into the outer portion of the inlet from the north. Dorset culture occupied the coast here until about 200 B.C. at which time it disappeared and was replaced by interior cultures once again. Groswater Dorset is an early and distinctive chronological and regional variant of the late Arctic Small Tool Tradition. After an extended occupation of the coast following the Dorset period by David Michelin, North West River, and Point Revenge cultures a second Eskimo culture move into the inlet occurred with the late appearance of the Ivuktoke Labrador Eskimo about A.D. 1500. These Eskimos remained in the coastal zone until the present.

The combined regional sequences from the coast and interior include 12 cultural units through the past 5000 years. Five of these units are grouped into larger cultural traditions known outside of Labrador. These are the Sandy Cove complex and Rattlers Bight Phase (Maritime Archaic), North West River Phase (Shield Archaic), Groswater Dorset (Arctic Small Tool), and Ivuktoke-Labrador Eskimo (neo-Eskimo). The remaining seven units are not presently assigned although several of them have typological relationships with cultures outside Labrador-Quebec which have not yet been defined in terms of traditions.

The prehistory of Hamilton Inlet contains no evidence to support claims for meaningful contact between Eskimos and Indians. Dorset culture is very different in terms of its archeological complex and subsistence-settlement system from previous and contemporary Indian cultures, and there are no specific typological parallels. Dorset culture was not found in the North West River sequence.

CULTURAL CONFIGURATIONS

An attempt at understanding prehistoric cultures and cultural adaptations resulted in a functional analysis of each archeological unit in terms of its culture area, settlement size and function, economic activities, trade, and other factors contributing to its subsistence-settlement system. In culture-ecological analysis a particular society's system of adaptation is as diagnostic as its archeological complex. From 11 archeological units (excluding Little Lake for lack of evidence) 4 basic *subsistence-settlement system types* and 8 *subtypes* were recognized as having been important adaptations in Hamilton Inlet (Table Z, Figure 70). These included Interior, Modified-Interior, Interior-Maritime, and Modified-Maritime types. In addition, several different *adaptation types* have been recognized for Hamilton Inlet and the adjacent environment. These types, which are not restricted to specific cultures (subsistence-settlement systems), include three types of coastal adaptation (limited, generalized, and specialized coastal adaptations) and two types of interior adaptations (generalized and specialized interior adaptations). Finally, three general adaptive processes have operated on the prehistoric and historic cultures of the inlet to cause their subsistence-settlement systems to change through time. *Microenvironmental reduction* resulted in a maximization of resources with increasingly smaller geographic areas, enhancing sedentarism, community stability and population growth. *Microenvironmental expansion* has operated to increase available resources by expanding the size of the territory utilized. *Microenvironmental restriction* has occurred in several instances reducing the territory and resources of a culture by external (natural or cultural) force of influence.

Besides characterizing the particular adaptations of Hamilton Inlet cultures, the analysis of configurational shifts through time demonstrates a useful method for studying cultural variability and regional adaptation and specialization. From this type of work may come theoretical and comparative approaches to problems of cultural development and ecology.

Several conclusions of this analysis can be stated. First, the predominant Indian pattern is the Modified-Interior type of subsistence-settlement system in which a dual interior-coastal annual cycle is followed. This is typified in coastal Algonkian culture of the Northeast. In Labrador the only alteration of this type occurs when the coast is excluded forcibly by Eskimo occupation, as during the Dorset and Ivuktoke periods. Only two cultures, Maritime Archaic and Point Revenge, underwent major ecological adaptation in the inlet. Both became increasingly oriented to summer maritime exploitation. Other interior cultures did not adapt extensively to the coast, preferring to use it only for hunting or fishing of species continuously distributed on both coast and interior or where marine species could be caught with interior technology. Through time there seems to be a developmental tendency toward increasing use of coastal resources during the summer. Cultures entering the peninsula from the St. Lawrence may already have been "pre-adapted" in this direction.

In Hamilton Inlet it appears that cultural and natural boundaries do not generally coincide. Ecological boundaries were important in seasonal variation of cultural patterns, but they have never been cultural barriers as they have in other areas. Here the close proximity of coastal tundra and boreal interior habitat and the continuous distribution of important species has reduced the effect of natural boundaries, especially for Indian populations. Eskimo cultures, on the other hand, have been restricted to the coastal tundra zone without apparently ever spending much time on the interior. For Eskimo adaptations in Labrador the coastal environment has been largely sufficient for life without the need of interior resources.

Four major changes have occurred in patterns of adaptation in the inlet. The first is the break between the Interior-Maritime pattern of the Maritime Archaic and the Modified-Interior pattern of subsequent Indian cultures, which had either limited or generalized coastal adaptations. A third major change occurred with the introduction of the Dorset Modified-Maritime pattern. Following Dorset there was a return for almost 2000 years to a Modified-Interior pattern. The introduction of Ivuktoke Modified-Maritime pattern represents the final change, which mirrored the Dorset pattern with the addition of new features of technology and settlement.

CULTURAL ECOLOGY

Paleoenvironmental and ethnographic data have been utilized in reconstructing past cultural and natural environments of Hamilton Inlet. In addition, an analysis of interior and marine ecological structures has been presented to facilitate explanation of the culture history of the inlet. It appears that ecological theory applies well to the hunting cultures of Labrador on both the interior and coast. Here man can be treated in similar ways by which ecologists approach animal populations in their relationships with their environment. Environmental conditions appear to prevail over cultural shields.

In particular, an interior and a marine ecological model are developed. The interior model suggests that cultures relying on tundra and boreal food chains are subject to periodic ecological fluctuation resulting from climatic and environmental conditions. This provides a hypothesis for cultural instability which is reflected in the ethnographic case of the Naskapi Indians. It is suggested that cultures with predominantly interior adaptations are subject to severe ecological control. Interior cultures with proportionately greater dependence on marine resources, or with less specialized interior economies should be subject to less ecological and climatic limitation.

By contrast, marine food chains are more stable and less subject to periodic collapse. A larger pool of resources of use to man and for supporting the complex ecology of the sea is available, and individual population fluctuations are small. Marine ecological control over human populations is therefore less strong than on the interior. Climatic shifts result in ecological shifts, but these occur more slowly and less directly than on the interior, and human populations can adjust more easily to the changing circumstances.

These models suggest that culture history in Labrador should reflect at least partially these environmental conditions. In particular, it is suggested that the lack of cultural continuity on the interior is a result of ecological fluctuation and periodic starvation and population replacement. Culture change in the marine-adapted cultures appears to be slower. On the central Labrador coast the appearance of Eskimo cultures coincides with cool climatic periods, suggesting that the southern movements of northern cultures results from extensions of the northern pack ice and associated northern marine fauna; it is more difficult to relate change and culture area shifts on the interior to climatic factors, partially due to the lack of information on northern Indian cultures. However, the northern extension of Maritime Archaic culture coincides with the Climatic Optimum and northern forest extension and its withdrawal coincides with cooling and forest retreat following 1500 B.C. These hypotheses are possibly of cross-cultural interest in the Arctic and Subarctic North America and elsewhere in similar environments.

Literature Cited

Backus, Richard H.
1957. The Fishes of Labrador. *American Museum of Natural History Bulletin,* 113(4):279–337.

Balikci, Asen
1964. The Eskimos of the Québec-Labrador Peninsula: Ethnographic Contributions. Pages 375–394, in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution à l'Étude de l'Occupation Humaine.* Mouton Company for École Pratique des Hautes Etudes, Sorbonne, Paris.

Banfield, Alexander F. W.
1961. A Revision of the Reindeer and Caribou Genus *Rangifer. National Museum of Canada Bulletin,* 177. Ottawa.

Banfield, Alexander F. W., and J. S. Tener
1958. A Preliminary Study of the Ungava Caribou. *Journal of Mammalogy,* 39(4): 560–573.

Barnett, D. M., and J. A. Peterson
1964. The Significance of Glacial Lake Naskapi 2 in the Deglaciation of Labrador-Ungava. *Canadian Geographer,* 8(4):173–181.

Barry, R. G.
1959. A Synoptic Climatology for Labrador-Ungava. *Arctic Meteorology Research Group, Publication in Meteorology,* 17. Schefferville.
1960. The Application of Synoptic Studies in Paleoclimatology: A Case Study for Labrador-Ungava. *Geografiska Annaler,* 42(1):36–44.
1966. Meteorological Aspects of the Glacial History of Labrador-Ungava with Special Reference to Atmospheric Vapor Transport. *Geographical Bulletin,* 8(4):319–340.

Beverton, R. J. H., and A. J. Lee
1965. Hydrographic Fluctuations in the North Atlantic Ocean and Some Biological Consequences. Pages 79–109, in C. G. Johnson and L. P. Smith, editors, *The Biological Significance of Climatic Changes in Britain.* Symposia 14 of the Institute of Biology. New York: Academic Press.

Biays, P.
1964. Quelques aspects de la geógraphie des glaces marines dans l'est du Canada. Pages 95–136 in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution à l'Étude de l'Occupation Humaine.* Mouton Company for École Pratique des Hautes Études, Sorbonne, Paris.

Bigg, Michael A.
1969. The Harbor Seal of British Columbia. *Fisheries Research Board of Canada Bulletin,* 172.

Binford, Lewis R., and Sally R. Binford
1966. A Preliminary Analysis of Functional Variability in the Mousterian of Levallois Facies. In J. D. Clark and F. C. Howell, editors, Recent Studies in Paleoanthropology, *American Anthropologist,* 68(2, part 2): 238–295.

Bird, Junius
1945. Archaeology of the Hopedale Area, Labrador. *Anthropological Papers of the American Museum of Natural History,* 39(2).

Birket-Smith, Kai
1918. Skraelingerne i Vinland og Eskimoernes Sydost-Graense. *Geografisk Tidsskrift,* band 24: 157–167. Copenhagen.

Blake, Weston, Jr.
1956. Landforms and Topography of the Lake Melville Area, Labrador, Newfoundland. *Geographical Bulletin,* 9:75–100.

Blank, T. H., and J. S. Ash
1962. Fluctuations in a Partridge Population. Pages 118–133 in E. D. Le Cren and M. W. Holdgate, editors, *The Exploitation of Natural Animal Populations.* Oxford: Blackwell Science Publications.

Blumberg, B. S., et al.
1964. Blood Groups of the Montagnais and Naskapi Indians of Schefferville, Quebec. *Human Biology,* 36(3):263–272,
1967. Genetic Studies on the Naskapi and Montagnais Indians of Schefferville, P. Q. *McGill Subarctic Research Paper,* number 23:75–78.

Borden, Charles E.
1952. A Uniform Site Designation Scheme for Canada. *Anthropology in British Columbia,* number 3: 44–48.

Breton, Y.
1968. La Culture Matérielle des Blanc Sablonais. *Traveaux Divers,* number 19. Centre d'Études Nordiques, Laval University, Laval, Quebec.

Brookhaven National Laboratory
1969. Diversity and Stability in Ecological Systems: A Symposium, Upton, New York, May 1969. *Brookhaven Symposia in Biology,* number 22. Upton: Biology Department, Brookhaven National Laboratory.

Brown, R. Jerry E.
1967. Permafrost in Canada. Geological Survey of Canada Map 1246A. Ottawa: Department of Mines, Energy and Resources.

Brummer, J. J., and E. L. Mann
1961. Geology of the Seal Lake Area, Labrador. *Geological Society of America Bulletin,* 72:1361–1382.

Bryson, Reid A.
1966. Air Masses, Streamlines, and the Boreal Forest. *Geographical Bulletin,* 8(3):228–269.

Bryson, Reid A., William N. Irving, and J. A. Larsen
1965. Radiocarbon and Soil Evidence of Former Forest in the Southern Canadian Tundra. *Science,* 147:46–48.

Bryson, Reid A., and W. M. Wendland
1967. Tentative Climatic Patterns for Some Late Glacial and Post-Glacial Episodes in Central North America. Pages 271–298, in W. J. Meyer-Oakes, editor, *Life, Land and Water.* Winnipeg.

Burgesse, J. Allen
1949. Esquimaux in the Saguenay. *Primitive Man,* 22(1–2): 23–32.

Butzer, Karl W.
1964. *Environment and Archeology.* Chicago: Aldine.

Byers, Douglas S.
1959. The Eastern Archaic: Some Problems and Hypotheses. *American Antiquity,* 24:233–256.
1962. New England and the Arctic. Pages 143–153, in J. M. Campbell, editor, Prehistoric Cultural Relations between the Arctic and Temperate Zones of North America. *Arctic Institute of North America Technical Publication,* number 11.

Cabot, William B.
1920. *Labrador.* Boston: Gorham Press.

Campbell, John M.
1962. Editor. Prehistoric Cultural Relations between the Arctic and Temperate Zones of North America. *Arctic Institute of North American Technical Paper,* number 11.
1968. Territoriality Among Ancient Hunters: Interpretations from Ethnography and Nature. Pages 1–21, in Betty J. Meggers, editor, *Anthropological Archeology in the Americas.* Anthropological Society of Washington, D. C.

Canadian Hydrographic Service
1965. *The Labrador and Hudson Bay Pilot.* Second Edition. Ottawa: Department of Mines and Technical Surveys.

Cartwright, Sir George
1792. *A Journal of Transactions and Events, During a Residence of Nearly Sixteen Years on the Coast of Labrador.* 3 volumes. London: Newark.

Cary, Austin
1892. Exploration on Grand River, Labrador. *Journal of the American Geographical Society,* 24 (part 1).

Christie, A. M., S. M. Roscoe, and W. F. Fahrig
1953. Preliminary Map of the Central Labrador Coast. *Geological Survey of Canada Paper,* 53–14. Ottawa: Department of Mines and Technical Surveys.

Coachman, Lawrence K.
1953. River Flow and Winter Hydrographic Structure of the Hamilton Inlet-Lake Melville Estuary of Labrador. Blue Dolphin Expedition Report. Unpublished.

Coe, Michael D., and Kent V. Flannery
1964. Microenvironments and Mesoamerican Prehistory. *Science,* 143:650–654.
1967. Early Cultures and Human Ecology in South Coastal Guatemala. *Smithsonian Contributions to Anthropology,* 3.

Coleman, A. P.
1921. Northeastern Part of Labrador and New Quebec. *Geological Survey of Canada Memoir,* 124.

Coleman, J. S.
1937. The Present State of the Newfoundland Seal Fishery. *Journal of Animal Ecology,* 6:145–159.

Collins, Henry B.
1956a. Archaeological Investigations on Southampton and Coats Island, N. W. T. *National Museum of Canada Bulletin,* 142:82–113.
1956b. The T1 Site at Native Point, Southampton Island, N. W. T. *University of Alaska Anthropological Papers,* 4(2)63–89.
1957. Archaeological Investigations on Southampton and Walrus Islands, N. W. T. *National Museum of Canada Bulletin,* 147:22–61.

Conrad, Geoffrey W.
1969. The Lake Melville Project 1968. A Preliminary Report on the Archaeology of the Central Coast of Labrador. BA Thesis. Department of Anthropology, Harvard University.
1970. The Archaeological Potential of Indian House Lake, Quebec. Harvard University. Unpublished.

Cooke, Alan
1964. The Exploration of New Quebec. Pages 137–180, in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution à l'Étude de l'Occupation Humaine.* Mouton Company for École Pratique dés Hautes Études, Sorbonne, Paris.

Cooke, Alan, and F. Caron
1968. Bibliographie de la péninsule de Québec-Labrador. 2 volumes. Boston: G. K. Hall, for Centre d'Études Nordiques, Laval University, Laval, Quebec.

Cooke, Alan, and Clive Holland
1970. Chronological List of Expeditions and Historical Events in Northern Canada. *Polar Record,* 15(95):169–183, and 15(96):317–329.

Crabtree, Don E.
1968. Mesoamerican Polyhedral Cores and Prismatic Blades. *American Antiquity,* 33(4):446–478.

Crantz, David
1820. *The History of Greenland, Including an Account of the Mission Carried on by the United Brethren in that Country, with an Appendix Containing a Sketch of the Mission of the Brethren in Labrador.* 2 volumes. London.

Crisp, D. J.
1965. Observations on the Effects of Climate and Weather on Marine Communities. Pages 63–77, in C. G. Johnson and L. P. Smith, editors, *The Biological Significance of Changing Climates in Britain.* Symposia No. 14 of the Institute of Biology. New York: Academic Press.

Daly, Reginald A.
1902. Geology of the Northeast Coast of Labrador. *Museum of Comparative Zoology Bulletin,* 38: 205–270.

Dansgaard, W., S. J. Johnsen, J. Mollar, and C. C. Langway, Jr.
1969. One Thousand Centuries of Climatic Record from Camp Century on the Greenland Ice Sheet. *Science,* 199(3903):377–381.

Davies, J. L.
1958. Pliestocene Geography and the Distribution of Northern Pinnipeds. *Ecology,* 39(1):97–113.

Davies, W. H. A.
1843. Notes on Eskimo Bay and the Surrounding Country. *Transactions of the Literary and Historical Society of Quebec,* 4:70–94.

Dekin, Albert A.
1969. Paleo-Climate and Prehistoric Cultural Interaction in the Eastern Arctic. Paper presented at the 34th Annual Meeting of the Society for American Archaeology, May 1969. Unpublished.
1970. Paleo-Climate and Paleo-Ecology of the Eastern North American Arctic during its Occupancy by Man (2500 B.C. to date). Paper presented to the Third Annual Meeting of the Canadian Archaeological Association, March 1970. Ottawa. Unpublished.

Derbyshire, E.
1960. Glaciation and Subsequent Changes in Central Quebec-Labrador: A Critical Review. *Geografiska Annaler,* 42:49–61. Stockholm.

Dincauze, Dena F.
1968. Cremation Cemeteries in Eastern Massachusetts. *Papers of the Peabody Museum,* 59(1). Cambridge.

Douglas, G. Vilbert
1953. Notes on Localities Visited on the Labrador Coast in 1946 and 1947. *Geological Survey of Canada Paper,* 53-1. Ottawa: Department of Mines and Technical Surveys.

Dunbar, Maxwell J.
1959. Arctic Marine Zoogeography: Problems of the Pleistocene and Arctic. *McGill University Museums Publication,* number 1:55–61.
1960. The Evolution of Stability in Marine Environments: Natural Selection at the Level of the Ecosystem. *American Naturalist,* 94:129–136.
1966. The Sea Waters Surrounding the Quebec-Labrador Peninsula. *Cahiers de Géographie de Québec,* 19:13–35.
1968. *Ecological Development in Polar Regions: A Case Study in Evolution.* Englewood Cliffs: Prentice-Hall.
1970a. On the Fishery Potential of the Sea Waters of the Canadian North. *Arctic,* 23(3):150–174.
1970b. Marine Ecosystem Development in Polar Regions. Pages 528–534, in J. H. Steele, editor, *Marine Food Chains. Proceedings of a Symposium, Aarhus, Denmark, July, 1968.* Berkeley: University of California Press.
1970c. The Scientific Significance of the Circumpolar Region, and its Flora and Fauna. In W. A. Fuller and P. G. Kevan, editors, Productivity and Conservation in Northern Circumpolar Lands: A Symposium. *International Union for Conservation of Nature and Natural Resources Publication,* new series, number 16:71–77. Morges, Switzerland.

Ellis, M. B. H.
1908. *A Woman's Way Through Unknown Labrador: An Account of the Exploration of the Nascaupee and George Rivers.* London.

Elton, Charles S.
1942. *Voles, Mice, and Lemmings.* Oxford: Clarendon Press.

Emslie, R. F.
1968. The Geology of the Michikamau Intrusion. Labrador (13L, 23I). *Geological Survey of Canada Paper,* 68–57. Ottawa: Department of Mines and Technical Surveys.

Espmark, Yngve
1970. Abnormal Migratory Behavior in Swedish Reindeer. *Arctic,* 23(3):199–200.

Fairbridge, Robert W.
1961. Eustatic Changes in Sea Level. Volume 4: 99–185, in L. H. Ahrens, et al., editors, *Physics and Chemistry of the Earth.* New York: Pergamon Press.

Feit, Harvey A.
1969. Mistassini Hunters of the Boreal Forest. MA Thesis, McGill University, Montreal, Canada.

Fernald, M. L.
1925. Persistence of Plants in Unglaciated Areas of Boreal America. *American Academy of Arts and Sciences,* 15(3):237. Memoir of the Gray Herbarium of Harvard University II. Cambridge.

Fitzhugh, William W.
1967. Environmental Analysis in Air-Photo Archaeology. Peabody Museum Library, Harvard University. Unpublished.
1968. The Dorset-Thule Transition. Peabody Museum Library, Harvard University. Unpublished.
1969a. Archaeological Reconnaissance in Hamilton Inlet, Labrador: A Preliminary Report, 39 pages. National Museum of Canada, Ottawa. Unpublished.
1969b. The Concept of Laurentian in Northeastern Archaeology. Peabody Museum, Harvard Unisity. Unpublished.
1969c. Prehistoric Labrador: Archaeology Opens a New Frontier. *Science Forum,* 1969 (December): 31–34. University of Toronto Press.

Flannery, Regina J.
1939. An Analysis of Coastal Algonquian Culture. *Catholic University of America Anthropological Series,* number 7. Washington: Catholic University of America Press.

Forbush, William B.
1930. *Pomiuk: A Waif of Labrador.* Boston: Pilgrim Press.

Freeman, Milton, M. R.
1967. An Ecological Study of Mobility and Settlement Patterns Among the Belcher Island Eskimo. *Arctic,* 20(3):154–175.
1970. Studies in Maritime Hunting, I: Ecological and Technologic Restraints on Walrus Hunting, Southampton Island, N.W.T. *Folk,* 11–12:155–171.

Fuller, W. A., and P. G. Kevan, editors
1970. Productivity and Conservation in Northern Circumpolar Lands: A Symposium. *International Union for Conservation of Nature and Natural Resources Publication,* new series, number 16. Morges, Switzerland.

Giddings, James L.
1966. Cross-Dating the Archaeology of Northwestern Alaska. *Science,* 153(3732): 127–135.

Gordus, Adon A., Gary A. Wright, and James B. Griffin
1968. Obsidian Sources Characterized by Neutron-Activation Analysis. *Science,* 161:382–384.

Gosling, W. G.
1910. *Labrador: Its Discovery, Exploration and Development.* New York: John Lane Company.

Gray, James T.
1969. Glacial History of the Eastern Mealy Mountains, Southern Labrador. *Arctic,* 22(2):106–111.

Grayson, J. F.
1956. The Post-Glacial History of Vegetation and Climate in the Labrador-Quebec Region as Determined by Palynology. PhD Thesis, University of Michigan, Ann Arbor. Unpublished.

Hallowell, A. Irving
1929. The Physical Characteristics of the Indians of Labrador. *Journal de la Societé des Americanistes de Paris,* new series, 21:337–371.

Hantzsch, Bernhard A.
1930. Eskimo Stone Graves in Northeastern Labrador and the Collection of Anthropological Material from Them. *Canadian Field Naturalist,* 44(8): 180–182. (Translation by M. B. A. Anderson.)
1931–1932. Contributions to the Knowledge of Extreme Northeastern Labrador. *Canadian Field Naturalist,* volumes 45–46, serialized. (Translation by M. B. A. Anderson.)

Hare, F. Kenneth
1950. Climate and Zonal Divisions of the Boreal Forest Formation in Eastern Canada. *Geographical* Review, 40:615–635.
1959. A Photo-Reconnaissance Survey of Labrador-Ungava. *Geographical Branch, Department of Mines and Technical Resources Memoir,* 6. Ottawa.
1966. Recent Climatological Research in Labrador-Ungava. *Cahiers de Géographie de Québec,* 19: 5–12.

Hare, F. Kenneth, and M. R. Montgomery
1949. Ice, Open Water, and Winter Climate in the Eastern Arctic of North America, Part II. *Arctic,* 2(3):149–164.

Harp, Elmer, Jr.
1951. An Archaeological Survey in the Strait of Belle Isle Area. *American Antiquity,* 16(3):203–220.
1961. The Archaeology of the Lower and Middle Thelon, Northwest Territories. *Arctic Institute of North America Technical Paper,* 8. Montreal.
1963. Evidence of Boreal Archaic Culture in Southern Labrador and Newfoundland. *National Museum of Canada Bulletin,* 193:184–261. Ottawa.
1964. The Cultural Affinities of the Newfoundland Dorset Eskimo. *National Museum of Canada Bulletin,* 200. Ottawa.
1966. The Application of Advanced Air-Photo Technology and Interpretation to a Problem in Arctic Archaeology. National Science Foundation grant proposal. Unpublished.
1968a. Optimum Scales and Emulsions in Air Photo Archaeology. *Proceedings of the VIIIth International Congress of Anthropological and Ethnological Sciences, 1968, Tokyo and Kyoto,* 3:163–165.
1968b. Anthropological Interpretation from Color. Pages 384–385, in J. T. Smith, editor, *Manual of Color Aerial Photography, American Society of Photogrammetry Publication.*
n.d. The Prehistoric Eskimo and Indian Cultures of Labrador and Newfoundland. *Proceedings of the VIIth International Congress of Anthropological and Ethnological Sciences, Moscow, 1964.* In press.

Harp, Elmer, Jr., and David Hughes
1968. Five Prehistoric Burials from Port Aux Choix, Newfoundland. *Polar Notes, Occasional Publi-*

cation of the Stefansson Collection, 8:1–47. Dartmouth College, Hanover.

Harper, Francis

1961. Changes in Climate, Faunal Distribution, and Live Zones in the Ungava Peninsula. *Polar Notes, Occasional Publication of the Stefansson Collection,* 3:20–40. Dartmouth College, Hanover.

1964. Plant and Animal Associations in the Interior of the Ungava Peninsula. *University of Kansas Museum of Natural History Miscellaneous Publication,* 38.

Hawkes, Edward W.

1916. The Labrador Eskimo. *Department of Mines and Geological Survey Memoir,* 91. Ottawa.

Helm, June

1969. Remarks on Methodology of Band Composition Analysis. In D. Damas, editor, Contributions to Anthropology. *National Museums of Canada Bulletin,* 228:212–217.

Henriksen, Georg

1969. The Naskapi Indians on the Edge of the White Man's World. MA Thesis, University of Bergen.

Hiller, J. K.

1967. The Establishment and Early Years of the Moravian Missions in Labrador, 1752–1805. MA Thesis, Memorial University, St. John's Newfoundland.

Hind, Henry Y.

1963. *Explorations in the Interior of the Labrador Peninsula: The Country of the Montagnais and Nasquapee Indians.* 2 volumes. London: Longman, Green, Longman, Roberts, & Green.

Hoffman, Bernard G.

1952. Implications of Radiocarbon Datings for the Origin of Dorset Culture. *American Antiquity,* 18(1):15–17.

1961. *Cabot to Cartier: Sources for an Historical Ethnography of Northeastern North America, 1497–1550.* Toronto: University of Toronto Press.

Holme, Randle F.

1888. A Journey into the Interior of Labrador, July to October 1887. *Proceedings of the Royal Geographical Society,* 10:189–205. London.

Howley, J. P.

1915. *The Beothucks or Red Indians.* Cambridge, England.

Hubbard, Mrs. Leonidas (See M. B. H. Ellis.)

Hustich, Ilmari

1949. Phytogeographical Regions of Labrador. *Arctic,* 2(1):36–42.

1951. The Lichen Woodlands in Labrador and Their Importance as Winter Pastures for Domesticated Reindeer. *Acta Geographica,* 12(1):1–48.

Hutchinson, G. E.

1959. Homage to Santa Rosalia. *The American Naturalist,* 93:145–159.

Ingstad, Anne Stine

1970. The Norse Settlement at L'Anse Aux Meadows, Newfoundland: A Preliminary Report from the Excavations, 1961–1968. *Acta Archaeologica,* 41: 109–154.

Irving, William N.

1957. An Archaeological Survey of the Susitna Valley. *Anthropological Papers of the University of Alaska,* 6(1):37–52.

1968. The Barren Grounds. Pages 26–54, in C. S. Beals and D. A. Shenstone, editors, *Science, History and Hudson Bay.* Ottawa: Department of Energy, Mines and Resources.

Ives, J. D.

1960. The Deglaciation of Labrador-Ungava: An Outline. *Cahiers de Géographie de Québec,* 8:123–134.

Jenness, Diamond

1925. A New Eskimo Culture in Hudson Bay. *The Geographical Review,* 15(3):428–437.

1929. Notes on the Beothuk Indians of Newfoundland. *Department of Mines, Technical Report for 1927 Bulletin,* 56:36–39. Ottawa.

1965. Eskimo Administration, III: Labrador. *Arctic Institute of North America, Technical Publication,* 16. Montreal.

Johnson, Frederick

1948. The Rogers' Collection from Lakes Mistassini and Albanel, Province of Quebec. *American Antiquity,* 14(2):91–98.

Jones, Gwyn

1968. *A History of the Vikings. London*: Oxford University Press.

Junek, O. W.

1936. Blanc Sablon: A Study of an Isolated Labrador Community. *Journal of the Royal Society of Arts,* 84:1245–1260. London.

Kelsall, John P.

1968. The Migratory Barren Ground Caribou of Canada. *Canadian Wildlife Service Monograph,* 3. Ottawa.

Kidder, Alfred V.

1927. Eskimos and Plants. *Proceedings of the National Academy of Science,* 13:74–75.

Kindle, Edward M.

1924. Geography and Geology of Lake Melville District, Labrador Peninsula. *Geological Survey of Canada Memoir,* 141. Ottawa: Department of Mines.

Kleivan, Helge

1966. The Eskimos of Northeast Labrador: A History of Eskimo-White Relations, 1771–1955. *Norsk Polarinstitutt Skrifter,* 139. Oslo.

Kluckhohn, Clyde

1941. Patterning as Exemplified in Navajo Culture. Pages 109–130, in L. Spier, A. I. Hallowell, and S. S. Newman, editors, *Language, Culture and Personality: Essays in Memory of Edward Sapir.* Menasha.

Kohlmeister, Benjamin, and Georg Kmoch

1814. *Journal of a Voyage from Okkak, on the Coast* of *Labrador, to Ungava Bay, Westward of Cape Chudleigh*. London.

Kranck, E. H.

1953. Bedrock Geology of the Seaboard of Labrador Between Domino Run and Hopedale, Newfoundland. *Geological Survey of Canada Bulletin,* 26. Ottawa.

Krantz, G. S.

1970. Human Activities and Megafaunal Extinction. *American Scientist,* 58(2):164–170.

Lamb, H. H., R. P. W. Lewis, and A. Woodroffe

1966. Atmospheric Circulation and the Main Climatic Variables. Pages 174–217, in *Proceedings of the International Symposium on World Climate 8000–0 B.C.* London: Royal Meteorological Society.

Larsen, Helge, and Jorgen Meldgaard

1958. Paleo-Eskimo Cultures in Disko Bugt, West Greenland. *Meddelelser om Grønland* Band 161:2. Copenhagen.

Leacock, Eleanor

1969. The Montagnais-Naskapi Band. In David Damas, editor, Contributions to Anthropology: Band Societies. *National Museums of Canada Bulletin,* 228:1–17. Ottawa.

Le Cren, E. D., and M. W. Holdgate

1962. *The Exploitation of Natural Animal Populations.* Oxford: Blackwell Science Publications.

Lee, Richard B.

1969. !Kung Bushmen Subsistence: An Input-Output Analysis. In David Damas, editor, Contributions to Anthropology: Ecological Essays. *National Museums of Canada Bulletin,* 230:73–94. Ottawa.

Lee, Richard B., and I. DeVore, editors

1968. Problems in the Study of Hunters and Gatherers. Pages 3–12, in *Man the Hunter.* Chicago: Aldine.

Leechman, Douglas

1943. Two New Cape Dorset Sites. *American Antiquity,* 8(4):363–375.

Levesque, R., F. Fritz Osborne, and J. V. Wright

1964. Le Gisement de Batiscan. *National Museum of Canada Anthropological Papers,* number 6.

Lips, Julius E.

1947. Notes on Montagnais-Naskapi Economy. *Ethnos,* 12(1–2):1–78.

Lloyd, T. G. B.

1874. Notes on Indian Remains Found on the Coast of Labrador. *Journal of the Royal Anthropological Institute of Great Britain and Ireland,* 4:39–44.

Loughrey, A. G.

1959. Preliminary Investigation of the Atlantic Walrus *Odobenus rosmarus rosmarus* (Linnaeus). *Canadian Wildlife Service Management Bulletin,* series 1, 14.

Low, Albert P.

1896. Reports on Explorations in the Labrador Peninsula Along the East Main, Koksoak, Hamilton, Manicouagan, and Portions of Other Rivers in 1892–93–94–95. *Geological Survey of Canada Annual Report 1895,* 8(part L):1-387. Ottawa.

MacArthur, Robert

1955. Fluctuations in Animal Populations and a Measure of Community Stability. *Ecology,* 36 (3):533–536.

MacDonald, George F.

1968. Debert: A Palaeo-Indian Site in Central Nova Scotia. *National Museum of Canada Anthropological Paper,* 16. Ottawa.

McGee, John T.

1961. Cultural Stability and Change Among the Montagnais Indians of the Lake Melville Region of Labrador. *Catholic University of America Press, Anthropological Series,* 19. Washington.

McGhee, Robert

1970. Speculations on Climatic Change and Thule Culture Development, *Folk,* 11–12: 173–184.

MacKay, Ian A.

1956. Forest Types of the Kenamu-Kenemich Drainage Basin, Labrador: An Interpretation of Cover Types from an Aerial Photography Mosaic. Unpublished Thesis, McGill University, Montreal.

McLaren, Ian A.

1958a. The Biology of the Ringed Seal in the Eastern Canadian Arctic. *Fisheries Research Board of Canada Bulletin,* 18.

1958b. The Economics of Seals in the Eastern Canadian Arctic. *Fisheries Research Board of Canada Arctic Unit Circular,* 1.

1961. Methods of Determining the Numbers and Availability of Ringed Seals in the Eastern Canadian Arctic. *Arctic,* 14(3):162–175.

1962. Population Dynamics and Exploitation of Seals in the Eastern Arctic. Pages 168–183, in E. D. Le Cren and M. W. Holdgate, editors, *The Exploitation of Natural Animal Populations.* Oxford: Blackwell Science Publications.

McLean, John

1932. *Notes of Twenty-Five Years Service in the Hudson Bay Territory.* W. S. Wallace, editor. 2 volumes. Toronto.

MacLeod, Donald

1967. A Red Paint Burial Site in Northeastern Newfoundland. Paper presented to the 32nd Annual Meeting of the Society for American Archaeology, Ann Arbor.

Mailhot, José, and Andrée Michaud

1965. North West River: Étude ethnographique. *Divers Traveaux,* number 7. Centre d'Études Nordiques, Laval Université, Laval, Quebec.

Malaurie, J.

1964. Preface. Pages 9–29, in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution à l'Étude de l'Occupation Humaine.* Mouton

Company for École Pratique des Hautes Études, Sorbonne, Paris.

Manley, G.
1955. A Climatological Survey of the Retreat of the Laurentide Ice Sheet. *American Journal of Science,* 253:256–273.

Mansfield, A. W.
1963. Seals of Arctic and Eastern Canada. *Fisheries Research Board of Canada Bulletin,* 137.

Martijn, Charles A., and Edward S. Rogers
1969. Mistassini-Albanel. Contributions to the Prehistory of Quebec. *Traveaux Divers,* 25. Centre D'Études Nordiques, Laval Université, Laval, Québec.

Mathiassen, Therkel
1927. Archaeology of the Central Eskimo. *Report of the Fifth Thule Expedition 1921–1924,* 4 (parts 1–2). Copenhagen.
1934. Contributions to the Archaeology of Disko Bay. *Meddelelser om Grønland,* 93(2). Copenhagen.
1958. The Sermermiut Excavations 1955. *Meddelelser om Grønland,* 161(3) Copenhagen.

Matthews, Barry
1967. Late Quaternary Land Emergence in Northern Ungava, Quebec. *Arctic,* 20(3):176–202.

Meldgaard, Jorgen
1960. Prehistoric Culture Sequences in the Eastern Arctic as Elucidated in Stratified Sites at Igoolik. Pages 588–595, in A. Wallace, editor, *Selected Papers of the Fifth International Congress of Anthropological and Ethnological Sciences.* Philadelphia.
1961. Fra Brattalid til Vinland, *Naturens Verden,* 353–385. Copenhagen.
1962. On the Formative Period of the Dorset Culture. In J. M. Campbell, editor, Prehistoric Cultural Relations between Arctic and Temperate Zones. *Arctic Institute of North America Technical Publication,* 11:92–95.

Moore, Omar K.
1957. Divination—A New Perspective. *American Anthropologist,* 59:69–74.

Moorehead, Warren K.
1922. *A Report on the Archaeology of Maine.* Andover: Department of Archaeology, Phillips Academy.

Morrison, Allistair
1963. Landform Studies in the Middle Hamilton River Area, Labrador. *Arctic,* 16(4):272–275.
1970. Pollen Diagrams from Interior Labrador. *Canadian Journal of Botany,* 48:1957–1975.

Nelson, Richard K.
1969. *Hunters of the Northern Ice.* Chicago: University of Chicago Press.

Nichols, Harvey
1967. Pollen Diagrams from Sub-Arctic Central Canada. *Science,* 155(3770):1665–1668.

Noble, William C.
1971. Archaeological Surveys and Sequences in Central District Mackenzie, N.W.T. *Arctic Anthropology,* 8(1):102–135.

Nutt, David C.
1951. The Blue Dolphin Labrador Expeditions, 1949, 1950. *Arctic,* 4(1):3–11.
1953. Certain Aspects of Oceanography in the Coastal Waters of Labrador. *Journal of the Fisheries Research Board of Canada,* 10(4):177–186.
1963. Fjords and Marine Basins of Labrador. *Polar Notes, Occasional Publication of the Stefansson Collection,* 5:9–23. Dartmouth College.

Odell, N. E.
1938. The Geology and Physiography of Northernmost Labrador. In A. Forbes, editor, Northernmost Labrador Mapped from the Air. *American Geographical Society Special Publication,* 22. New York.

Odum, Eugene P.
1963. *Ecology.* New York: Holt, Rinehart & Winston.

Packard, Alphaeus S.
1885. Notes on the Labrador Eskimo and their Former Range Southward. *The American Naturalist,* 19:471–481, 533–560.

Paterson, T. T.
1939. Anthropogeographical Studies in Greenland. *Journal of the Royal Anthropological Institute of Great Britain and Ireland,* 69:45–76. London.

Periodical Accounts
1790–1958. *Relating to the Missions of the Church of the United Brethren, Established among the Heathen.* London: Bethlehem.

Pitelka, Frank A.
1957. Some Aspects of Population Structure in the Short-Term Cycle of the Brown Lemming in Northern Alaska. *Cold Spring Harbor Symposium on Quantitative Biology,* 22:237–251.

Pruitt, William O.
1960. Behavior of the Barren Ground Caribou. *University of Alaska Biological Paper,* 3.

Rappaport, Roy A.
1969. Some Suggestions Concerning Concept and Method in Ecological Anthropology. In D. Damas, editor, Contributions to Anthropology: Ecological Essays. *National Museum of Canada Bulletin,* 230:184–188. Ottawa.

Renfrew, Colin, J. E. Dixon, and J. R. Cann
1966. Obsidian and Early Cultural Contact in the Near East. *Proceedings of the Prehistoric Society,* 32:30–72.

Ridley, Frank
1954. The Frank Bay Site, Lake Nipissing, Ontario. *American Antiquity,* 20:40–50.

Ritchie, William A.
1968. The KI Site, the Vergennes Phase, and the Laurentian Tradition. *New York State Archaeological Bulletin,* 4:1–5.

1969. *The Archaeology of New York State*. 2nd edition. New York: Natural History Press.

Robinson, G.
1897. *Ice-riding Pinnipedes: A Description of the Migration and Peculiarities of the* Phoca groenlandica *and* Cystophora crista. London.

Rogers, Edward S.
1963. Notes on Lodge Plans in the Lake Indicator Area of South-Central Quebec. *Arctic,* 16(4): 219–227.
1964. The Eskimo and Indian in the Quebec-Labrador Peninsula. Pages 211–250, in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution á l'Étude de l'Occupation Humaine.* Mouton Company for École Pratique des Hautes Études, Sorbonne, Paris.
1967. The Material Culture of the Mistassini. *National Museum of Canada Bulletin,* 218. Ottawa.
1969. The Naskapi. *The Beaver,* outfit 300:40–43. Winnipeg.

Rogers, Edward S., and R. A. Bradley
1953. An Archaeological Reconnaissance in South-Central Quebec, 1950. *American Antiquity,* 19(2):138–144.

Rogers, Edward S., and Jean H. Rogers
1959. The Yearly Cycle of the Mistassini Indians. *Arctic,* 12(3):130–138.

Rogers, Edward S., and Murray M. Rogers
1948. Archaeological Reconnaissance of Lake Mistassini and Albanel, Province of Quebec, 1947. *American Antiquity,* 14(2):81–90.
1950. Archaeological Investigations in the Region Around Lakes Mistassini and Albanel, Province of Quebec, 1948. *American Antiquity,* 15(4): 322–337.

Rouse, Irving
1960. The Classification of Artifacts in Archaeology. *American Antiquity,* 25(3):313–323.

Rousseau, Jean
1948. The Vegetation of Life Zones of the George River, Eastern Ungava, and the Welfare of the Natives. *Arctic,* 1:93–96.
1952. Les zones biologiques de péninsule Québec-Labrador et l'hémiarctique. *Canadian Botanist,* 30:436–474.
1964. Coupe biogéographique et ethnographique de la péninsule Québec-Labrador. Pages 29–94 in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution a l'Étude de l'Occupation Humaine.* Mouton Company for École Pratique des Hautes Études, Sorbonne, Paris.

Rowley, Graham
1940. The Dorset Culture of the Eastern Arctic. *American Anthropologist,* 42(3):490–499.

Sahlins, Marshall D.
1961. The Segmentary Lineage: An Organization for Predatory Expansion. *American Anthropologist,* 63:322–345.

Sanger, David
1968. The High River Microblade Industry, Alberta. *Plains Anthropologist,* 13(41):190–208.

Sapir, Edward
1916. Time Perspective in Aboriginal American Culture: A Study in Method. *Canadian Geological Survey Memoir,* 90, Anthropological Series 13. Ottawa.

Sauer, Carl O.
1968. *Northern Mists.* Berkeley: University of California Press.

Schledermann, Peter
1971. The Thule Tradition in Northern Labrador. MA Thesis for the Department of Anthropology, Memorial University, St. John's, Newfoundland.

Scholl, D. W., Frank C. Craighead, and Minze Stuiver
1969. Florida Submergence Curve Revised: Its Relations to Coastal Sedimentation Rates. *Science,* 163:562–564.

Scotter, G. W.
1964. Effects of Forest Fires on the Winter Range of Barren Ground Caribou in Northern Saskatchewan. *Wildlife Management Bulletin Series,* 1:18.

Semenov, S. A.
1964. *Prehistoric Technology.* Translated by M. W. Thompson. Chatham, Kent: W. & J. MacKay and Company.

Sergeant, David E.
1961. *Whales and Dolphins of the Canadian East Coast.* Montreal: Fisheries Research Board of Canada, Arctic Unit Circular. Montreal.
1962. The Biology and Hunting of Beluga or White Whale in the Canadian Arctic. *Fisheries Research Board of Canada, Arctic Unit Circular* 8. Montreal.
1965. Migrations of Harp Seals *Pagophilus groenlandicus* (Erxleben) in the Northwest Atlantic. *Journal of the Fisheries Research Board of Canada,* 22(2):433–464.

Shelford, Victor E., and Sigurd Olson
1935. Sere, Climax and Influent Animals with Special Reference to Transcontinental Forests of North America. *Ecology,* 16(3):375–402.

Slobodkin, Lawrence B.
1961. *Growth and Regulation of Animal Populations.* New York: Holt, Rinehart & Winston.

Slobodkin, Lawrence B., and Howard L. Sanders
1969. On the Contribution of Environmental Predictability to Species Diversity. In *Diversity and Stability in Ecological Systems: Brookhaven Symposia in Biology,* number 22:82–95. Upton: Biology Department, Brookhaven National Laboratory.

Smith, B. L.
1948. An Analysis of the Maine Cemetery Complex. *Bulletin of the Massachusetts Archaeological Society,* 9:(2-3):19–71.

Speck, Frank G.
1926. Culture Problems in Northeastern North America. *American Philosophical Society Proceedings,* 65(4):272–311.
1931. Montagnais-Naskapi Bands and Early Eskimo Distribution in the Labrador Peninsula. *American Anthropologist,* 33:557–600.
1935. *Naskapi: The Savage Hunters of the Labrador Peninsula.* Norman: University of Oklahoma Press
1936. Inland Eskimo Bands of Labrador. Pages 313–330, in R. H. Lowie, editor, *Essays Presented to A. L. Kroeber.*

Stearns, Winfrid A.
1884. *Labrador: A Sketch of Its Peoples, Its Industries and Its Natural History.* Boston: Lee and Shepard.

Steele, J. H., editor
1970. Marine Food Chains. *Proceedings of Symposium, Aarhus, Denmark, July 1968.* Berkeley: University of California Press.

Stevenson, I. M.
1967. Goose Bay Map Area, Labrador. *Geological Survey of Canada Paper,* 67–33. Department of Mines and Technical Surveys, Ottawa.

Steward, Julian S.
1955. *The Theory of Culture Change.* Urbana: University of Illinois Press.

Stewart, T. Dale
1939. Anthropometric Observations on the Eskimos and Indians of Labrador. *Field Museum of Natural History Anthropology Series,* 31(1):1–163. Chicago.

Strong, William D.
1930a. A Stone Culture from Northern Labrador and Its Relation to the Eskimo-like Cultures of the Northeast. *American Anthropologist,* 32:126–144.
1930b. Notes on the Mammals of the Labrador Interior. *Journal of Mammalogy,* 11:1–10.

Struever, Stuart
1968. Problems, Methods and Organization: A Disparity in the Growth of Archaeology. Pages 131–151, in Betty J. Meggers, editor, *Anthropological Archeology in the Americas.* Washington, D.C.: Anthropological Society of Washington, D.C.

Tanner, Vaino
1944. Outlines of the Geography, Life and Customs of Newfoundland-Labrador. *Acta Geographica Fenniae,* 8 (1, parts 1,2). Helsinki.

Taylor, J. Garth
1968. An Analysis of the Size of Eskimo Settlements on the Coast of Labrador During the Early Contact Period. PhD Dissertation, University of Toronto, Canada.
1969. William Turner's Journeys to the Caribou Country with the Labrador Eskimos in 1780. *Ethnohistory,* 16(2):141–164.
1970. Structure of Early Contact Labrador Eskimo Social Units. *Verhandlungen des XXXVIII Internationalen Amerikanistenkongreses,* Stuttgart-Munchen, Band II: 251–255.

Taylor, Walter W.
1948. A Study of Archaeology. *American Anthropological Association Memoir,* 69.

Taylor, William E., Jr.
1959a. Review and Assessment of the Dorset Problem. *Anthropologica,* 1(1–2):24-46.
1959b. The Mysterious Sadlermiut. *The Beaver,* outfit 290 (winter 1959):26–33. Winnipeg.
1963. Hypotheses on the Origin of Canadian Thule Culture. *American Antiquity,* 28(4):456–464.
1964. The Prehistory of the Quebec-Labrador Peninsula. Pages 181–210, in J. Malaurie and J. Rousseau, editors, *Le Nouveau-Québec: Contribution á l'Étude de l'Occupation Humaine.* Mouton Company for École Pratique des Hautes Études, Sorbonne, Paris.
1968. The Arnapik and Tyara Sites: An Archaelogical Study of Dorset Culture Origins. *Society for American Archaeology Memoir,* 22.

Templeman, W.
1966. Marine Resources of Newfoundland. *Fisheries Research Board of Canada Bulletin,* 154.

Templeman, W., H. J. Squires, and A. M. Fleming
1957. Nematodes in the Fillets of Cod and Other Fishes in Newfoundland and Neighboring Areas. *Journal of the Fisheries Research Board of Canada,* 14(6):831–897.

Terasmae, Jean
1961. Late Quaternary Climatic Changes in Canada. *Annals of the New York Academy of Science,* 95(1):658–675.

Thwaites, Reuben G., editor
1897. *The Jesuit Relations and Allied Documents.* 74 volumes. Cleveland: The Burrows Brothers Company.

Tuck, James A.
1970. An Archaic Indian Cemetery in Newfoundland. *Scientific American,* 222(6):112–121.

Tucker, Ephriam W.
1839. *Five Months in Labrador and Newfoundland During the Summer of 1938.* Concord: I. S. Boyd and W. White.

Turner, Lucien
1894. Ethnology of the Ungava District, Hudson Bay Territory. *Annual Report of the Bureau of American Ethnology,* 11:159–350.

UNESCO
1970. *Ecology of the Subarctic Regions: A Symposium, Helsinki, July-August 1966.* Paris: UNESCO.

Vayda, Andrew P., and Roy A. Rappaport
1968. Ecology: Cultural and Noncultural. Pages 477–497, in J. A. Clifton, editor, *Introduction to Cultural Anthropology.* Englewood: Prentice-Hall.

Vibe, Christian
1967. Arctic Animals in Relation to Climatic Fluctuations. *Meddelelser om Grønland,* 170:5. Copenhagen.
1970. The Arctic Ecosystem Influenced by Fluctuations in Sun-Spots and Drift-Ice Movements. Pages 115–120, in W. A. Fuller and P. G. Kevan, editors, Productivity and Conservation in Northern Circumpolar Lands: A Symposium, Edmonton, Alberta, 15–17 October 1969. *International Union for Conservation of Nature and Natural Resources Publications,* new series, number 16. Morges, Switzerland.

Voorhis, E.
1930. *Historic Forts and Trading Posts of the French Regime and of the English Fur Trading Companies.* Ottawa: Natural Resources Intelligence Service, Department of the Interior.

Wallace, Dillon
1905. *The Lure of the Labrador Wild: The Story of the Exploring Expedition Conducted by Leonidas Hubbard, Jr.* New York: Fleming H. Revell Company.
1907. *The Long Labrador Trail. New York:* The Outing Publishing Company.

Weil, Gary
1971. The Biological Consequences of Acculturation: A Study of the Eskimos of Northern Labrador. BA Thesis, Department of Anthropology, Harvard University.

Wenner, Carl G.
1947. Pollen Diagrams from Labrador. *Geografiska Annaler,* 29(3–4):137–373. Stockholm.

Wheeler, E. P.
1930. Journeys about Nain: Winter Hunting with the Labrador Eskimo. *Geographical Review,* 20: 454–468.
n.d. Report on Northern Labrador Geology. Unpublished Manuscript, British-Newfoundland Exploration Company, North West River, Labrador.

White, James
1926. *Forts and Trading Posts in Labrador Peninsula and Adjoining Territory.* Ottawa: Restricted Distribution. Copy at Library of the University of Texas.

Willey, Gordon R., and Philip Phillips
1958. *Method and Theory in American Archaeology.* Chicago: University of Chicago Press.

Willoughby, Charles
1935. *Antiquities of the New England Indians.* Cambridge: Peabody Museum, Harvard University.

Wilmsen, Edwin N.
1968. Paleo-Indian Site Utilization. Pages 22–40, in Betty J. Meggers, editor, *Anthropological Archeology in the Americas.* Washington, D.C.: Anthropological Society of Washington, D.C.

Wintemberg, William J.
1930. Review of W. D. Strong: A Stone Culture from Labrador and Its Relation to the Eskimo-like Cultures of the Northeast. *Geographical Review,* 20:673.
1939. Eskimo Sites of the Dorset Culture in Newfoundland, Part 1. *American Antiquity,* 5:83–102.
1940. Eskimo Sites of the Dorset Culture in Newfoundland, Part 2. *American Antiquity,* 5(4): 309–333.

Winters, Howard D.
1969. The Riverton Culture. *Illinois State Museum Reports of Investigations,* number 13.

Wright, James V.
1968. The Boreal Forest. Pages 55–68, in C. S. Beals, editor, *Science, History and Hudson Bay.* Ottawa: Department of Energy, Mines and Resources.
1970. The Shield Archaic in Manitoba: A Preliminary Statement. Pages 29–45, in W. M. Hlady, editor. *Ten Thousand Years: Archaeology in Manitoba.* Manitoba Archaeological Society.

Appendix 1

BRIEF HISTORY OF HAMILTON INLET

The history of Hamilton Inlet is largely unknown. This appendix summarizes the available data, which comes from several sources. The most complete treatment of the earlier periods is found in Gosling (1910). Other important sources are A. P. Low (1896), J. White (1926), E. Voorhis (1930), V. Tanner (1944), A. Cooke (1964), B. Hoffman (1961), D. Jenness (1965), and Hiller (1967). Of these, White and Voorhis are listings of trade routes and forts; Cooke summarizes the history of the peninsula. Hoffman deals with the discovery era between Cabot and Cartier, Hiller with the early Moravian Mission, and Jenness considers early contact and Eskimo administration.

The first European contact in Labrador appears to have come with the Viking voyages. The following summary is taken from G. Jones (1968). In A.D. 986 Bjarne Herjolfsson, sailing from Iceland to Greenland, was blown off course and discovered Labrador (Markland) and Newfoundland (Vinland) before making his way to his destination. Leif Eriksson sailed from Greenland about A.D. 1000 to explore these lands and overwintered there, probably in Newfoundland. Leif was followed shortly by Thorvald Eriksson. Thorvald sailed Leif's route to Vinland; then the party split, some exploring down the west coast of Newfoundland, while Thorvald traveled up the coast where he may have discovered Hamilton Inlet. If so, Thorvald was the first European to enter the inlet, which he may have penetrated as far west as the English River. This location has been suggested because the saga reports Thorvald's visit to a river flowing east to west, and the English River is the only one of this kind on the coast. In addition, there is an admirable harbor at the river mouth suitable for an anchorage. Here Thorvald discovered natives, and in the ensuing hostilities he was wounded by an Indian arrow and died. His burial, probably somewhere in this region, has not been found.

The major voyage to the west was made by Thorfinn Karlsefni a few years later. Intending to make a permanent settlement, Karlsefni set out for Vinland with men, women, and cattle. The sagas differ in regard to the location of the Karlsefni settlement in Vinland. It appears that the group remained there for three years during which rivalry within the party and hostilities with the Skraelings forced Karlsefni to retreat. Several other voyages to Vinland and Markland (Labrador) may have been made, but the last documented voyages seem to have been completed by A.D. 1020. The L'Anse aux Meadows site discovered by the Norwegian, Helge Ingstad, in northern Newfoundland probably dates one of these voyages, perhaps the Karlsefni expedition (Ingstad 1970).

Rediscovery of Labrador may have occurred during the 15th century when Basque and Bristol fishermen discovered rich fishing grounds off Newfoundland and Labrador (Sauer 1968). Documented voyages begin with the Cabots (1497, 1498, 1508), and Gaspar and Miguel Corte Real (1500, 1501, 1502). By 1510 the coast seems to have been fairly well known according to Gosling, who bases his judgment on the number of maps and place names from this period. Also, around 1504 the settlement of Brest was emplaced in southern Labrador (Low 1896). Brest seems to have been a small seasonal fishing settlement, and not a "city" as some have claimed. Gosling believes its location to have been at Old Fort Bay and not at Bradore. The Bradore ruins belong to Courtemanche's Fort Pontchartrain, which was established after 1702.

During the 17th century several important voyages are recorded. Following Cartier's explorations in 1532–1535 (Hoffman 1961), Martin Frobisher investigated the Hudson Strait area in 1577, and John Davis searched for the North West passage in 1586–1587. Besides describing an inlet at 56° N, which may have been Davis Inlet, he noted the entrance to a large inlet at 54° 30′ N which he did not enter, but which seems to have been Hamilton Inlet. Eight leagues to the south he was attacked by "brutish people" with bows and arrows. This may have been in Sandwich Bay.

Other voyages followed in the 17th century, but no settlements are reported. Captain George Weymouth investigated an inlet at latitude 56° N, which must have been Hamilton Inlet, and in 1606 John Knight explored the same area, where two of his sailors were killed by Eskimos. While the natives encountered by Davis in 1585 could have been either Indians or Eskimos, Knight's description assures us that Eskimos were in Hamilton Inlet by 1606.

The first documented settlement of Labrador by Europeans came with Courtemanche's establishment of a trading concession in 1702. At this time Fort Pontchartrain was built at Bradore. By then the southern Eskimos are reported as having firearms. From this time until 1763, when the land was ceded to the English, the French controlled the Labrador trade market. During this period the first settlement of Hamilton Inlet occurred. Violence between Indian and Eskimo continued, with the French supplying the Indians with arms.

In 1729, an American whaler named Captain Atkins encountered Eskimos in what was probably Hamilton Inlet. They had no firearms, traded whalebone (baleen), and had had little contact with Europeans. With the return of Labrador to English control in 1763 an attempt was made to quell the disturbances, and at the behest of Governor Hugh Palliser of Newfoundland a peace treaty was arranged between the Indians and Eskimos by Jens Haven in 1765 (Jenness 1965:7). The Indian attack on Eskimo Island seems to have occurred just before this time. The success of the treaty was remarkable, and the leading Eskimo family in Hamilton Inlet assumed the Palliser family name in gratitude.

About 1770 Sir George Cartwright established a large trading operation on the southern Labrador coast in Sandwich Bay. Cartwright contributed greatly to pacifying the Eskimo, but had the misfortune of bringing several of his Eskimo friends to England, where some died of smallpox. Those that survived returned to Labrador, but later succumbed to disease, as reported by Cartwright. He records the account of a traveler named William Phippard who in 1779 discovered an entire Eskimo family dead in their house on an island in Ivuktoke Bay (Hamilton Inlet). Among the corpses he found a medallion which had been presented by Cartwright's brother to the Eskimo woman, Caubvick, in England the year before.

During this same time the Moravian missionaries led by Jens Haven received a charter to establish a religious mission among the Eskimos of Labrador. The mission was granted 100,000 acres in Hamilton Inlet for the project. The Moravians, however, decided to begin their work in northern Labrador, at Nain, in 1771 because the French and English traders had become entrenched in Hamilton Inlet, supplying the Eskimos with both rifles and alcohol. The size and number of Moravian missions grew swiftly in northern Labrador, the southernmost one being at Makkovik.

In 1777 the first English traders began moving into Hamilton Inlet (Low 1896, Voorhis 1930). Previously, French traders had settled the region, beginning probably shortly after a French memoir on Labrador dating to 1715 recommended establishing a post at "Baie de Kesselaki" (Hamilton Inlet). In 1743 the Governor General of Canada commissioned Louis Fornel to explore Hamilton Inlet and take formal possession for the French crown. Phippard noted the ruins of the French posts at Rigolet and North West River during his winter there in 1777–1778. Thereafter the English remained in control of the area, though some French concerns continued.

The lack of information concerning the natives of Hamilton Inlet during the early periods is almost total. One record alone has been found to date. This is a letter written by Captain William Martin who investigated Hamilton Inlet for Sir Charles Hamilton, then Governor of Newfoundland. Hamilton, as a shipmaster, had himself explored the Labrador coast. Martin's letter (Gosling 1910:448) is important in giving a brief description of the Indians whom he encountered during a trip in which he ascended the Churchill River some fifty miles above Goose Bay. From the description it appears that he met the Indians at Muskrat Falls. He also noted the numbers of English and American traders in the area. Small traders, such as Hunt and Henley and others, continued to operate in the inlet until 1834–1835 when the Hudson's Bay Company established Fort Rigolet in the Narrows, and in 1836, when Fort Smith was erected at North West River. Soon after, the Hudson's Bay Company bought out their competitors and became the sole trading concern.

A final comment here is reserved for the Hamilton Inlet Eskimo participation in the 1893 Chicago World Columbian Exposition. Gosling (1910:311) reports that a colony of 12 families including 57 men, women, and children were sent from Labrador to the exposition, some coming from northern Labrador, but the majority coming from Hamilton Inlet. These were the only Eskimos exhibited at Chicago and thus much of what the American public of the time knew of Eskimos came from their encounter with this group.

A village and a trading post were set up and Eskimos dressed in seal skin clothing in the Chicago summer threw harpoons, shot arrows, and pulled tourists by dog sled. Following the exposition the Eskimos were returned destitute and diseased by schooner to Newfoundland, from which they had to make their way home. Many never made the journey or subsequently died of typhoid. The experience was summed up by one Eskimo as follows: "We are glad to be at liberty once more, and not to be continually looked at as if we were animals. We shall never go again" (Gosling 1910:312). Later, however, the same man responsible for bringing the Eskimos to Chicago convinced a group of 33 to tour Europe, Algeria, and America between 1898–1903. Only six Eskimos returned from this harrowing experience.

A writer of boys' stories, William Byron Forbush, documented the experience of a crippled Eskimo boy named Pomiuk at the 1893 fair and his subsequent return to Labrador where he was treated by Dr. Wilfred Grenfell, founder of the International Grenfell Mission in Labrador. Pomiuk's disease was incurable, and he soon died. The sensitive book, entitled *Pomiuk, A Waif of Labrador* (1903), portrays the suffering of one individual at the fair, and gives a touching dimension to the practice of human exhibit common in the 19th century.

The following history of trading posts in Hamilton Inlet has been obtained from White (1926) and Voorhis (1930).

Rigolet

1715 Author of a memoir on Labrador recommends the establishment of a fishing post at *Baie de Kesselaki* (Hamilton Inlet).

1743 Governor General of Canada commissioned Louis Fornel to explore Hamilton Inlet and take formal possession for the French crown. Fornel landed four miles west of Rigolet, erected two crosses, raised the French flag, and took formal possession. He left two men who erected winter quarters at North West River.

1779 William Phippard, wintering in *Baie des Esquimaux,* noted the remains of three French establishments, probably Rigolet, North West River, and another.

1788 Marcoux built a post for a Quebec trading company at Rigolet, according to White. This may be the same post that Voorhis says was established in 1785 by the Quebec Fur Trading Company.

1834 Nathaniel Jones of Quebec had two posts at Eskimo Bay, of which the principal post was a station on the coast (probably at Rigolet).

1836 D. R. Stewart had posts at Rigolet, North West River, and Kibokak (Kaipokak?). Hudson's Bay Company erected a post at Rigolet to compete with Stewart.

1837 Hudson's Bay Company purchased the Stewart properties, including the Rigolet post, and others.

North West River

1743 Cugnet, director of *Domaine de Roy,* says Louis Fornel left two pilots in the Hamilton River basin to explore and trade and erect a winter post in *Baie des Esquimaux.*

1744 Fornel's men wintered at *Riviere Nord-Ouest Post* in a structure described as the first building of "civilized man" in the Hamilton River basin.

1749 *Baie des Esquimaux* concession was granted to the widow Fornel. The fur trade was so good that vessels were sent here yearly to pick up the fur.

1777 Davies, writing in 1843, says the French first gave the name *Baie des Esquimaux* to the inlet and traded here. In 1777 the first Englishman, William Phippard wintered here, noting the remains of the French posts at Rigolet, North West River, and reported these to Cartwright. The French continued, however, to operate in the area until bought out by the Hudson's Bay Company in 1837.

1784 Two French trading companies—Marcoux and Dumontier—were established at North West River, on either side of the river.

1799 The two French companies united their interests.

1836 The Hudson's Bay Company erected Fort Smith at North West River beside D. R. Stewart's post. The name of the post was changed to North West River House in 1840.

1837 Hudson's Bay Company bought Stewart's establishment.

1838 John McLean arrived at Fort Smith on 16 February, the first European to complete an overland trip from Fort Chimo. The Hudson's Bay Company continued operation at North West River until the present day.

Fort Kenamu

1799 Dumontier and Co. engaged men for service at the *posts de Kenomish dans le dite Baie des Esquimaux.* The French post was apparently built before this date.

1836 The post was purchased by the Hudson's Bay Company.

Sandy Banks

1844 Hudson's Bay Company had a post here built some time before 1844.

1876–1877 Post closed.

1895. Low saw a clearing at this site in 1895. Reopened sometime later.

1923 Post noted in operation again. Later closed.

Mud Lake Post

1906 Mud Lake post opened by Hudson's Bay Company.

1926 Noted still in operation, but closed sometime later.

Mulligan Post

1836 A competitor of Hudson's Bay Company had a post here at Mulligan river mouth. This was probably D. R. Stewart. Subsequently it was probably bought out and discontinued.

Fort Michikamau

1840 Hudson's Bay Company established a post at outlet of Hamilton River from Michikamau.
1880 Abandoned about this date.

Fort Winokapau

1830 Established.
1876 Abandoned.

Kaipokok

1790 Built before 1790 by the French or "other Europeans," according to Voorhis.
1836 D. R. Stewart of Quebec operated the post.
1837 Hudson's Bay Company bought the post from Stewart.
1879 Hudson's Bay Company closed the post.

Aillik House

1840 Hudson's Bay Company operated a post at Aillik.
1877 Post closed.
1891 Reopened.

Davis Inlet

1869 Post sold by A. B. Hunt to Hudson's Bay Company.

Erlandson Post (Fort Trial)

1838 John McLean built a post at outlet of Indian House Lake for Hudson's Bay Company.
1842 Fort Trial abandoned.
1857 In use again.
1895 Low found the post abandoned.

Snooks Cove (Hamilton Inlet Narrows)

1862 Donald A. Smith (later Lord Strathcona) wrote that Hunt and Henley contemplated erecting a post at North Snooks Cove, which would detract from the Hudson's Bay Company's business.
1865 Hunt and Henley sold Snooks Cove post to Hudson's Bay Company.
1897 The Moravian Mission inquired whether Hudson's Bay Company would object to the Moravians building a station at Snooks Cove near the site of the Hudson's Bay Company's old establishment there.

Notes from J. White's map:

1. The Narrows were once called "River Kessessakiou."
2. Hamilton River has been called Kessessakiou, or Esquimaux, or St. Louis, or Ashuanipi, or Grand River.
3. Hudson's Bay Company once had an outpost on lower Naskapi River about 1836.
4. Naskapi River also called North West River, or Nord-Ouest, or Meshikamau River.
5. Hamilton Inlet also called *Baie des Esquimaux,* St. Louis, Kitchechatchau, or Ivucktoke [sic], or Hollandais Bay.

Appendix 2

FAUNAL REMAINS FROM HAMILTON INLET SITES

Except for the historic Eskimo sites, Hamilton Inlet sites produced very little faunal material. Only four prehistoric sites contained bone: Rattlers Bight 1, Hound Pond 2, Big Island 1, and Henry Blake 1. The bone from the Henry Blake 1 site was destroyed in obtaining a radiocarbon date and was not analyzed. The following report on the remaining bone material has been submitted by Dr. Howard Savage of the Royal Ontario Museum and Department of Anthropology, University of Toronto. I greatly appreciate Dr. Savage's analysis of these small, fragmented remains.

In his cover letter dated 8 March 1970 Dr. Savage made the following general comments:

The attached results and comments on the material from Rattlers Bight, Hound Pond, and Big Island sites, are, I believe, valid identifications out of the 1442 specimens of the faunal sample. Its fragmentary condition because of the calcination does reduce the bone surface characters. 22 specimens identified to genus, or 1.5% of the total number of specimens, is less than my usual batting average....

Regarding seasonal use of these sites, the presence of the Black Bear material at the Rattlers Bight and Big Island sites would suggest a spring, summer and/or fall occupation, while the Common Goldeneye and Beaver material at the Hound Pond site suggests similar season or seasons of use.

The minimum number of individuals of each of the identified genera at the 3 sites is still only 1, but the great amount of unavailable material from these sites would provide a much more significant figure if it could be identified.

Rattlers Bight 1
(GcBi–7)

VIAL 2.—5S 0W: Contained 82 specimens, all calcined to a variable degree, and all fragmentary in size. Also 75 unidentified and probably unidentifiable fragments.

	Species	*Bone*	*Remarks*
1.	Seal sp. (*Phoca sp.*)	Metapodial bone, distal end	Adult by absence of epiphyseal line; believed by specimen size to be harbor seal (*Phoca vitulina*) or ringed seal (*P. hispida*)
2.	Black Bear (*Ursus americanus*)	Sesamoid bone, proximal metacarpophalangeal	Available by hunting from spring to fall only
3.	Seal sp.	Proximal phalanx, distal end	Seal sp. as above, by specimen size
4.	Harbor Seal (*Phoca vitulina*)	Left premaxilla portion containing incisor alveoli	Year-round resident in Labrador coastal waters
5.	Mammalian sp.	Premaxilla or mandible, alveolar portion	Alveolar cavities of similar size to those of specimen 4
6.	Mammalian sp.	Vertebral or costal articular facet	
7.	Mammalian sp.	Bone fragment	

VIAL 3.—*0N 35W, 5N 35W:* Contained 154 specimens, all calcined to variable degrees, and fragmentary in size. Also 151 unidentified and probably unidentifiable fragments.

	Species	*Bone*	*Remarks*
1.	Mammalian sp.	Bone fragment	
2.	Mammalian sp.	Phalanx, distal end, with articular facet portion	Mammalian sp. of medium size, e.g., seal or beaver probable
3.	Avian sp.	Extremity bone, shaft fragment	Avian sp. of medium size indicated by thinness of cortex

VIAL 4.—*0N 5E:* Contained 501 specimens, all calcined to a variable degree, and all fragmentary in size. Also 488 unidentified and probably unidentifiable fragments.

	Species	*Bone*	*Remarks*
1.	Avian sp.	Anterior synsacrum, fragment	Medium-sized avian sp., e.g., duck, believed present
2.	Black Bear (*Ursus americanus*)	Proximal phalanx, distal ¾	Large bone specimen
3.	Seal sp. (*Phoca* sp.)	Proximal phalanx, distal end	Seal sp. believed harbor or ringed seal
4.	Seal sp. (*Phoca* sp.)	Proximal phalanx, proximal end	Small adult specimen, by lack of epiphysis and size
5.	Seal sp. (*Phoca* sp.)	Distal phalanx, proximal end	Seal sp. believed harbor or ringed seal
6.	Seal sp. (*Phoca* sp.)	Left 4th tarsal bone	Believed by size to be from harbor or ringed seal
7.	Seal sp. (*Phoca* sp.)	Middle phalanx, distal end	Seal sp. believed harbor or ringed seal
8.	Seal sp. (*Phoca* sp.)	Rib, shaft, fragment	Seal sp. believed harbor or ringed seal
9.	Seal sp. (*Phoca* sp.)	Rib, shaft, fragment	Seal sp. believed harbor or ringed seal
10.	Mammalian sp.	Rib, shaft, fragment	
11.	Mammalian sp.	Flat bone, fragment	Scapula or sternum probably bone represented
12.	Seal sp. (*Phoca* sp.)	Middle phalanx, distal end	Seal sp. believed harbor or ringed seal
13.	Seal sp. (*Phoca* sp.)	Rib, shaft or middle phalanx, fragment	Seal sp. believed harbor or ringed seal

Hound Pond 2
(GcBi–9)

VIAL 1.—Contained 93 specimens, all calcined to a variable degree, and all fragmentary in size.

	Species	*Bone*	*Remarks*
1.	Mammalian sp.	Bone, fragment	
2.	Mammalian sp.	Bone, fragment	

VIAL 2.—Contained 515 specimens, all calcined to variable degree, and all fragmentary in size. Also 502 unidentified and probably unidentifiable fragments.

	Species	*Bone*	*Remarks*
1.	Otter (*Lutra canadensis*)	Right radius, proximal end	Large specimen by size
2.	Beaver (*Castor canadensis*)	Right promaxilla, portion of wall of incisor canal	Available from spring to fall, and with difficulty in winter
3.	Mammalian sp.	Bone, fragment	
4.	Mammalian sp.	Rib shaft, portion	Believed from medium-sized mammal
5.	Mammalian sp.	Extremity bone, shaft fragment	Believed from medium-sized mammal
6.	Beaver (*Castor canadensis*)	Proximal phalanx, distal end	Transverse incised groove distally, as from butchering
7.	Mammalian sp.	Bone, fragment	
8.	Seal sp. (*Phoca* sp.)	Rib, sternal end	Believed harbor or ringed seal, by specimen size
9.	Avian sp.	Tarsometatarsus, middle condyle	Believed from medium-sized avian sp., e.g., duck
10.	Common Goldeneye (*Bucephala clangula*)	Left coracoid bone, distal end	Duck sp., resident in Labrador from spring to fall
11.	Avian sp.	Extremity bone, shaft fragment	Believed from medium-sized avian sp., e.g., duck
12.	Mammalian sp.	Skull portion	Believed from a large mammal, e.g., bear or caribou
13.	Mammalian sp.	Bone, fragment	Of similar appearance as specimen 12

Big Island 1
(GbBm-1: square 24S 12E)

VIAL.—Contained 92 specimens, all mammalian and all calcined to a variable degree, and fragmentary in size. Also 87 specimens of unidentified and probably unidentifiable fragments.

	Species	*Bone*	*Remarks*
1.	Black Bear (*Ursus americanus*)	Distal phalanx, portion	
2.	Black Bear (*Ursus americanus*)	Proximal phalanx, distal third	Large specimen, but still in range of black bear
3.	Black Bear (*Ursus americanus*)	Left 3rd tarsal bone, portion	Available by hunting from spring to fall only
4.	Mammalian sp.	Rib shaft, portion	Two fitted pieces, believed from a large mammal, e.g., bear

Appendix 3

ARTIFACT DESCRIPTION

Introductory Comments

This appendix includes a detailed discussion of the artifacts collected by the Lake Melville Project during the 1968 and 1969 field seasons, as well as collections which were donated to the project. The classification terms used describe the artifacts first in terms of a functional category, when that can be discerned, and secondarily in terms of descriptive features. No attempt has been made to erect a typological classification in a formal sense, and thus no type names are given to the specimens, even where a reasonable number of a particular variety have been found. For the most part it would be unwise to suggest type names even for the more prominent specimens because there are in general too few of the same type to understand its formal variation.

The organization of the appendix is by site, for which the Borden System of site classification (Borden 1952) is used. For example, a specimen numbered FjCa–1:25, Plate 37*g*, comes from the first site (FjCa–1) from North West River entered in the central site file of the National Museum of Man in Ottawa, and is the 25th artifact to be recorded from that site. The illustration reference follows the catalog number. Measurements of artifacts are given in millimeters in the following fashion: 31(l), 18(w), 4(t), where (l) is length, (w) width, and (t) thickness. Further information on the artifacts is contained in the Lake Melville Project artifact catalog on file at the National Museum of Man in Ottawa.

FjCa–1: Radio Shack Site

COLLECTION (Plate 37):23 artifacts, including 1 point, 20 biface fragments, 1 scraper, and 1 utilized flake.

POINT

Corner-notched (FjCa–1:21; Plate 37*l*): Midsection of a corner-notched point. Patinated purple chert or felsite. Broken at shoulder and tip. Full length may have been about 45 mm. Possibly intrusive into the site from nearby FjCa–33.

BIFACES

Bases (FjCa–1:22, 26, 28; Plate 37*e,j,d,* respectively): Biface basal fragments, slightly waisted as if for hafting. Later edges retouched and worn. Bases are squared and thinned. Full length of specimens would have been about 90 mm. A complete specimen from this site is owned by BRINEX in North West River. Dimensions of the broken pieces range 23–31(w), 7–9 (t).

Biface blanks

Tip (FjCa–1:16, 17; Plate 37*c,b,* respectively): Blunt tip of purple chert.

Bases (FjCa–1:19, 23–25, 27, 29; Plate 37*f,g,i,k*): 6 specimens; 5 of purple chert, 1 of red quartzite. All lack retouch and have sinuous edges. They tend to have slightly tapered sides and convex bases. FjCa–1:27 is an early stage preform. Dimensions range 30–40(w), 7–8(t).

Midsections (Plate 37*a*): 9 specimens; 7 of purple chert, 1 of red chert, 1 of red quartzite. All have straight sides and sinuous edges. Cutting function is indicated on some lateral edges; these tools may have been used in their unfinished state. Dimensions range 28–32(w), 8–9(t). FjCa–1:16 is an early stage preform, unifacial and thick. A portion of one edge has been used as a scraper.

SCRAPERS

End scraper (FjCa–1:31; Plate 37*n*): Single specimen of purple chert. Unifacial; rectangular in shape with parallel sides and convex working edge at one end. Lateral margins retouched. One side is heavily ground; the other is slightly ground and bears small areas of scraper retouch on the unifacial face of the tool. Dimensions: 43(l), 30(w), 8(t).

Side scraper (FjCa–1:11; Plate 37*m*): A fragment of a small purple chert scraper. Flake scars are water worn or wind blasted.

UTILIZED FLAKES: Flake of lavender chert or tuff.

DEBITAGE: Chipping debris was not retained by D. Charles, the excavator of the site. However, purple chert was the preferred material. 19 of the 31 specimens were of this material while the remainder were of red quartzite or lavender tuff. The chipping technique seems to have emphasized the removal of flat, broad flakes, and very little edge retouch was done.

COMMENT: The lack of many scraping tools at this site is conspicuous. It may be the result of the collection procedure. All of the bifaces were broken above the base and most specimens are highly fractured, suggesting thermal breakage in a water-doused fire. The breaks are not the result of use fracture.

FjCa-2: Bunkhouse Area

A core fragment of dolomitic rock came from this area where it was thought another site might be located. Excavation resulted in no further evidence and the specimen was included with the nearby Dining Hall site, and is designated FjCa-4:8.

FjCa-3: Cookery Site

COLLECTION (Plate 39): 26 artifacts, including 1 point, 9 bifaces, 7 biface blanks, 1 scraper fragment, 8 flake tools, and 1,062 pieces of debitage.

POINT

Unifacial, leaf-shaped (FjCa-3:5; Plate 39*n*): Small unifacial point with marginal retouch on dorsal surface. Dimensions: 22(l), 13(w), 3(t).

BIFACES

Knives: FjCa-3:8 (Plate 39*l*) is a tongue-shaped knife with one use-scarred lateral edge and basal thinning. FjCa-3:14 (Plate 39*a*) is a thin leaf-shaped biface with unmodified striking platform on base.

Fragments: 5 specimens. FjCa-3:15-19 (Plate 39*b-e,m*) are of white quartzite. FjCa-3:18 (Plate 39*e*) is the midsection of an asymmetric biface; FjCa-3:19 (Plate 39*m*) is a notched biface fragment.

Blanks (FjCa-3:7, 20, 21, 23-25; Plate 39*k,g,h,i,j,f*, respectively): 6 specimens of white quartzite with convex bases, made from cobble cores and cortex flakes. Several specimens have been used as knives or scrapers although they were unfinished.

SCRAPER

End scraper (FjCa-3:6; Plate 39*p*): Fragment of red chert end scraper. This may not belong with the quartzite component of the site. (See FjCa-9.)

UTILIZED FLAKES: Several specimens used as knives or scrapers.

DEBITAGE: 1,062 flakes; 907 of white-brown quartzite, 108 of quartz, 19 of opaque chert, 15 of vein quartz, 13 of red quartzite. Quartzite flakes tend to be large; chert flakes are small. 21 of 26 specimens are of quartzite.

COMMENT: The chert, quartz, and red quartzite materials on this site may be intrusive from FjCa-4. This could not be verified by stratigraphic evidence since the site has been disturbed; however, the red quartzite and vein quartz were found at the eastern end of the site, suggesting they belong with FjCa-4.

FjCa-4: Dining Hall Site

COLLECTION (Plate 38): 8 artifacts, including 2 points, 2 knives, 1 scraper, and 3 cores.

POINTS

Stemmed (FjCa-4:1; Plate 38*a*): Large, thin biface of brown quartzite. Broad, flat flake scars with very little secondary retouch. Basally thinned. Convex-sided blade; incurvate stem sides. Blade width maximum at shoulders. Found broken in three pieces. Dimensions: 95(l), 45(w), 8(t), 21 (stem basal width). Similar to the Mansion Inn blade type (Dincauze 1968: 16-23).

Corner-notched (FjCa-4:4; Plate 38*d*): Small unifacial point of white quartzite made with marginal retouch. Dimensions: 27(l), 15(w), 4(t).

KNIVES

Lanceolate (FjCa-4:3; Plate 38*c*): Thick lanceolate knife of white quartzite with convex base. Unfinished.

Hand knife (FjCa-4:6; Plate 38*f*): Large casual knife of dolomitic rock. Retouched along edge of natural break.

CORES

Exhausted (FjCa-4:7, 8): 2 flake cores, 1 of dolomitic rock, the other of red quartzite. Both have been heavily battered.

Linear flake core (FjCa-4:2; Plate 38*b*): Identification uncertain, but the specimen appears to be the striking platform portion of a core similar to FjCa-13:34 (Plate 42*f*), which has had its pyramidal upper section broken off. Made of banded lava.

SCRAPER

Side scraper (FjCa-4:5; Plate 38*e*): Made on a flake of purple chert.

DEBITAGE: 34 flakes, of which 21 are red quartzite, 9 of white-brown quartzite, 2 of quartz, 2 of greenish siltstone or dolomite.

FjCa-5: Brinex Path

COLLECTION: No artifacts found. 13 flakes of purple quartzite.

FjCa-6: North West River Historic artifacts

These specimens have been included in the North West River miscellaneous collections, FjCa-34.

FjCa-7: Garbage Site

COLLECTION: 1 artifact and 112 flakes.

SCRAPER

Side scraper (FjCa-7:1): Small side scraper of tuffaceous felsite.

DEBITAGE: 112 flakes, of which 110 are a heavily weathered white sandstone, 1 of pink chert, and 1 of red chert.

FjCa-8: Roadbend Site

Collection (Plate 56*b*): 2 artifacts, including 1 bifacial knife fragment, 1 utilized flake. 272 flakes.

Biface

Tip (FjCa-8:1; Plate 56*b*): Tip of broad, blunt biface, probably functioned as knife. Reminiscent of FjCa-32:2 (Plate 56*c*) found by D. McLeod in 1967.

Utilized flake: A single utilized flake of quartzite was found.

Debitage: 272 flakes of gray quartzite.

FjCa-9: Piloski Garden Site

Collection (Plates 40, 41*a-c, e-w*): 35 artifacts; 12 scrapers, 1 biface tip, 22 flake tools, 32 linear flakes. 808 pieces of debitage.

Biface

Fragment (FjCa-9:14; Plate 40*l*): Blunt tip, red chert. Probably a knife.

Scrapers

Triangular, humpback (FjCa-9:1-5; Plate 40*a,c,b,d,e*, respectively): 5 specimens. All have broad, thick working edges. Four specimens also have side scrapers edges on one side. Retouch around all the tool margins. Striking platform at narrow (proximal) end. Tendency for elongated stem. FjCa-9:28 seems to be fragment of working edge of a similar kind of scraper.

Disk type (FjCa-9:6-9, 11; Plate 40*g,k,i,f,h*, respectively): 5 specimens made on thin flakes of pink chert. Scraper retouch around entire margin. All pieces worn from use. Some retain the striking platform opposite major working edge.

Oval type (FjCa-9:10; Plate 40*j*): Fragment of oval or tongue-shaped scraper similar to FjCa-13:11 (Plate 42*g*) and FjCa-39:11 (Plate 55*e*). Made on thin flake of pink chert.

Utilized flakes: 22 flake tools used as scrapers or knives. Made on thin irregular flakes of opaque chert.

Specialized flakes

Biface thinning flakes: Result from sharpening or thinning bifaces or finished preforms. The proximal ends bear the original edge of the biface before flake removal.

Linear flakes (FjCa-9:40; Plate 41*e,u*): 6 examples of flakes with parallel sides, one or two dorsal ridges; triangular or trapezoidal cross-section.

Triangular flakes (FjCa-9:40; Plate 41*a-c, f-t, v,w*): In the southeastern corner of the site D. Charles found a concentration of gray-banded lava flakes; 23 of these are of interest for their typological difference from the thin irregular flakes of chert. These flakes are usually more than twice as long as they are wide. They have one or two medial dorsal ridges, a single ventral scar, and are roughly triangular in outline. Their cross-sections are either trapezoidal or triangular. In each case the proximal end bearing the striking platform is the wide end of the flake; the distal end usually tapers to a point. This distinctive pattern does not result from the chipping characteristics of the lava. Rather, the flakes seem to have been produced by a repetitive process aimed at this particular result. It would seem that the production of standard flakes was the aim of this process. If so, there is little evidence indicating what the flakes might have been used for. Several bear edge retouch or use wear at their distal ends. This suggests they may have been used as narrow scrapers or grooving tools.

It is evident that the flakes were struck from a prepared core, but no such core was found at the site. However, the front runner for a suitable core was found at the Road Site 1 (FjCa-13:12; Plate 42*f*, 41*d*). It, also, is of banded lava. The core is oval and pyramidal in shape. The bottom is flat and has been used as the striking platform. Flakes have been removed from the bottom margins of the core toward its peak. The flakes struck off were triangular in outline with constricting ends, indicated by the converging flake scars. Many of the triangular flakes from FjCa-9 fit roughly into the flake scars of this core, though it is probably not the parent core.

This core and flake technology is restricted to the banded lava material. No similar flakes are found in the chert debitage.

Debitage: 808 flakes; 662 of purple, red, pink, tan, or gray chert, 127 of banded lava, 13 of white quartzite, 3 of red quartzite, 2 of Ramah chert, 1 of vein quartz. All material could be obtained locally except the opaque cherts which probably come from the Seal Lake area, while the Ramah chert must have come via coastal contact.

FjCa-10: Sutton Site

Collection: 5 flakes, of which 4 were quartzite and 1 of quartz.

FjCa-11

Collection: 1 biface fragment, a gift of Mrs. Edna Piloski. Cataloged with the site near which it was found, FjCa-1.

FjCa-12: Test Pit Site

Collection: 1 point, 11 flakes.

Point

Side-notched (FjCa-12:1; Plate 56*g*): Pink chert specimen with convex blade edges; flat, thinned base. Notches are long and set low on blade edge. Notch interiors are crushed. Broad flaking, with careful edge retouch. Dimensions: 80(l), 35(w), 10(t), 31 (basal width), 11 (notch length).

Debitage: 11 flakes; 7 of opaque chert, 2 of dark volcanic rock, 2 of quartzite.

FjCa-13: Road Site 1

Collection (Plate 42): 37 artifacts, including 1 biface fragment, 1 scraper fragment, 1 core, 34 utilized flakes. 3622 pieces of debitage.

BIFACE

Large tip fragment (FjCa–13:23; Plate 42*a*): From broad, thin biface knife. Broken across base. The specimen is remarkable for its large size and broad, flat flaking. Edges are finely retouched. The missing fragment, unfound, would probably have made the whole specimen about 200 mm long. Dimensions: 150(l), 110(w), 12(t). Flat flaking is a characteristic with important parallels to the flat, squamous flakes of the Piloski Garden site (FjCa–9).

Edge fragment (FjCa–13:1): Small fragment of chert.

SCRAPER

Tongue-shaped (FjCa–13:33; Plate 42*g*): Proximal end of scraper with distal working end broken off. Striking platform at proximal end. Like the scrapers from FjCa–9 it is made on a large thin flake of chert with the striking platform opposite the working end. Scraper retouch along the latter edge. Complete specimen was probably about 90 mm long. Dimension: 50(w).

CORE

Pyramidal (FjCa–13:34; Plate 43*f*): Core of banded lava (Figure 37*i*). Tapered triangular flakes between 30–40 mm in length have been struck from the roughly oval striking platform on its base, towards its peaked top. The core may be nearly exhausted. There is no evidence of its being used as a tool itself. See discussion of this core and flake industry under FjCa–9 (page 76).

UTILIZED FLAKES

Flake scrapers and knives: 14 irregular flakes of gray or red chert have been used as scrapers or knives. They vary in size from 10–45 mm in length.

SPECIALIZED FLAKES

Thinning flakes: 5 examples of biface thinning flakes. The conditions of the striking platforms of two indicate they were removed in resharpening a biface; 3 have larger striking platform angles and were removed in the process of thinning a preform.

Linear flakes (FjCa–13:2,3; Plate 42*e,d*): 9 flakes might be called linear flakes or pseudo-blades (Plate 42*b-c*). The fact that there were so few in such a large sample of debitage indicates they probably do not result from a true blade technique. However, two specimens could very well have come from the side of true blade cores since they bear the parallel scars of three and four separate flakes, respectively. These flakes are suggestive of a core and blade industry, but by themselves do not validate a claim for this technology (Plate 42*d,e*).

DEBITAGE: 3632 flakes; 3539 of opaque chert, 31 of white quartzite, 26 of red quartzite, 21 of vein quartz, 11 of banded lava, and 4 of Ramah chert. The majority of the flakes are less than 10 mm long; very few medium to large flakes occur. This indicates technological emphasis on finishing work and resharpening rather than primary stages of production as seen in the high frequency of large flakes at FjCa–9. Most of the material seems to have been imported from the Seal Lake area. A strong preference for fine-grained cherts is indicated.

FjCa–14: Road Site 2

COLLECTION (Plate 44*a-k*): 24 artifacts, including 2 point bases, 2 biface fragments, 2 end scrapers, 4 flake scrapers, and 14 flake tools; 826 flakes.

POINTS

Side-notched (FjCa–14:1,2; Plate 44*a,b*): 2 specimens broken above notches. One of lavender tuff, the other of quartz. Bases are thinned and squared; side-notches are small and circular, about 8 mm up from base; notch interiors ground. Dimensions: 22,22(w); 6,7(t). Blade end appears to have been slightly convex. Some similarity to Meadowood point (Ritchie 1968).

BIFACES

Blank (FjCa–14:13; Plate 44*e*): Tip of rough biface blank of white quartzite.

Midsection (FjCa–14:12; Plate 44*f*): Pink quartzite. Unfinished.

SCRAPERS

End scrapers (FjCa–14:3,4: Plate 44*c,d*, respectively): 2 specimens of brown banded chert made on thick, triangular cross-section flakes. Flakes have been detached radially from chert cobble and retain portion of cortex on proximal (striking platform) end of flake. Working end prepared at distal end of thick flake. Medial ridge runs down dorsal side of flake. Lateral margins have been crushed and dulled.

Side scrapers (FjCa–14:5,7; Plate 44*g,h*): 4 side scraper fragments are made of flakes of lavender tuff and Ramah chert. FjCa–14:5 (Plate 44*g*) is on a large thin flake and bears a scraper edge on one side and a knife edge on the other. These working edges are parallel to each other and are straight. The striking platform is unmodified.

UTILIZED FLAKES: 8 flakes of quartz and vein quartz have been utilized.

DEBITAGE: 826 flakes; 328 of opaque chert, 258 of quartz, 146 of red quartzite, 87 of white quartzite, 6 of Ramah chert, and 1 of banded gray lava. Several biface thinning and blade-like flakes occur.

FjCa–15: Herbert Michelin 1

COLLECTION (Plate 44): 9 artifacts, including 1 point, 2 bifaces, 1 asymmetric knife, 5 utilized flakes; 142 pieces of debitage.

POINT

Stemmed (FjCa–15:2; Plate 44*m*): Fragment of stemmed point of white quartzite. 27(w), 6(t). Stem not ground.

KNIVES

Asymmetric: FjCa–15:3 (Plate 44*n*) is of white quartzite, parallel-sided with flat base (thinned) and diagonal cutting edge. Lateral sides ground. FjCa–15:5 (Plate 44*o*) is possibly a second type of asymmetric knife. It is thick (14 mm) and roughly worked. The left-hand margin has been prepared for cutting. A fracture has altered the tool from its original oval form.

UTILIZED FLAKES: 5 flakes; 3 of quartzite and 2 of lavender chert—retouched and used as scrapers.

DEBITAGE: 142 flakes; 104 of purple and red chert, 37 of white quartzite, 1 of banded gray lava. The chert and quartzite collections were spatially separated and probably belong to different site components.

FjCa-16: Michelin Trailer Site

COLLECTION: 9 pieces of debitage. 1 artifact.

BIFACE

Preform (FjCa-16:1): Tip of roughly finished preform of gray banded volcanic rock. Dimensions 76(l), 68(w).

DEBITAGE: 9 pieces; 7 of white quartzite, 1 of lavender chert, 1 of banded gray lava.

FjCa-17: Selby Michelin Site

COLLECTION (Plate 43*d-h*): 17 artifacts, including 2 biface blanks and 15 flake tools.

BIFACES

Blanks (FjCa-17:1,6; Plate 43*h,g,* respectively): Basal fragments of biface blanks of gray banded lava. Both bear substantial portions of the original flake scars on their ventral surfaces.

UTILIZED FLAKES: FjCa-75:2,5,11 (Plate 43*f,d,e,* respectively) are flake tools prepared as knives. Other specimens show restricted areas of use wear.

DEBITAGE: 1008 flakes, mostly small thin chips; 977 of gray banded lava, 14 of vein quartz, 10 of opaque chert, 4 of Ramah chert, 2 of white quartzite, 1 of red quartzite.

FjCa-18: Selby Michelin Basement Site

COLLECTION: 3 artifacts including 3 utilized flakes, 45 pieces of debitage.

FLAKE TOOLS

Flake scraper (FjCa-18:1): gray chert.

Utilized flakes (FjCa-18:2,3): small areas of utilization.

DEBITAGE: 45 flakes; 31 of opaque chert, 6 of quartz, 3 of white quartzite, 3 of red quartzite, 1 of Ramah chert, 1 of gray banded lava. Mostly large squamous flakes similar in technique to flakes from FjCa-9.

FjCa-19: David Michelin Site

COLLECTION (Plate 45): 32 artifacts, including 6 points, 1 biface, 1 blank, 9 biface fragments, 2 knives, 3 flake scrapers, 10 utilized flakes; 233 pieces of debitage.

POINTS

Straight stemmed points (FjCa-19:1-3,25; Plate 45*d,c, b,a,* respectively): 4 artifacts; 2 of banded gray chert, 1 of quartzite, and 1 of Ramah chert. Dimensions: 43-64(l), 27-31 (max. blade width), 5-12(t), 14-22 (stem width). These points are bifacially worked and probably functioned as knives. They have slightly convex blades and the stem sides are ground. Bases thinned except FjCa-19:1. Sharp or slightly tapered shoulders; blunt tip.

Tapered stem points (FjCa-19: 4,5; Plate 45*e,f*): 2 specimens, one of gray banded chert, one of weathered pink chert or felsite. These points are similar in outline, but different in manufacture. FjCa-19:4 (Plate 45*e*) is bifacially worked and thick, tapering to a point at both stem and tip; FjCa-19:5 (Plate 45*f*) is made on a thin unifacial flake, marginally retouched along the sides. The stems of both taper smoothly from the shoulders to the pointed base; blade edges are slightly convex; stem margins not ground. These points probably served as projectile tips while the straight-stemmed variety were used as knives.

FLAKE KNIFE (FjCa-19:6; Plate 45*j*): Tabular piece of purple chert with one edge worked into cutting edge; the other side has been left blunt. Base is thinned, perhaps for hafting. Unifacial.

BIFACES

Fragments: 8 specimens. 5 tip fragments—FjCa-19:8, 11 are unfinished; FjCa-19: 9 (Plate 45*i*) appears to be the blunt tip of a broad knife; FjCa-19:10, 12 may have been point tips. 2 midsections—FjCa-19:17 of tan chert, the other (FjCa-19:16) of black basalt. 1 base: FjCa-19:14 a carefully flaked corner fragment of Ramah chert which may have been part of a large biface such as FjCa-32:2.

SCRAPERS

Disk-shaped (FjCa-19:18; Plate 45*k*): Banded chert tool utilized as scraper and knife.

End scraper (FjCa-19:20,22; Plate 45*l*): Banded chert and Ramah chert.

UTILIZED FLAKES: 10 specimens.

DEBITAGE: 233 pieces, mostly large flat, thin flakes; 202 of opaque cherts, 29 of Ramah chert, 1 of red quartzite, 1 of vein quartz. 6 flakes are biface thinning flakes.

FjCa-20: Henry Blake 1

COLLECTION (Plate 46*a-d*): 10 artifacts, including 1 point, 4 biface fragments, 1 side scraper, 1 scraper-knife combination tool, 3 flake scrapers; 344 flakes.

POINT

Corner-notched (FjCa-20:1; Plate 46*a*): Single specimen of Ramah chert. Large point with convex blade sides and flat, thinned base. Broad corner notches, ground interiors. Dimensions: 91(l), 32 (basal width), 9(t). This point is very similar to GbBn-6:1 (Plate 67*a*).

KNIFE SCRAPER

Combination tool (FjCa-20:10, Plate 46*d*): Large thin flake of Ramah chert with scraper edge on one side and knife on other. Formally similar to FjCa-14:5 (Plate 44*g*).

SCRAPERS

Side scraper (FjCa-20:2; Plate 46*b*): Small side scraper of Ramah chert found by MacLeod. Made on tabular flake with scraper edges on 2 of 4 sides.

Flake scrapers (FjCa–20:2,4,5; Plate 46*c*): 3 specimens of Ramah chert. Fire patination on two.

BIFACES

Fragments (FjCa–20:8,9,11): 3 specimens of a Ramah chert biface. Highly fractured as though from thermal breakage.

DEBITAGE: 344 flakes; 302 of Ramah chert, 41 of red quartzite, 1 of beach quartzite. No artifacts of red quartzite were found, and all flakes of this material were distributed away from the center of the site. The near exclusive use of Ramah chert in a North West River site was unique and indicates coastal contact.

FjCa–21: Henry Blake 2

COLLECTION (Plate 46*e,f*): 2 bifaces and 242 flakes.

BIFACES

Leaf-shaped (FjCa–21:1,2; Plate 46*e,f*): 2 specimens of white-brown quartzite. Both are leaf-shaped with convex bases and sides. Well thinned. Dimensions: 71, – (l), 30, 32(w), 9,8(t).

DEBITAGE: 242 flakes; 239 of white quartzite, 3 of Ramah chert.

FjCa–22: Surface Collection South of Henry Blake's House

COLLECTION: 2 scrapers and 186 flakes.

SCRAPER

Fragment (FjCa–22:2): Small patinated fragment of Ramah chert.

Flake scraper (FjCa–22:1): Flake of Ramah chert.

DEBITAGE: 186 flakes, of which 173 are white quartzite, 9 of Ramah chert, 2 of opaque chert, 1 of red quartzite, and 1 of baked green sediment. The material from this site probably derives in part from both FjCa–20 and FjCa–21.

FjCa–23: Surface Collection North of Henry Blake's House

COLLECTION: 1 blank, 1 biface tip.

BLANK

Oval (FjCa–23:1): Small quartz blank found in road.

BIFACE

Tip (FjCa–23:2): Biface tip of lavender chert found by D. Charles. May belong with David Michelin site.

FjCa–24: Sid Blake Site

COLLECTION (Plate 47, 48, 49): 138 cataloged artifacts, including 2 points, 4 knives, 22 bifaces, 18 biface blanks, 3 core fragments, 1 core scraper, 2 hammerstones, 5 flake knives, 41 utilized flakes, numerous indeterminate fragments.

POINTS

Stemmed (FjCa–24:7,111; Plate 47*a,b*): 2 specimens of white-brown quartzite. FjCa–24:7 (Plate 47*a*) has a triangular blade, is well shouldered and has a parallel-sided stem. Its base is ground and roughly finished. The blade is roughly flaked also, with little retouch. FjCa–24:111 (Plate 47*b*) is smaller in size. Its blade is more convex, stem more tapered, and shoulders less accentuated. The stem sides are ground and thinned. Tips from both pieces are broken. Dimensions: 51, 40(l); 25, 20(w); 7, 6(t).

KNIVES

Asymmetric: 4 specimens, each of slightly different form. FjCa–24:6 (Plate 47*n*) is tongue-shaped with rounded distal end and vague side notches. FjCa–24:10 (Plate 47*r*) has an oblique cutting edge on one side and a convex edge on the other. Its base is flat, unmodified, and thick. The lower lateral sides of the tool are ground. FjCa–24:85 (Plate 47*s*) is leaf-shaped, well made, with convex edges; broken at tip and base. This may have been a stemmed point. FjCa–24:12 (Plate 47*t*) is an asymmetric specimen with a rounded tip and broken base.

BIFACES

Leaf-shaped: 22 specimens, of which 11 are broken and 11 are whole or could be reconstructed from fragments. Their attributes vary as widely as the knives. Common to all, however, are general leaf-to-lanceolate shape with rounded bases. In most cases the workmanship is fairly rough. The lower margins of their edges are often ground. Frequently only one edge, or a portion of an edge, has been finished. Bases are usually thinned. In two cases the bases are pointed (FjCa–24:45,107; Plate 47*j,q*) and appear to have been hafted.

There are four general types: bi-pointed (FjCa–24:45,107); broad ovate (FjCa–24:88; Plate 47*l*); round-based leaf-shape (FjCa–24:50,82; Plate 47*h,i*); and lanceolate (FjCa–24:62,96,108; Plate 48*e*, 47*g,f*). Most finished pieces' maximum width is just above the base. Except for a single specimen that is largely unifacial and smaller than the rest, the bifaces are uniform in size (54–79 mm length) with the mean length falling about 60 mm. Maximum width is between 25–30 mm. The fact that so many of the specimens were broken reinforced the belief that they functioned as knives. Numerous biface fragments were found that could not be reconstructed. All of these conform to the basic pattern of the complete pieces.

BLANKS: 18 specimens, including 10 broken and 8 reconstructed or whole. Three types occur: blanks on cortex flakes (FjCa–24:42,47,57,58,78,115; Plate 49*e-k*) are generally oval and thick. Some have been used, but the majority were abandoned when the cortex surface could not be removed. The second type is a core blank (FjCa–24:3,9,95; Plate 49*b,a,c*, respectively) taken from the center of a quartzite cobble rather than from cortex flakes. Most of the larger bifaces seem to have been made from these large blanks. Some bifaces were made from smaller flakes and retain the striking platform at the base of the blank (FjCa–24:2; Plate 49*d*). In general, the blanks show great variety and it seems likely that they were all used interchangeably depending on the suitability of the cobble and the primary flakes removed from it.

CORE FRAGMENTS: 3 specimens, FjCa–24:77 (Plate 49*p*) is one example of an exhausted core.

CORE SCRAPER: FjCa–24:1 (Plate 49*n*) is a cortex flake of dense green metamorphosed sediment. It is the only specimen of its type excavated, and bears large flake removals from its working edge.

HAMMERSTONES: 2 specimens. A large 4-inch diameter granite cobble (FjCa–24:19) has been used to crush bones or crack quartzite cobbles for flaking. FjCa–24:18 (Plate 49*o*) is a smaller hammerstone which may have been used as a primary flaking tool.

FLAKE TOOLS

Flake knives: 5 specimens of quartzite have been used as casual cutting implements; they were fashioned from irregular flakes. Several pieces were found (e.g., FjCa–24:44; Plate 48*m*) with more carefully prepared cutting edges. Many more similar flake knives probably exist in the collection. There is great difficulty in identifying such flake tools in coarse-grained quartzite assemblages.

Flake scrapers: 41 specimens of quartzite prepared or used as scrapers with removals from one face of the flake (FjCa–24: 47,109,122; Plate 48*p-r*). The edges tend to be slightly convex and located opposite the striking platform. Many are cortex flakes.

DEBITAGE: An average of 500–800 flakes of quartzite was encountered in each five-foot square. In all, about 10,000 flakes were recovered. Except for about 100 flakes, these were all white-brown quartzite. The less common materials included gray banded lava (75), Ramah chert (22), baked sediment (10), and several flakes of vein quartz and red quartzite. Except for the Ramah chert and gray banded lava the materials are locally available. The Ramah chert indicates contact with the coast; the lava may come from the interior.

FjCa–25,26

Included in the Sid Blake site, FjCa–24.

FjCa–27: Dance Hall Site

COLLECTION: 1 point.

POINT

Corner-notched (FjCa–27:1; Plate 56*a*): Made on a thin flake of white quartzite. Nearly unifacial, with marginal retouch on the ventral scar. The base is thinned; notches are not ground.

FjCa–28: Stuart Michelin Site

COLLECTION: 2 flake scrapers, 4 flakes of debitage.

SCRAPERS: 2 specimens of Ramah chert with restricted areas of utilization.

DEBITAGE: 4 flakes; 2 of Ramah chert, 1 of white quartzite, 1 of vein quartz.

FjCa–29: Graveyard Site

COLLECTION (Plate 43*a-c*): 4 artifacts, including 1 point, 1 asymmetric knife, 1 biface tip, 1 blank. 3366 pieces of debitage.

POINT

Stemmed (FjCa–29:5; Plate 43*b*): Small white quartzite point with convex blade edges, broken tip, and narrow contracting stem. Flat thinned base. 43 mm long. Similar to FjCa–24:111 (Plate 47*b*) and FjCa–15:2 (Plate 44*m*).

KNIFE

Asymmetric (FjCa–29:2; Plate 43*c*): Unfinished knife of white quartzite with oblique cutting edge on one side and convex edge on the other. Thinned base. Similar to FjCa–24:10 and less similar to FjCa–15:3.

BIFACE

Tip (FjCa–29:4): White quartzite.

BLANK (FjCa–29:1; Plate 43*a*): A blank 57 mm long with cortex remnant on one face.

DEBITAGE: 3366 flakes, all of white-brown quartzite except for 2 flakes of Ramah chert and 1 of fine grained sediment.

FjCa–30: Tower Road Site

COLLECTION: 14 flakes, including 12 of red quartzite and 2 of green slate-like rock.

FiCa–31: Ronald Watts Site

COLLECTION: 15 flakes of white quartzite.

FjCa–32: D. MacLeod Collection

COLLECTION (Plate 56*c,f*): 3 artifacts, including 1 biface knife, 1 retouched flake, and 1 stemmed point.

BIFACE

Knife (FjCa–32:2; Plate 56*c*): Large biface knife donated to D. MacLeod by North West River resident in 1967. Provenience is unknown; however, the biface probably came from the David Michelin site (FjCa–19) as this is the only site known to date in North West River which makes use of gray banded chert, and because this site is known to have been excavated by local people who could have acquired the specimen. The specimen is carefully thinned, with secondary retouch and a good cutting edge on both sides and the tip. The tip is heavily worn from use. Base is thinned. Apparently a finished tool. Dimensions: 127(l), 51(w), 13(t).

POINT

Stemmed (FjCa–32:3; Plate 56*f*): Made of porphyritic rock. Roughly finished triangular blade. Rounded shoulders, wide-stemmed base, slightly convex.

Basally thinned. Similar to stemmed points from FjCa–19. Dimensions: 54(l), 27(w), 11(t).

UTILIZED FLAKE (FjCa–32:1): Retouched flake of Ramah chert.

FjCa–33: Brinex Bunkhouse Site

COLLECTION (Plates 50,51): 25 artifacts, including 1 point, 4 bifaces, 3 blanks, 5 end scrapers, 1 disk knife, 1 perforator, 10 utilized flakes.

POINT

Corner-notched (FjCa–33:6; Plate 50*a*): Fragment of a small corner-notched point of gray weathered chert. Its blade is triangular with slightly convex edges, and is 20 mm wide. The completed specimen would have been about 32 mm long. Notches are ground. A similar point was recovered at the Radio Shack site (FjCa–1:21, Plate 37*l*) a few feet below the Brinex Bunkhouse site. This point probably belongs with the Bunkhouse collection and was thrown or washed the small distance downslope.

BIFACES: 5 fragments. 2 basal pieces (FjCa–33:10,11; Plate 50*e,f*) of quartzite are completed specimens, well thinned, with convex bases; 2 midsections occur, 1 parallel-sided specimen of red quartzite (FjCa–33:2) and 1 triangular fragment of purple chert (FjCa–33:13; Plate 50*i*). The latter is unifacial and bears the suggestion of a notch at its base. The final piece is a small (35 mm) leaf-shaped biface of quartz with a flattened base and a cutting edge on the side.

BLANKS: 3 specimens, including 2 complete and 1 basal fragment. FjCa–33:1,3 (Plate 50*c,b*) are 65, 66 mm long, of gray quartzite.

SCRAPERS

End Scrapers: Three types.

Triangular snub-nosed variety made on thin flakes. 2 specimens, one of black chert (FjCa–33:15; Plate 51*b*), another of weathered pink chert (FjCa–33:21; Plate 51*d*).

End scrapers on distal ends of blade-like flakes (FjCa–33;14,22; Plate 51*a,c*): The complete specimen is 57 mm long, 22 mm wide and has a triangular cross-section. It is made from banded lava and has been retouched all along the sides of the flake. The flakes suggest a core and blade industry. A proximal end of such a flake was found as well.

Thick linear chunk of quartzite (FjCa–33:4; Plate 51*j*) with a triangular cross-section and a thick working end has been used as a heavy scraper or scraper plane. Its constricted end has been prepared for hafting.

KNIFE

Disk-shaper (FjCa–33:8,12; Plate 51*f*): Made on thin flake of red chert. Bifacial.

PERFORATOR

Tip (FjCa–33:23; Plate 51*i*): Tip fragment of a perforator or drill. May have been used as a punch rather than a drill, since it lacks rotary striations.

FLAKE TOOLS: 9 specimens of pink and gray chert and vein quartz have been used as knives. They are made on irregular flakes. No evidence of scraper function.

DEBITAGE: 153 flakes were saved by Mr. Charles. This is surely not the entire sample. The debitage reflects the same eclecticism as the artifacts in raw material usage; 61 of opaque cherts, 55 of white quartzite, 20 of red quartzite, 14 of quartz, 2 of gray banded lava, 1 of Ramah chert.

FjCa–34: North West River Miscellaneous Collections

COLLECTION (Plate 56,57): 28 specimens, including 1 point fragment, 1 knife, 3 scrapers, 1 blank, 6 utilized flakes, 2 shells, and 14 historic artifacts.

POINT

Side-notched base (FjCa–34:7; Plate 56*d*): Basal fragment with deep, ground side notches and a convex base. Made of white quartzite, broken at notches. Similar to FjCa–38:1,10. Dimensions: 19(l), 4(t).

KNIFE

Asymmetric (FjCa–34:11; Plate 57*d*): Small specimen of purple chert, bifacially worked, with convex cutting edge and cortex remnant on one side.

SCRAPERS

Side scrapers (FjCa–34:1,10; Plate 57*f*): 2 specimens, both made on flakes of Ramah chert, with carefully prepared edges along their longer sides.

Stemmed scraper (FjCa–34:27; Plate 57*e*): A large stemmed scraper of quartz, with lateral edges and stem end dulled for hafting or holding, and distal working end showing heavy use wear. Similar to stemmed scrapers from FjCa–9. Dimensions: 58(l), 34(w), 12(t).

BLANKS

Biface blanks (FjCa–34:9,15; Plate 57*a*): 2 specimens of brown quartzite. FjCa–34:9 is made from a cortex flake and is similar to blanks from FjCa–24. FjCa–34:15 is a larger core blank, roughly finished.

FLAKE TOOLS: 5 specimens are utilized flakes with scraping edges.

Historic artifacts

KNIFE

Crooked knife (FjCa–34:8; Plate 54*i*): Probably only a few years old. Made from a common steel file.

SPEAR

Deer spear (FjCa–34:2; Plate 54*j*): Long-shanked, narrow-bladed spear used for spearing caribou from canoes. A common trade item. 263(l).

CLAY PIPES

Bowl (FjCa–34:22; Plate 54*h*): Imitation briarwood clay bowl. No trademark.

Pipestems (FjCa–34:24; Plate 54*g*): 6 unmarked stems, post-18th century. No trademark.

GUNFLINTS

English type (FjCa–34:17–21; Plate 54*b-f*): 5 specimens of gray-black flint, one with tan chalky cortex remnant; 2 flints (FjCa–34:17,18) are large, with trapezoidal cross-sections; the others are smaller, of similar style.

French type (FjCa–34:23; Plate 54*a*): Blond flint, wedge-shaped, with nibbled, rounded end.

FjCa–37: Herbert Michelin 2

COLLECTION: 6 artifacts, including 1 biface tip, 1 core fragment, 4 utilized flakes. 555 flakes of debitage.

BIFACE

Tip: (FjCa–37:3): Thick blank tip of white quartzite.

CORE

Fragment (FjCa–37:1): Exhausted flake core of white quartzite, 75 mm long. One edge possibly used as scraper.

UTILIZED FLAKES (FjCa–37:2): 4 specimens of white quartzite with scraper edges on restricted areas of the irregular flakes.

DEBITAGE: 555 flakes; 553 of white quartzite, 2 of purple chert. The wide range of flake types from split cobbles to biface trimming flakes indicates that the full range of biface production occurred here. In raw material and lithic technology the site resembles FjCa–24, and 15.

FjCa–38 (Red Ocher Site)

COLLECTION (Plates 52,53): 8 artifacts, including 2 points, 2 biface fragments, 1 blank, 1 core, 2 grindstone fragments. Red ocher and 242 flakes.

POINTS

Side notched (FjCa–38:1,10; Plate 53*c,a,* respectively): 2 specimens. Side-notched and convex based. Both of white quartzite. The complete piece is carefully thinned; its blade edges are sharp and serrated, and convex in outline. The notches are small, deep, with ground interiors, placed 5 mm above base. The base is thinned, convex, and not ground. A careful flaking technique resulted in the removal of tiny flakes from both faces of the point, with little hinge fracture in the quartzite, and little retouch is used. Dimensions: 68(l), 25(w), 7(t). The second point has a broken base, and other than being slightly smaller, is similar to the complete specimen.

BIFACE

Fragments: 2 specimens. One a convex basal piece (FjCa–38:5; Plate 53*d*); the other a tip (FjCa–38:4; Plate 53*e*).

KNIFE

Triangular (FjCa–38:2, Plate 53*b*): Small triangular chert knife with straight, thinned base and nearly straight sides, blunt tip. One side has been utilized as knife. The specimen may also have served as a point blank. Dimensions: 32(l), 20(w), 6(t).

GRINDSTONES: 2 specimens: One of basaltic rock with grinding facet (FjCa–38:9, Plate 52*a*). Other fragments of the parent cobble were found. The stone may have been used as an ocher grindstone. A possible second specimen made of red quartzite was found.

CORE: FjCa–38:7 (Plate 52*b*): A fist-size red quartzite cobble was used as a core from which to remove flakes for further working. It is doubted that the core was used as a chopping tool, since its edges are not battered.

DEBITAGE: 242 flakes, including 114 of beach quartzite, 83 of opaque chert, 38 of red quartzite, 7 of basaltic rock. Most of the flakes are only 3–6 mm long; the chert flakes are the smallest.

FjCa–39: Louis Montague Site

COLLECTION (Plate 55): 11 artifacts, including 2 end scrapers, 1 side scraper, 2 flake scrapers, 1 biface fragment, 4 utilized flakes, 1 core fragment. 126 pieces of debitage.

SCRAPERS

End scrapers: two types.

Oval-shaped, double-ended (FjCa–39:11, Plate 55*e*): Made on large unifacial flake of dark banded gray chert. Working edges at both ends; retouch along margins. Planoconvex in cross-section. Dimensions: 108(l), 56(w), 14(t).

Single-ended, tanged (FjCa–39:5; Plate 55*a*): Leaf-shaped in outline. Made on thick flake of purple chert or felsite. Striking platform obliterated. Working edge at broad end. Proximal end thinned and tapered. One side is ground, perhaps for hafting. Dimensions: 71(l), 36(w), 14(t). Similar to end scrapers from FjCa–9 (Plate 40*a-e*).

Side scraper (FjCa–39:1; Plate 55*d*): Working edge along one side of triangular flake of felsite. Heavily worn edge.

Flake scrapers (FjCa–39:8; Plate 55*c*): End scraper prepared at distal end of Ramah chert flake. Scraper retouch also around margin of flake on dorsal surface, except at a spot where a concave notch has been chipped into the ventral surface. FjCa–39:4 (Plate 55*f*) is a large flake of red quartzite bearing a small area of utilization.

FLAKE SCRAPERS: Several flakes of white quartzite have been used as scrapers.

BIFACE

Edge fragment: A small fragment of Ramah chert biface edge was found.

CORE: A large chunk of white-brown quartzite has been used as a flake core.

DEBITAGE: 126 flakes, including 46 of opaque chert, 45 of white-brown quartzite, 30 of red quartzite, and 5 of Ramah chert.

GbBo–1: Rigolet Spy Site

COLLECTION (Plate 63): 9 artifacts, including 1 point, 1 biface, 2 end scrapers, 5 utilized flakes.

POINT

Triangular (GbBo–1:7; Plate 63*a*): Mottled gray chert. Small flat-based point with convex serrated edges and thinned base. No hafting modification. Manufactured from a blade-like flake. Dimensions: 32(l), 15(w), 5(t).

Biface

Basal section (GbBo–1:4; Plate 63*b*): Mottled gray chert. Flat-based fragment similar to previously described point. Unfinished.

Scrapers

End Scrapers (GbBo–1:5,6; Plate 63*c,d*): Lavender chert. GbBo–1:5 is a complete triangular thumbnail type scraper marginally retouched along the lateral margins and steeply retouched at the end. Proximal end comes to a point at the striking platform. Ventral surface is a single flake scar while dorsal surface has a medial longitudinal ridge. Both this specimen and the proximal fragment (GbBo–1:6) appear to have been made from large blades or blade-like flakes. Dimensions: 27(l), 19(w), 5(t).

Utilized flakes (GbBo–1:1; Plate 63*e*): 5 specimens showing use as knives or scrapers. Raw materials utilized include purple chert, vein quartz, and red quartzite.

BbBn–1: Ticoralak 1

Collection: 3 flakes of Ramah chert.

GbBn–2: Ticoralak 2

Collection (Plate 64): 21 artifacts, including 3 fragments of a biface knife blank, 1 chipped and ground burin-like tool, 1 chipped and ground crescent, 14 microblades, 1 microblade core fragment, 1 fragment of ground slate; 51 pieces of debitage.

Biface

Knife blank (GbBn–2:3,4,7; Plate 64*a-c*): Tip, base, and corner section of bifacial knife blank, chert.

Burin-like tool

Side-notched (GbBn–2:10; Plate 64*d*): Chipped and ground; convex base, thinned. Probably end-hafted. Distal end spalled from use. Two working edges prepared by grinding: one, at tip, has spalled off in the direction of the force and was probably used for cutting narrow grooves in wood or bone; a second edge has been formed by the intersection at an acute angle of the lateral (left-hand) facet with the transverse blade facet. This edge was used as a knife or plane. Dimensions: 15(l), 14(w), 2(t). See description of GbBn–7:4, p. 226.

Crescent

Chipped and ground (GbBn–2:15: Plate 64*e*): Unreported in other Dorset collections. One end of tool is chipped, the other chipped and ground along sides and with a round flat ground facet at the end. May have functioned as a skin softener or creaser. Length: 21 mm.

Core

Microblade core fragment (GbBn–2:22; Plate 64*f*): Small fragment from striking platform. 4 blade scars; U-shaped cross-section. Distal end is snapped and polished on dorsal face from use as scraper.

Microblades: 14 specimens of mottled chert (Plate 64*g-u*). Most are snapped midsections

Utilized microblades: 4 microblades have had their proximal and distal ends snapped off for use as knives. All have lengths ranging 23–37 mm, width 7–8 mm, and bear use scar, particularly at the snapped corners. Some may have been inset in wood or bone. One blade has been notched and shows use on its opposite corner (GbBn–2:2; Plate 64*h*).

Ground slate: A small flake of ground slate indicates the presence of this technology in the tool kit.

Debitage: 51 flakes, including 39 of opaque mottled chert varying from tan to green and brown, 5 of Ramah chert, and 7 of beach quartzite. The quartzite flakes are intrusive in the complex and come from the nearby Indian site, GbBn–6.

GbBn–3: Ticoralak 2 East

Collection (Plate 65*a-g*): 7 artifacts, including 1 corner-notched knife, 5 microblades, 1 fragment of polished slate. 6 pieces of debitage.

Knife

Corner-notched (GbBn–3:6; Plate 65*a*): Brown-gray chert. Blade is biconvex, with convex edges, basal thinning, and ground notches. Dimensions: 30(l), 16(w), 4(t).

Microblades: 5 specimens, including 2 of chert, 3 of quartz crystal. None utilized. All irregular fragments.

Ground slate

Fragment: Small fragment from a larger ground slate tool.

Debitage: 6 small flakes, including 4 of mottled chert, 2 of quartz crystal. Evidently no primary working of materials undertaken in this site.

GbBn–4: Ticoralak 3

Collection (Plate 66): 77 artifacts, including 3 point fragments, 4 biface fragments, 7 biface edge fragments, 4 fragments of ground slate, 1 quartz grindstone, 1 end scraper, 35 microblades, 1 core preparation flake, 21 utilized flakes. 1261 pieces of debitage.

Points

Side-notched, "box-based" (GbBn–4:1,31; Plate 66*b,c*): 2 specimens. Triangular blade, straight edges, planoconvex cross-section. Planar surface chipped and ground smooth, presumably with quartz grindstone. Deep side-notching with ground notch interiors. Stem carefully "boxed" by steep retouch. Thinned at base for hafting. Dimensions: 31(l), 18(w), 3–4(t). The complete point would have measured about 50 mm in length.

Tip (GbBn–4:2; Plate 66*e*): Biconvex tip of chert.

Bifaces

Asymmetric (GbBn–4:19; Plate 66*d*): Planoconvex. Possibly crescentic side-blade or asymmetric knife.

Midsection (GbBn–4:28; Plate 66*a*): Biconvex, thin, and straight-edged.
Flake knives (GbBn–4:29,30; Plate 66*g,f*): Fragments from bifacial tools, unfinished.
Edge fragments (GbBn–4:20,69; Plate 66*g,r*): 7 pieces from the edges of bifaces.

SCRAPER
Small, stemmed end scraper (GbBn–4:3; Plate 66*t*): Circular in shape, stem broken off. Made of brown chert, 10 mm in diameter.

GRINDSTONE
Quartz fragment (GbBn–4:53; Plate 66*h*): One side bears flat ground facet; the other is an irregular natural scar. Probably used for grinding chert and slate.

MICROBLADES (N=35)
Notched blades (GbBn–4:4,14,16,22; Plate 66*l,n,p,k*, respectively): 3 specimens are snapped and notched and have use wear. 7 other blades show signs of utilization as knives.
Nonutilized blades: 17 specimens of broken or faulty microblades.

CORE PREPARATION FLAKES: (GbBn–4:5,59; Plate 66*j,i*): 2 specimens are ridge flake removals from the prepared working face of a microblade core. One specimen appears to be a core rejuvenation flake.

FLAKE TOOLS
Graver (GbBn–4:19, Plate 66*w*): Small flake retouched to produce sharp corner. Burin-like spalls have been driven off one side of the corner.
Denticulate (GbBn–4:61, Plate 66*v*): Triangular flake with denticulate retouch on two sides.
Flake-knives: 4 thin oval flakes have had their distal ends truncated and retouched. 2 have knife edges; 2, scrapers.
Utilized flakes: 15 irregular small flakes have been utilized as notches, knives, or scrapers.

GROUND SLATE: 4 fragments (GbBn–4:10,32; Plate 66*jj,ii*): 3 have flat facets; 1 has a curved surface and may have been removed from an adze.

DEBITAGE: 1261 flakes, including 1204 of opaque chert, 35 of Ramah chert, 12 of slate, 7 of vein quartz, 2 of red quartzite (probably intrusive), 1 of quartz crystal. The crystal is scarce in the site; the chert is unlike that used by Indian cultures.

GbBn–5: Ticoralak 4

COLLECTION (Plate 65*h-k*): 4 artifacts, including 3 microblades and 1 end scraper. 30 flakes.

END SCRAPER (GbBn–5:3; Plate 65*a*): Large stemmed end scraper with flaring edges, convex edge. Stem constricted for hafting.

MICROBLADES
Retouched (GbBn–5:5; Plate 65*j*): Black chert microblade with retouched edge; probably hafted.
Utilized (GbBn–4:2,4; Plate 65*i*): 2 specimens with use wear. Knives.

DEBITAGE: 28 flakes, including 27 of opaque chert, 1 of Ramah chert. Black chert is rare in this area and may be a northern import.

GbBn–6: Ticoralak Surface collection

COLLECTION (Plate 67*a,b*): 9 artifacts, including 1 point, 2 possible grindstone fragments, and 6 utilized flakes. 130 flakes of debitage.

POINT
Corner-notched (GbBn–6:1; Plate 67*a*): Red quartzite specimen similar to North West River points FjCa–12:1 (Plate 56*g*) and FjCa–20:1 (Plate 46*a*). Large blade with convex edges. Notches ground; base convex. 87(l), 36(w), 10(t).

GRINDSTONE
Sandstone: A large tabular piece of ripple-marked Double Mer sandstone was found that may have been used for a grindstone. This type of rock was not encountered elsewhere on the Beach Pass, though it does outcrop in other parts of the island.

UTILIZED FLAKES: 6 specimens of beach quartzite utilized as scraping tools. One flake of quartz may have been worked.

DEBITAGE: 130 flakes, including 66 of beach quartzite, 49 of red quartzite, 14 of quartz, 1 of chert. These flakes are large and thick; very different from the small, thin Dorset flakes.

GbBn–7: Ticoralak 5

COLLECTION (Plates 68,69): 108 artifacts, including 3 points, 4 bifacial knives, 3 triangular flake knives, 4 side blades, 4 burin-like tools, 1 spall tool, 2 pieces of ground slate, 2 core fragments, 69 microblades, 16 utilized flakes. 856 pieces of debitage.

POINTS
Side-notched (GbBn–7:1,2,43,3; Plate 68*a,b,d*): 3 points, 1 of banded green chert, 2 of brown, and 1 of bluish chert. Planoconvex. Made from triangular blanks. Blades slightly convex. No grinding on plannar surface. Notches broad and deep, ground. Bases straight to slightly convex. GbBn–7:1 is a finished point; GbBn–7:2 is more roughly finished. Dimensions: 36(l); 16, 18(w);5, 3.5(t). GbBn–7:43 is smaller and has a broken base. Dimensions: 21(l), 11(w), 3(t).

KNIVES
Notched (GbBn–7:3; Plate 68*e*): Corner or side-notched. Bifacial; asymmetric. Notch interiors crushed. Probably unfinished.
Stemmed, asymmetric (GbBn–7:60; Plate 68*k*): Tanged, brown chert knife. Cutting edge at upper right on convex edge. Dimensions: 67(l), 25(w), 7(t).
Triangular flake knives (GbBn–7:80; Plate 68*i*): 2 specimens with flat base and a concave edge which is the primary cutting edge. A third piece is a midsection of small bifacial knife.

SIDEBLADES
Biconvex (GbBn–7:76/94; Plate 68*f*): A single broken

specimen. Dimensions: 39(l), 18(w), 3(t). Bi-pointed. One side roughly finished; the other, the less convex, is sharpened.

Leaf-shaped (GbBn-7:63,70; Plate 68*h,g*): 3 specimens. GbBn-7:70 is unfinished; GbBn-7:60 of brown chert has one side (the less convex one) carefully finished. It is pointed, with rounded base, and may have been made from a microblade. GbBn-7:94 (Plate 68*j*) is a bifacial sideblade made from a core fragment, or possibly a microblade from the edge of a tabular core. It has a thick "backed" side opposite the cutting edge.

BURIN-LIKE TOOLS

Side-notched, large (GbBn-7:4,69; Plate 68*l,m*): 2 specimens of this type, also found in Newfoundland Dorset (Harp 1964:60); 1 specimen is complete, 1 broken. Formed on tabular piece of chert which has been first chipped to shape, then ground on both faces of the blade and distal end, and often at one lateral edge, which is the working section of the tool. In one case (Plate 68*l*), this edge is 20 mm long and has been chipped, creating an acute angle intersection of the lateral edge with the ground facet on the reverse side of the tool; in the other (Plate 68*m*), the lateral edge has been first chipped and ground to create a more even, durable edge. Two burin blows directed from the distal apex of the lateral edge resulted in removal of long thin flakes from the edge. This process helped to prepare the cutting edge of the tool and in addition resulted in a thin spall that was itself used as a tool (see below: Spall-graver).

At the distal end, the lateral edge intersected the ground convex distal end of the tool at a right angle. The distal end has a U-shaped cross-section, and the presence of spall scars (such as the large one on GbBn-2:10) indicates that the tool functioned as a graver as well as a knife. The position of the notches, with the more pronounced notch and larger projecting spur beneath the working edge, suggests the tool was either end- or side-hafted with force directed in the direction of the spall removals. The tool would be used for cutting grooves and carving bone and wood.

Side-notched, small (GbBn-7:93; Plate 68*c*): Base of a similar graving tool, recognized by pronounced notch and spur on one side. Thinned, straight base.

Flake-graver (GbBn-7:61; Plate 68*o*): Bifacially chipped and partially ground on both faces. Tip of lateral edge partially ground. Probably used unhafted.

Spall-graver (GbBn-7:42; Plate 68*n*): Small 16 mm long removed by burin blow from the tip along ground lateral edge of tool described above. Its proximal end retains portion of ground distal end of the tool, while the sides of the spall are ground on three sides, one with acute angle, showing that it was once the lateral beveled edge of a graver. Two small flakes have been removed from the proximal end of the spall to create a sharp cutting tip, 1 mm thick. The thin distal end has been snapped and utilized as a small cutting tool; its lateral edges are scarred from use. This tool and its parent graver "core" is the local Dorset analog of the pre-Dorset burin and burin spall industry. The function of the spall tool was probably to cut inset grooves, holes, and harpoon head sockets.

CORES

Tabular (GbBn-7:59; Plate 69*a*): Fragment of microblade core bearing blade-removal scars on one edge. Battered striking platform; surface of lateral side fully chipped, with scraper edge prepared on one side. Dimensions: 35 mm along blade removal surface, 11 mm wide. Acute angle striking platform.

Rejuvenation flake (GbBn-7:89; Plate 69*b*): Fragment from striking platform, bearing chalky cortex.

MICROBLADES N=69

Ridge-flakes (GbBn-7:17,52,108; Plate 69*g,e,f*): 3 core preparation flakes have median ridges and one or two dorsal facets with lateral flake scars. Removed from core as final preparation before blade production (Sanger 1968). The two complete ridge-flakes are 48 and 55 mm long and indicate the approximate lengths of the parent core.

Stemmed microblade (GbBn-7:41, Plate 69*d*): 1 specimen of milky chert, snapped. Lateral edges constricted for hafting.

Notched microblades: 8 specimens, mostly snapped midsections of blades with a single notch on one lower edge. Hafted as knives. Distal cutting edges show utilization. Chert pieces (6) average 30–35 mm, apparently a "standard" size; quartz crystal blades (2) are shorter.

Utilized microblades: 12 specimens of chert; 1 of quartz crystal. Lateral edges show use wear. Many are snapped midsections.

Nonutilized microblades: 45 specimens, all of chert; many are blade fragments, by-products in production of above. Others are rejects.

GROUND SLATE: 2 small flakes of tan ground slate.

FLAKE TOOLS

Flake knives: 3 specimens.

Flake scrapers: 16 specimens with restricted areas of utilization.

DEBITAGE: 856 flakes, including 824 of opaque chert, 27 of quartz crystal, 3 of slate, 2 of Ramah chert. Most debitage consisted of very small flakes.

GbBn-8: Ticoralak 6

COLLECTION (Plate 67*c-g*): 8 artifacts, including 1 point, 1 point blank, 1 biface base, 1 biface tip, and 4 utilized flakes. 1529 waste flakes.

POINT

Side-notched (GbBn-8:1; Plate 67*c*): Red quartzite point with tip missing. Long, narrow blade with parallel sides. Notches set low near base, which is convex. One notch had broken and the corner had been reworked. 66(l), 25(w), 7(t). Similar to corner-notched point GbBn-6:1, though narrower, perhaps due to resharpening of blade.

BLANK

Triangular (GbBn–8:7; Plate 67*e*): Green chert blank; straight base, slightly convex sides. Unfinished tip. Dimensions: 47(l), 27(w), 4(t). Probably blank for Dorset side-notched end blade, like GbBn–7:1 (Plate 68*a*).

BIFACES

Base (GbBn–8:2; Plate 67*g*): Unfinished rounded base of beach quartzite. Dimensions: 32(w), 9(t). Similar to specimens from FjCa–24.

Tip (GbBn–8:6): Undiagnostic tip of quartzite.

FLAKE SCRAPERS (GbBn–8:3–5; Plate 67*d,f*): 4 irregular flakes of white quartzite with small scraping edges.

DEBITAGE: 1529 flakes, including 1519 of beach quartzite, 7 of chert, 2 of quartz, 1 of red quartzite. Quartzite flakes range from large to small retouch flakes. Chert intrusive from nearby Dorset site.

GbBm–1: Big Island 1

COLLECTION (Plate 70*a-f*): 15 artifacts, including 3 points, 2 point fragments, 1 blank tip, 1 side-scraper fragment, and 8 utilized flakes. 815 pieces of debitage. All artifacts are of Ramah chert.

POINTS

Corner-notched (GbBm–1:1,4,11,12; Plate 70*d,a-c*, respectively): 4 specimens, including 2 complete, 2 broken. GbBm–1:4 is the most carefully made, with a bifacial triangular blade, straight edges, and a thinned convex base. Corner notches are deep and U-shaped. It has a blunt tip, and its edges, worn flat Dimensions: 39(l), 25(w), 6(t). A second point and smooth, may have been ground, as has its base. (GbBm–1:1) is slightly smaller but of the same type, and is made on a thin flake of Ramah chert only partially retouched on one face. GbBm–1:11,12 are corner-notched points (possibly knives) with asymmetric blades, both with convex edges. Their bases, broken, were also convex; deeply notched.

SIDE SCRAPER (GbBm–1:2; Plate 70*e*): a tabular piece of patinated Ramah chert has been fashioned into a side scraper.

UTILIZED FLAKES (GbBm–1:3,9,10,13–16; Plate 70*f*): 8 flakes have been utilized as small scrapers or knives. Three biface thinning flakes were found.

DEBITAGE: 815 small, thin flakes, including 799 of Ramah chert, 14 of beach quartzite, 2 of gray chert.

GcBk–1: Sandy Cove 1

COLLECTION (Plates 71,72): 23 artifacts, including 8 points, 1 biface base, 1 knife, 5 ground and chipped celts, 1 ground slate point or knife base. 7 flake tools. 369 flakes.

EASTERN AREA

The following were found associated with Houses 1, 2 or in the eastern end of the blowout. Most of the pieces were of Ramah chert.

POINTS

Corner-notched, small (GcBk–1:7–11,18,20; Plate 71 *f-m*): 2 complete points, 5 basal fragments, 1 tip; all of same general type. All except Plate 71*f*, which is a bifacial point of quartzite, are made on small, thin flakes of Ramah chert and bear the original flake scars on one or both faces. Only the edges of the blades have been trimmed. Blades are asymmetric, convex; notches are shallow and set into the corners of the flake; bases thinned and straight or convex. Dimensions: 27–30(l); 19–20(w); 3–4(t) except quartzite point which is bifacial: 6(t).

BIFACE

Rounded base (GcBk–1:17; Plate 71*b*): Single specimen of beach quartzite. Probably leaf-shaped biface similar to FjCa–24 examples. Lateral edges are ground. Dimensions: 27(w), 9(t).

GROUND SLATE BIFACE

Rounded base fragment (GcBk–1:15,16; Plate 71*a*): Made of red slate; highly weathered. Found spalled in two pieces. Biconvex cross section, ground bifacially. Edges are dull. May have been base of slate knife or bayonet. Probably belongs with Maritime Archaic component from central area. Dimensions: 32(w), 7.5(t).

FLAKE TOOLS

Denticulate (GcBk–1:6,22; Plate 71*d*): 2 flakes of slightly patinated Ramah chert with denticulate retouch.

Scrapers (GcBk–1:12–14,21,23; Plate 71*e*): 5 irregular flakes with restricted areas of retouch.

CENTRAL AREA

Five celts and one quartz knife were found 10–15 feet north of House 3. No Ramah chert chipping debris was found; but quartz, red quartzite, and slate occurred.

SLATE CELTS

Chipped and ground (GcBk–1:1–4,24; Plate 72*a-e*): 5 specimens of green slate. All show varying degrees of workmanship and use wear. They have been manufactured from blanks, originally large flakes of slate, and worked down by chipping into rough rectangular slabs. The working ends of the blanks were then pecked into shape and ground to take on their final form. Generally, only the bit ends have been fully finished; the upper two-thirds of the celts remained in chipped form. Only one specimen (GcBk–1:1; Plate 72*d*) has its bit intact; it seems to have been used as an adze. Spalls have broken off the bits of the other specimens during use. Poll ends are battered as well. One tool (GcBk–1:2; Plate 72*c*) has a highly polished surface with both faces near fully ground. The dimensions (in mm) of the celts from GcBk–1 vary considerably.

Number	*Length*	*Width of Working Edge*	*Width of Butt*	*Thickness*
1	131	60	41	24
2	113	51	15	21
3	183	64	39	25
4	153	67	48	22
24	165	51	40	25

Variability notwithstanding, the celts have several features in common: they flare toward the bit end, and have narrower polls; 3 of the 5 have angled polls (see Harp and Hughes 1968:13) which may be hafting modifications. Apparently the tools have been used for heavy woodworking, perhaps boat or house construction, or for cutting firewood. Size variation may simply be a function of the task performed. Several of the celts bear red ocher stains.

FLAKE KNIFE (GcBk–1:5; Plate 71*c*): A single specimen of a knife fashioned from a quartz flake was found near House 3. A tip and cutting edge on one side has been prepared.

WESTERN AREA

No tools were found in this area. However, a sample concentration of chipping debris was plotted and collected.

DEBITAGE: The sample collection came from an area several feet in diameter at the extreme western end of the blowout. It contained 193 flakes, including 120 of slate, 68 of quartz, and 5 of red quartzite.

GcBk–2: Sandy Cove 2

COLLECTION (Plate 73): 50 artifacts, including 10 points, 17 point fragments. 1 point blank, 9 knives, 1 fragment of ground slate, 12 utilized flakes.

POINTS: All of the chipped points found were stemmed. Several varieties were present:

LARGE

Single-shouldered (GcBk–2:40; Plate 73*a*): 1 specimen had a pronounced shoulder on one side while the other had only a slight constriction. It is bifacial with straight tapered stem with the striking platform on the base. Stem approximately as long as the blade, which is convex-sided. Made of weathered tan chert or siltstone. Dimensions: 68(l), 26(w), 10(t).

Symmetrical, stemmed: 2 specimens of Ramah chert.

GcBk–2:34 (Plate 73*c*): Triangular blade with straight edges; short, tapered stem; striking platform at bottom. Thin blade with collateral flaking. Finely chipped. Dimensions: 56(l), 27(w), 7(t).

GcBk–2:41 (Plate 73*b*): Thick triangular blade with convex edges. Sharply shouldered; tapered stem, with lateral grinding. Striking platform thinned. Dimensions: 68(l), 28(w), 8(t).

INTERMEDIATE

Symmetrically stemmed (GcBk–2:7/53; Plate 73*g*): Broken in the process of manufacture; tip unfinished. Tapered stem broken above base. Dimensions: 38(l), 20(w), 5(t).

SMALL

Bifacial, stemmed (GcBk–2:21,22,42; Plate 73*i,f,h*): 3 specimens, including 1 of weathered tan rock, 1 of quartz, 1 of Ramah chert. Blade/stem ratio proportions about 1:1. Blades convex; tapered stems unground, with striking platform present at base. The weathered point has a spalled fragment missing from blade; it differs from other two having a shorter more convex blade. GcBk–2:21,2 were found within a few inches of each other in a quartz chipping concentration. Dimensions: 38, 37,36(l); 19,19,16(w); 7,7,6(t).

Unifacial flake points (GcBk–2:33,16,52; Plate 73 *j,k,l*): Made on thin flakes of Ramah chert. GcBk–2:33 is unifacial with snapped base; GcBk–2:16,52 are flake points with original flake scars on both sides, with bifacial retouch around the edges only. Blade edges straight to convex; stems tapered, with striking platform removed, round-based; unground. Dimensions: 34,41,36(l); 17,18,17(w); 5,5,4(t).

POINT FRAGMENTS

Stems (Plate 73*n-q*): 6 specimens of Ramah chert, all bifacial. Four varieties represented: (1) GcBk–2:57 (Plate 73*o*): Round-based, lobate, tapered stem. Broken at the base of shoulder. Short, wide stem. (2) GcBk–2:45 (Plate 73*p*): Narrow, more tapered stem. (3) GcBk–2:11: Narrow tapered stem with snapped base, thick. (4) GcBk–2:27 (Plate 73*q*): Flake-point stem; narrow, tapered, thin.

Tips: 11 pieces of Ramah chert, including 4 broad, blunt biface tips; 4 sharp thin tips; 2 long narrow tips, 1 blank tip. Since no Ramah chert knives have been found on the site the blunt broad specimens may have been intended to be worked down into points.

POINT BLANK

Basal fragment (GcBk–2:19; Plate 73*m*): Preform for tapered stem point of Ramah chert. Straight taper from shoulder to pointed base. Dimensions: 33(w), 8(t).

KNIVES

Bifacial, stemmed (GcBk–2:23/24; Plate 73*e*): Single broken and refit specimen of vein quartz. Triangular blade, pointed stem. One blade edge carefully sharpened. Dimensions: 51(l), 26(w), 9(w).

Biface tip (GcBk–2:30; Plate 73*u*): Thick tip fragment of unfinished bifacial quartz knife.

Asymmetric blank (GcBk–2:39; Plate 73*x*): Asymmetric blank of red quartzite knife. The only bifacial specimen of this material found at GcBk–1.

Flake knives (GcBk–2:8,15,28,31,32,35,36; Plate 72*s,t,-v,w*): 6 flakes of crystalline quartz have been bifacially flaked to prepare a cutting edge on one or more sides. Tend to be round-based. Size varies from 36–66 mm. GcBk–2:31 (Plate 73*w*) is a thin flake of red quartzite whose lateral edges have been bifacially retouched.

UTILIZED FLAKES: 12 utilized flakes were found, including 8 of Ramah chert, 3 of quartz, 1 of gray chert.

GROUND SLATE FRAGMENT: A fragment of weathered green slate (GcBk–2:18; Plate 73*r*) was found which may have been spalled from a ground slate tool. Its ground side is convex. Several other flakes of slate were collected. Most of the slate on the terrace was badly weathered and decomposed.

DEBITAGE: A few collections of chipping debris were made. All concentrations however, were mapped and identified as to raw materials to be plotted for site distributions and correlations with artifacts (Figure 49).

GcBk–2a: Sandy Cove 2 excavation

COLLECTION: 15 artifacts, including 1 point stem, 1 flake knife, 1 whetstone, 2 core fragments, and 10 utilized flakes.

POINT

Stemmed point fragment (GcBk–2a:14): Small stem of bifacial point, thinned, snapped diagonally. Dimensions: 13(w), 4(t).

FLAKE KNIFE

Red quartzite (GcBk–2a:5): Oval flake with tip missing. Bifacially flaked on one edge. Dimensions: 71(l), 45(w).

WHETSTONE

Metamorphosed sediment (GcBk–2a:9): Rectangular slab with polish on one side. Dimensions: 115(l), 44(w), 8(t).

CORE FRAGMENTS

Red quartzite (GcBk–2a:6,8,11): Large thick specimens with irregular flake removals. One edge of GcBk–2a:11 has been used as a scraper. A smaller fragment (GcBk–2a:6) also has a scraper edge.

UTILIZED FLAKES: 9 irregular flakes have been used as scrapers; 8 are of red quartzite, 1 of quartz.

DEBITAGE: Only a small sample was retained. The majority of the lithic debris was red quartzite; quartz was well represented, and Ramah chert was present as a trace.

GcBk–3: Sandy Cove 3

COLLECTION (Plate 74): 17 artifacts, including 2 celts, 2 point fragments, 1 biface fragment, 1 knife, 1 ground slate piece, 2 core fragments, and 8 utilized flakes.

CELTS

Chipped, oval (GcBk–3:1; Plate 74*d*): A single specimen chipped from large flake of red quartzite. Bit end bifacially flaked; U-shaped cutting edge. The sides are chipped flat and converge toward the poll, which is battered. Dimensions: 142(l), 68(w), 26(t).

Ground celt fragment (GcBk–2:9; Plate 74*e*): Found in fragmented, rotting condition. Made of tan slate with one face fully ground; the other side chipped only. The working edge is not present. The celt may be unfinished. The chipped side has a deep transverse groove which does not seem to have been gouged or cut, but appears natural. The sides of the celt have been thinned by flaking.

POINT FRAGMENTS

Stemmed (GcBk–3:7,8; Plate 74*a-b*): 2 specimens of Ramah chert. GcBk–3:8 is an unfinished stem which is thick and probably broken during manufacture; GcBk–3:8 is a completed stem, short, and broken off at the shoulder. It is broad and bifacially thinned, similar to GcBk–2:57.

KNIVES

Edge fragment (GcBk–3:10; Plate 74*c*): Edge piece from a bifacially flaked quartz knife.

Ovate blank (GcBk–3:14; Plate 74*f*): Flake of crystalline quartz worked bifacially into blank. Dimensions: 61(l), 39(w), 13(t). Broken in manufacture.

CORE FRAGMENTS

Red quartzite (GcBk–3,4,15): Core fragments of red quartzite; pyramidal shape.

GROUND SLATE

Tan Slate (GcBk–3:5; Plate 74*g*): Fragmented chunk of tan slate, ground to convex shape on top; flake scar on bottom. Used as abrading stone after fracture; one piece bears several linear grooves.

UTILIZED FLAKES: 8 flakes have been used as scrapers or knives, including 2 of purple volcanic rock and 6 of quartz.

DEBITAGE: Only a small sample retained. Several pounds of flakes were excavated. By far the most numerous were quartz flakes, mostly large and irregular; red quartzite accounted for about 25 percent; the remainder was purple volcanic, Ramah chert, and slate.

GcBk–4: Sandy Cove 4

COLLECTION (Plate 75): 12 artifacts, including 2 biface fragments, 6 utilized flakes, 4 battered or chipped slate pieces.

BIFACE FRAGMENTS

Stem (GcBk–4:7; Plate 75*a*): Patinated specimen of Ramah chert, apparently a stem of an unfinished point.

Tip (GcBk–4:8; Plate 75*b*): Blunt, heavily worn, of Ramah chert.

UTILIZED FLAKES (GcBk–4:2–5,9–12): Irregular flakes of quartz and Ramah chert utilized as knives or scrapers. Only the less crystalline portions of the quartz were used.

SLATE

Battered fragments (GcBk–4:1,6): Two thick chunks of slate have been battered and may have been used as tools; several flakes may have been used also, but there is very little evidence available because they have been badly weathered.

DEBITAGE: A representative sample of the chipping debris was collected. It consists of approximately 45 percent quartz, 45 percent slate, and the remainder Ramah chert, red quartzite, and two flakes of a new material—a black and gray-banded chert, not found in other Hamilton Inlet sites to date.

MICA: Several small flakes of mica were found in the excavation.

GcBk-5: Sandy Cove 5

COLLECTION: Recovered from test pit. One artifact—a knife fragment, and 26 flakes.

KNIFE FRAGMENT

Edge fragment (GcBk-5:1): Bifacially worked specimen of quartz. Portion of a straight edge heavily worn from use, 27 mm long.

DEBITAGE: 26 flakes, including 10 of gray chert, 7 of quartz, 6 of red quartzite, and 3 of Ramah chert.

GcBk-6: North West Brook 1

COLLECTION (Plate 76): 29 artifacts, including 5 side-notched point bases, 1 triangular knife, 1 point blank, 5 scrapers, 4 biface fragments, 2 blade-like flakes, and 11 utilized flakes.

POINTS

Side notched (GcBk-6:20,21,25–27; Plate 76*a-e*): 5 basal fragments; 2 of quartz, 2 of red quartzite, 1 of gray chert. All represent the same type: side-notched 4–5 mm above the base; thinned convex base. Basal width 19–20 mm for red quartzite pieces; between 10–16 mm for chert and quartz.

Triangular (GcBk-6:12; Plate 76*f*): Small triangular point of red quartzite with slightly serrated, straight edges; snapped or unfinished base; possible notch on one side. Blade appears finished. Dimensions: 28(l), 17(w), 6(t).

Leaf-shaped blank (GcBk-6:17; Plate 76*h*): Point blank of red quartzite; broken tip, convex base. Dimensions: 52(l), 27(w), 8(t).

BIFACES

Midsection (GcBk-6:23; Plate 76*g*): Pink chert midsection. Spalled; found in test pit. Dimensions: 19(w), 5.5(t).

Fragments (GcBk-6:24,28): Small edge fragments and tip of quartz bifaces. GcBk-6:29 is blunt tipped and thick; unfinished.

SCRAPERS

Thumb-nail (GcBk-6:11,16,18; Plate 76*j,k,l*): 3 specimens of this type made on thin flakes of red quartzite. Working (distal) end straight to convex; lateral sides retouched; proximal end unmodified, and narrower than distal end. Dimensions: 21(l), 21–24(w), 4–5(t).

Elongate (GcBk-6:10; Plate 76*i*): Orange chert, spalled dorsal surface. Convex distal end missing. Scraper retouch along lateral sides, converging toward striking platform.

Fragment (GcBk-6:22): Orange chert with knife edge on one side, scraper on the other.

LINEAR FLAKES (GcBk-6:3,19; Plate 76*o,p*): 2 specimens of red quartzite. One has triangular cross-section; the other trapezoidal. Striking platform at end of flake. Both have snapped distal ends. No traces of use.

UTILIZED FLAKES: 10 specimens, including 9 of red quartzite, 1 of quartz. Made on irregular flakes. Most were used as scrapers.

GcBk-7: North West Brook 2

COLLECTION (Plate 77): 7 artifacts, including 5 scrapers, 1 biface, and 1 utilized flake.

SCRAPERS

Stemmed end scrapers (GcBk-7:2,6,7; Plate 77*f,e,d*): 2 made of gray fibrous quartzite, 1 of gray volcanic or poor chert. All have thick working edges, which are the widest part of the tool. The two complete specimens have tapered stems, with chipped lateral margins. Ventral surface of the quartzite pieces have been thinned. Hinge fractures common. Dimensions of the complete specimens GcBk-7:2,7: 80,67(l); 33,33,37 (w); 10,13,16(t).

Disk-scrapers (GcBk-7:1,5; Plate 77*c,b*): 2 specimens of gray quartzite, made on flat flakes; unifacial. Working end opposite striking platform; broad, convex edge. Retouched around lateral margins. Dimensions: 41,57(l); 43,33(w); 9,9(t).

BIFACE

Convex base (GcBk-7:4; Plate 77*a*): Basal fragment of gray quartzite. Two flakes broken from base. Probably unfinished. Dimensions: 28(w), 7(t).

UTILIZED FLAKE (GcBk-7:3): Gray quartzite.

GcBj-1: Bluff Head Cove 1

COLLECTION: 79 pieces of debitage, including 36 of quartz, 19 of purple chert, 20 of mottled green chert, 4 of Ramah chert.

GcBj-2: Bluff Head Cove 2

COLLECTION: 17 pieces of debitage, including 10 of Ramah chert, 4 of red quartzite, 3 of purple chert.

GcBj-3: Bluff Head Cove 3

COLLECTION: 10 flakes of Ramah chert.

GcBj-4: Bluff Head Cove 4

COLLECTION (Plate 70*g,h*): 2 artifacts and 41 flakes.

POINTS

Contracting stemmed (GcBj-4:1,2): 2 specimens, bifacially flaked from Ramah chert. Larger point has a pointed stem, less marked shoulders than the smaller specimen. Blades are convex and widest at the shoulder. Both points have the striking platform from the original flake unaltered at the base of the stem. Dimensions: 37,33(l); 18,16(w); 5,6(t).

DEBITAGE: 41 flakes, including 39 of Ramah chert, 2 of quartz.

GcBi-1: Winter Cove 1

COLLECTION (Plate 78*a*): 4 artifacts, including 2 biface fragments, 1 scraper fragment, 1 utilized flake. 150 flakes.

Biface fragments

Convex base (GcBi–1:1; Plate 78*a*): Specimen of beach quartzite, possibly uncompleted when broken; hinge-fractured and lacking secondary retouch; sinuous edges; basally thinned. Dimensions: 33(w), 10(t).

Tip (GcBi–1:2): Small unifacially worked tip; blunt, with convex blade; Ramah chert.

Scraper

Fragment (GcBi–2:5): Small fragment from working edge of black chert scraper.

Utilized flake: One specimen of Ramah chert, worked at thin, distal end.

Debitage: 150 small flakes, including 136 of Ramah chert and 14 of beach quartzite. Some of the Ramah chert flakes have a greenish hue unusual in the most common varieties of the stone.

GcBi–2: Winter Cove 2

Collection (Plate 78*b-d*): 10 artifacts, including 2 point fragments, 1 biface fragment, 1 scraper fragment, 1 ground slate piece, and 5 utilized flakes. 1185 flakes.

Points

Stemmed basal fragments (GcBi–2:4,5; Plate 78*b,c*): 2 specimens of Ramah chert. One has its tip missing and is mostly unifacial; its slightly contracting stem is bifacially chipped, with striking platform removed.

Thin, unground, lanceolate blade. Dimensions: 18(w), 5(t). Second point fragment is bifacially worked, with ground edges; basally thinned.

Biface blank

Edge fragment (GcBi–2:6; Plate 78*d*): Fragment of large unfinished biface of Ramah chert.

Scraper

Edge fragment (GcBi–2:9): Heavily worn working edge of Ramah chert scraper.

Ground slate

Fragment (GcBi–2:10): Small fragment with convex, ground surface.

Utilized flake scrapers: 5 small, thin, irregular flakes.

Debitage: 1185 flakes—mostly small and thin—including 1184 of Ramah chert, and 1 of slate. The site was evidently used only for finishing or resharpening tools. No traces of primary production.

GcBi–3: Winter Cove 3

Collection: 1 artifact—a utilized flake—2 thinning flakes, and 20 pieces of debitage.

Utilized flake

Flake scraper (GcBi–3:1): Flake scraper of purple chert.

Debitage: 22 flakes of purple or lavender chert. This material is commonly found among early interior sites but is rarely found on the coast. Two thinning flakes from thin bifaces or blanks were found.

GcBi–4: Winter Cove 4

Collection: 7 artifacts, including 2 biface fragments and 5 utilized flakes. 581 pieces of debitage.

Biface fragments

Midsections (GcBi–4:6,7): 2 specimens of Ramah chert, patinated and probably fire burnt. Dimensions: 23 (w), 8(t).

Utilized flakes: 5 flakes of Ramah chert have been used as scrapers. One (GcBi–4:3) is a large flake that has been used on all its margins.

Debitage: 581 flakes, including 579 of Ramah chert (mostly small flakes) and 2 of quartz.

GcBi–5: Winter Cove 5

Collection: Several flakes excavated from a test pit. No artifacts recovered.

GcBi–6: Buxo Bank

Collection: 1 artifact—a preform fragment—and numerous flakes.

Preform

Fragment (GcBi–6:1): Large preform fragment of red quartzite. Bifacially flaked with sinuous edge. Dimensions: 70(w), 32(t).

GcBi–7: Rattlers Bight 1

Collection (Plates 79,80): 273 artifacts, including 60 points and point fragments, 12 biface fragments, 125 flake tools, 10 ground slate knives, 2 gouge fragments, 3 adze fragments, 2 plummets, 6 whetstones, 1 maul, 51 ground slate fragments, 1 barbed bone leister. 3984 flakes.

Chipped Stone Inventory

Points: The total sample of the class includes 60 specimens, all of Ramah chert. The sample is divided into two series—a bifacial series of 37 points, and a unifacial series of 23 points. Throughout the entire class and within both series there is remarkable variability in a wide range of attributes, most particularly in size (which is from 10–113 mm); however, the unifying attribute of the class is that all points have contracting stems. It is not possible at this point to develop a typology for the points since the sample of complete specimens in the bifacial series is too small (5), and the unifacial series is very irregular in technology. With such a sample it is not possible to define types statistically. In fact, the variability of the materials suggest that "morphological types" in the formal sense do not exist in the assemblage. A more fruitful approach would be from attribute analysis, which, again, would require a larger sample.

BIFACIAL SERIES
(N = 37)

This series consists of five tentative groupings, represented by the complete specimens:

Lanceolate, round stem (GcBi–7:179; Plate 79*aa*): A single specimen of this group has a long, narrow blade with straight, sharp edges and is widest at the shoulders. The shoulders are narrow, the stem straight-sided and slightly contracting, with a rounded base bearing a small remnant of the striking platform. The flaking technique is collateral and carefully controlled. The stem is not laterally ground. Dimensions: 113(l), 25(w), 7(t), stem length, 24; width below shoulders, 17 mm. Several of the round-based stem fragments (GcBi–7: 38,83) may belong to points of this type, probably used as a lance.

Broad-stemmed (GcBi–7:200; Plate 79*bb*): A single specimen, found near GcBi–7:179, of Ramah chert. Triangular blade with straight edges; very slight shoulders; wide, straight-sided contracting stem; flat and thick base with unmodified, unground striking platform. Dimensions: 75(l), 30(w), 7(t); maximum stem width, 25; minimum, 17.

Asymmetric (GcBi–7:128; Plate 79*v*): Smaller point with slightly asymmetric blade, convex sides, and sharp, pronounced shoulders; parallel-sided stem with convex base; laterally ground on one side below shoulder. Dimensions: 43(l), 23(w), 6(t).

Flat-based (GcBi–1:7,36,81,89; Plate 79*x,t,q,y*); 11 specimens, including 2 complete points, 9 bases. These attributes seem fairly consistent for medium-sized points. The complete points are smaller than those whose stems were found. They share straight-sided, tapered stems and flat bases, which have been left unmodified from the striking platforms, or are snapped, or have been chipped square. All tend to have sharp sloping shoulders and straight-sided triangular blades.

Convex base (GcBi–7:38,83,143,228): 5 basal fragments of tapered stems with thinned convex bases. 2 stems are laterally ground.

Tips: 15 specimens, some of which may be knife tips.

Midsection: 2 specimens, one a shoulder piece of an unfinished point.

FLAKE SERIES
(N = 23)

This series is extremely variable in form and size, from 10–35 mm in length. All are made on small flakes of Ramah chert which have been worked only at their margins. They are termed "flake points," since both ventral and dorsal surfaces remain unmodified.

Shouldered, triangular bladed (GcBi–7:20,63; Plate 79*h,p*): 2 specimens, on curved flakes. Broad triangular blades; sharply shouldered; straight stemmed; flat base.

Micropoint (GcBi–7:37,95,130; Plate 79*a-n*): 20 specimens, varying from 10–32 mm in length. 15–22 mm is the most common size range. Manufactured on irregular flakes; marginally retouched to produce a pointed end, a stem, and generally a narrow blade. They conform to no definite template. The larger varieties tend to have less constricted stems and more lanceolate blades.

BIFACES

Asymmetric knife (GcBi–7:162; Plate 79*ee*): Resembles semilunar sideblade; pointed, one edge more markedly convex; thick diagonal base, unretouched. Sharpened on both sides. A unique specimen in the collection.

Fragments: 11 specimens are fragments of bifaces, probably points, since there are no unstemmed bifaces in the assemblage.

UTILIZED FLAKES

End scrapers (GcBi–7:18,34,123): 8 small oval flakes have their distal ends retouched as end scrapers. The pattern is consistent enough to suggest that a particular type of flake and finished tool was intended. Dimensions: 15(l), 10(w).

Flake gravers (GcBi–7:258,259): 2 flakes may have been used as gravers for cutting bone or wood. Cutting edges have not been carefully prepared; identification is based on use wear. Many other broken or pointed flakes could have been used for this task; no specific tool type seems to have been used.

Drill (GcBi–7:249): A small, narrow flake has a tapered tip with sides heavily worn, as though from use as a drill. No special preparation was entailed.

Flake knives and scrapers: 114 specimens were found to have been used as knives or scrapers or denticulate tools. They are made from irregular flakes and bear utilization in restricted areas. Almost all the flakes found at the site that were larger than 20 mm in length were used in this fashion, suggesting a parsimonious attitude toward the use of larger flakes of Ramah chert. GcBi–7:105 (Plate 79*dd*) is not a convex base biface fragment, but a utilized flake.

Ground Stone Inventory

The portion of the assemblage manufactured from ground stone consists of five classes of tools represented here by small and often incomplete samples. While it is expected that the chipped stone complex is fairly representative, that of ground stone is probably only a small percentage of the final assemblage. This is due to the smaller frequency of these tools in the assemblage, the fact that slate tools particularly may be effectively cannibalized and redesigned for other uses when their original function is impaired, and the tendency for small slate tools to be poorly preserved. Many were in a soft chalky condition when excavated.

POINTS

Stemmed points:

Chipped and ground (GcBi–7:158; Plate 80*l*): Medium-sized point of tan slate partially ground on one side. Thin lanceolate blade, tapered shoulders, contracting stem. Possibly uncompleted; roughly made. Dimensions: 46(l), 14(w), 3(t).

Micropoint (GcBi–7:159; Plate 80*k*): Made from red slate. Blade has convex edges which are ground flat from shoulders to tip; its tip, however, is sharp; medial ridge down the center of the blade on both faces; the sloping shoulders have been ground also; the stem is chipped and roughly finished. The point may have been adapted from a larger broken point. Dimensions: 21(l), 11(w), 4(t).

Lance points:

Basal and tip fragment (GcBi–7:156,215; Plate 80*g*, *h*): 2 specimens probably of the same artifact, of greenish slate. Ground over entire surface. The tip has a biconvex cross-section with flattened sides, sharpened tip and edges, which are convex also. Point midsection missing. Base has rectangular cross-section with its edges ground flat and 3 mm thick; one side has a slight medial range, the other is nearly flat. The base is flat. Slight flaring at upper edge on one side suggests the presence of shoulders on the original artifact; if so, this is a fragment of a tapered stem. Dimensions: 39(l), 16–22(w), 6(t). The complete artifact would not have been less than 150 mm in length.

KNIVES

Stemmed (GcBi–7:195; Plate 80*j*): Specimen of red slate, fully ground. Blade triangular, slightly asymmetric with convex, sharpened edges; blunt tip. Flat cross-section, tapered edges. Sharply constricted shoulders; narrow tapered stem, rectangular cross-section; snapped, unground flat base. Knife blank was thin slab of slate; grindstone cross-section was flat with convex edges (note stem and upper shoulder profile).

Semilunar (GcBi–7:198; Plate 80*m*): Tan slate flake with semi-lunar shape. Upper edge is flat, battered and thick. The curved margins have been sharpened. Flake scar on one side, ground surface on other. Not a true "semilunar knife" type. Length across flat edge, 47. Dimensions: 34(w), 4(t).

Midsection (GcBi–7:135): Section near tip of red slate point or knife; straight edges, sharpened; plano-convex cross-section

Flake knives (GcBi–7:50,99; Plate 80*i*): 2 specimens of greenish slate chipped over most of their surface area with one edge ground. One side of GcBi–7:99 is thick and battered; the other has a partially ground, beveled edge. GcBi–7:50 is a long flake with a ground straight cutting edge at its narrow end. May have been used as a scraper.

WOODWORKING TOOLS

Gouge (GcBi–7:49; Plate 80*a*): Bit end of a polished green slate gouge; distal end of tool broken diagonally from larger specimen. Proximal end is battered, apparently from use as a hammer platform when tool was reused after being broken. The channel groove in bit has the form of a shallow truncated cone, originally about 60 mm long. Cutting edge is curved and partially fractured from use. The tool has flat, ground sides which converge slightly toward the working end. The bottom of the gouge is rounded and thick; upper surface flat, with low lateral lips. Dimensions: 60(l), 42(w); cutting edge, 35(w). GcBi–7:234 is an edge flake from another gouge.

Adze (GcBi–7:157; Plate 80*b*): Fragment of green slate adze including a side and the corner of the bit edge. One side of the tool is ground flat; one surface is flat with slight taper toward the side; the other is markedly convex, also tapering toward the side, and toward the cutting edge. Its general grinding features are angular, not rounded, and similar in terms of a blank to the gouge. The sides of both have flat facets. Dimensions: 46(l), cutting edge 31. Two small bit fragments (GcBi–7:54,55) found nearby may be pieces of the same tool.

Celt fragment (GcBi–7:225; Plate 80*d*): Pecked and ground from green slate. Oval cross-section; roughly finished. Proximal end battered; tool flares towards working end. Dimensions: 108(l), 64(w), 27(t). GcBi–7:190 (Plate 80*c*) is a broken distal fragment of an adze with only small areas of the original surface intact (portion of flat side and convex working end). It has a battered flat, proximal end, caused by re-use after the bit broke from the original tool.

PLUMMETS

Soapstone (GcBi–7:65; Plate 80*n*): Small, polished specimen, with gouged perforation and grooved around the neck and over the top. Body rounded, with pointed base and flat, unfinished backside. Dimensions: 35(l), 21(w), 15(t).

Knobbed (GcBi–7:113; Plate 80*f*): Top fragment of feldspathic rock pecked into shape. Large knobbed top with shallow groove and narrow abdomen. Bottom portion missing. Knob width, 30; neck, 25.

WHETSTONES: (GcBi–7:140,153,214; Plate 80*o*): Six whetstones were collected. They vary from fine to coarse grain, have a wide variety of shapes, and at least one grinding surface on each specimen.

MAUL (GcBi–7:241; Plate 80*p*): A cylindrical specimen of gneiss with rounded ends has been used as a hammer. It was found on a flat rock slab in the midst of a thick red ochre concentration.

GROUND FLAKES: 51 fragments of ground slate artifacts were recovered. Of these, 18 have convex ground portions suggesting a parent tool such as an adze or gouge. The others have flat ground facets and may belong to knives or points. Many are probably resharpening flakes after which the working edge was re-ground.

Bone Industry

Small samples of bone were preserved in hearths. Most included small mammal and bird remains. Only the artifacts which had been burned survived.

LEISTER (GcBi–7:142,154; Plate 79*z*): Small fragments could be reconstructed into a portion of a barbed antler leister. Seven fragments remain unfitted. The complete specimen is slightly curved and twisted. The barbs are small, narrow, and of the saw-tooth variety, with flat tops, separated by narrow grooves. A cross-section of the tool including the barbs has a tear-drop shape. The barbs are slightly inset from the edge of the bone. Dimensions: 88(l), 8(w), 5(t).

MICA: Flakes of mica as large as 50 mm were frequently found associated with hearth deposits and red ochre concentrations. One piece had been cut and bears a flat straight edge. Most, however, were irregular flakes. The function of this material is unknown, but it appears to have been utilitarian, rather than ceremonial.

DEBITAGE: 3984 unutilized flakes were recovered. Of these, 3779 were Ramah chert, 190 slate, 9 of gray chert, and 6 of quartz. These flakes, with rarely any exception, were smaller than 25 mm in length; most were between 5–20 mm. Any larger flakes were almost invariably utilized, emphasizing the importance of conserving the material. The Ramah chert flakes tended to be small and symmetrical in shape. Many were sharpening or resharpening flakes from bifaces. The lack of large irregular flakes and biface thinning flakes indicates that bifaces were generally not formed on the site, an interpretation supported by the lack of biface blanks and fragments. These seem to have been manufactured elsewhere and brought in near-finished form to the site. The lack of large flakes of slate indicates that the same procedures were used for this material. The gray chert and quartz are traces only, and the stone industry here can be realistically described as one restricted to Ramah chert for chipped tools, and slate for cutting tools of ground stone. Hammerstone, whetstones, and plummets were made of more clastic materials. This lithic complex is different from the Sandy Cove sites, which have more variability in raw materials within the chipped stone technology. Most important is the high frequency of quartz and red quartzite usage in the Sandy Cove sites. These materials were not used at all by the Rattlers Bight people.

GcBi–8: Hound Pond 1

COLLECTION (Plate 78*e-h*): 20 artifacts, including 1 point, 2 point fragments, 2 flake knives, and 15 utilized flakes. 1769 flakes.

Chipped Stone Inventory

POINTS

Stemmed (GcBi–8:1; Plate 78*e*): A single specimen of white-brown quartzite. Triangular, straight-sided blade with beveled edges; sharply shouldered; wide-stemmed with parallel-sides, ground edges; base thinned and flat. Dimensions: 42(l), 23(w), 5(t); stem width 15.

Tips: 2 specimens of Ramah chert from small or very narrow bifaces.

FLAKE KNIVES: (GcBi–8:10,11; Plate 78*f,g*): 2 specimens, one a large beach quartzite cortex flake bifacially flaked on one edge; the second is a triangular flake of Ramah chert with unifacial retouch on two sides.

UTILIZED FLAKES: 15 specimens, of which 12 are irregular flakes of Ramah chert, utilized in small areas, and 3 flakes of purple quartzite have been similarly used.

DEBITAGE: 1769 flakes, of which 1522 are Ramah chert, 238 purple-pink quartzite, and 9 of beach quartzite. The flakes of quartzite are larger than those of Ramah chert. Many are thinning flakes, which are generally not found in the Ramah chert debris. Biface manufacture seems to have occurred in the quartzite industry and not in the Ramah chert industry. Thus there is some evidence for the identification of two cultural components from the lithic waste, as well as from stratigraphy.

GcBi–9: Hound Pond 2

COLLECTION (Plate 81): 22 artifacts, including a chipped inventory of 11 points or point fragments, 2 biface blank fragments, 2 flake tools, 1 utilized flake, and a ground slate collection of 1 stemmed point fragment, 1 adze or gouge fragment, 1 wedge, and 3 ground flakes. 504 flakes of debitage.

Chipped Stone Inventory

POINTS

Stemmed, bifacial (all of Ramah chert)

Asymmetric, tapered stem (GcBi–9:2; Plate 81*c*): Single specimen with convex blade, asymmetrically shouldered, with narrow tapered stem, pointed at base. Sharp cutting edges near tip. Dimensions: 49(l), 16(w), 6(t).

Flat-based (GcBi–9:1,5,6; Plate 81*a,f,e*): One complete specimen, 2 basal fragments. Straight-sided triangular blade; sharp shoulders; narrow stem with flat base. In two cases the base was purposefully snapped after flaking. Stem sides are ground in 2 of 3 specimens. The points are of medium size, with the complete specimens slightly smaller: Dimensions: 49(l), 20(w), 5(t).

Fragments: 5 parts of points, including 3 tips, 1 side fragment, and 1 stem. The stem (GcBi–9:4; Plate 81g), broken at the base of the shoulder, is long

(31 mm), narrow, thick, and has a thinned flat base.

Stemmed, unifacial (Ramah chert)

Flake point (GcBi–9:10; Plate 81*b*): Made on thin flake bifacially retouched at margins only. Sharp shoulders, broken stem. Dimensions: 45(l), 19(w), 3(t).

Micropoint (GcBi–9:3; Plate 81*d*): Triangular blade; tapered stem; thick, flat base. Blade section bifacially flaked. Dimensions: 36(l), 14(w), 4(t).

BIFACE BLANKS

Fragments: 2 specimens—a tip (GcBi–9:22) and a midsection (GcBi–9:7). Both of Ramah chert, unfinished.

FLAKE TOOLS

Flake knife (GcBi–9:8; Plate 81*i*). Small flake bifacially flaked on one edge, unifacially flaked on the other. Dimension: 32(l).

Flake scraper (GcBi–9:9): Scraper edge on thick flake.

UTILIZED FLAKE (GcBi–9:23): Single specimen of Ramah chert.

Ground Stone Inventory

POINT

Stemmed fragment (GcBi–9:14; Plate 81*h*): Shouldered section of tan slate point. Bifacially ground. Sharp shoulder on one side; smooth tapered shoulder at the other. Stem battered at base; rectangular cross-section. Blade biconvex. Stem width, 11; thickness, 3.

CELT

Fragment (GcBi–9:15; Plate 81*k*): Midsection or unfinished portion of celt; biconvex faces, flat-ground sides.

GROUND FLAKES: 4 flakes of slate have ground surfaces. One-piece (GcBi–9:17; Plate 81*l*) has a convex surface which may have been an adze fragment. After breaking it may have been used as a wedge.

DEBITAGE: 504 flakes, of which 502 are Ramah chert and 2 are slate. Several thinning flakes indicate biface manufacture, as do the blank fragments. Little slate work seems to have been undertaken at the site.

GcBi–10: Hound Pond 3

COLLECTION: 1 utilized flake.

GcBi–11: Shell Island 1

COLLECTION: 47 artifacts, including 2 biface tips, 2 biface blank fragments, 1 piece of ground slate, 38 utilized flakes, 2 iron nails, 1 tin can key opener, 1 piece of sheet iron. 5000 grams of chipping debris.

BIFACES

Tips (GcBi–11:1,39): 2 specimens of Ramah chert. GcBi–11:1 is part of a triangular blade with straight, sharp edges; it appears to have been a knife. GcBi–11:39 is thicker and blunt-tipped, with convex sides. Both pieces are fairly large: Dimensions: 41,28(l).

Blank Fragments (GcBi–11:6,30): Basal corner fragment of a convex-base biface blank; the blank tip is thick and roughly formed.

UTILIZED FLAKES: 38 flakes have been used as knives or scrapers. They have been made on restricted areas of irregular flakes of many shapes and sizes.

GROUND SLATE

Beveled fragment (GcBi–11:41): Small chip of ground tan slate with beveled facets on the ground side. This piece may be part of an intrusive Dorset or Maritime Archaic component in the site.

Iron Artifacts

(From recent component in upper level of deposit.)

IRON NAILS (GcBi–11:45,50): 2 specimens of thick, flat heads, shanks have square cross-section. Badly corroded.

CAN KEY (GcBi–11:52): Bent wire key with bifurcate shank.

IRON SHEET (GcBi–11:51): Small, thin piece of sheet iron.

Ceramics

BANDED CREAM WARE (GcBi–11:46–49): 4 sherds of banded cream ware with tan paste, white-glazed interior, white-glazed exterior with narrow olive green and sepia bands.

DEBITAGE: 5000 grams of Ramah chert flakes, mostly large (between 30–60 mm) and thin. Many have been frost-fractured in the ground. Many are thinning flakes from bifaces and biface blanks. Some flakes retain an iron-stained flat surface of cortex, where the chert deposit bedded with an adjacent stratum. This indicates the material was quarried from in situ bedded deposits and not from boulders or cobbles. One flake of brown chert similar to that used by Dorset peoples was found.

GcBi–12: East Pompey Island 1

COLLECTION (Plates 82,83): 425 artifacts, including the following classes: 10 points or point fragments, 11 bifacial knives, 3 side blades, 5 burin-like tools, 1 end scraper, 3 flake knives, 2 cores, 10 core fragments or ridge flakes, 1 stemmed microblade, 7 notched (hafted) microblades, 35 utilized microblades, 177 blade fragments, 149 flake tools, 1 ground slate scraper, 3 adze flakes, 7 ground slate fragments. 5520 flakes of debitage. The collection includes materials from both areas 1 and 2 since they were contemporaneous occupations.

Chipped Stone Industry

All but ten of 434 artifacts recovered were flaked from chert. Within the classes of points, bifaces, and gravers many tools were partially ground after flaking. The dominance of chert in the technology is seen in the usage frequency of different raw materials. Of the total sample of tools, 400 (0.93) were made of brown-green-tan cherts, 15 of Ramah chert (0.03), 10 of slate (0.02), and 9 of quartz crystal (0.02). A similar usage frequency is found within the chipping debris: chert (0.97); slate (0.007); quartz crystal (0.003); Ramah chert (0.02).

POINTS: 10.

Side-notched, large (GcBi–12:267,299; Plate 82*d,e*): 2 specimens of chert, one from each excavation area. Both are basal fragments with broad side notches, stem widths narrower than blade width; stems are squared, with flat parallel sides 6–7 mm long; flat bases. Cross-sections are plano-convex with grinding on planar surface of GcBi–12:267; both are basally thinned on planar side. Stem width, 15, 15 mm; thickness, 3,3 mm. Points conform to GcBn–4:1 style, but have wider stems.

Side-notched, medium (GcBi–12:1; Plate 82*a,c*): 2 specimens, one broken (Ramah chert), and one complete (chert). Plano-convex, with broad, flat side-notches 5 mm long and 5 mm from the base, with crushed interiors; short blade, sharp tip, convex sides; base is squared and flat, beveled by chipping from planar surface, which in this point has not been ground. Dimensions: 30(l), 13(w), 4(t). A second point of this variety (GcBi–12:128) was of Ramah chert, with a diagonally broken blade. It, too, has broad side-notches, a flat base and short blade. Rather poorly made.

Side-notched, small (GcBi–12:262 Plate 82*b*): Single specimen of chert, partially ground on planar surface; short convex-sided blade; broad concave notches; squared stem with flat base, beveled from planar side. Original flake scar remnant on convex side of blade indicates point was made from a flake rather than a blade. Dimensions: 21(l), 11(w), 3(t).

Single side-notched (GcBi–12:2/380; Plate 82*j*): 1 specimen, chert, plano-convex cross-section; sharp tip; slightly asymmetric blade. Single shallow notch on one side; flat base, beveled from planar surface. Basal portion of specimen is thinned, as if for hafting; may have been used as a knife as it is similar to single-notched knives (below); they, however, are less carefully made blunt, shorter and not plano-convex, an attribute generally associated with points.

Fragments (GcBi–12:3,221,284,416): 2 tips, 1 midsection, 1 basal fragment—all plano-convex and of chert.

BIFACES: 11.

Knives, corner-notched (GcBi–12:361; Plate 82*f*): Basal fragment, of chert. Ovate, slightly asymmetric blade; constricted base; waisted notches with ground interiors; convex base, thinned. Dimensions: 29(l), 26(w), 5(t); basal width, 20.

Asymmetric, flat base (GcBi–12:107,108/109; Plate 82*i,g*): 2 specimens, one of Ramah chert, one of chert. Flat base, unnotched; asymmetric blade with convex edges. One side, the straighter, tends to be more carefully prepared as a cutting edge. Dimensions: 32,35(l), –, 21(w), 3,3(t).

Single side-notched (GcBi–12:110,111,301; Plate 82*k,l*): 3 specimens of chert, including 2 broken bases; the third (GcBi–11:301), a complete tool illustrated in the field notes, is lost. Roughly chipped, bifacial; with short, rounded blade; shallow side-notch; asymmetric, slanted flat base. The missing piece was better made and more symmetrical, with a flat base, pointed tip, and a grinding facet on one face. The side opposite the notch was flat. Dimensions: 25(l), 12(w), 3(t).

Fragments (GcBi–12:92–4,223,379): 1 edge of a bifacial knife, 1 thinning flake, 3 preform edge pieces.

Side blades

Large (GcBi–12:4; Plate 82*h*): Broken fragment, chert. Semilunar shape. Dimensions: 25(l), 15(w), 3(t).

Small (GcBi–12:276,358; Plate 82*r,s*): 2 specimens of chert. Semilunar, slightly asymmetric. The more convex side seems to have been the inset edge. Dimensions: 19,21(l); 13,12(w); 2,2(t).

BURIN-LIKE TOOLS: The tools in this class compose a distinct and important feature of the assemblage and are found as frequently as points. The chipped and ground variety have been called "beveled knives" (Harp 1964:60); they are here classified as "burin-like tools" under the rubric generally used for Dorset tools which have evolved from the pre-Dorset burin technology, to which this industry, including utilized spalls, is closely related. The tools undoubtedly had multiple functions as both cutting and grooving implements. (See descriptions for GbBn–2,7, pages 225–226.)

Corner-notched, large (GcBi–12:362; Plate 82*m*): Basal fragment of a ground and chipped chert burin-like tool; broken at base of blade. Thinned, convex base; corner notches have ground interiors. Grinding facet on one side. Dimensions: Basal width, 21; thickness, 3. (Similar to GbBn–7:4.)

Eared, small (GcBi–12:127; Plate 82*n*): Chert specimen similar to GbBn–2:10. Blade end of tool has a beveled concave edge on one side and convex edge at the other. The two edges intersect at the distal end in an apex which is ground on both faces, top, and concave edge of the blade. The tip and beveled edge have been used as cutting edges. Deep side-notch on one side with eared spur at base; the other side has no spur and only a shallow notch; the base is thinned and slightly convex. Dimensions: 15(l), 13(w), 3(t).

Distal fragment (GcBi–12:8; Plate 82*o*): Tabular piece of tan chert with broken base. Ground smooth on both faces, lateral sides, and top. Convex lateral side has a ground working edge formed by intersection at an acute angle of laterally ground facet with one ground perpendicular along ventral side of the blade. The apex at the intersection of this edge and the ground distal end of blade are also worn and polished. Remnant saw-tooth edge at opposite side of blade. Dimensions: 14(l), 12(w), 1.5(t).

Spall tools (GcBi–12:214,279; Plate 82*q,p*): 2 specimens of chert have been removed from the lateral working edge of burin-like tools in the manner of burin spalls. They are tiny, thin flakes with bulbs of percussion at their tip, which bears the intersection apex of the parent tool's lateral and distal facets. Intersection of the spall edge with the lateral facet creates a sharp edge, which often shows evidence of use. GcBi–12:214 has a snapped and utilized distal end; GcBi–12:279 has wear at proximal end, and is also snapped. Dimensions: 11,13(l), 5,3(w), 1,1(t).

SCRAPERS

End scraper (GcBi–12:275, Plate 82*t*): Single specimen, chert. Rectangular stem with parallel sides, lateral grinding; thinned at base; thick, distal end with unifacial retouch; eared, with graver spurs on both ends of working edge. Dimensions: 21(l), 20(w).

Flake scrapers (GcBi–12:402): 25 examples of end scrapers on small rectangular blade fragments or linear flakes. None were hafted. Conforms to standard pattern and may be a specific tool type. Dimensions: 16–20(l), 8–12(w).

FLAKE KNIVES

Bifacial (GcBi–12:5,191,255): 3 specimens of chert with knife edges do not conform to the biface category. They are bifacially flaked but were not hafted and have only restricted areas of use.

Microblade Industry

One quarter of the artifacts cataloged were microblades, one-third of which were utilized. Many were fragmented in the process of tool production; others were discards. Chert was the major blade material (0.90), while quartz crystal (0.06) and Ramah chert (0.04) were used in small amounts.

MICROBLADES: 220.

Stemmed (GcBi–12:6 Plate 83*i*): 1 specimen of chert. A large blade has been stemmed at proximal end. Striking platform at base; parallel-sided stem; distal end broken; lateral edges heavily use-scarred. Dimensions: 30(l), 25(w), 3(t). This was the largest blade found at the site.

Hafted (GcBi–12:102,103,144): 7 specimens have had both lateral edges of their proximal ends retouched and dulled. One (GcBi–12:144) is slightly stemmed. Lateral edges show use-wear. The blades appear to have been end-hafted. Length of complete blades ranges from 25–50 mm; width 5–15 mm.

Utilized: 35 blades and blade fragments have restricted areas of utilization. A thick blade of Ramah chert has been used as a side scraper. Most have been used as knives; some are snapped midsections whose sharp corners were used as knives or gravers.

General: 177 blades (including 5 of Ramah chert, 5 of quartz crystal) were recovered which have no hafting modification, retouch, or clear evidence of use wear. Although some of these, at least, have certainly been used, many are proximal or distal ends of snapped blades, or rejects. They vary greatly in size and width.

MICROBLADE CORES (GcBi–12:7, 141; Plate 83*a*): 2 cores were found. One (GcBi–12:7) was a wedge-shaped fragment with blades removed from a flat surface on one side of the core. It appears to be a piece of a larger core which was discarded and subsequently reused as a scraper along several edges. Striking platform angle is 60 degrees; the length of the blade removal surface, 20–25 mm. The second was discarded after removal of two short blades. It is an unprepared core with a striking platform angle 80 degrees and a flat blade removal surface from which two short blades are removed.

Core fragments (GcBi–12:219,300,420; Plate 83*c*): 3 small fragments of blade removal surfaces of cores.

Core preparation flakes (GcBi–12:59,85,319; Plate 83*b*): 2 flat tabular flakes and one small chunk.

Ridge flakes (GcBi–12:11,118, 160,168; Plate 83*d-g*): 4 blades removed during final preparation of blade removal surface. In each case one of the dorsal facets retains lateral flake scars, showing that the flake has been removed from one or the other side of the first ridge flake.

FLAKE TOOLS: 149.

Flake Gravers (GcBi–12:417,434): 2 specimens—tabular flakes of chert with pointed tips showing graver use. One (GcBi–12:417) has been snapped and the squared end thinned by removal of several small spalls.

Notches: 12 irregular flakes of chert with notches retouched into one side of the flake.

Diagonal flake knives: 9 specimens on linear flakes. Distal ends have a diagonal cutting edge; some have bifacial retouch; others have edges battered and worn.

Utilized flakes: 126 flakes bear areas of restricted use, mostly as scrapers. There is no standard flake size or shape. 6 of the flakes are Ramah chert; 1 is quartz crystal.

Ground Slate Industry

Ground slate artifacts constituted a small part of the collection, 0.04. Only one complete tool of slate was found.

SCRAPER

Beveled end scraper (GcBi–12:218; Plate 82*u*): Made on a triangular-shaped tabular piece of tan slate. The narrow (proximal) end has been thinned by removal of several flakes; the flaring sides are flat and unground, as are both faces of the tool. The distal end is convex and has a flat beveled surface on each side meeting in a sharp medial ridge, which is the working edge. One bevel is steeper that the other, giving an asymmetric adze-like appearance to the edge; however the tool could only have been serviceable as an end scraper.

HEAVY CHOPPING TOOLS

Adze-flakes (GcBi–12:122,216,259,418): 4 flakes form the cutting edge of adze blades. The two convex ground surfaces intersect at an angle between 50–70 degrees. The working edge is curved, indicating a slightly bowed cutting edge characteristic of most adzes. The flakes were probably removed during the process of resharpening. At least two separate tools were involved—one of tan slate, another of green slate.

Convex flakes: 7 flakes of tan slate have polished convex surfaces. They must have come from celts or adzes, but there is no edge remnant present to identify the type.

DEBITAGE: 5520 flakes of waste material were collected, including 5340 of opaque cherts, 127 of Ramah chert, 35 of slate, and 18 of quartz crystal. Almost all of the flakes were small and irregular in shape. Some bear a chalky cortex surface.

GdBj–1: Halfway Brook 1

COLLECTION (Plate 84*a*): Stemmed point.

POINT

Tapered stem (GdBj–1:1; Plate 84*a*): Ramah chert point with short, broad blade; convex sides; horizontally indented shoulders; stem tapers to narrow, flat base, which is partially thinned and laterally ground. Dimensions: 57(l), 27(w), 6(t).

GeBk–1: Red Rock Point 1

COLLECTION (Plate 84*b*): 2 artifacts—the base of a biface blank and a retouched flake. 60 flakes of debitage.

BIFACE

Blank base (GeBk–1:1; Plate 84*b*): Lavender chert; slightly convex sides and base; no secondary retouch. Dimensions: 75(l), 55(w), 14(t).

UTILIZED FLAKE (GeBk–1:2): Flake scraper prepared at distal end of a large biface thinning flake. Dimension: 45(l).

DEBITAGE: 60 flakes, including 30 of vein quartz, 21 of red quartzite, 6 of Ramah chert, and 3 of beach quartzite. This collection only sampled the different types of lithic materials found on the site.

GeBk–2: Red Rock Point 2

COLLECTION (Plate 84*d-l*): 26 artifacts, including 5 biface fragments, 2 burin-like tools, 1 spall tool, 1 core fragment, 11 microblades, 5 utilized flakes, and 1 ground slate celt fragment. 393 flakes.

BIFACES

Side-notched base (GeBk–2:25; Plate 84*g*): Specimen of Ramah chert with wide convex base, broken above side notches. Dimensions: 35(l), 4(t).

Tip (GeBk–2:2; Plate 84*h*): Small broken tip of chert with one convex edge and one angled straight edge. Probably the tip of a single side-notched knife, similar to GcBi–12:110.

Fragments: 2 edge fragments of Ramah chert; 1 thinning flake.

BURIN-LIKE TOOLS

Side-notched, large (GeBk–2:4,16; Plate 84*d,e*): 2 specimens of chert, one complete, the other missing the base. Tabular blade is completely ground on both sides, lateral edges, and tip. The sides converge toward the tip which is at a slightly oblique angle to the axis of the blade. Lateral working edge has acute angle; use wear is evident at the intersection of this edge with the top-ground facet. The base of the complete tool is flat; side-notches deep. The projecting spur at the base of the notch below the working edge has been broken off. This tool measures 26(l), 18(w), 3(t); the broken tool, 23(w), 3(t).

Spall tool (GeBk–2:9; Plate 84*l*): Chert spall removed from a burin-like tool before edge-grinding; it does not bear any ground facets. One edge has a remnant flaked surface. The distal end has wear similar to the spall tools from GcBk–12. Dimensions: 15(l), 5(w), 2(t).

CORE

Fragment (GeBk–2:11; Plate 84*i*): Remnant from corner of striking platform of exhausted core of tan chert. 2 blade scars visible. Dimension: 11(l).

MICROBLADES: 11 fragments of microblades, some with utilization evidence. Most of the blades are snapped proximal or distal ends, or rejects.

CELT

Edge fragment (GeBk–2:1; Plate 84*f*): Corner fragment from edge of a small ground slate celt or thick knife. Cutting edge has a thin taper from both faces. Flat lateral side. Dimensions: 21(l), 5(t).

UTILIZED FLAKES: 5 flakes of chert have been used as knives or scrapers.

DEBITAGE: 393 flakes—375 of chert and 18 of Ramah chert. Mostly small, thin flakes.

GeBk–3: Red Rock Point 3

COLLECTION (Plate 84*c*): Lanceolate biface.

BIFACE

Lanceolate (GeBk–3:1; Plate 84*c*): Made from tan, poor-quality chert. Roughly flaked. Unfinished base (flat) and lower lateral sides. The tip has been bifacially thinned on one side for use as a knife. Dimensions: 88(l), 31(w), 10(t).

Appendix 4

RAMAH CHERT ANALYSES

Geochemical Assay

Dr. Timothy Meyer of the BRINEX Geochemical Laboratory kindly accepted a set of samples for analysis of some of the intermediate trace elements using geochemical techniques. The results of his analyses for zinc, copper, lead, nickel, cobalt, manganese, iron, molybdenum, barium, and silver are included as Table 1. The results of the analysis are far from conclusive, and were not entirely unexpected given the nature of geochemical methods. In general, the variation in parts per million (ppm) between the specimens is remarkably slight. In fact, the consistency between the samples, including the control specimens which are grossly different by visual characteristics, uniformly varies only by a few ppm. Copper, lead, nickel, cobalt, and molybdenum are completely useless for distinguishing differences. Among the other elements there are occasional dramatic fluctuations from the generally consistent norm. The Sharp Hill archeological specimen registered five times as much zinc as the others; however, in other respects they

TABLE 1.—*Geochemical analysis of Ramah chert*
(in parts per million or percentage)

Sample	*Zn*	*Cu*	*Pb*	*Ni*	*Co*	*Mn*	*Fe* (%)	*Mo*	*Ba*	*Ag* (%)
Bears Gut*	22	6	2	1	0	5	0.37	0	0	0.1
Bears Gut*	22	7	2	1	4	5	0.17	0	0	0.05
Bears Gut*	24	7	1	1	0	5	0.18	0	0	1.2
North West Corners	23	7	2	1	1	5	0.21	0	0	0
Bluff Head Cove	24	5	0	0	0	5	0.18	0	0	0
Tadoussac quartzite**	22	6	2	0	0	7	0.15	0	0	0
North West River; Ramah chert	24	4	0	1	0	4	0.10	0	0	0.05
Sid Blake quartzite**	30	4	0	0	0	2	0.09	0	0	0.10
Hebron RC (gray)	22	4	0	0	0	2	0.09	0	0	0.05
Hebron RC (black)	24	5	2	1	0	10	0.23	0	0	0.05
Big Island 1	24	4	0	0	0	3	0.18	0	0	0.10
Sid Blake Ramah chert	21	3	0	0	0	10	0.12	0	0	0.05
Winter Cove 1	22	4	1	0	0	40	0.19	0	20	0.10
Okak (gray)	22	4	2	0	0	10	0.11	0	0	2.7
Okak (black)	24	6	1	0	0	10	0.18	0	0	0.1
Sharp Hill Ramah chert	120	4	1	1	0	10	0.13	0	0	0.1
Mistassini quartzite**	25	6	5	1	0	15	0.24	0	0	0.1
Sandy Cove 2	27	4	1	1	0	20	0.16	0	10	0.1
Mistassini quartzite**	25	6	2	0	0	15	0.13	0	0	0.1
Mistassini quartzite**	24	5	5	1	0	20	0.23	0	0	0.1
Sandy Cove 2	27	5	2	1	0	10	0.12	0	10	0.1
Winter Cove 2	25	4	2	1	0	7	0.13	0	10	0.1

*Geological sample.
**Control specimen of quartzite.

were identical. A Ramah chert specimen from Okak registers an unusually high silver content. These, however, are random occurrences.

Only in the case of Winter Cove 1 (Hamilton Inlet) did a pattern of two elements (manganese, barium) diverge from the others. Here there is a possible suggestion of a consistent trend, for similar high values of these elements were also found in the Sandy Cove 2 and Winter Cove 2 samples. Using manganese and barium as covariants one might suggest a possible distinction between the Winter Cove-Sandy Cove material (Ramah chert) and the northern Ramah and Mistassini and common quartzite samples. This might support the idea of a southern quarry in Labrador distinct from the Ramah beds in the north from both geological and archeological samples.

These results however must be viewed as tentative, for the number of samples (22) and test runs (1) cannot by any means be construed as statistically significant. Large numbers of samples would have to be run to substantiate these results. As an aside, the tests demonstrate the problems typical of trace-element analyses, which cannot be described here, of relying on single-element diagnostics or small numbers of samples for materials which commonly have wide variation within their source beds or deposits. Covarient analysis, large sample numbers, many elements, and repeated runs are necessary procedures if reliable identification is to result.

Neutron Activation

Many of these problems can be more easily approached through neutron activation analysis, which can measure minute quantities of large numbers of elements fairly rapidly. In North America the pioneering work with this technique for archeological applications is being conducted at the University of Michigan by James B. Griffin and A. Gordus, who generously accepted a suite of Labrador samples for analysis. Fifty samples were submitted. Six of the 50 were geological samples from the Ramah chert bed in Bear's Gut and Rowsell Harbor, northern Labrador; 44 were archeological samples. Of these 33 were samples defined as being Ramah chert by macroscopic inspection, and 11 were control samples of common white quartzite from Hamilton Inlet, or fine-grained milky quartzites from archeological sites in the Lake Mistassini region of central Quebec, or Tadoussac in southern Quebec.

In these initial studies only three elements were measured: sodium, manganese, and potassium. The sodium and manganese figures are expressed in percent figures, and are the result of direct comparison with known standards. The potassium figures are measures of the number of potassium disintegrations per second per milligram, and are not directly comparable to the other measures. They can, of course, be used as an additional line of evidence within the sample series. Each sample was given a 600-second irradiation in the University of Michigan reactor. Gamma ray spectra were recorded in a Northern Scientific Corporation 4096-channel pulse-height analyser. Radioisotope decay was detected on an Ortec Corporation lithium drifted germanium gamma-ray detector. The raw data given in Table 2 was supplied to the author by the University of Michigan group.

The two basic questions to be asked of these data are: (1) Can the visually distinct Ramah chert be distinguished from other materials on the basis of trace elements? (2) Is there any evidence to suggest that within the Ramah chert samples more than one geologic source exists? While encouraging in some respects, the initial results indicate that considerably more work must be done if these questions are to be answered in acceptable scientific terms.

Since only three elements were tested relatively few means of differentiating the samples exists. Values for each element were plotted individually to determine if clusters existed and these were compared with the visual identifications of the material, and their geographical origin and context. A fourth value—the ratio sodium/manganese—was computed as this at times enables discrimination which may be masked by the value of each individual element. Finally, two-dimensional plots of sodium with respect to manganese, and sodium/manganese with respect to potassium decays were made.

MANGANESE: The range of manganese in the samples was from .005 (CH–16) to 3.053 (CH–21), a very great difference. Even within the geological samples from Bear's Gut manganese varied from 0.0254 (CH–27) to 3.053 (CH–21). This suggests that this element is not a very useful one for identification purposes. The common quartzite and control specimens were all included well within this range. In general, however, most specimens contained only small amounts of the element. Manganese may possibly contribute to the black staining and bands in Ramah chert. If so, the color variations within a sample may result in the anomalously high values for this element in some of the specimens.

SODIUM: Sodium ranges from 0.006 (CH–16) to 0.0509 (CH–49). Sodium does not enable Ramah chert to be distinguished from non-Ramah specimens, whose values lie comfortably within the Ramah range. However, sodium may possibly prove useful in distinguishing among the Ramah samples for possible

TABLE 2.—*Neutron activation analysis of Ramah chert*

UMMA Sample Number	*Museum Catalog Number*	*Na* (%)	*Mn* × *100* (%)	*Mn/Na Ratio* (%)	*No. of K Counts per mg per sec.*	*Provenience* [1]
CH-1	51194	.0078	.3340	.0233	1.08 X-100	Okak (AS)
CH-2	51194	.0024	.0260	.0924	1.22 X-100	Okak (AS)
CH-3	126/10756	.0333	.0436	.7640	0.55 X-100	Mistassini (AS)
CH-4	126/11360	.0332	.0474	.7010	0.83 X-100	Mistassini (AS)
CH-5	PG106.2	.0157	2.510	.0063	absent	Bear's Gut (GS)
CH-6		.0162	.0258	.6380	0.53 X-100	Henry Blake 1 (AS)
CH-7	17/1280 117002-L	.0424	.1380	3.0700	3.93 X-100	NW Corners (AS)
CH-8*	139/13645	.0113	.0353	.3200	2.95 X-100	Tadoussac (AS)
CH-9	–	.0054	.0088	.6140	0.37 X-100	Sandy Cove (AS)
CH-10	–	.0046	.4170	.0110	0.74 X-100	Winter Cove 2 (AS)
CH-11	–	.0080	.0168	.4760	0.63 X-100	Bluff Head Cove (AS)
CH-12	–	.0056	.0210	.2670	26.8 X-100	Bluff Head Cove (AS)
CH-13	51116	.0010	.0111	.9000	0.64 X-100	Hebron (AS)
CH-14	51116	.0035	.0113	.3100	0.25 X-100	Hebron (AS)
CH-15	–	.0090	.0097	.9280		Winter Cove 1 (AS)
CH-16*	126/11355	.0006	.0050	1.300	0.195 X-100	Mistassini (AS)
CH-17*	sample 1	.0109	.0107	1.04	1.45 X-100	Sid Blake (AS)
CH-18	17/1236	.0108	.00045	24.0		Sharp Hill (AS)
CH-19	PG-112.6	.0136	.0493	.276	0.55 X-100	Bear's Gut (GS)
CH-20	PG-112.6	.0152	.0422	.360	0.26 X-100	Bear's Gut (GS)
CH-21	PG-112.6	.0181	3.0530	.0059	absent	Bear's Gut (GS)
CH-22	–	.0117	.0113	1.0360	0.64 X-100	Big Island 1 (AS)
CH-23	17/1314	.0189	.0484	.3910	0.85 X-100	Windy Tickle (AS)
CH-24	–		(not analyzed)			Rowsell Hbr (GS)
CH-25	–	.0159	.0133	1.1940	0.80 X-100	Sandy Cove (AS)
CH-26*	sample 2	.0265	.0414	.6400	18.39 X-100	Sid Blake (AS)
CH-27	–	.0278	.0254	1.086	0.25 X-100	Bear's Gut (GS)
CH-28	–	.0271	.0089	3.050	0.77 X-100	Thalia Pt. 1 (AS)
CH-29	–	.0211	.0056	3.770	0.81 X-100	Shell Island 1 (AS)
CH-30	–	.0501	.0219	2.280	4.30 X-100	Shell Island 1 (AS)
CH-31	–	.0152	.0647	.235	1.88 X-100	Shell Island 1 (AS)
CH-32	116950B	.0129	.1430	.9030	6.14 X-100	Sharp Hill (AS)
CH-33	176950C	.0119	.0729	.1630	absent	Sharp Hill (AS)
CH-34	176950G	.0290	.0171	1.700	1.35 X-100	Sharp Hill (AS)
CH-35	51116	.0486	.0592	.8820	2.37 X-100	Hebron (AS)
CH-36	126/11046	.0150	.0228	.6580	0.52 X-100	Mistassini (AS)
CH-37*	139/13647	.0483	.0112	4.310	0.52 X-100	Tadoussac
CH-38*	–	.0470	.0114	4.120	1.09 X-100	Herbert Michelin (AS)
CH-39*	–	.0267	.0565	.4730	11.90 X-100	Nantucket, Mass. (AS)
CH-40	85648	.0154	.0094	1.64	0.51 X-100	Emerson, Me. (AS)
CH-41	50435	.0100	.1920	.0521	0.51 X-100	Hathaway, Me. (AS)
CH-42	122/9737	←	(incomplete)	→	2.62 X-100	Haskell, Me. (AS)
CH-43	122/9737	.0030	.5480	.0547	1.28 X-100	Spaulding, Me. (AS)
CH-44	52437	.0231	.0991	.2330	1.28 X-100	Spaulding, Me. (AS)
CH-45	55975	.0165	.0078	2.11	0.62 X-100	Pemaquid Pd, Me. (AS)
CH-46	–	.0129	.0135	.955	1.62 X-100	Nasqeag Pt., Me. (AS)
CH-47	88506	.0483	.0329	1.47	0.69 X-100	Squirrel Island, Me. (AS)
CH-48	Go-32-BR	.0126	.0407	.309	1.31 X-100	Goddard, Me. (AS)
CH-49*	93404	.0950	.5450	.934	1.49 X-100	Deer Isle, Me. (AS)
CH-50*	M2326	.0353	.0360	.980	1.52 X-100	Concord, Mass. (AS)

* Quartzite control sample.
[1] AS, archeological sample; GS, geologic sample.

source locations, if more than one exists. In particular, the northern Labrador Ramah specimens (CH–1, 2, 13, 14) tend to have very little amounts of sodium in comparison to samples collected south of Nain. However, the northern samples CH–28 and 35 are quite high, and this pattern is not without exception. Most of the Sharp Hill samples (18, 32, 33) tend to be similar among themselves in sodium, ranging from .011 (CH–18) to .013 (CH–32), with only one (CH–34, .029) anomalous value. The Hamilton Inlet samples (CH–6, 9–12, 15, 22, 25, 29, 31) range broadly between 0.005 (CH–9) to 0.021 (CH–29) in 10 of 11 cases, with CH–30 out of this range. The specimens from Maine (CH–40–48) are found spread within the range of those from Hamilton Inlet. The control samples of non-Ramah material are found within the Ramah values and cannot be separated on this basis.

The data suggest a possible distinction between northern Labrador specimens and those from the south, including Maine. While the southern Ramah specimens encompass a great amount of variation, the cluster of Sharp Hill values might be taken as indication of homogeneous materials from a southern source. Such homogeneity might also, however, result from flakes of the stone deriving from the same core, in which case their similarity is to be expected.

POTASSIUM: The Ramah pieces tend to have values for potassium decays less than 1.4 (total sample range: 0.25 [CH–14]–18.39[CH–26]), while common quartzites tend to have high values. This however does not distinguish the Mistassini quartzites from Ramah. The northern Ramah usually has a very low value in the samples measured. Once again, the distinction between northern and southern specimens is suggested but is not consistent throughout.

SODIUM/MANGANESE RATIO: Northern samples tend to have low sodium/manganese values; otherwise this does not distinguish between Ramah and quartzites, or isolate samples geographically within the Ramah range. Even within single component sites sodium/manganese values may vary greatly, as in the case of Shell Island (3.77[CH–29], 2.28[CH–30], 0.235[CH–31]).

SODIUM WITH RESPECT TO MANGANESE: Due to the extreme variability in manganese of some samples this two-dimensional plot is not particularly revealing. No clear clusters of samples occur; all are more or less randomly dispersed irrespective of material or geography. Once again, the low values in sodium and manganese (with two glaring exceptions) are represented.

SODIUM/MANGANESE WITH RESPECT TO POTASSIUM DECAYS: No definite clusters occur. Northern samples tend to cluster with low values, but it is not possible to distinguish between Ramah and non-Ramah, or make geographic separations.

CONCLUSIONS: These studies show that on the basis of sodium, manganese, and potassium values, it is not possible to make any clear distinctions between Ramah chert specimens and non-Ramah materials. The Tadoussac and Mistassini samples consistently fall within the ranges for Ramah, and there is only the slightest suggestion that common white beach quartzites tend to have higher values for these elements than Ramah chert.

The results for distinctions within the Ramah samples is slightly less discouraging. Here, there is some evidence that Ramah chert in archeological and geological contexts in northern Labrador tend to have low values for potassium, sodium, and sodium/manganese, while Ramah materials south of the Ramah bed areas usually have higher values for these. This suggests a possible distinction between a northern and a more southern source of the rock, although visually the stone from both is indistinguishable. Further, within the southern samples the Sharp Hill specimens tend to cluster tightly in sodium, and though not distinguishable from the wide range of Hamilton Inlet and Maine specimens, they may indicate a separate quarry. If so, it is not possible to determine if the southern samples were drawn from this source or not. Indeed, homogeneity of the Sharp Hill samples, though tending to support Strong's claim for a separate quarry here, may be also a result of these specimens being flaked from the same core.

Any conclusions from such a small sample in the initial stages of testing must be taken as very tentative ones indeed. They are advanced here because they tend to support the possibility of a second quarry in Labrador, south of the one presently known source of Ramah chert, and to indicate the need for further testing. It is felt that the three elements tested to date are not particularly useful ones in this case and that a larger series of determinations on numerous elements will be necessary before a diagnostic element or combination of elements is discovered. Most importantly, a wide suite of samples from their geologic context in the Ramah series is needed to discover the range and variation in this bed. Further testing and sampling is planned for the future.

Petrographic Analysis

While neutron activation analysis has not yet produced any specific means of identifying Ramah chert from other materials, there is some hope that petrographic characteristics may be useful. However, only a small number of samples has been examined, and here also the results can only be considered suggestive.

TABLE 3.—*Quartzite and Ramah chert petrography*

Criteria	*Sample* *							
	Ramah					*Other*		
	1	4a	4b	5	7	2	3	6
1. Coarseness (IC#)	467	563	1062	511	1573	367	932	697
2. Foliation	1	1	1	1	3	1	1	3
3. Sorting	3	3	1	1	2	2	1	1
4. Roundness	1	2	1	1	1	1	1	1
5. Grain boundaries	1	1	1	1	2	3	1	2
6. Strain	2	3	2	2	2	1	2	1
7. Pyrite	2	1	2	2	2	1	1	1
8. Interstitial graphite	1	1	3	3	3	1	2	1
9. Mica	1	1	1	1	1	3	1	3
10. Other minerals	1	1	1	1	1	1	1	3 (zircon)
Score totals, less IC	13	14	13	13	17	14	11	16
Mean	←		14		→	←	14	→
Scores (sum for each sample of criteria 3, —5, 6, 7, 8, —9 only)	6	6	6	6	6	—1	4	—1

*Sample descriptions:
1. Shell Island 1: Clear Ramah chert speckled with brown and black stains.
2. Sid Blake Site: Brownish-gray "common quartzite."
3. Lake Mistassini, Quebec: Fine-grained-gray quartzite (appears similar to Ramah chert, but is more milky and less vitreous).
4a,b. Hebron Site: Ramah chert flake with transition from clear Ramah chert to fine-grained black.
5. Okak Site: Clear to black large grained Ramah chert.
6. Cookery Site, North West River: Fine-grained common cobble quartzite.
7. Shell Island 1: Fine-grained black Ramah chert.

E. P. Wheeler (pers. comm.) has volunteered information on thin sections of Ramah chert which he obtained (presumably from their geological context) in northern Labrador. These specimens

> showed streaks or patches of considerable variation in grain size, about 0.1-0.5 mm across. Accessory carbonate in grains to 0.5 mm across were present in all the sections, the carbonate apparently an iron carbonate—ankerite or siderite. The weathering of these accessories no doubt accounts for the brown spots and staining. There is dimensional and crystallographic preferred orientation of the quartz that varies considerably from one specimen to another. This might result from the structural setting of the specimen, at the crest or flank of a major or minor fold. The degree of preferred orientation even varies markedly in sections cut in different directions from a given specimen, so that a random section may or may not show it. I could not detect it in the hand specimen, so it is purely a matter of chance whether the section will show it or not.

These data may prove useful upon comparative analysis with other specimens of chert and quartzite.

A comparative analysis of Ramah chert and other materials has been graciously undertaken by S. A. Morse of Franklin and Marshall College. Although the sample is small (five sections of Ramah, three of other materials) Morse's report, which is reproduced below, indicates a very hopeful approach to the problem of Ramah chert identification.

Morse's analysis proceeded by studying each sample according to several different criteria, ranking each on a broad scale, and comparing the totaled scores for each piece with respect to visual characteristics. The following criteria were used:

Criteria	*Rank*		
	1	2	3
Foliation	none or weak	moderate	strong or extreme
Sorting	poor, fair	good	excellent
Roundness	poor	good	excellent
Grain boundaries	fuzzy	ragged	sharp
Strain	none	moderate	ubiquitous
Other minerals	none	present	relatively abundant

Morse reports:

> These criteria are obviously subjective, but in general it is relatively easy to distinguish between rank 1 and 3. Comments on terminology: *Foliation* is a two-dimensional (planar) elongation, an appearance which may also result from lineation, so in this case the two are lumped together. *Sorting* means homogeneity of grain size; well-sorted means all the same size. *Roundness* is opposite to angularity. *Strain* is shown by shadows sweeping across a grain under crossed polarizers.

There is one quantitative criterion, namely, *coarseness*. This is the conventional "IC number," or the number of grain identity changes in a traverse of 40 mm length. The traverse is best laid out diagonal to foliation, when that is present. IC numbers larger than about 200 are characteristic of fine grained rocks. The numbers for these quartzites range from 367 to 1573. The IC on the finer rocks was normalized to 40 mm from shorter traverses. Sample 4 in table 3 is treated as two; a = coarse, b = fine.

Table 3 summarizes the observations. The raw scores are not too useful, which is not surprising. However, a score compiled from rows 3, 5, 6, 7, 8, and 9 does offer some hope of discrimination; such a score is likely to be 6 for Ramah and less than 4 (or even negative) for the others. In this light, the probable properties of Ramah chert are as follows: (1) Ramah is likely to have IC = 500 ± 70 or else greater than 1000. (2) Ramah is likely to be better sorted. (3) Ramah tends to have fuzzy grain boundaries, near sharp. (4) Ramah is sure to be strained, never unstrained. (5) Ramah is very likely to contain pyrite, others do not. (6) Ramah appears more likely to have "abundant" (i.e., noticeable) *interstitial graphite* (especially visible in samples 4b, 5, 7), which causes the dark bands. (7) Ramah never contains mica. (8) Ramah never contains zircon.

According to these criteria, there is a fair chance of correctly identifying Ramah. With more samples to review and polished sections to confirm the opaque minerals, the chances may just possibly become excellent.

Appendix 5

ARCHEOLOGICAL COLLECTIONS FROM LABRADOR

Collector	*Location*	*Year*	*Disposition*	*Description*	*Reference*
Jewell D. Sornborger	Hebron, Okak	1897	Peabody Museum, Harvard University	Labrador Eskimo, Dorset	
Bernhard Hantzsch	McLelan Strait	1906	Anthropologisch-Ethnographischen Museums zu Dresden	Labrador Eskimo	
John Bryant	Hebron, Nain, Komaktorvik	1908	Peabody Museum, Harvard University	Labrador Eskimo, Dorset, Indian	
Alfred V. Kidder	Blanc Sablon	1910	Peabody Museum, Harvard University	Indian, Dorset	
William D. Strong	Sharp Hill, Windy Tickle, Northwest Corners	1927–8	R. S. Peabody Foundation, Andover, Massachusetts	Indian, Dorset	1930a
Junius Bird	Hopedale	1927, 1933, 1934	American Museum of Natural History	Labrador Eskimo, Dorset, Indian	1945
William J. Wintemberg	Southern Labrador		National Museum of Man, Ottawa	Indian, Dorset	
Elmer Harp, Jr.	Southern Labrador	1949, 1950, 1961	Dartmouth College Museum, Hanover, New Hampshire; National Museum of Man, Ottawa	Indian, Dorset	1951, 1963
James A. Tuck	Saglek	1969, 1970	Memorial University, St. John's, Newfoundland	Indian, Dorset, Labrador Eskimo	
Douglas Leechman	McLelan Strait	1935, 1936	National Museum of Man Ottawa	Dorset, Labrador Eskimo	1943
Jorgen Meldgaard	Coastal Labrador Viking Survey	1956	Nationalmuseet, Copenhagen	Indian, Eskimo	
Helge Instad	Coastal Labrador Viking Survey	1962–1970	Oslo	Norse, Dorset	
E. P. Wheeler	Northern Labrador		National Museum of Man, Ottawa	Labrador, Eskimo	
Donald MacLeod	Lake Michikamau, Sandgirt Lake	1967, 1968, 1969	National Museum of Man, Ottawa	Indian	
Stearns A. Morse	Kiglapait area		Dartmouth College Museum, Hanover, New Hampshire	Indian, Dorset	
Lawrence Shields	Central Labrador coast		R. S. Peabody Foundation, Andover, Massachusetts	Indian, Labrador Eskimo	
Rev. F. M. Grubb	Central Labrador coast		R. S. Peabody Foundation, Andover, Massachusetts	Indian, Labrador Eskimo	
Capt. W. Knutsen	Nain	ca. 1949	Smithsonian Institution	Dorset	
A. H. Mallery	Southern Labrador		American Museum of Natural History	Indian, Dorset	

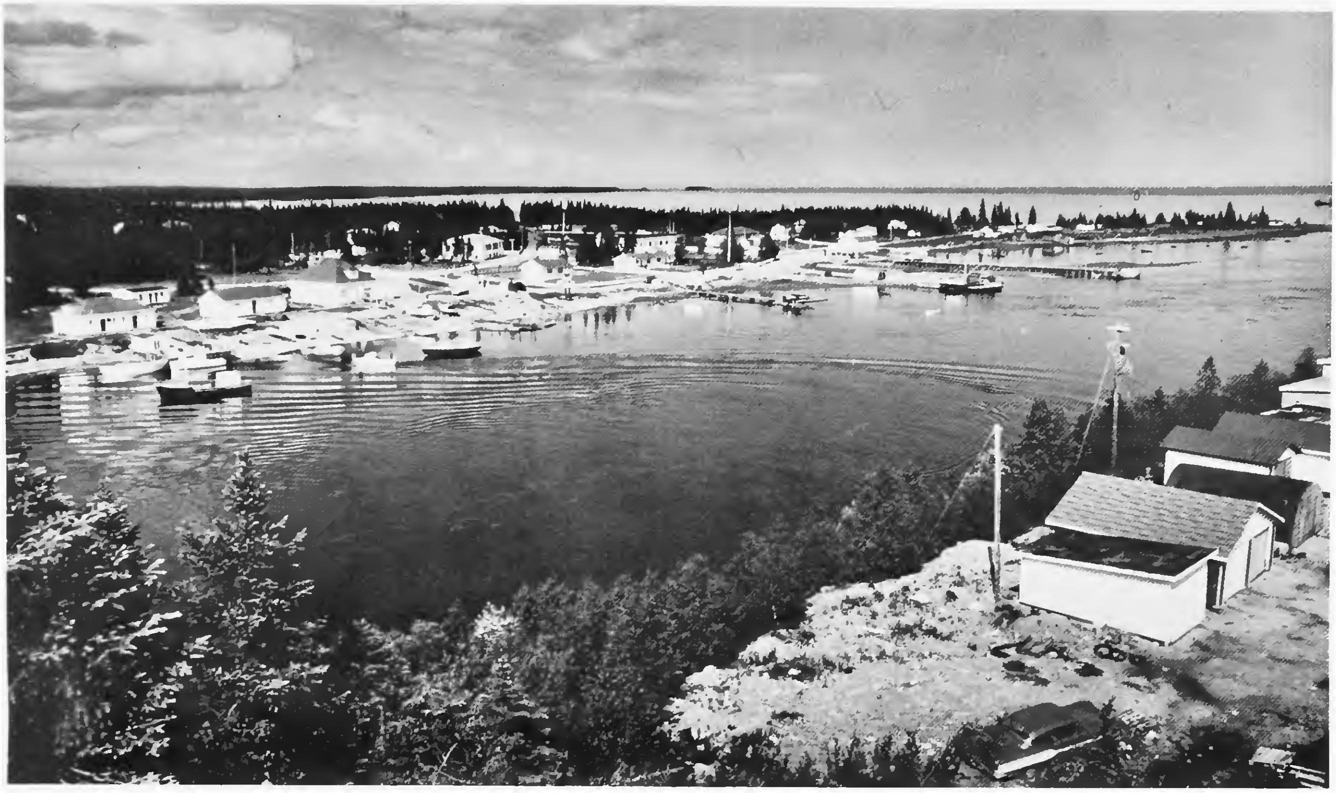


PLATE 1.—North West River. View northeast across river toward Lake Melville. Hudson's Bay Company buildings at left.

PLATE 2.—North West River. View to northwest toward Little Lake, Grand Lake, and the Naskapi River. The major site areas in North West River settlement are in center field.

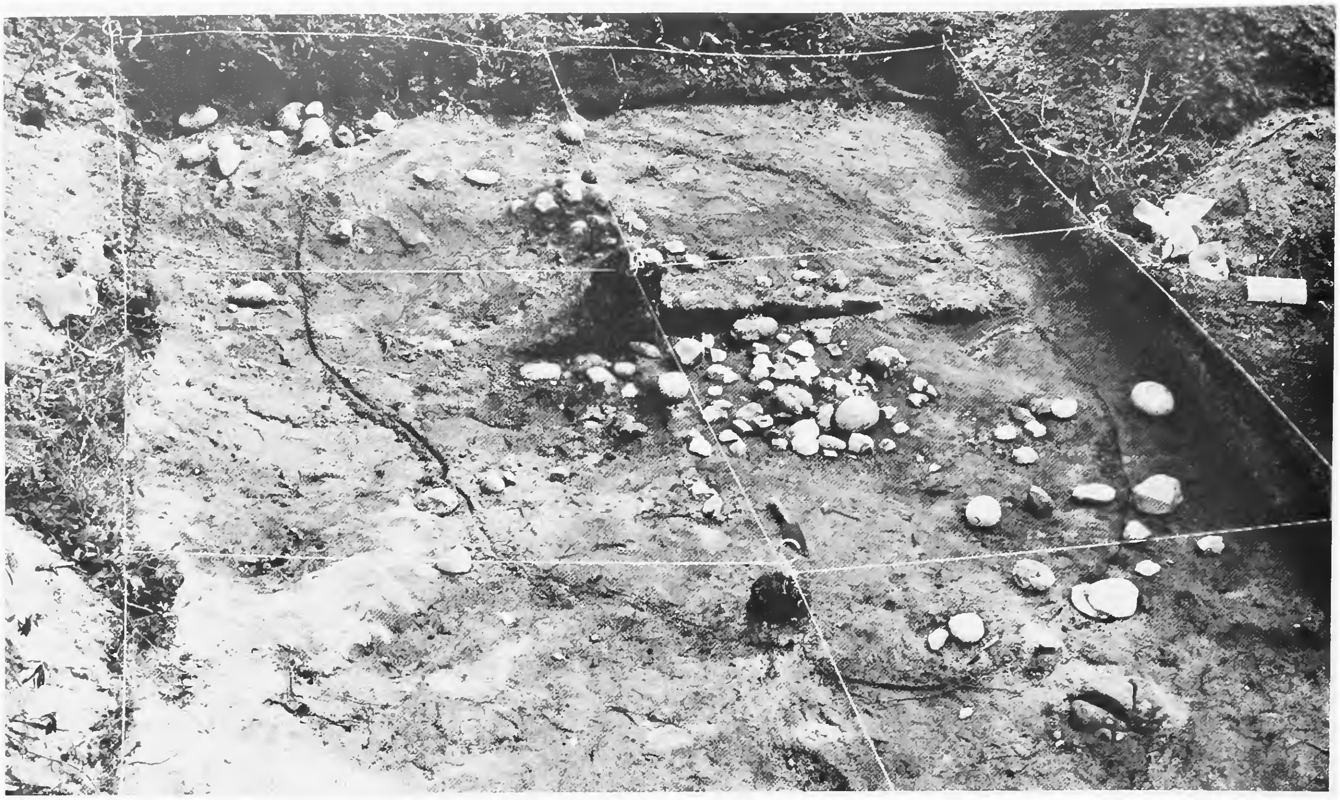


PLATE 3.—Red Ocher site (FjCa-38). Central hearth area with red ocher concentration outlined in the sand.

PLATE 4.—Brinex B-3 terrace. Sites shown are the Bunkhouse site (FjCa-33) at right, Cookery sites (FjCa-3) in front of the Cookery porch at left, and Dining Hall area site (FjCa-4) between the bunkhouse and the cookery.

PLATE 5.—Little Lake sites. Road Site 1 (FjCa-13) test excavation being conducted in remnant bulldozed deposit. Road Site 2 (FjCa-14) is at upper right off the road, and the Louis Montague site (FjCa-39) is just off the upper right corner of the illustration.

PLATE 6.—Louis Montague site (FjCa-39). Hearth area at center right in excavation. North is to the left. The Red Ocher site lies at the brow of the hill, center top of the photograph.

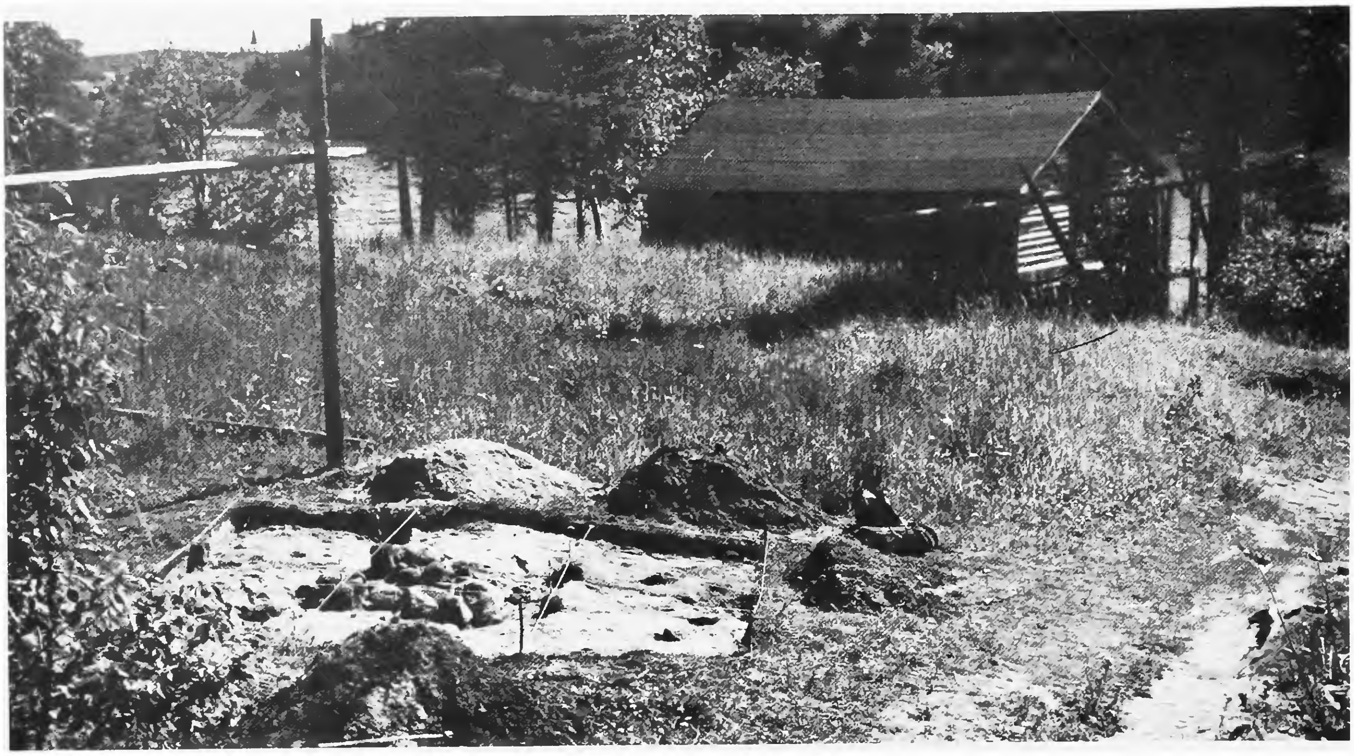


PLATE 7.—Henry Blake site (FjCa-20). View south toward North West River. Hearth at center of excavation.

PLATE 8.—Sid Blake site (FjCa-24). View to east across southern area of the site, 1969 excavation.

PLATE 9.—Sid Blake site (FjCa-24). View southwest across northern area of the site with North West River in the background. 1968 excavation.

PLATE 10.—Eskimo Island 1 (GaBp-1). View to southwest. Houses 1, 2, and 3 of House Group 1 shown with House 1 in the background and House 3 in the foreground with Peter Wells indicating the large scale of construction. Lake Melville stretches southwest in the center background, with Caravalla Head to the right.

PLATE 11.—Eskimo Island 2 (GaBp-2). View north toward House Group 2 with House 4 in the foreground, House 5 to the right, and House 6 in the center background, unseen. Houses 4 and 5 are double-roomed houses.

PLATE 12.—Eskimo Island 3 (GaBp-3). View north from Eskimo Island 1, showing Eskimo Island 3 site area at left center. Geoff Conrad is excavating a test pit in House 2. House 1 is at left center and House 3 in center foreground.

PLATE 13.—Double Mer Point 1 (GbBo-2). Conrad and Wells standing in the center of a group of three Eskimo houses at Double Mer Point. Entrance tunnels extend to the left. The Narrows is in the background. View southeast.

PLATE 14.—Ticolalak Beach Pass area, looking north. Ticoralak 2, 2E, 3, and 6 at right center. Datum rock at left center. Ticoralak 5 at left.

PLATE 15.—Ticoralak sites. Ticoralak 2 (GbBn-2) in right background; Ticolalak 2E (GbBn-3) in center background; Ticoralak 3 (GbBn-4) in foreground. 1968 excavations.

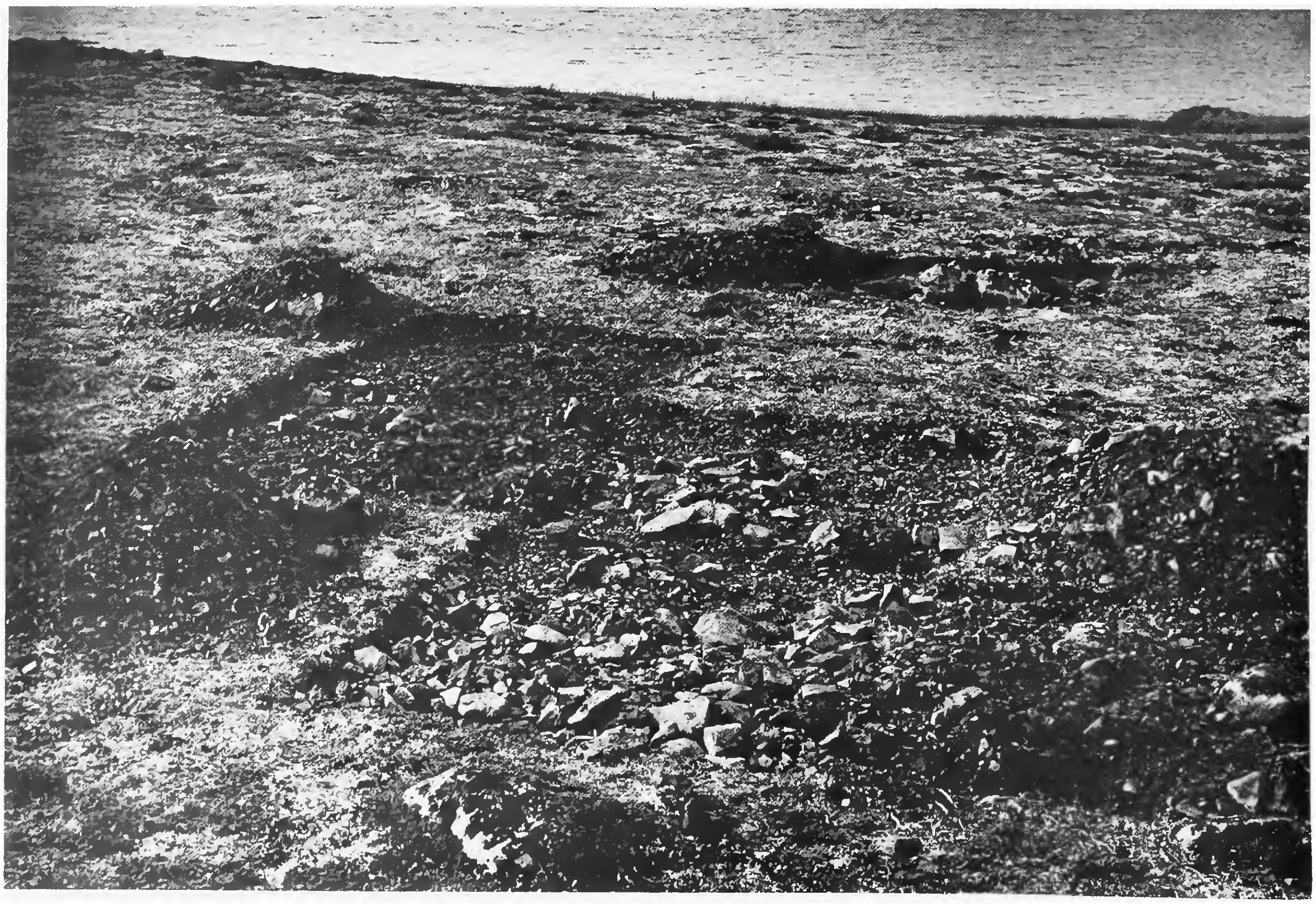


PLATE 16.—Ticoralak 5 (GbBn-7). Hearth in background. View northwest.

PLATE 17.—Ticoralak 6 (GbBn-8). View across Indian site toward the east. Ticoralak Dorset sites (GbBn-2, 3, and 4) in background. 1969 excavation.

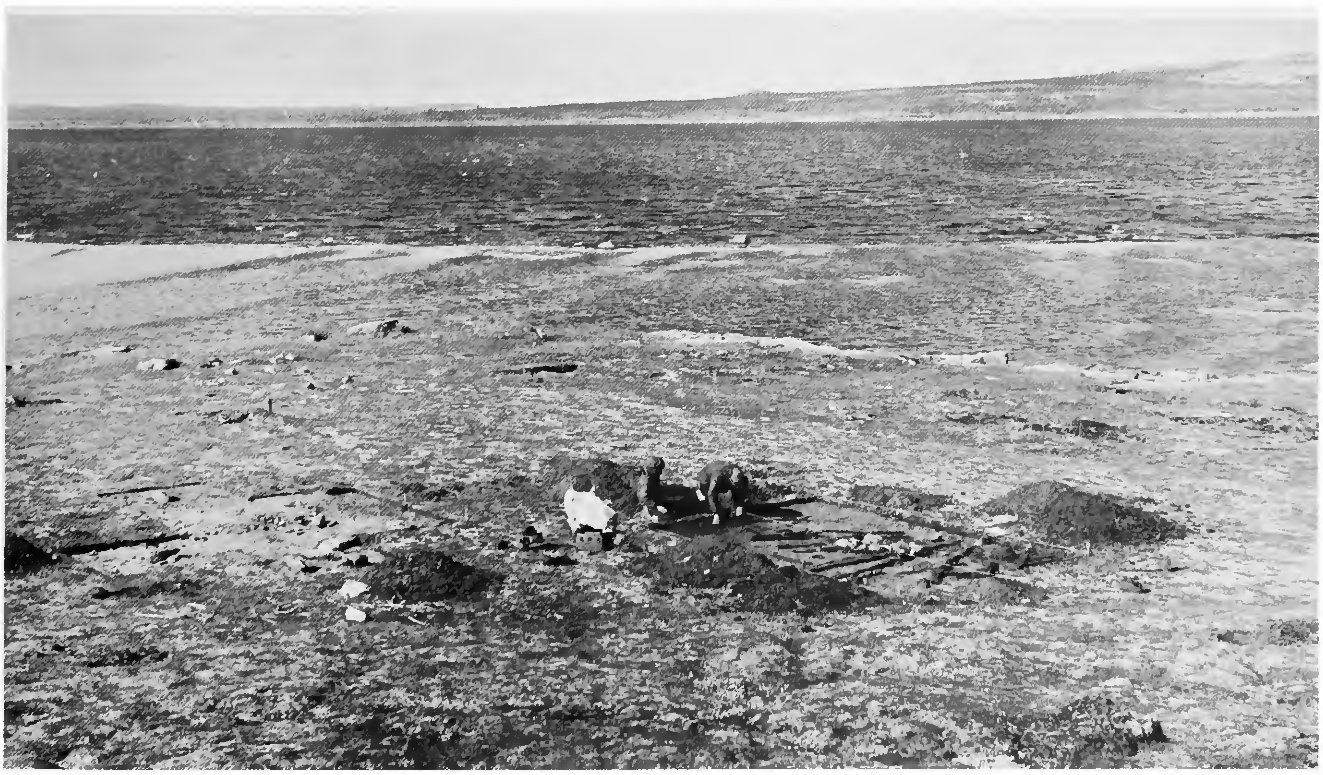


PLATE 18.—Big Island 1 (GbBm-1). Areas A and B, to left and right. View to northeast with Pompey Island in background and boulder barricade near the shore.

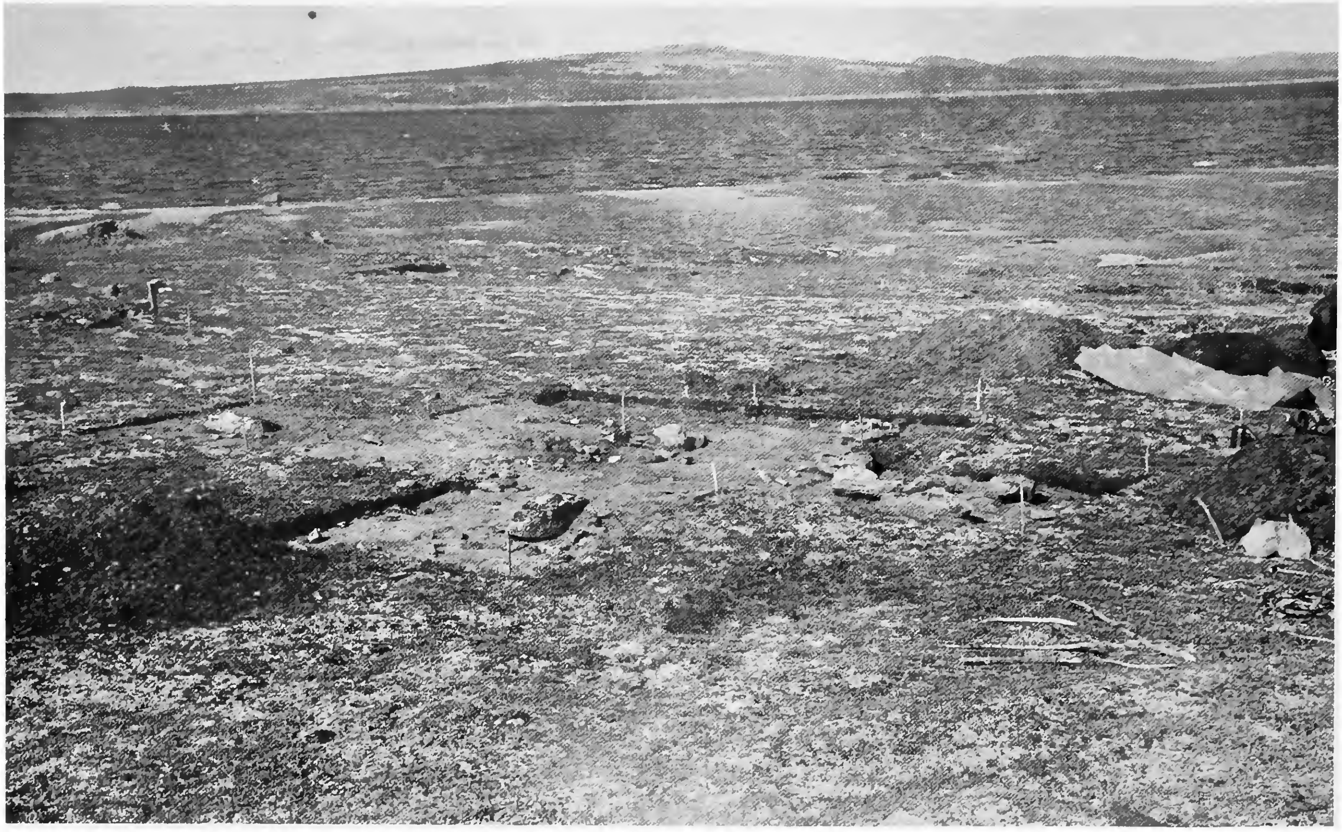


PLATE 19.—Big Island 1 (GbBm-1). View northeast across area A, with hearth in center of excavation. Thin soil cover prevented the preservation of logs in this area.

PLATE 20.—Big Island 1 (GbBm-1). Area B, showing collapsed tent frames and central hearth. View northeast.

PLATE 21.—Pompey Island 1 (GbBm-2). Conrad and Wells sitting in one of three boulder houses near the summit of Pompey Island.

PLATE 22.—Sand Cove 1 (GcBk-1). View west from within the large blowout. House 3 is seen above Conrad's head. Big Black Island in background.

PLATE 23.—Sandy Cove 1 (GcBk-1). Houses 1 and 2 seen eroding from the expanding wall of the blowout.

PLATE 24.—Sandy Cove 1 (GcBk-2). House 3 resting deflated on the stone pavement. Five celts were found a few feet north of this house. The lack of other nearby artifacts suggest this house is of the Sandy Cove complex of the Maritime Archaic.

PLATE 25.—Sandy Cove 2 (GcBk-2). Terrace blowouts on the 45 foot terrace east of GcBk-1. Collections were made in the blown out areas. Marine boulder beachlines are visible on the hillside in the background. The higher beachline is at 300 feet; a lower beach at 225 feet is more prominent.

PLATE 26.—Sandy Cove 3 (GcBk-3). View northwest.

Plate 27.—Sandy Cove 4 (GcBk-4). Hearth at center right of test excavation. Red ocher lens visible at right in profile. View north.

Plate 28.—North West Brook area. North West Brook 1 (GcBk-6) is in the background above Gary Weil's head. North West Brook 2 (GcBk-7) is in the foreground between the shovel and Gary Weil. View east. Pottles Bay at upper right.

PLATE 29.—Bluff Head Cove area. Bluff Head Cove 1 and 2 (GcBj-1, 2) are located at the edge of the tombolo terrace to the right of the modern graveyard. Bluff Head 3 (GcBj-3) is in the center ground in the midst of the blowouts, and Bluff Head 4 (GcBj-4) is located in blowouts off the picture to the left. The sites were occupied during the active stage of this now relic cove. View east.

PLATE 30.—Rattlers Bight 1 (GcBi-7). View south from hillside north of the site, which lies on the broad tombolo terrace in center field. Relic coves on the left side of the terrace face east. Small ponds to the right supply water for the area. Beyond the ponds is the small fishing settlement of Rattlers Bight. Scale is difficult to perceive, but the longitudinal extent of the site is about 500 feet.

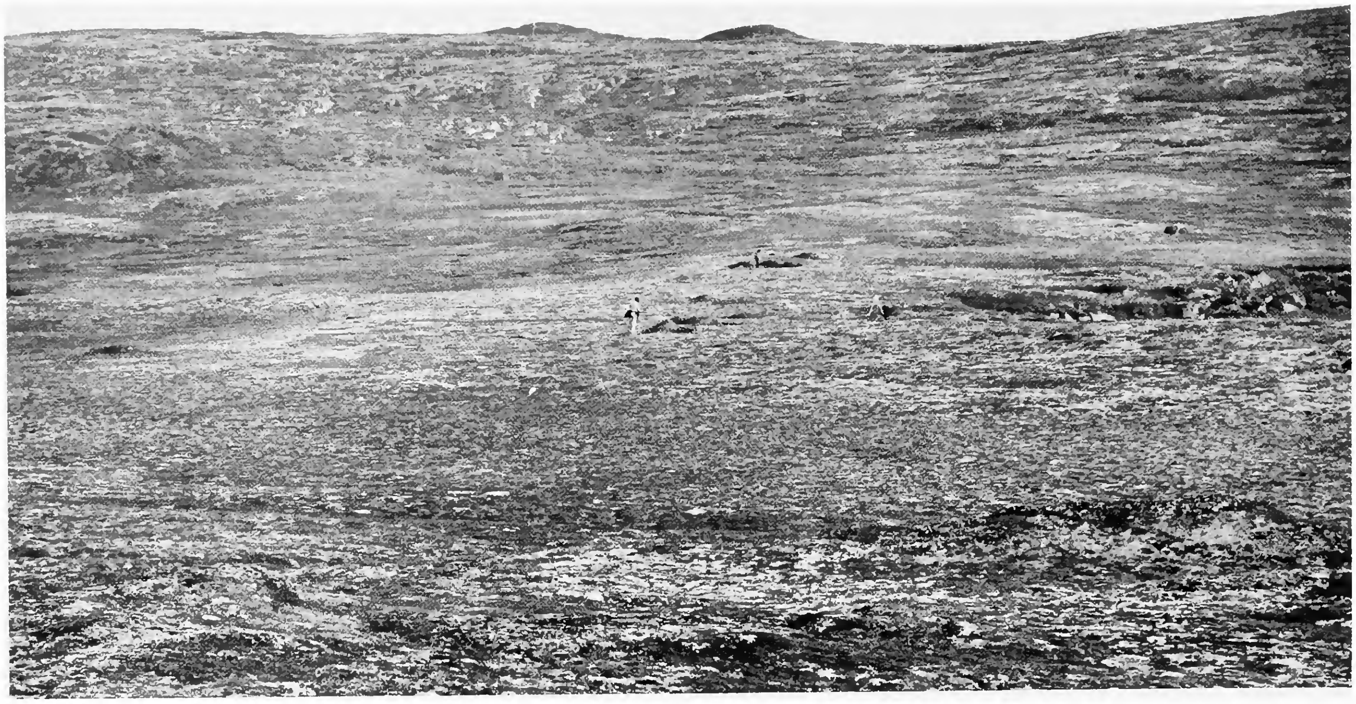


PLATE 31.—Rattlers Bight 1 (GcBi-7). View north across the site showing the occupied portion of the terrace and several test pits in the process of excavation. Steve Cox provides scale in the center field; relic cove at right. The south datum area (southern cove) part of the site extends off the picture to lower right.

PLATE 32.—Rattlers Bight 1 (GcBi-7). G. W. Conrad excavating two northern test squares. The depth of the deposit in this area extends to about 20 inches. Frost disturbance can be seen in the sand and peat lenses in the wall profile. View northeast.

PLATE 33.—Shell Island 1 (GcBi-11). View south across the site. Three cultural components were distributed within the 16–24 inches of peat deposit. Trenching shovels were used in clearing the upper turf horizon.

PLATE 34.—East Pompey Island 1 (GcBi-12). Excavation areas 1 and 2 shown at right and left of small pond. View northwest toward Winter Cove, at upper left.

PLATE 35.—East Pompey Island 1 (GcBi-12). Area 1 excavations showing the rocky pavement upon which this Dorset site was found. View to southwest.

PLATE 36.—Red Rock Point 2 (GeBk-2). Beginning of excavation at lower left with Michael River discharging into bay at upper right. GcBk-1 is located around a small pond barely seen at upper left.

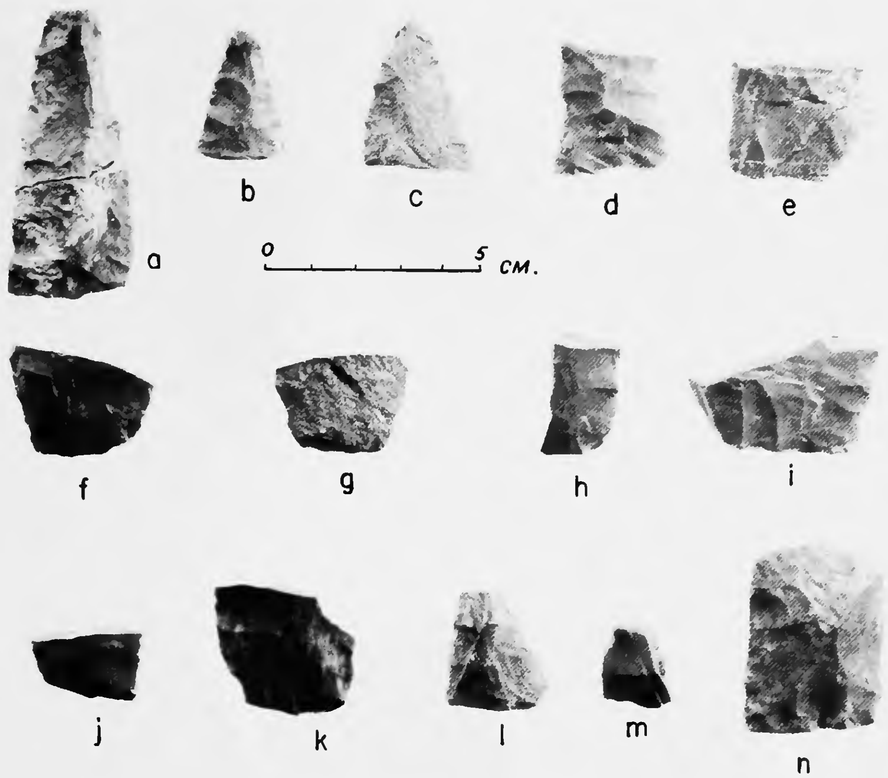


PLATE 37.—Radio shack site (FjCa-1). *a-k,* Biface fragments. *l,* Corner-notched point fragment. *m,* Scraper fragment. *n,* End scraper.

PLATE 38.—Dining hall area (FjCa-4). *a,* Large stemmed biface. *b,* Core base. *c,* Lanceolate knife. *d,* Small corner-notched point. *e,* Side scraper. *f,* hand knife.

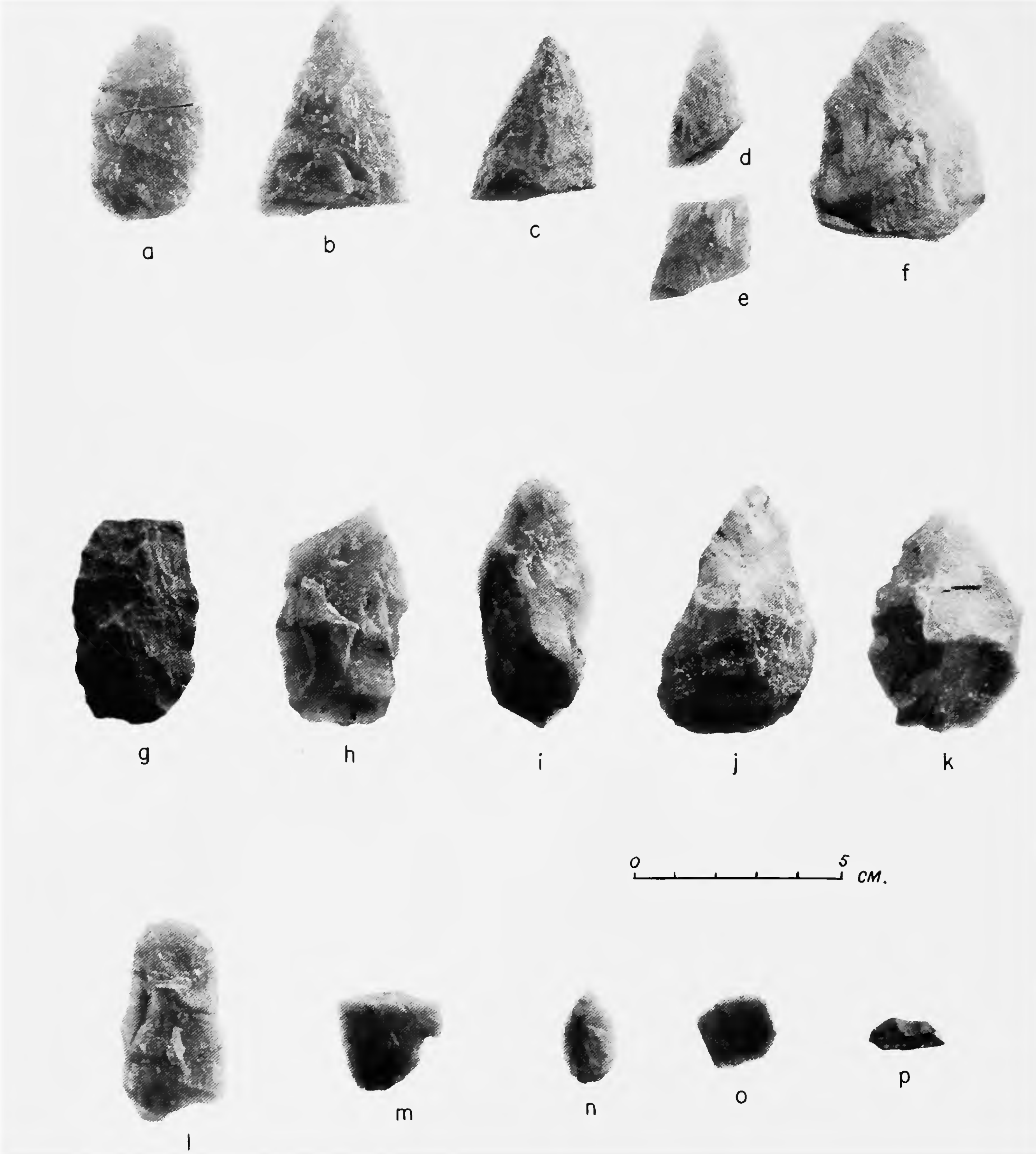


PLATE 39.—Cookery site (FjCa-3). *a*, Leaf-shaped biface. *b-e*, Biface fragments. *f-k*, Preforms and preform fragments. *l*, Tongue-shaped knife. *m*, Notched flake. *n*, Uniface point. *o*, Utilized flake. *p*, End scraper fragment.

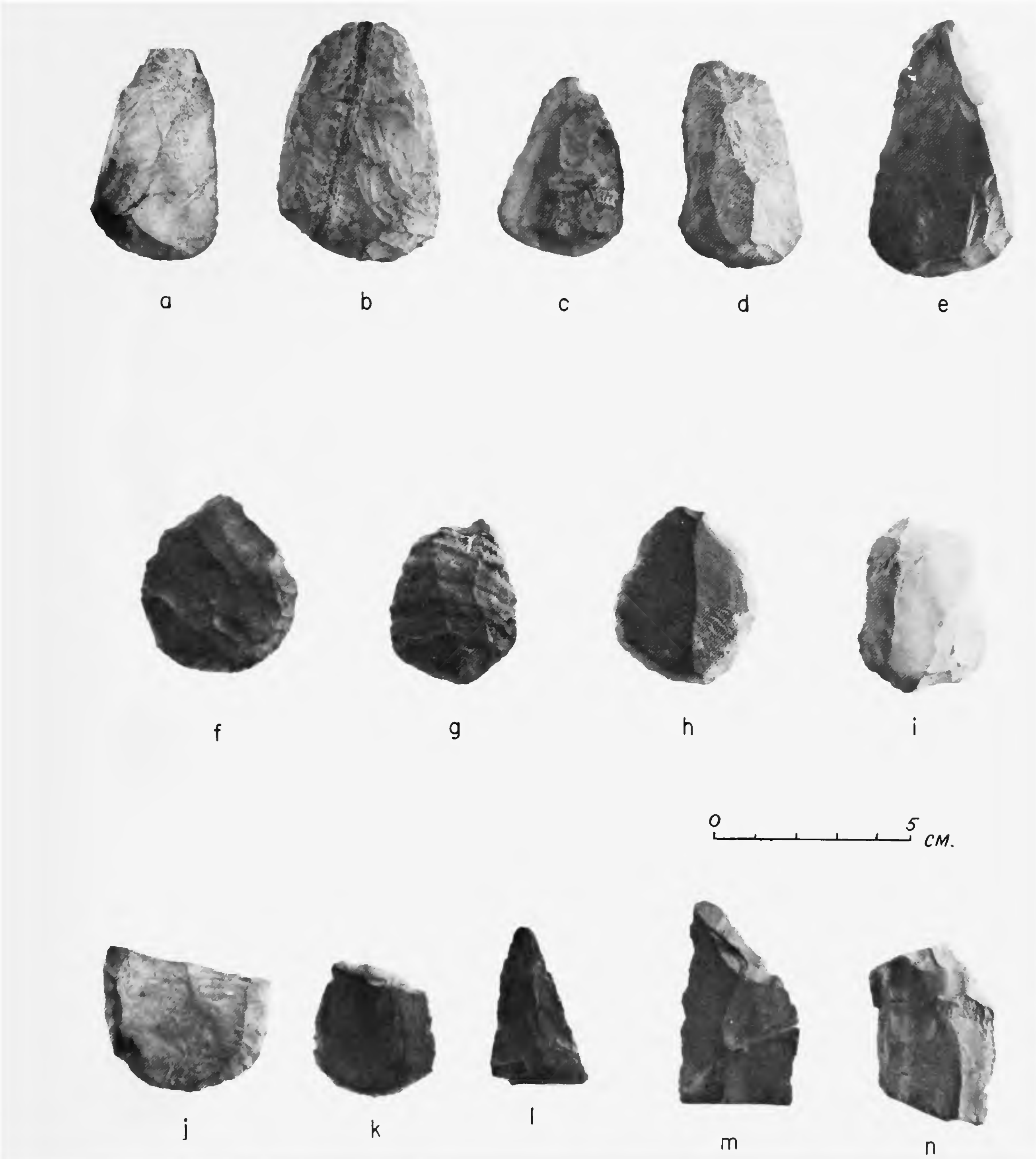


PLATE 40.—Piloski garden site (FjCa-9). *a-e,* Triangular humpbacked end and side scrapers. *f-i,* Disk scrapers. *j-k,* Oval scraper fragments. *l,* Biface tip. *m-n,* Utilized flakes.

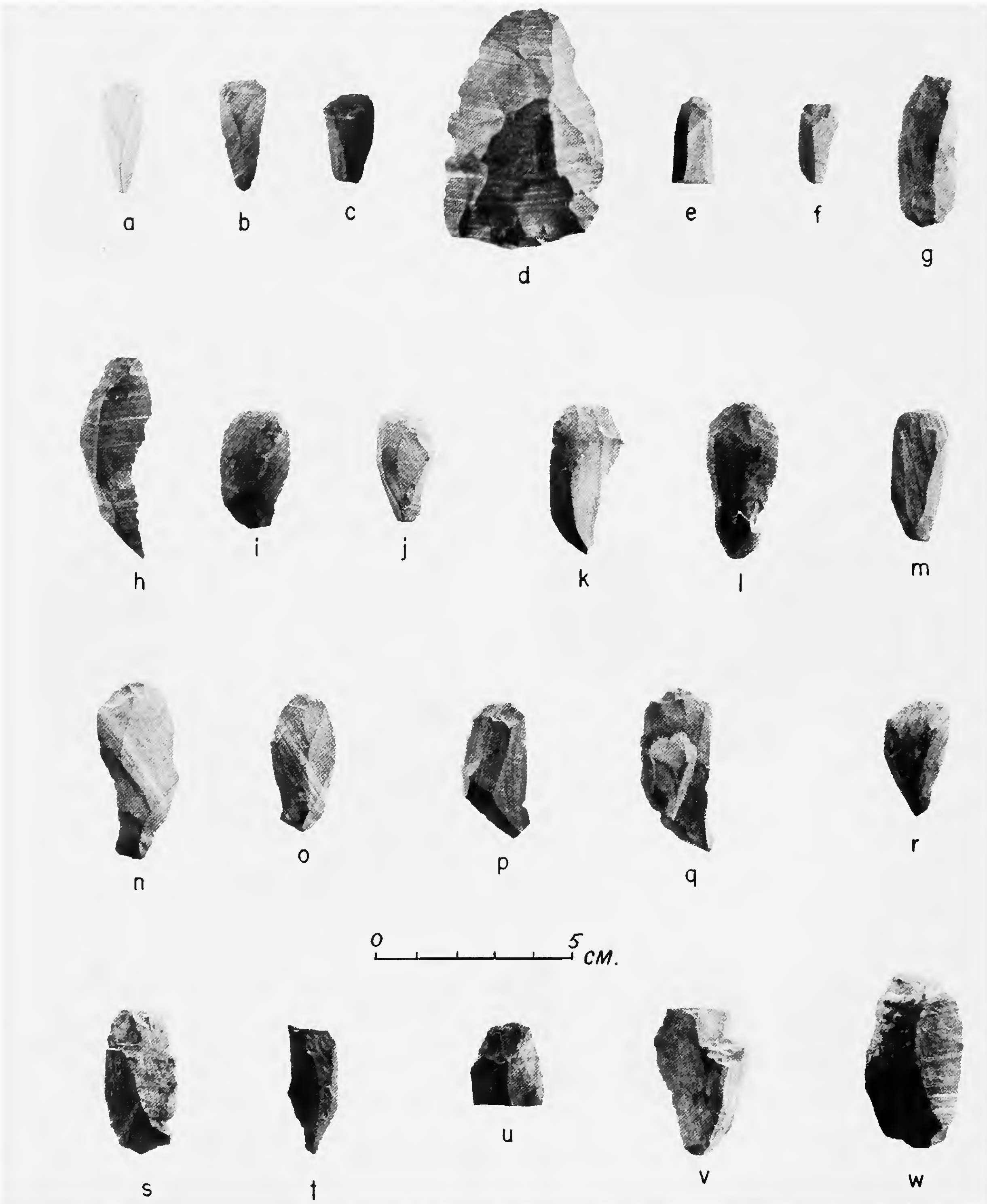


PLATE 41.—Triangular flakes and flake core. *a-c, e-w,* Flakes from FjCa-9. *d,* Core from FjCa-13. Many of the flakes have retouch and use wear on their distal (bottom) tips.

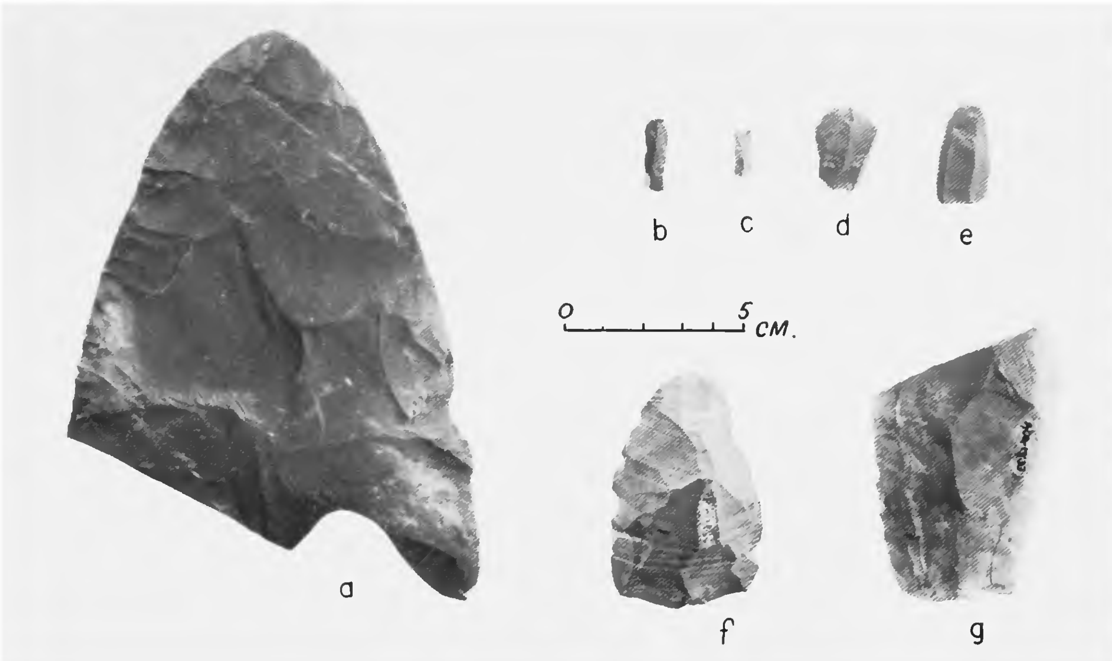


PLATE 42.—Road site 1 (FjCa-13). *a*, Biface tip. *b-c*, Linear flakes. *d-e*, Linear (possible core) flakes. *f*, Pyramidal-shaped triangular flake core. *g*, Scraper, proximal fragment.

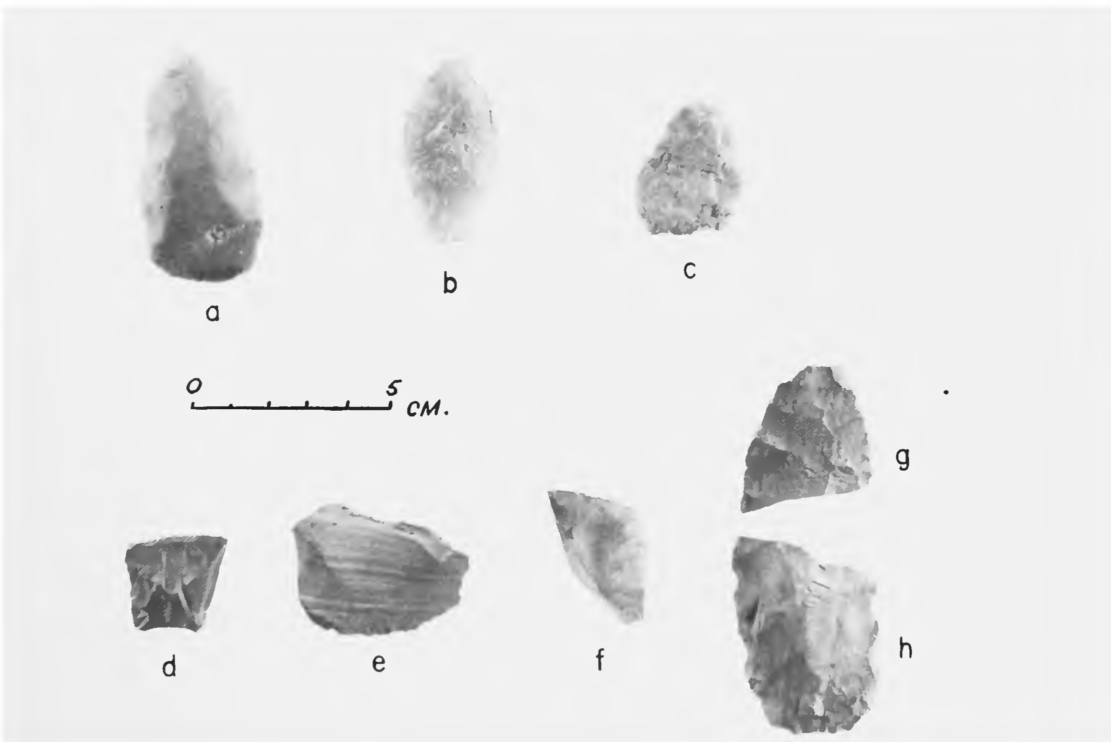


PLATE 43.—Graveyard site (FjCa-29). *a*, Biface preform. *b*, Stemmed point. *c*, Asymmetric knife. Selby Michelin Basement site (FjCa-17): *d-f*, Utilized flakes. *g-h*, Biface Preform fragments.

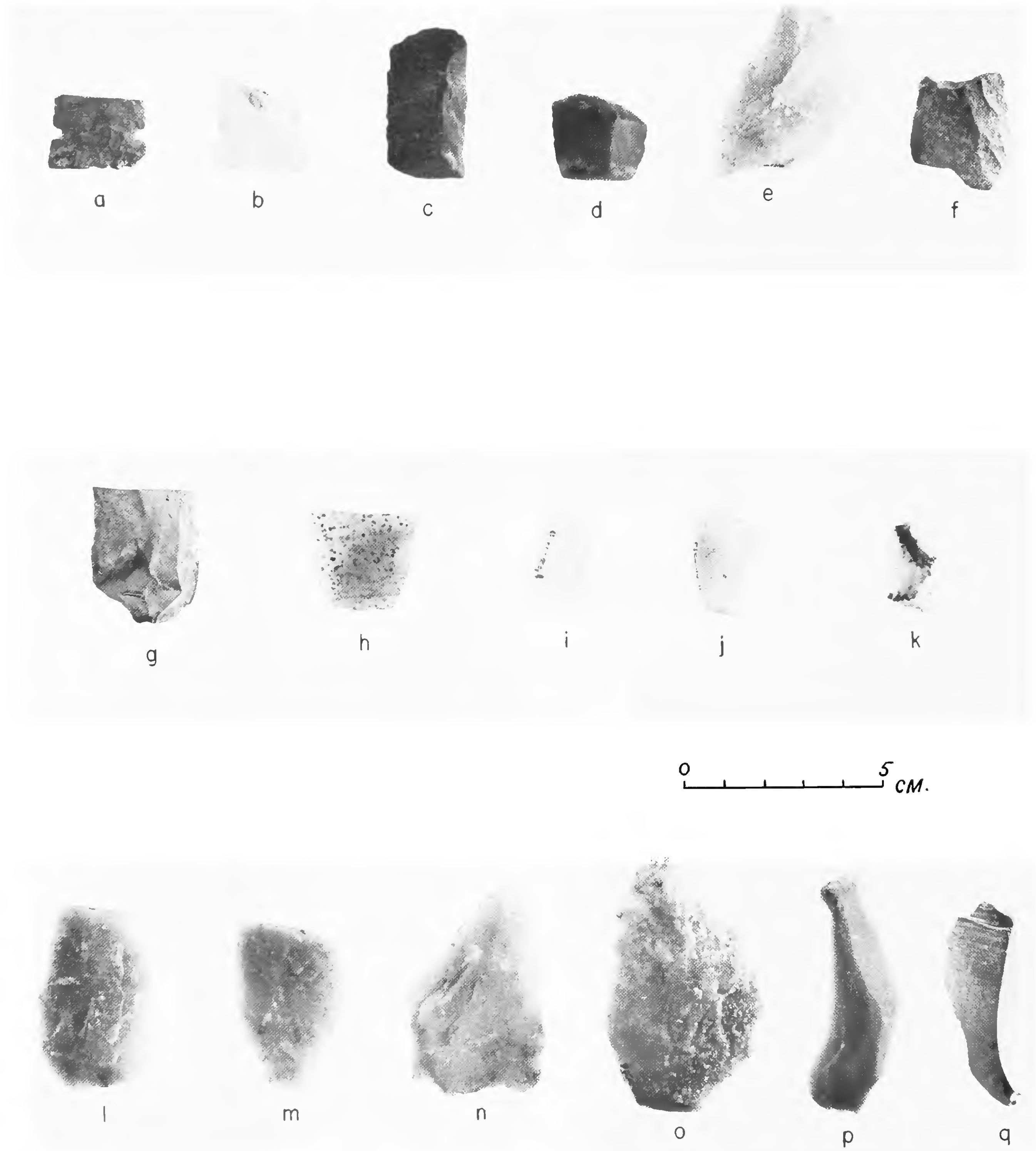


PLATE 44.—Road site 2 (FjCa-14): *a-b*, Side-notched point bases. *c-d*, End scrapers with triangular cross-sections. *e-f*, Biface midsections. *g*, Flake knife and scraper tool. *h-j*, Utilized flakes. *k*, Pseudo-blade. Herbert Michelin garden site 1 (FjCa-15): *l*, Biface base. *m*, Stemmed point base. *n-o*, Asymmetric knives. *p-q*, Utilized flakes.

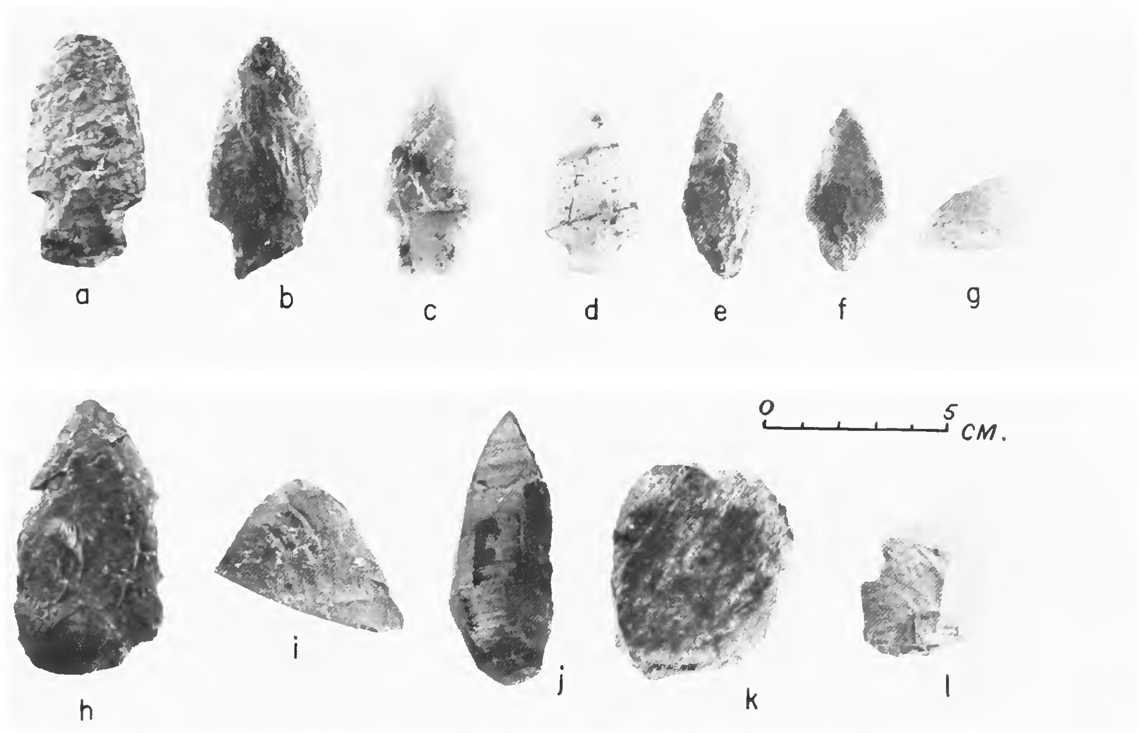


PLATE 45.—David Michelin site (FjCa-19). *a-d*, Straight-stemmed points (*d* of Ramah chert). *e-f*, Tapered-stemmed points. *g*, Biface basal corner. *h*, Preform fragment. *i*, Biface tip. *j*, Unifacial "backed" knife. *k*, Dick-shaped knife. *l*, Scraper.

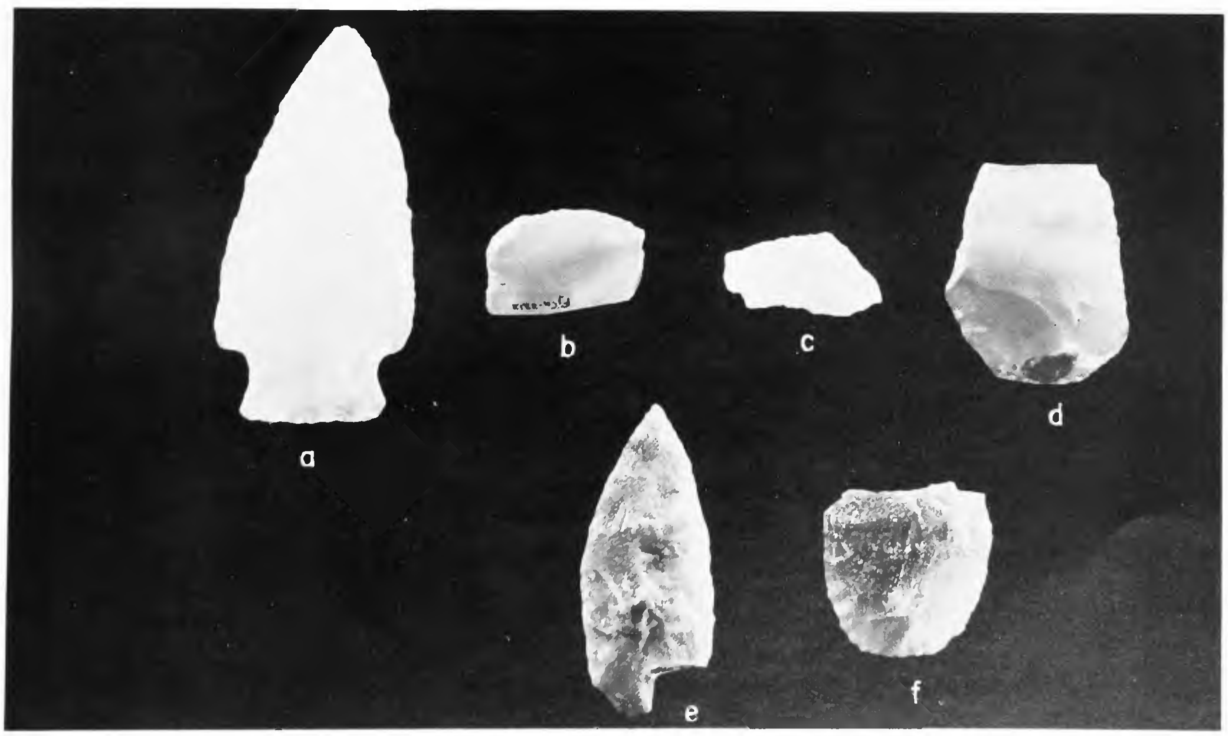


PLATE 46.—Henry Blake 1 (FjCa-20). *a*, Corner-notched biface of Ramah chert. *b*, Scraper. *c*, Patinated biface fragment of Ramah chert. *d*, Scraper-knife tool. Henry Blake 2 (FjCa-21): *e-f*, Biface fragments.

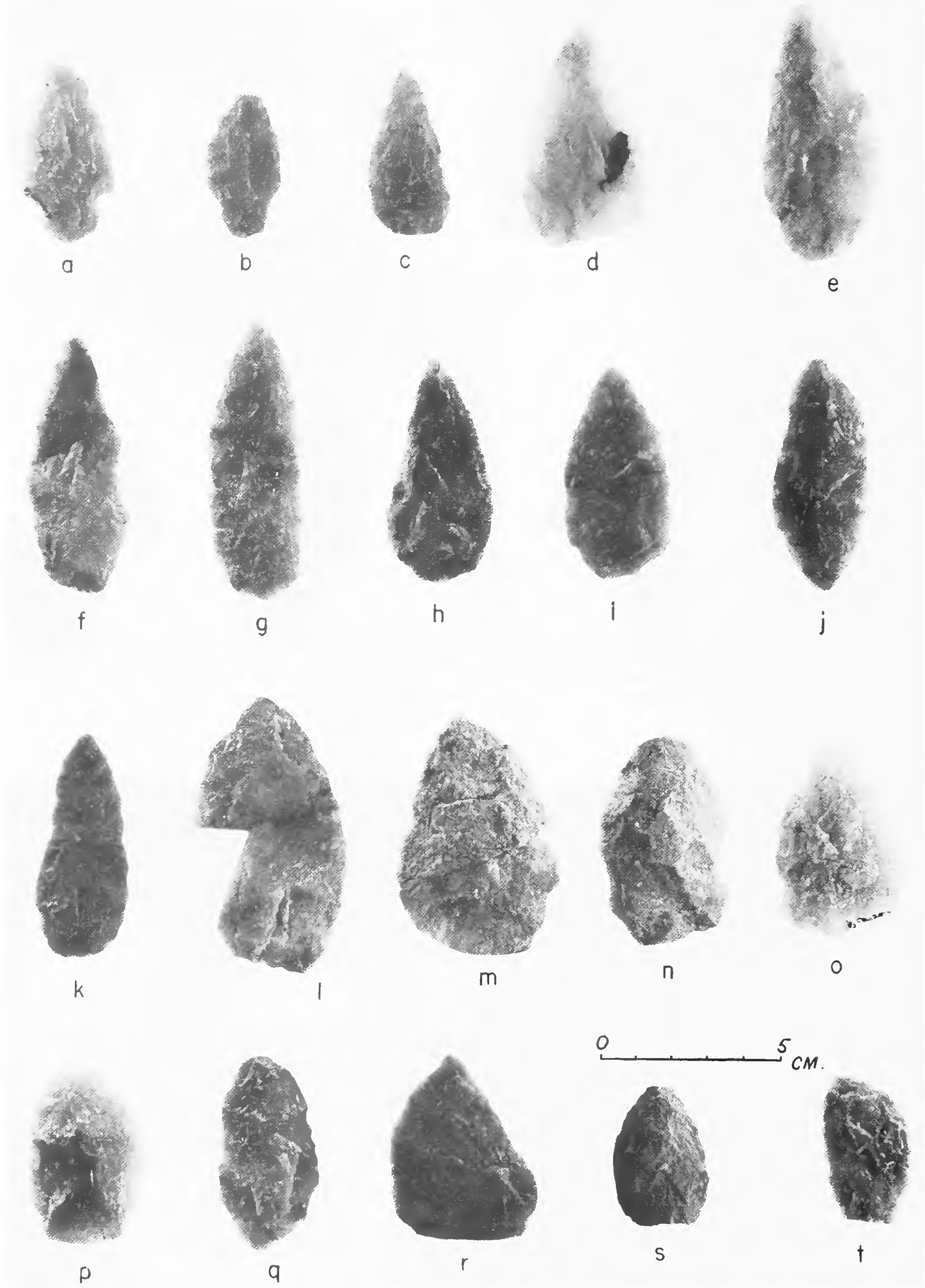


PLATE 47.—Sid Blake site (FjCa-24). *a-b*, Stemmed points. *c-p*, Bifaces. *q-t*, Asymmetric knives.

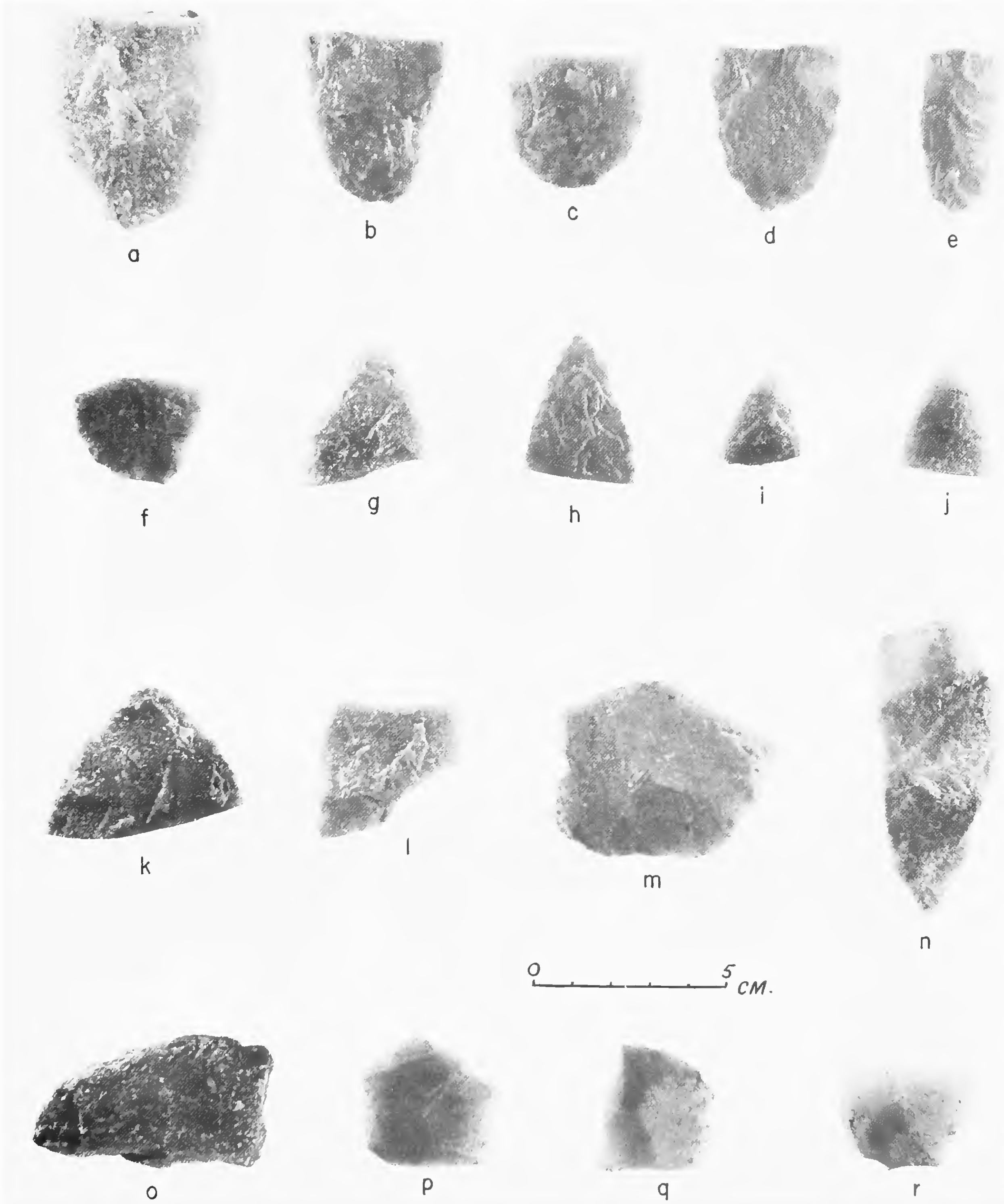


PLATE 48.—Sid Blake site (FjCa-24). *a-f*, Biface bases. *g-k*, Biface tips. *l*, Biface midsection. *m-r*, Utilized flakes.

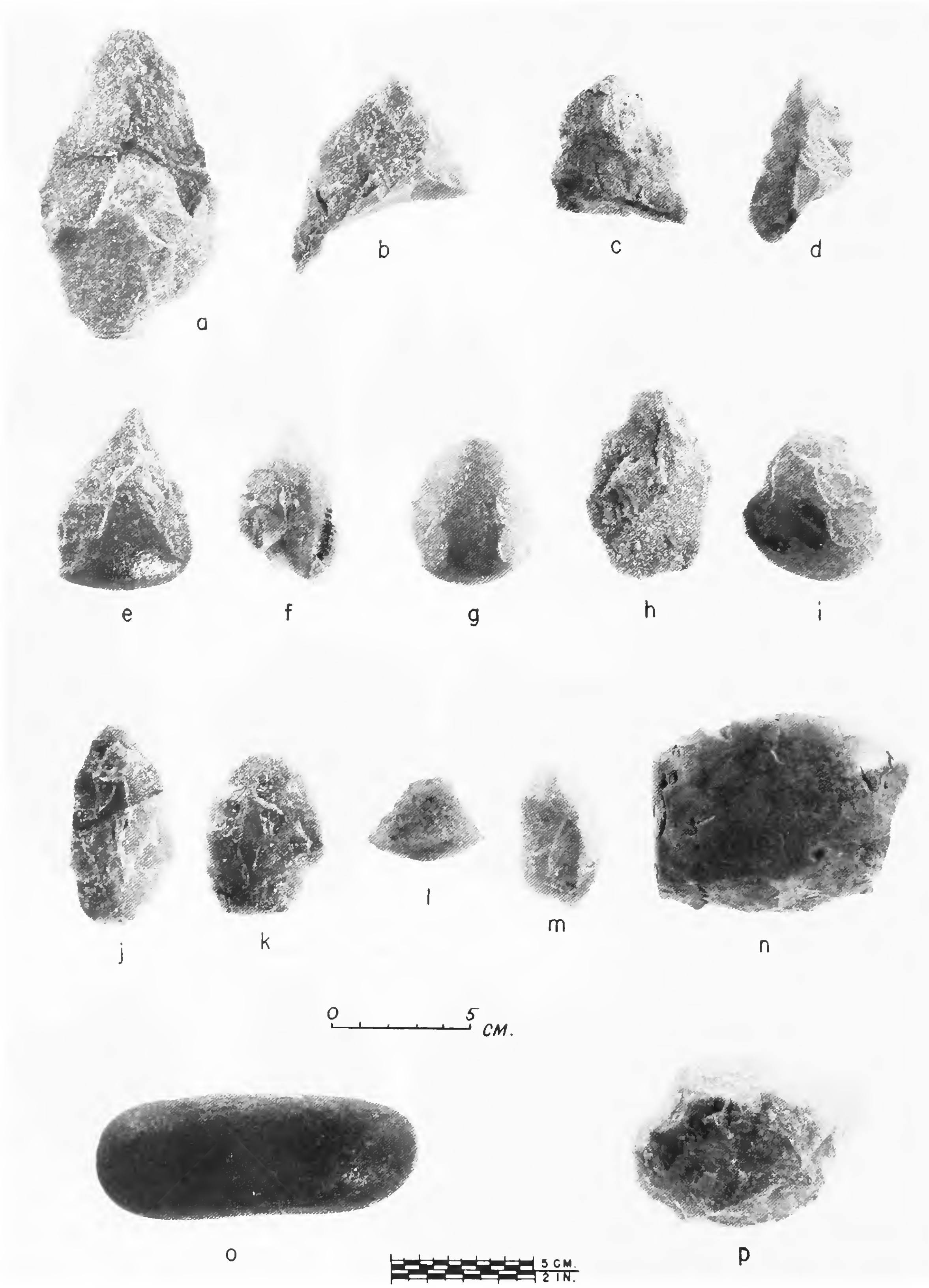


PLATE 49.—Sid Blake site (FjCa-24). *a-m*, Biface preforms and preform fragments. *n*, Core scraper. *o*, Hammerstone. *p*, Exhausted core.

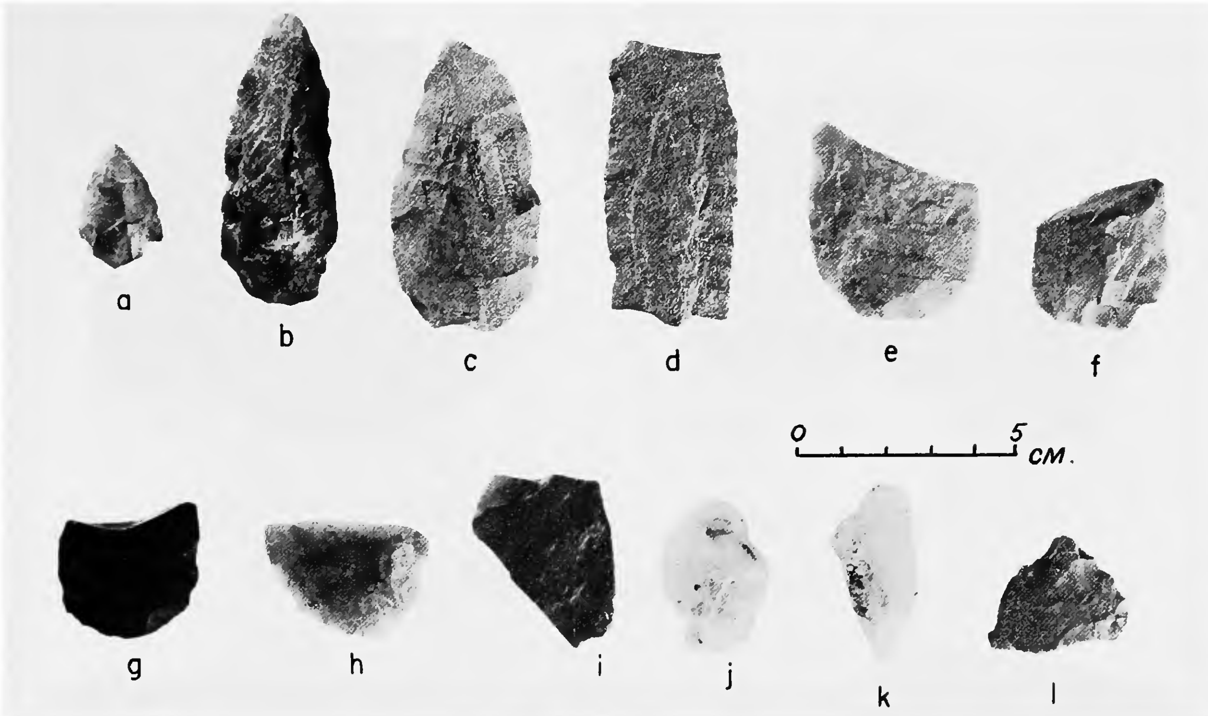


PLATE 50.—Bunkhouse site (FjCa-33). *a,* Corner-notched point. *b-c,* Biface blanks. *d-e,* Biface fragments. *f-g,* Biface bases. *h,* Biface blank. *i,* Corner-notched biface fragment. *j-k,* Flake tools. *l,* Utilized flake.

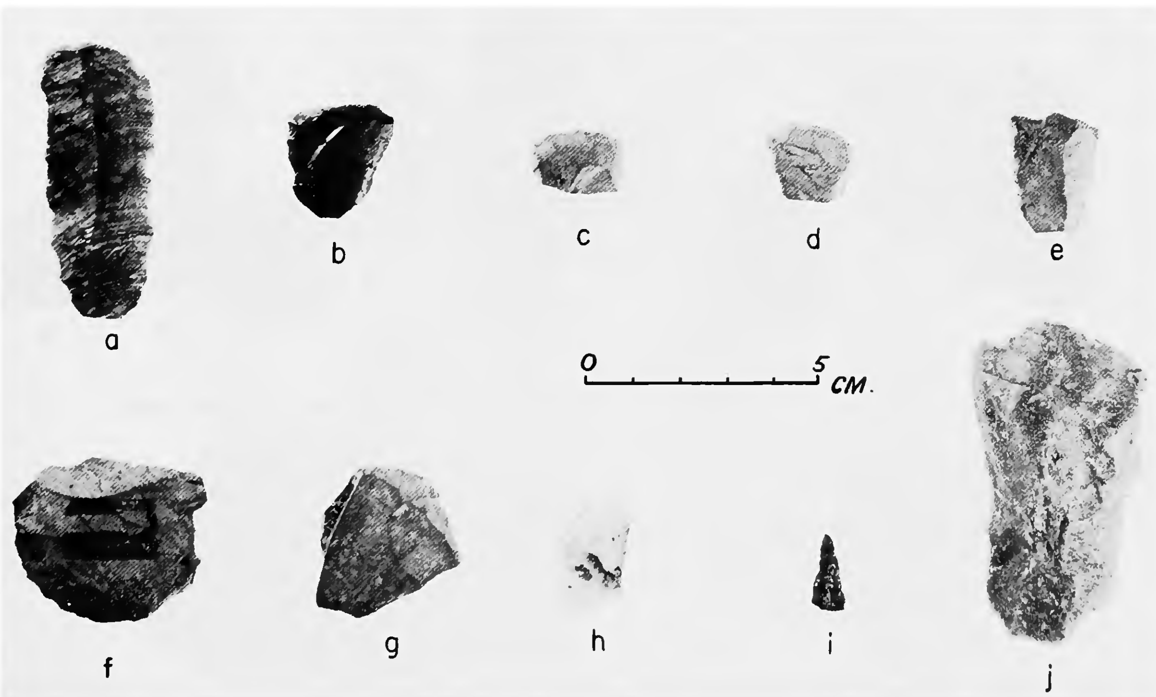


PLATE 51.—Bunkhouse site (FjCa-33). *a,* End scraper on blade-like flake. *b-d,* End scrapers. *e,* End scraper on blade-like flake. *f,* Disk-shaped knife. *g-h,* Utilized flakes. *i,* Perforator. *j,* End scraper.

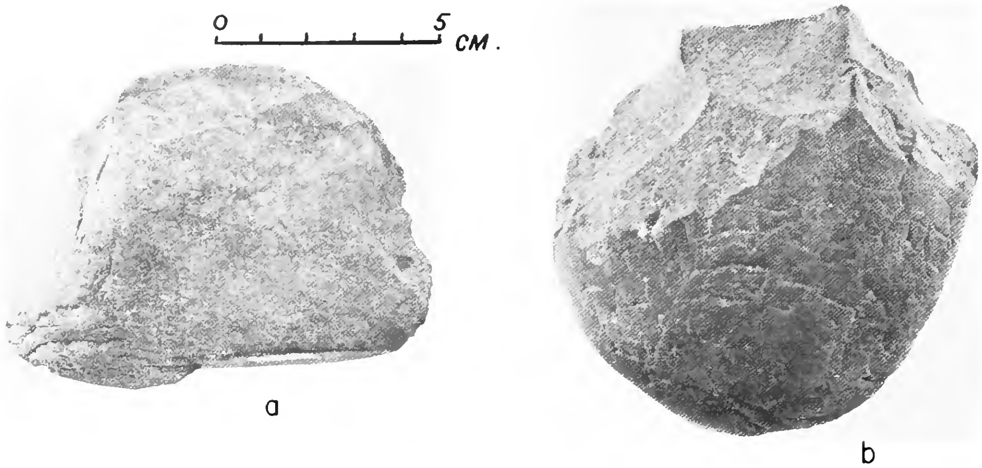


PLATE 52.—Red Ocher site (FjCa-38). *a*, Grindstone fragment. *b*, Cobble flake core.

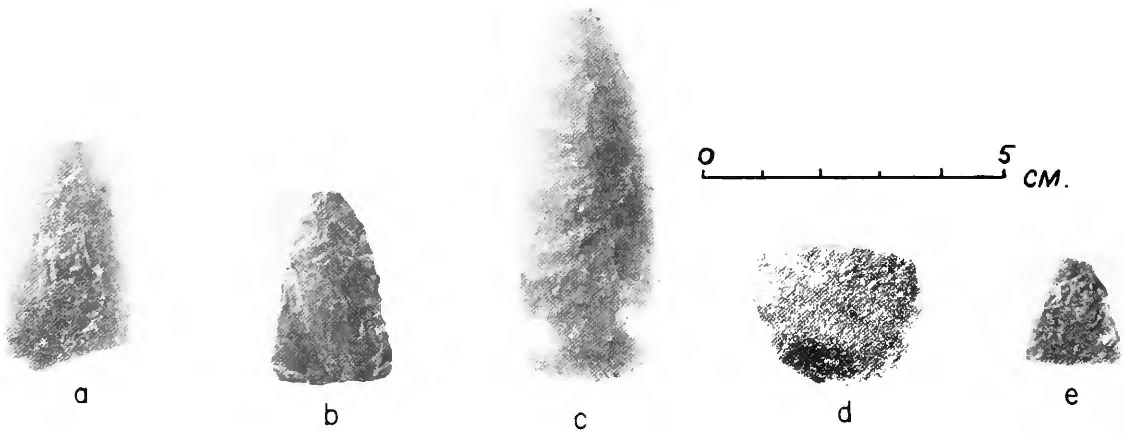


PLATE 53.—Red Ocher site (FjCa-38). *a*, Notched point fragment. *b*, Bifacial knife. *c*, Side-notched point. *d*, Biface base. *e*, Biface tip.

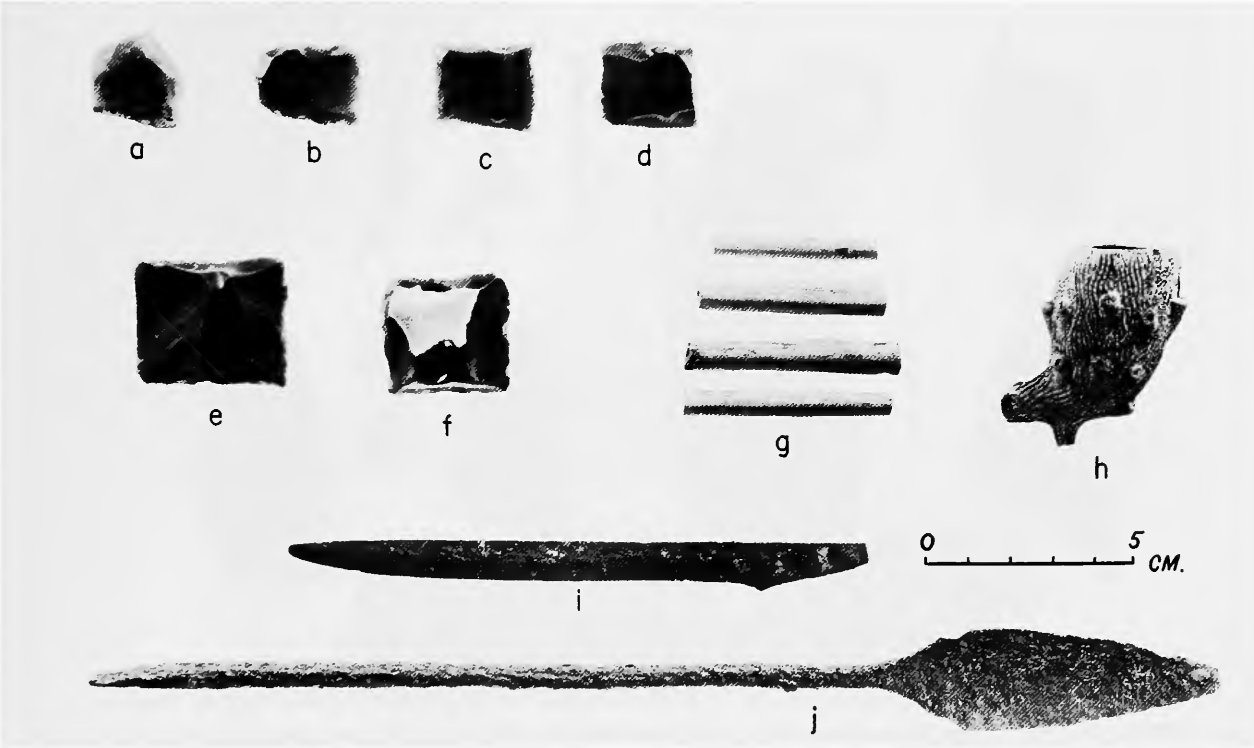


PLATE 54.—Historic Material from North West River (FjCa-34). *a*, French style gunflints. *b-f*, English style gunflints. *g*, Clay pipe stems. *h*, Pipe bowl. *i*, Iron crooked knife. *j*, Iron deer spear.

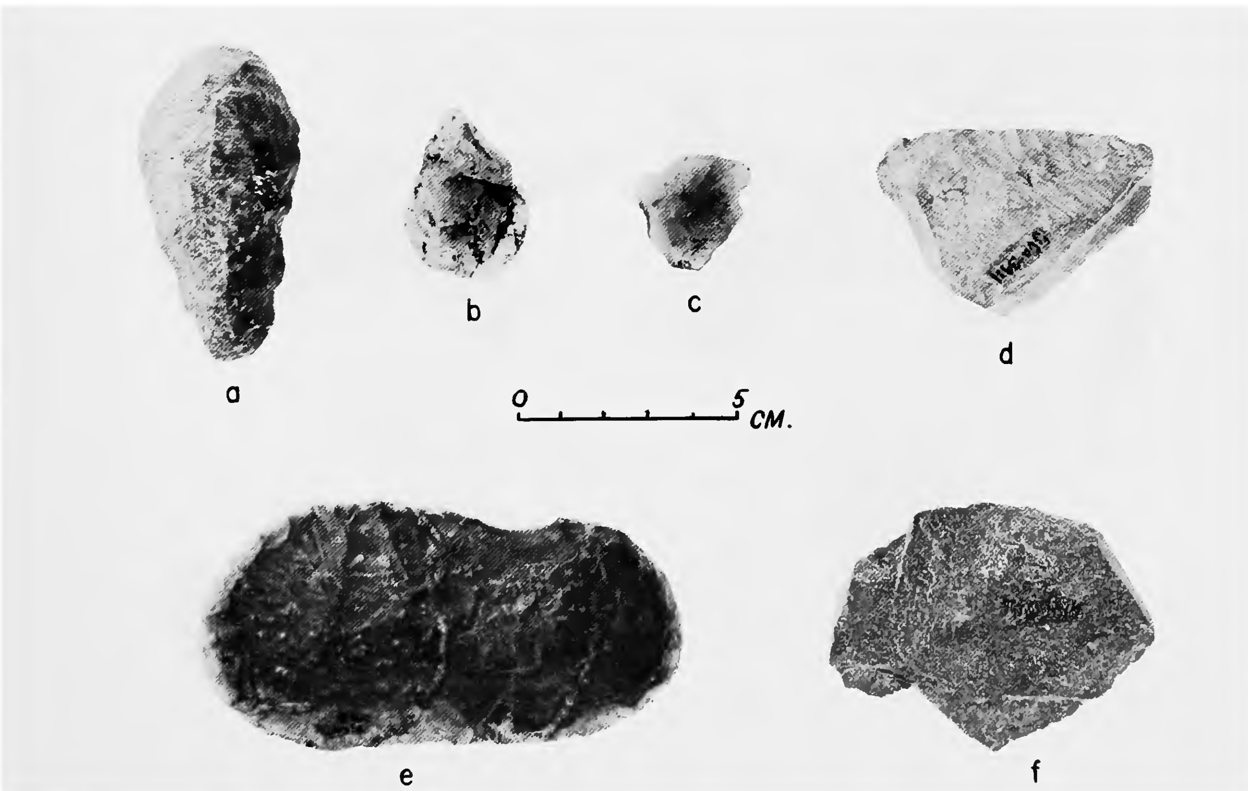


PLATE 55.—Louis Montague site (FjCa-39). *a*, Stemmed end scraper. *b*, Utilized flake. *c*, Flake scraper. *d*, Side scraper. *e*, Oval double-ended scraper. *f*, Utilized flake.

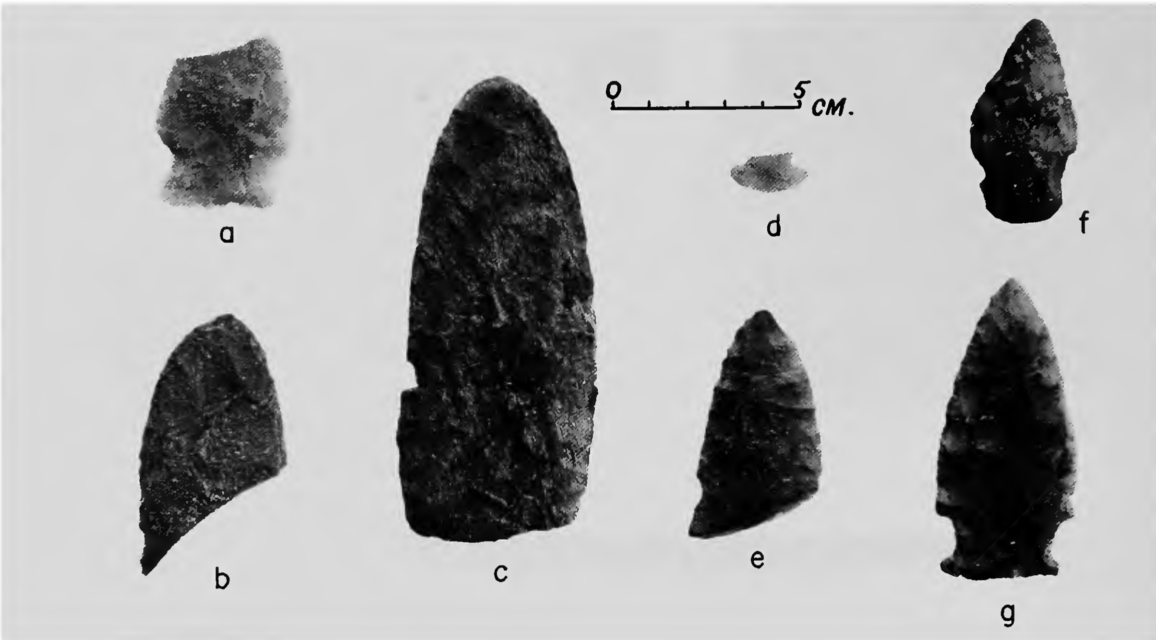


PLATE 56.—North West River Miscellaneous (FjCa-34). *a*, Corner-notched biface. *b*, Biface fragment. *c*, Bifacial knife. *d*, Side-notched point base. *e*, Biface fragment. *f*, Stemmed point. *g*, Side-notched point.

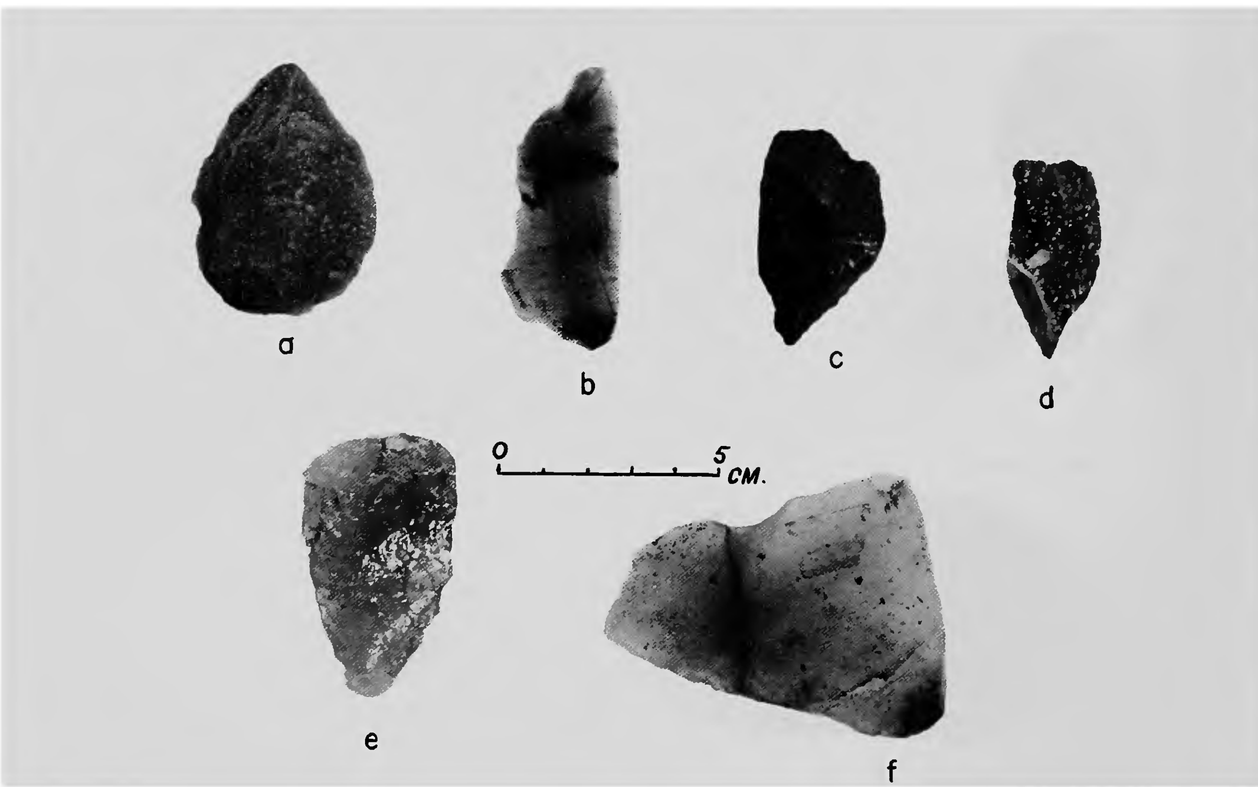


PLATE 57.—North West River Miscellaneous (FjCa-34). *a*, Biface blank. *b-c*, Utilized flake. *d*, Flake knife. *e*, Stemmed scraper. *f*, Utilized flake (Ramah chert).

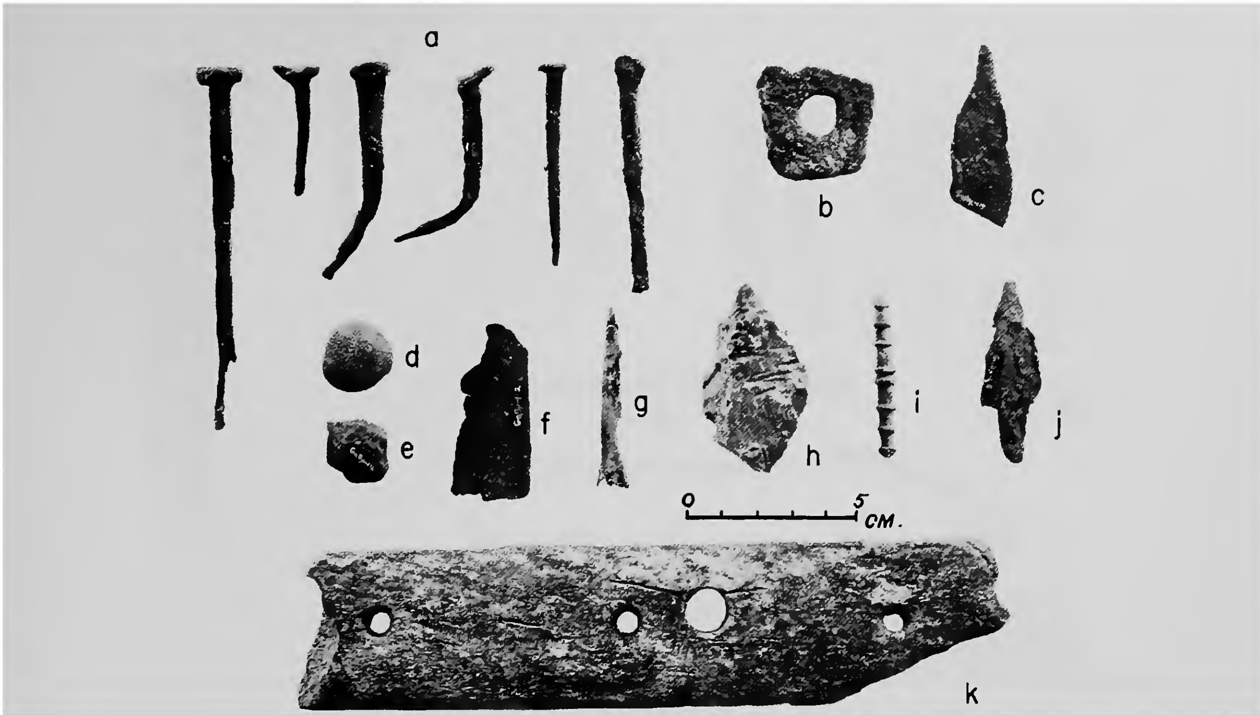


PLATE 58.—Eskimo Island 1 (GaBp-1). *a,* Iron nails. *b,* Lead fragment. *c,* Iron sheet. *d-e,* Iron pyrite. *f,* Sheet iron. *g,* Copper strip. *h,* Soapstone fragment. *i,* Bone toggle. *j,* Iron arrowhead. *k,* Whalebone sled runner.

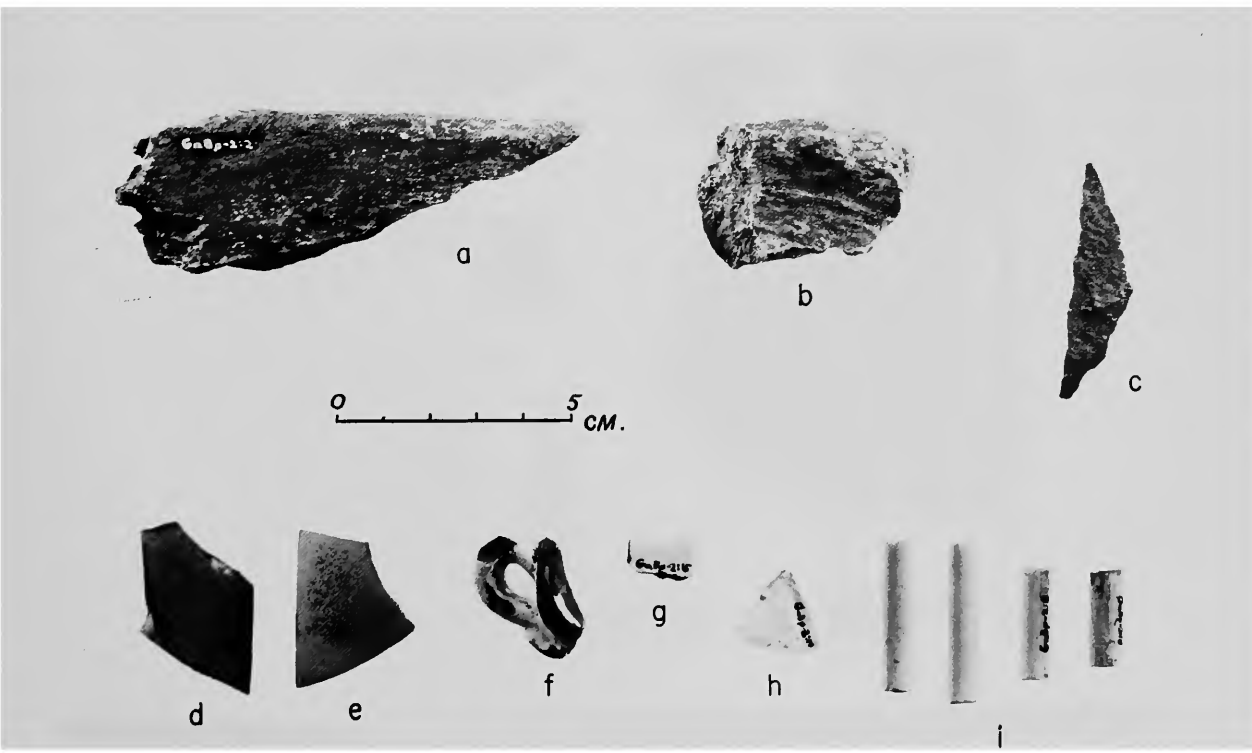


PLATE 59.—Eskimo Island 2 (GaBp-2). *a-b,* Soapstone vessel fragments. *c,* Iron fragment. *d,* Glass fragment. *e,* Salt glaze sherd. *f-g,* Software sherds. *h,* Strike-a-light/scraper of quartz crystal. *i,* Clay pipe stems.

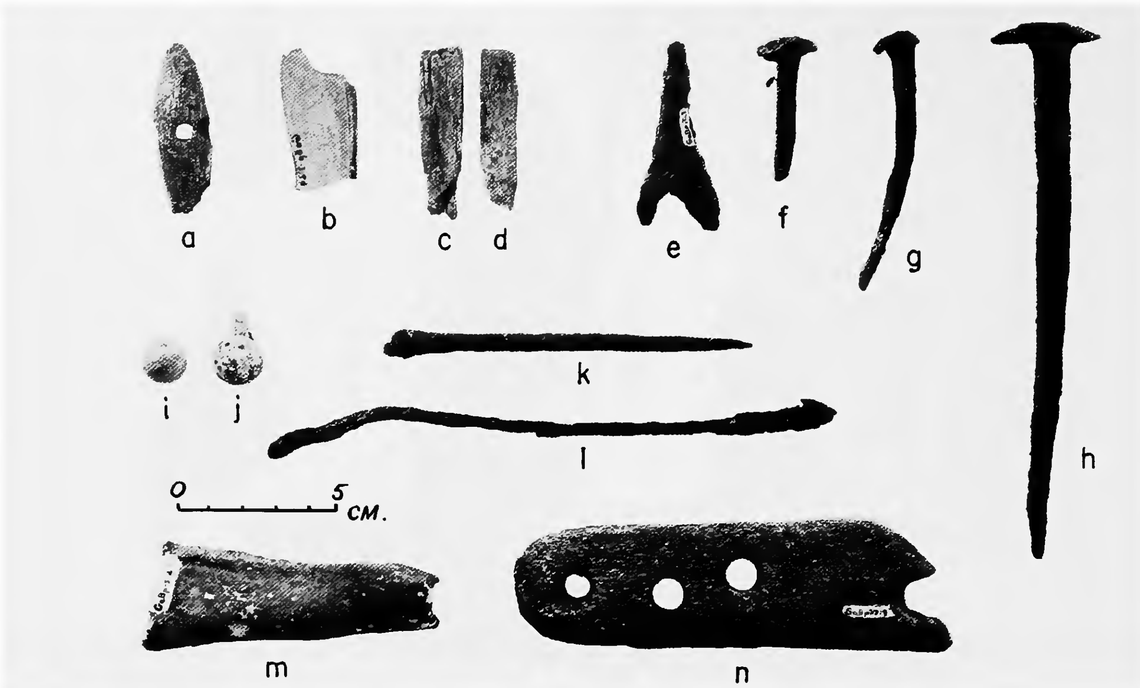


PLATE 60.—Eskimo Island 3 (GaBp-3). *a,* Wooden toggle. *b,* Glass fragment. *c-d,* Baleen fragments. *e,* Lead sheet. *f-h,* Iron spikes. *i-j,* Musket balls. *k-l,* Iron fragments. *m,* Lead strip. *n,* Sled runner fragment.

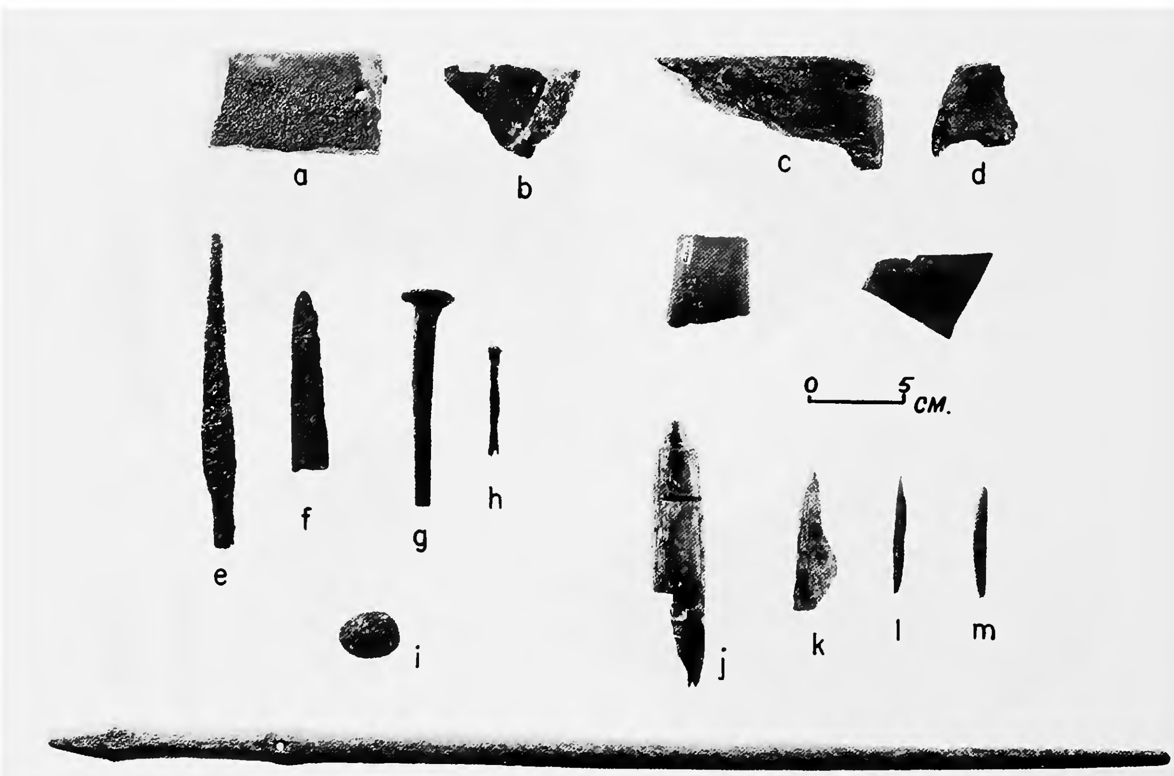


PLATE 61.—Eskimo Island 4 (GaBp-4). *a-d,* Soapstone vessel fragments. *e-f,* Iron fragments. *g-h,* Iron nails. *i,* Iron pyrite. *j,* Harpoon socket piece. *k-l,* Bone awls. *m,* Fish gorge or toggle. *n,* harpoon foreshaft.

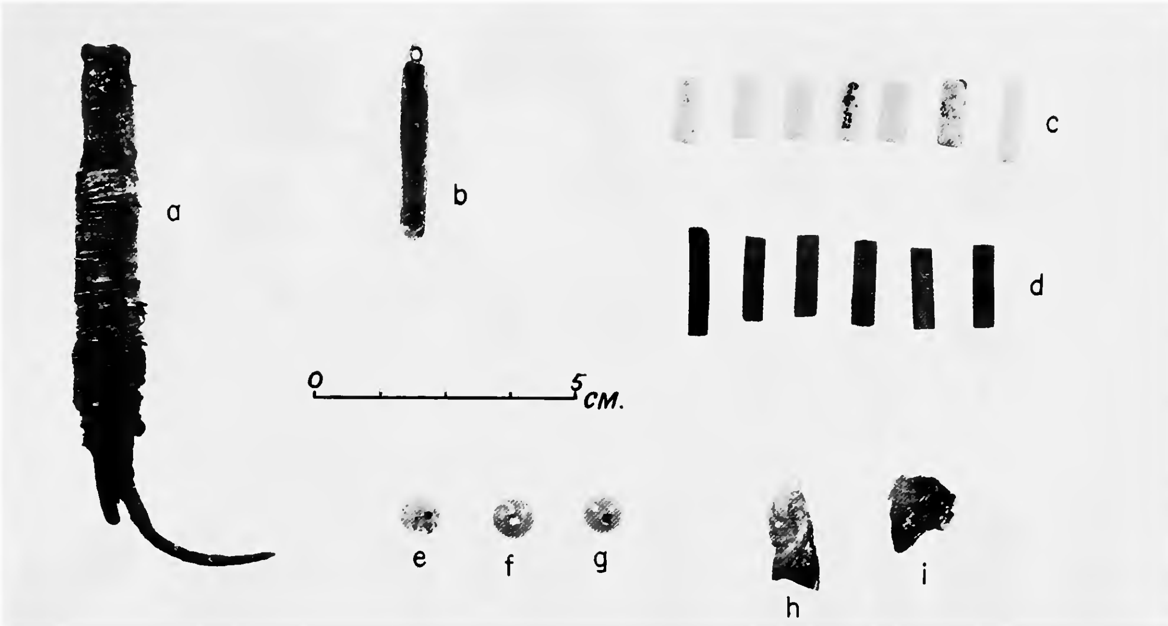


PLATE 62.—Double Mer Point (GbBo-2): *a,* Codfish jig. Eskimo Island grave (GaBp-5): *b,* Perforated lead pendant. *c-d,* Opaque tubular glass beads. *e-g,* Opaque rolled glass beads. *h-i,* Mussel shells.

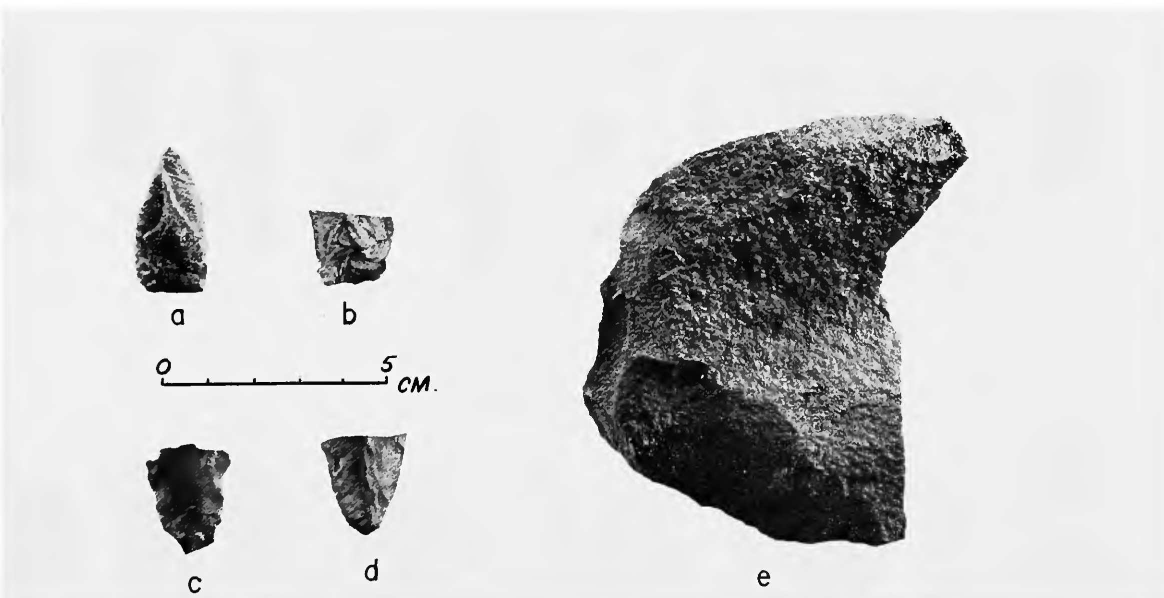


PLATE 63.—Rigolet site (GbBo-1). *a,* Bifacial point. *b,* Biface base. *c,* End scraper. *d,* End scraper, proximal fragment. *e,* Utilized flake.

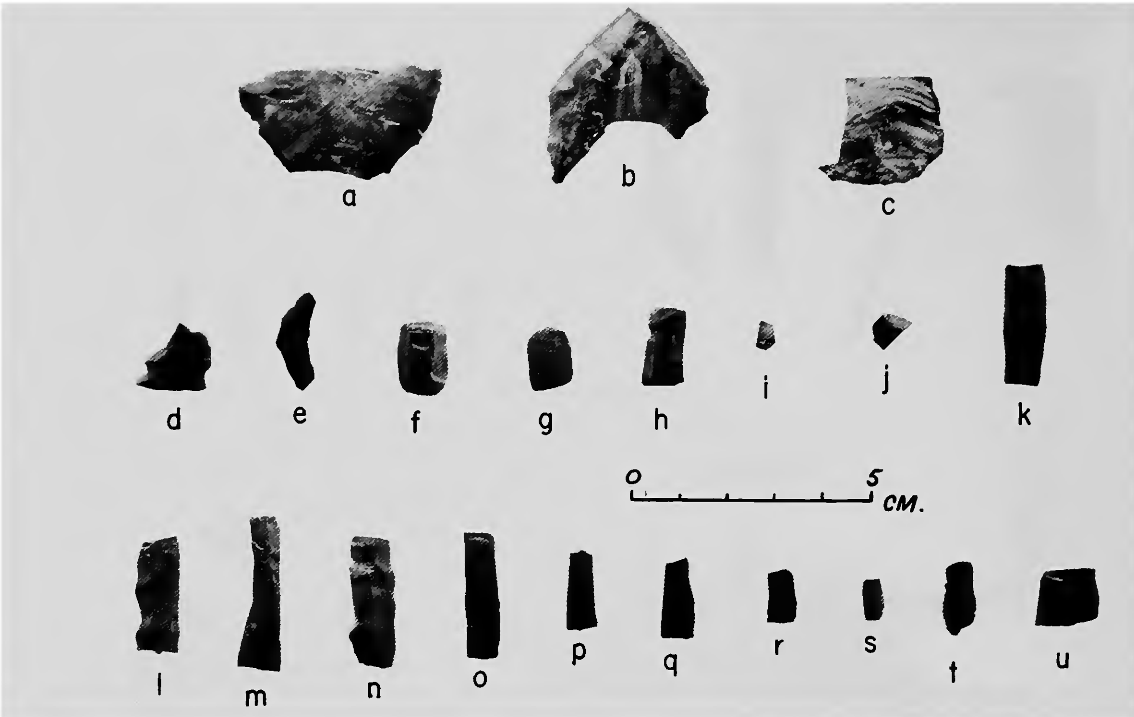


PLATE 64.—Ticoralak 2 (GbBn-2). *a-c,* Biface fragments. *d,* Side-notched burin-like tool. *e,* Crescent. *f-u,* Microblade fragments, utilized, notched, or discarded.

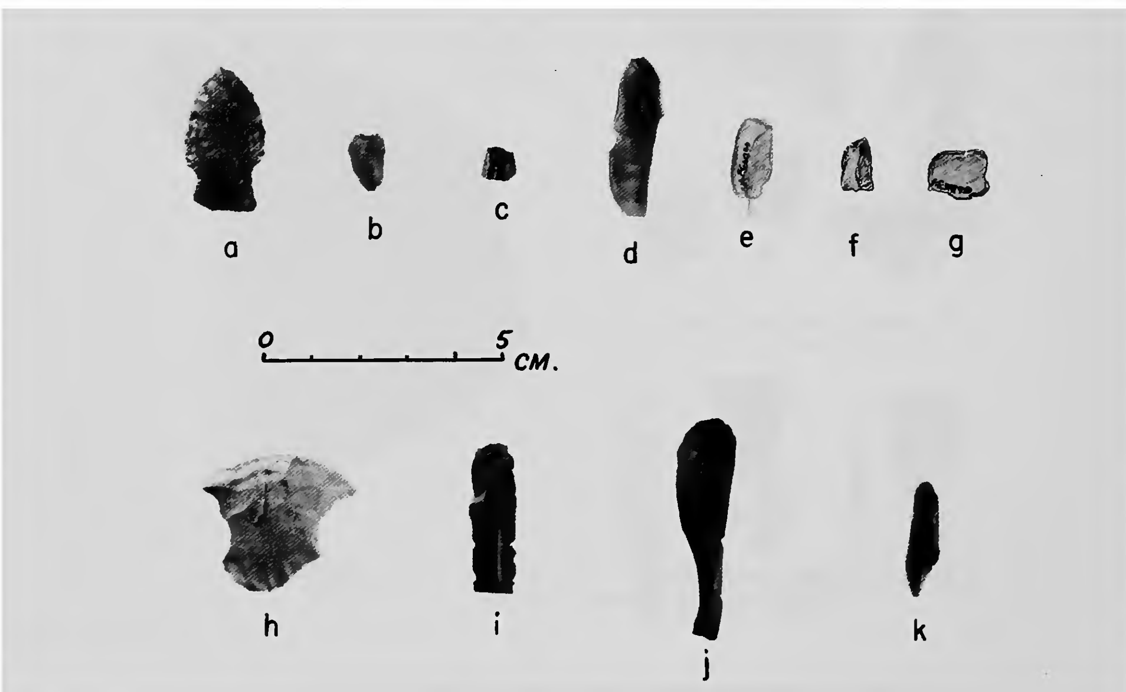


PLATE 65.—Ticoralak 2 East (GbBn-3): *a,* Side-notched knife. *b,* Ground slate fragment. *c-g,* Microblade fragments. Ticoralak 4 (GbBn-5): *h,* Eared end scraper. *i-k,* Microblade fragments.

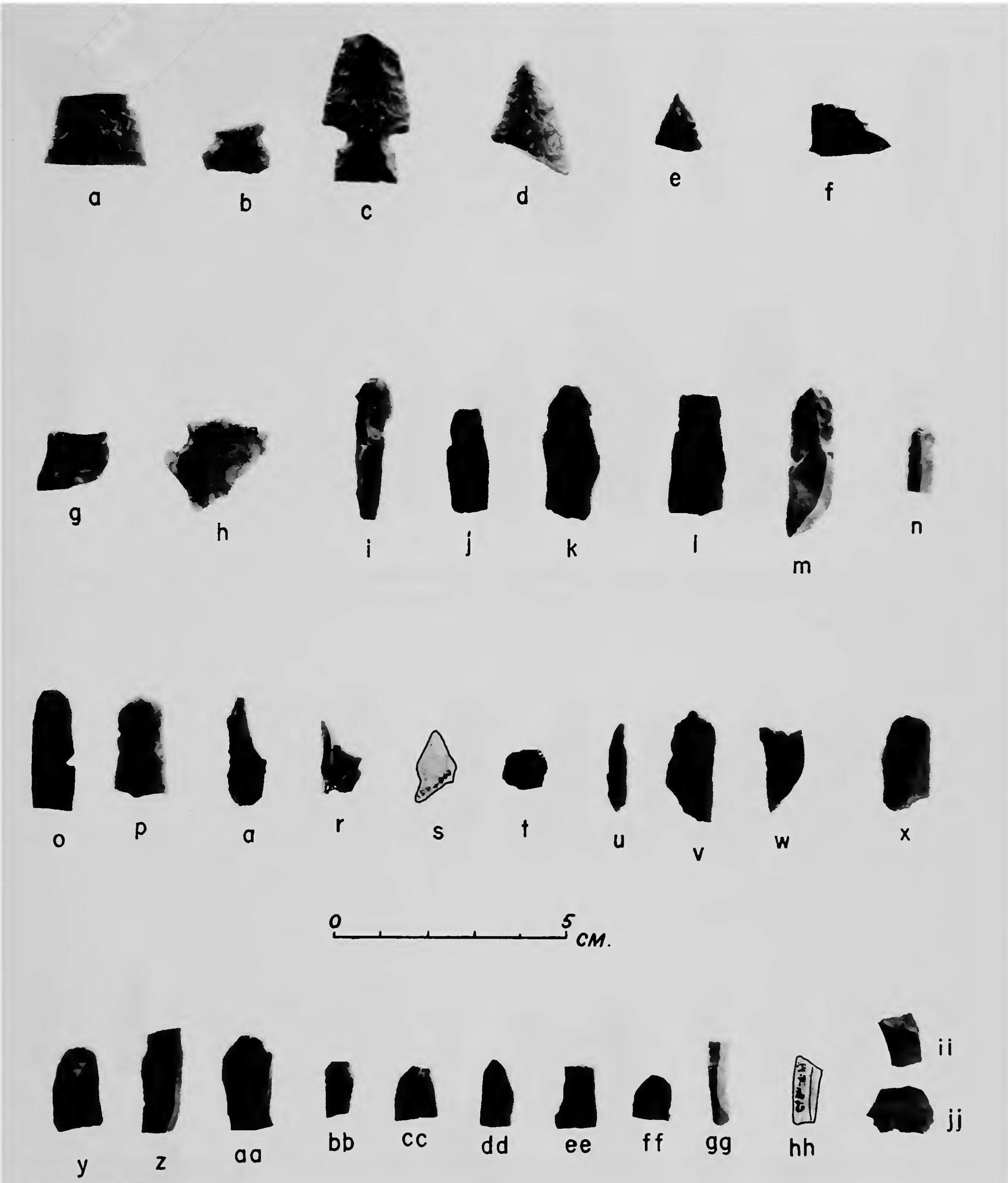


PLATE 66.—Ticoralak 3 (GbBn-4). *a*, Biface midsection. *b-c*, Box-based point fragments. *d-e*, Biface fragments. *f-g*, Flake knives. *h*, Grindstone fragment. *i-j*, Core preparation flakes. *k-p*, Notched microblades. *q-s*, Biface fragments. *t*, Disk scraper. *u-w*, Gravers. *x-hh*, Microblades. *ii-jj*, Ground slate fragments.

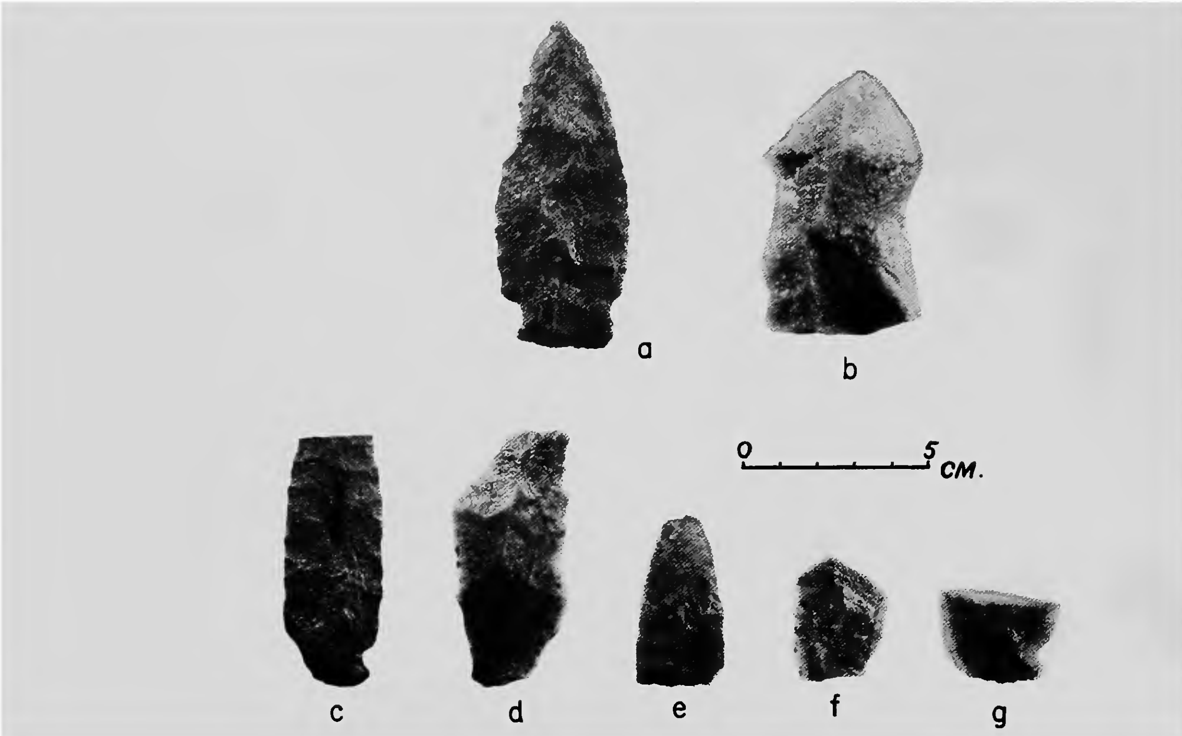


PLATE 67.—Ticoralak Surface Collection (GbBn-6). *a,* Corner-notched point. *b,* Flake scraper. Ticoralak 6 (GbBn-8). *c,* Corner-notched point. *d,* Utilized flake. *e,* Triangular Dorset point blank. *f,* Utilized flake. *g,* Biface base.

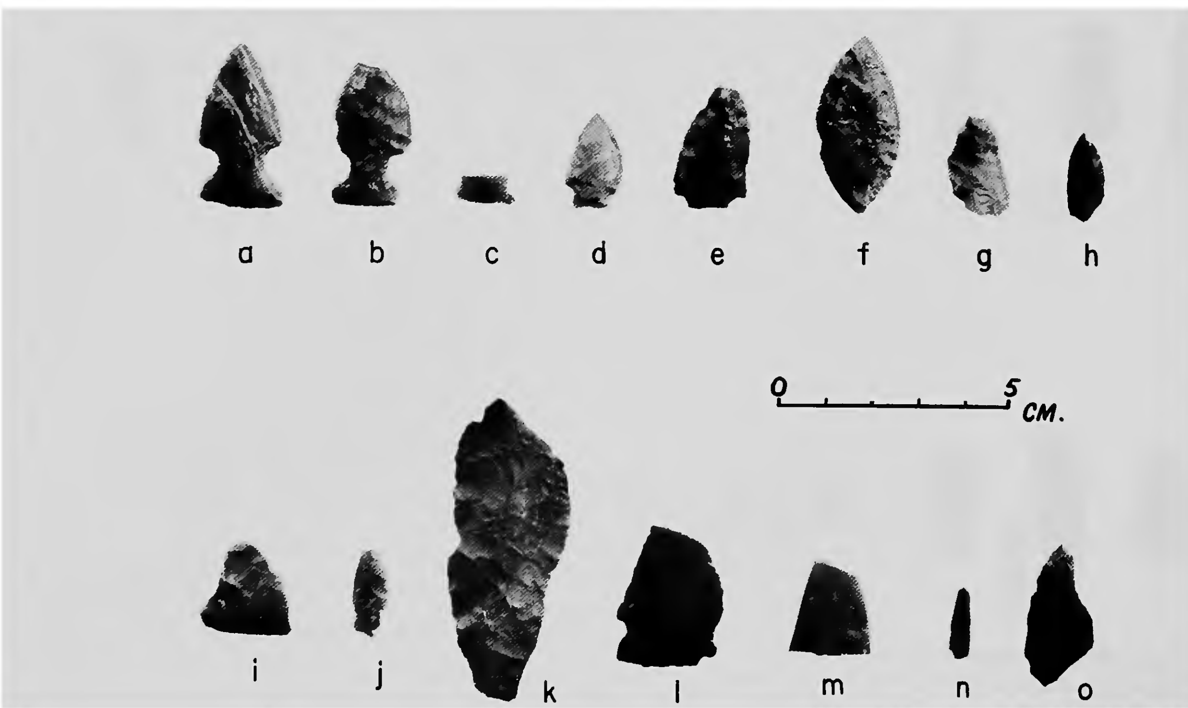


PLATE 68.—Ticoralak 5 (GbBn-7). *a-b,* Side-notched points. *c-e,* Notched biface fragments. *f-h,* Side blades. *i,* Flake knife. *j,* Biface fragment. *k,* Flake knife. *l-m,* Burin-like tools (ground and chipped). *n,* Burin spall tool. o, Flake-graver.

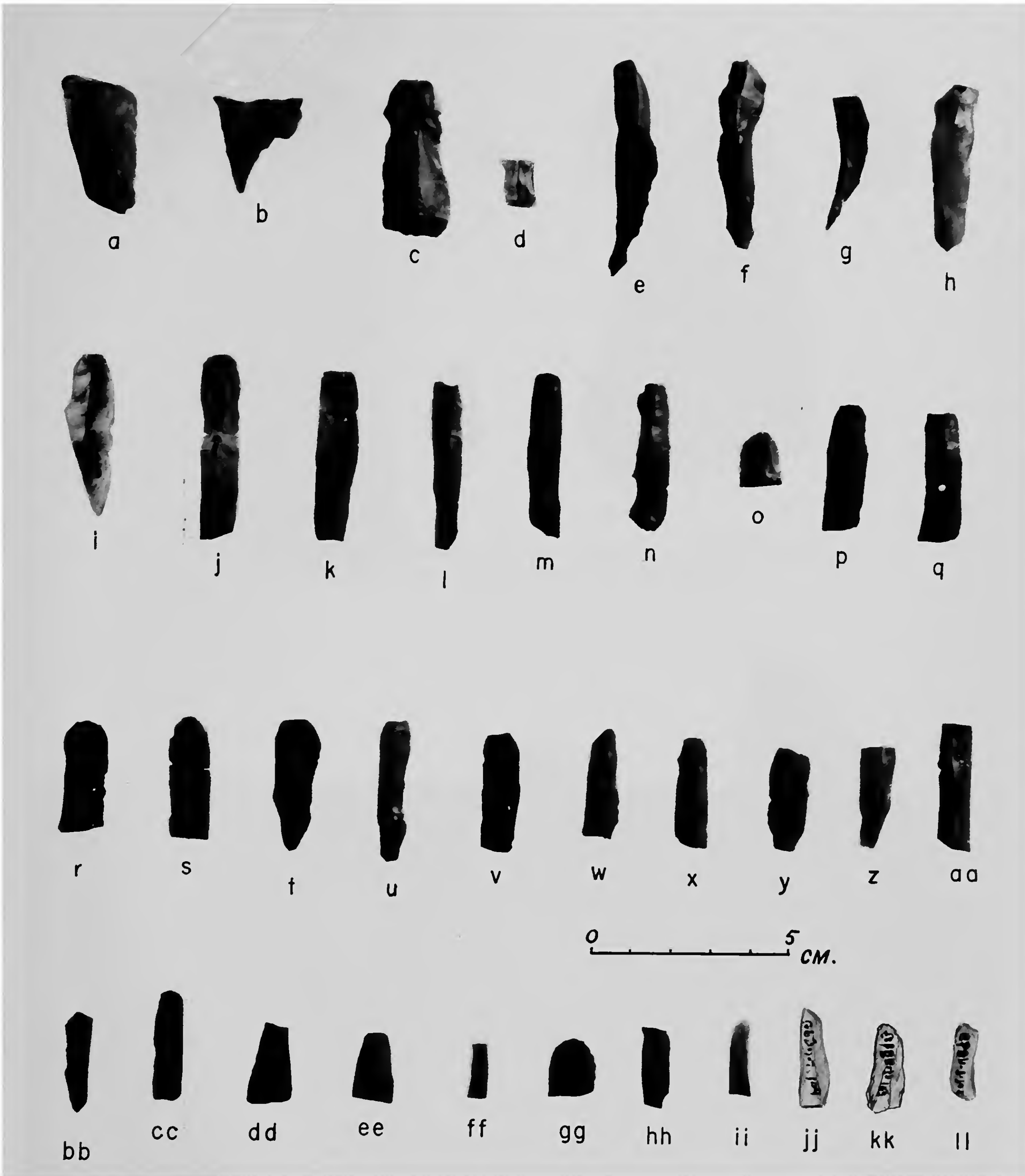


PLATE 69.—Ticoralak 5 (GbBn-7). *a,* Microblade core. *b,* Core rejuvenation flake. *c-d,* Notched microblades. *e-g,* Core preparation flakes. *h-ll,* Microblades.

PLATE 70.—Big Island 1 (GbBm-1): *a-d*, Corner-notched points. *e-f*, Utilized flakes. Bluff Head Cove 4 (GcBj-4): *g-h*, Stemmed points.

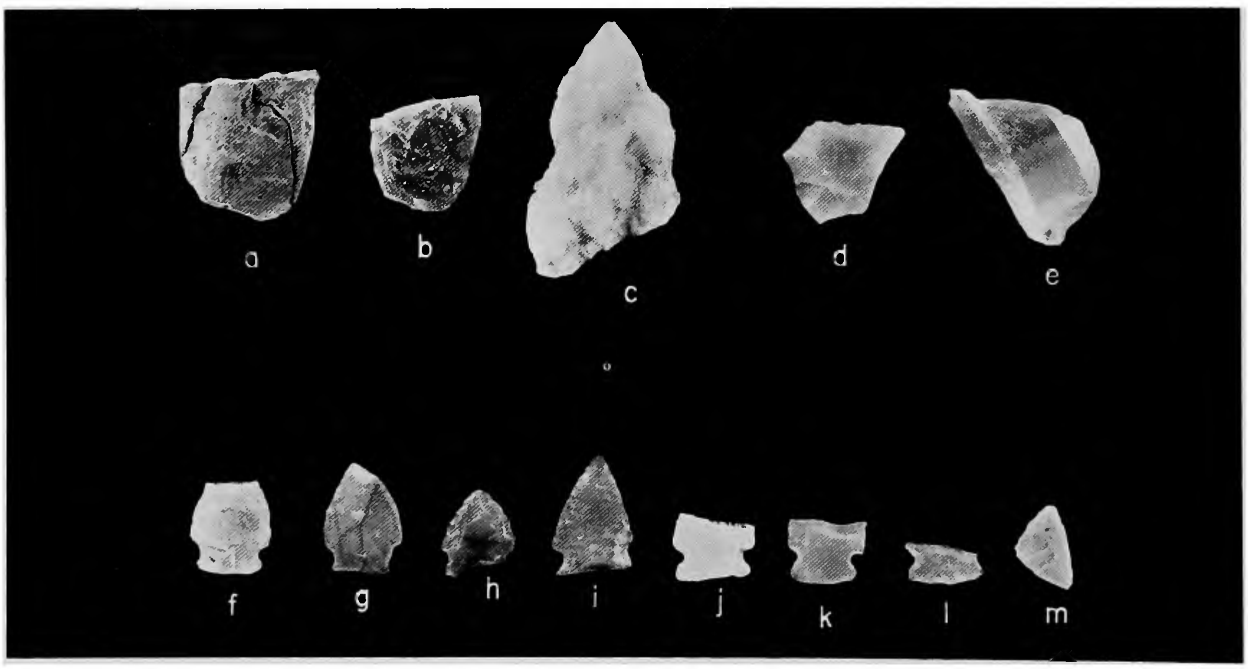


PLATE 71.—Sandy Cove (GcBk-1). *a*, Ground slate biface base. *b*, Chipped quartzite biface base. *c*, Flake knife. *d*, Denticular flake. *e*, Utilized flake. *f-m*, Corner-notched flake points.

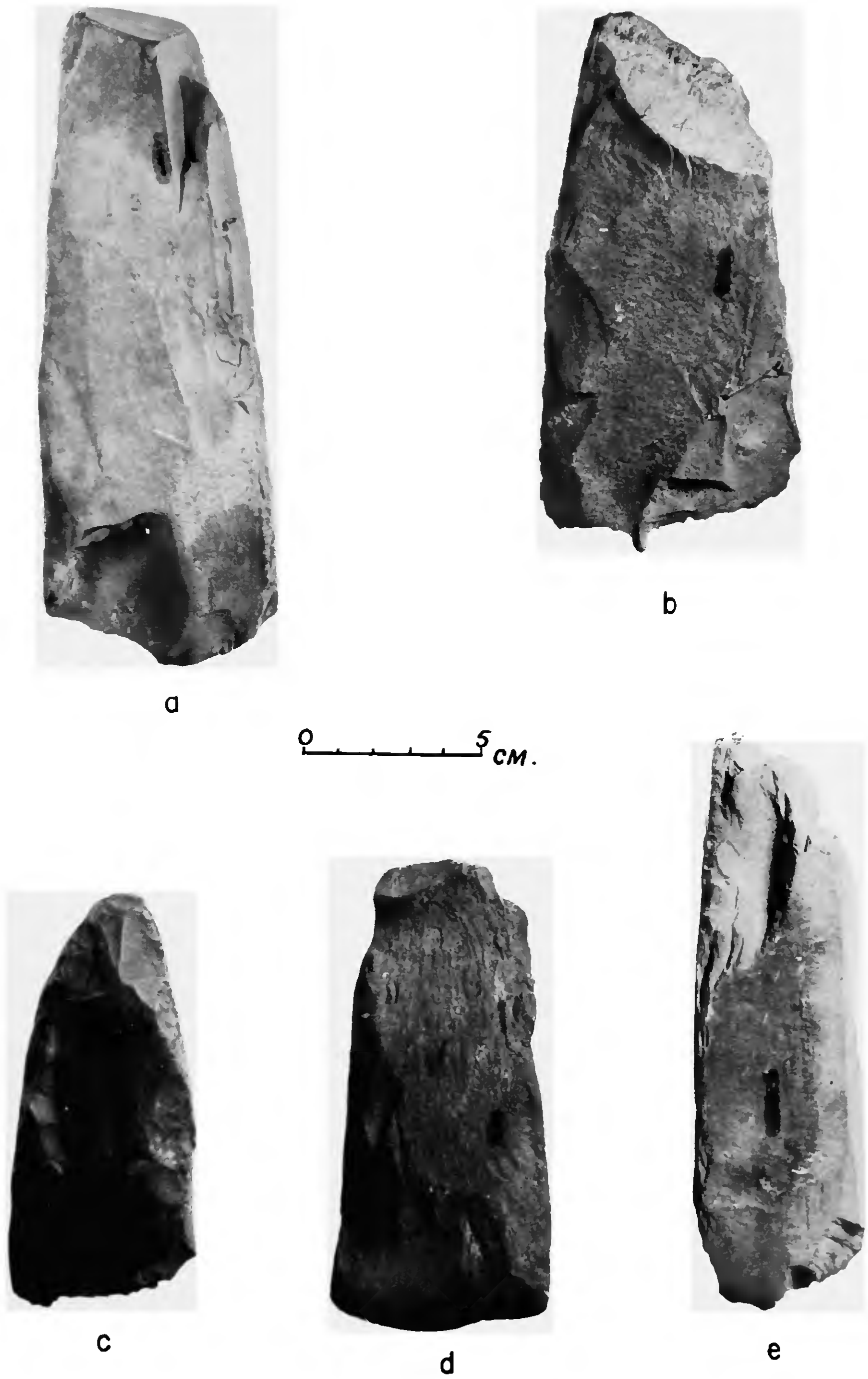


PLATE 72.—Sandy Cove 1 (GcBk-1).*a-e*, Ground and pecked slate celts.

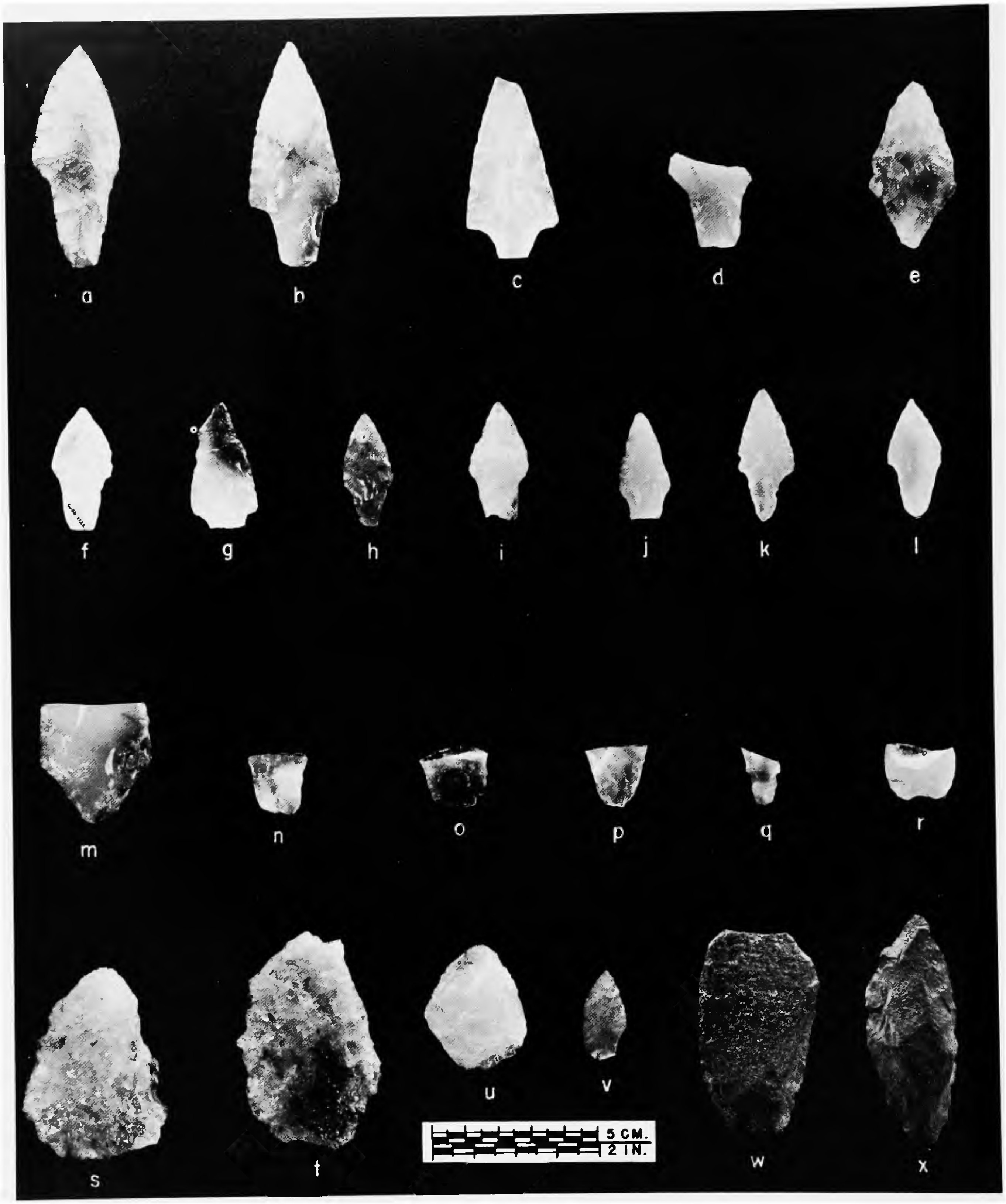


PLATE 73.—Sandy Cove 2 (GcBk-2). *a*, Single-shouldered biface point. *b-d*, Stemmed points. *e*, Stemmed biface. *f*, Patinated stemmed point. *g*, Stemmed biface. *h-j*, Stemmed points. *k-l*, Flake (unifacial) points. *m*, Biface blank. *n-q*, Stem fragments. *r*, Ground slate biface base. *s-u*, Quartz knives. *v*, Flake tool. *w*, Flake knife. *x*, Leaf-shaped biface blank.

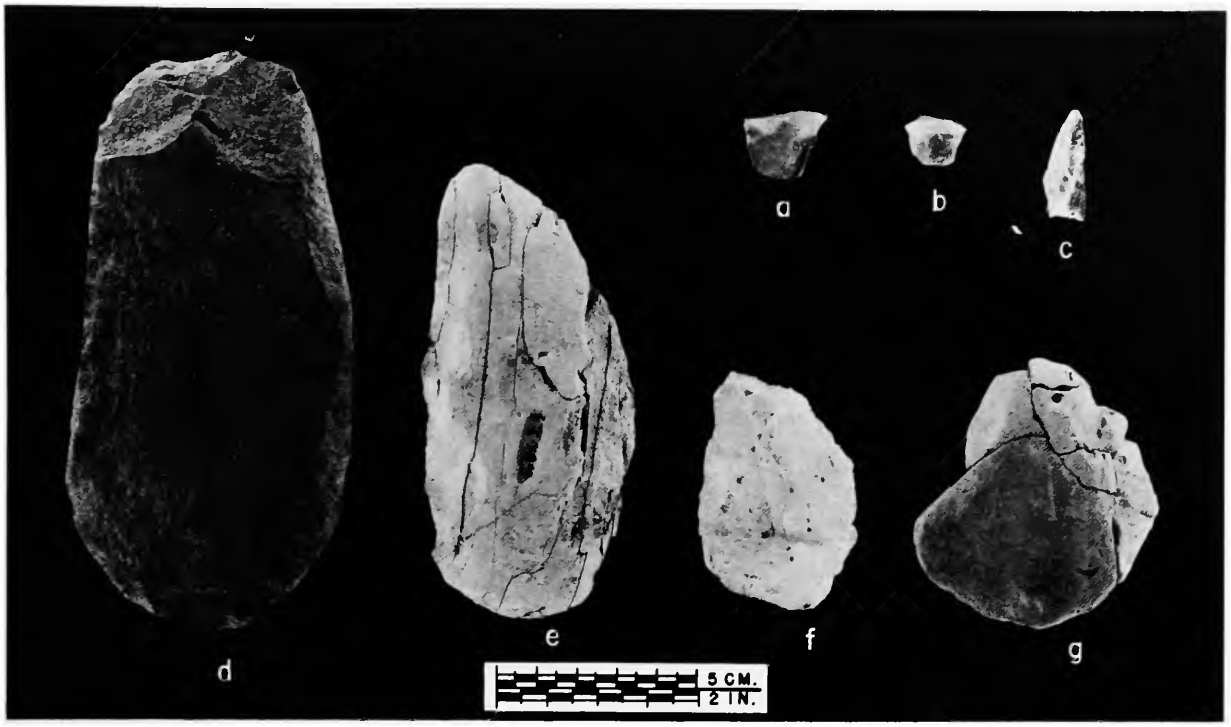


PLATE 74.—Sandy Cove 3 (GcBk-3). *a-b,* Stemmed point bases. *c,* Quartz biface edge fragment. *d-e,* Chipped and ground celts. *f,* Biface knife. *g,* Grooved slate fragment.

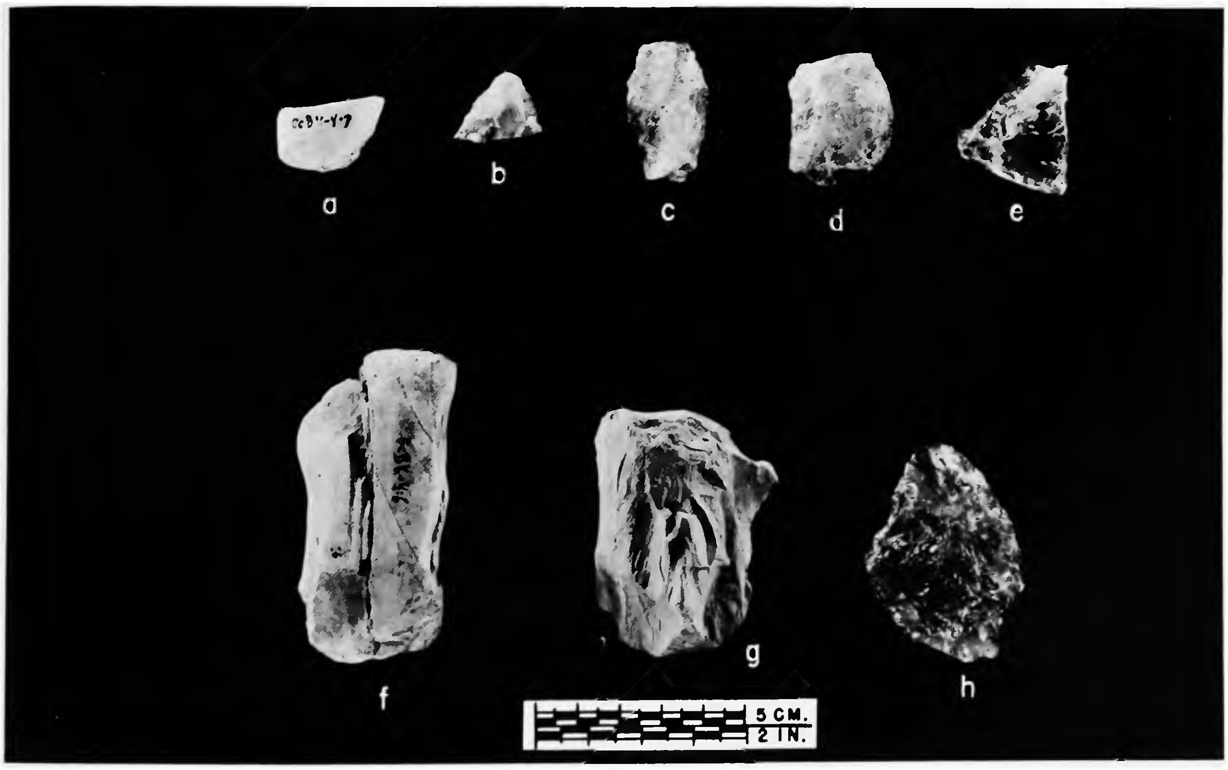


PLATE 75.—Sandy Cove 4 (GcBk-4). *a,* Biface stem fragment. *b,* Biface tip. *c-e,* Utilized flakes. *f-g,* Battered slate chunks. *h,* Utilized flake.

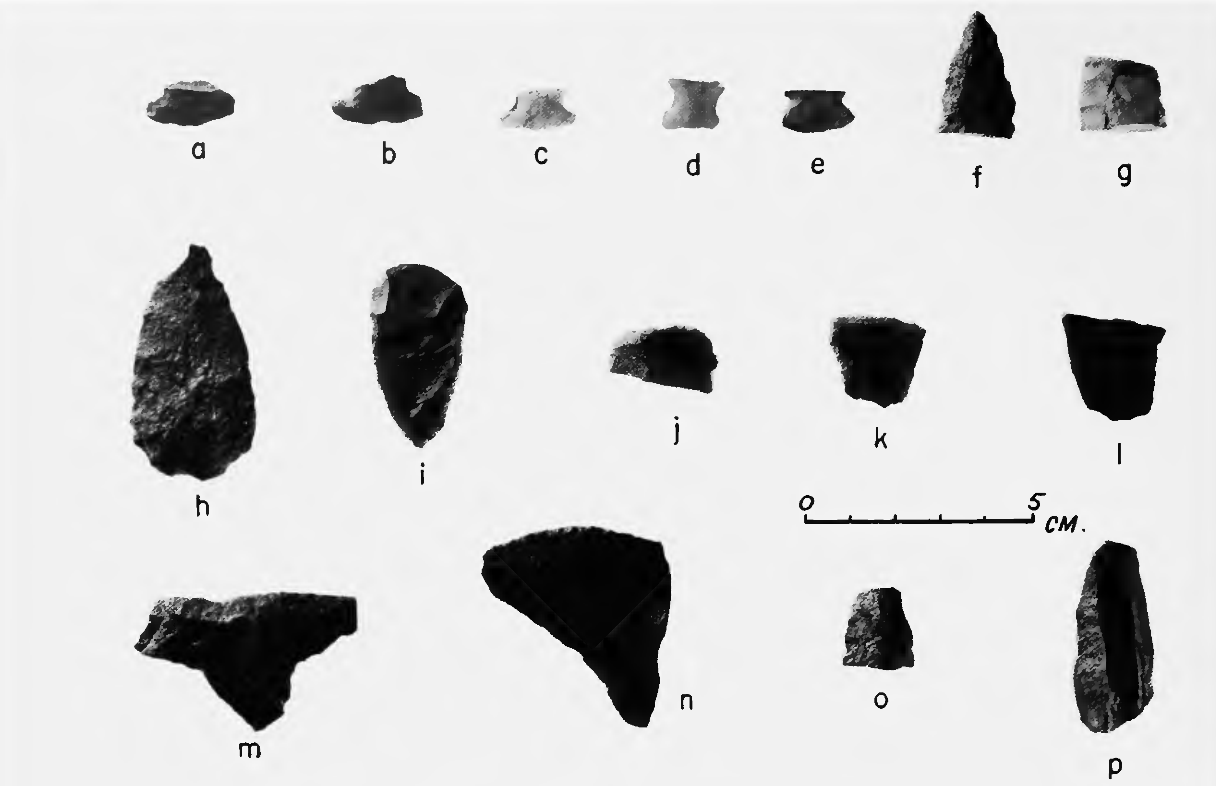


PLATE 76.—North West Brook 1 (GcBk-6). *a-e,* Side-notched biface bases. *f,* Triangular knife. *g,* Biface midsection. *h,* Biface blank. *i,* Elongate scraper fragment. *j-k,* End scrapers. *l-n,* Utilized flakes. *o-p,* Linear flakes.

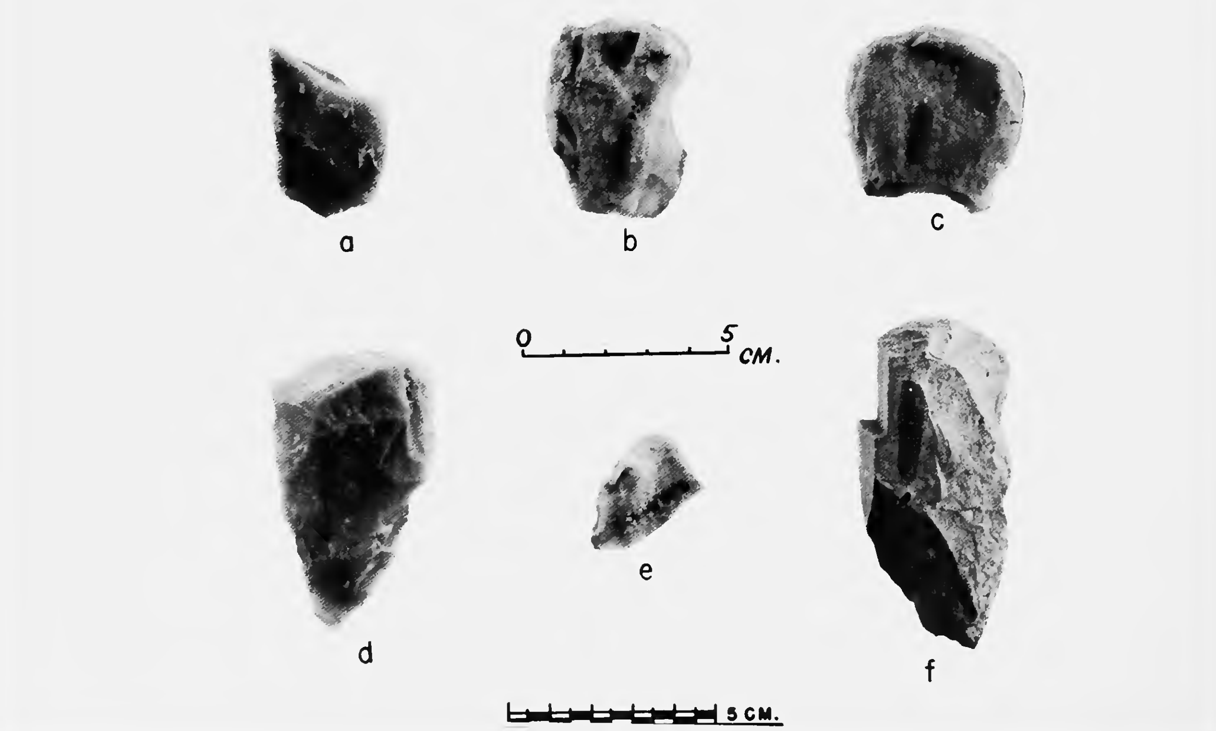


PLATE 77.—North West Brook 2 (GcBk-7). *a,* Biface base. *b-c,* Disk scrapers. *d,* Stemmed end scraper. *e,* Utilized flake. *f,* Stemmed end scraper.

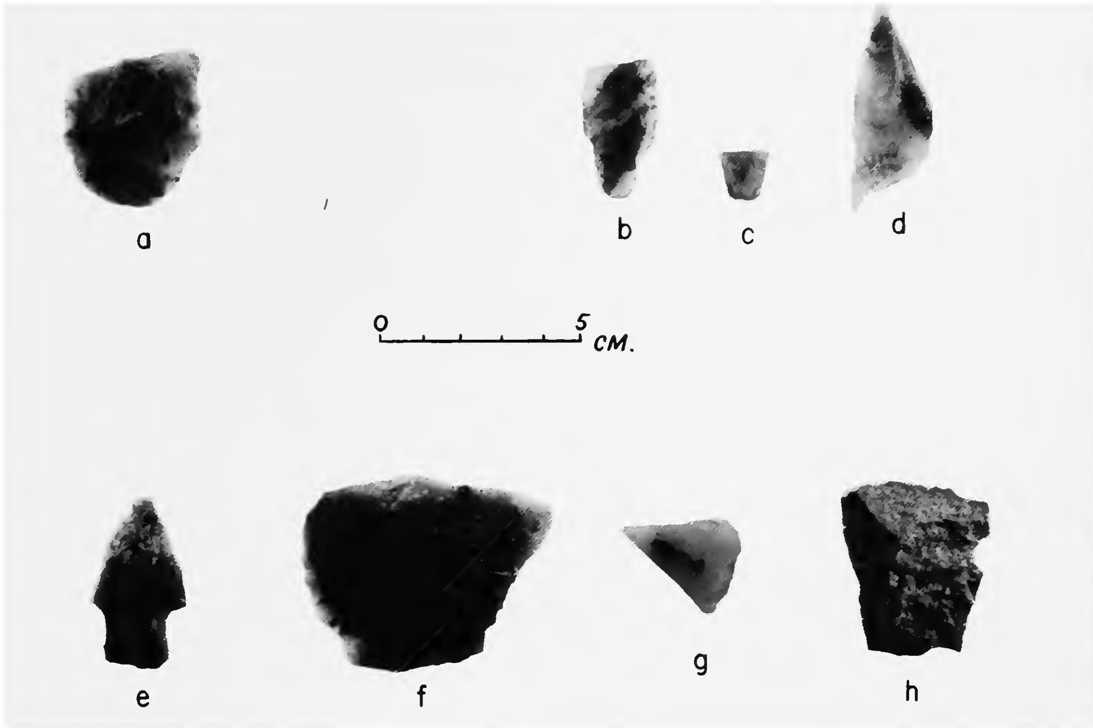


PLATE 78.—Winter Cove 1 (GcBi-1): *a,* Biface base. Winter Cove 2 (GcBi-2): *b-c,* Point Bases. *d,* Utilized flake. Hound Pond 1 (GcBi-8): *e,* Stemmed point. *f-h,* Utilized flakes.

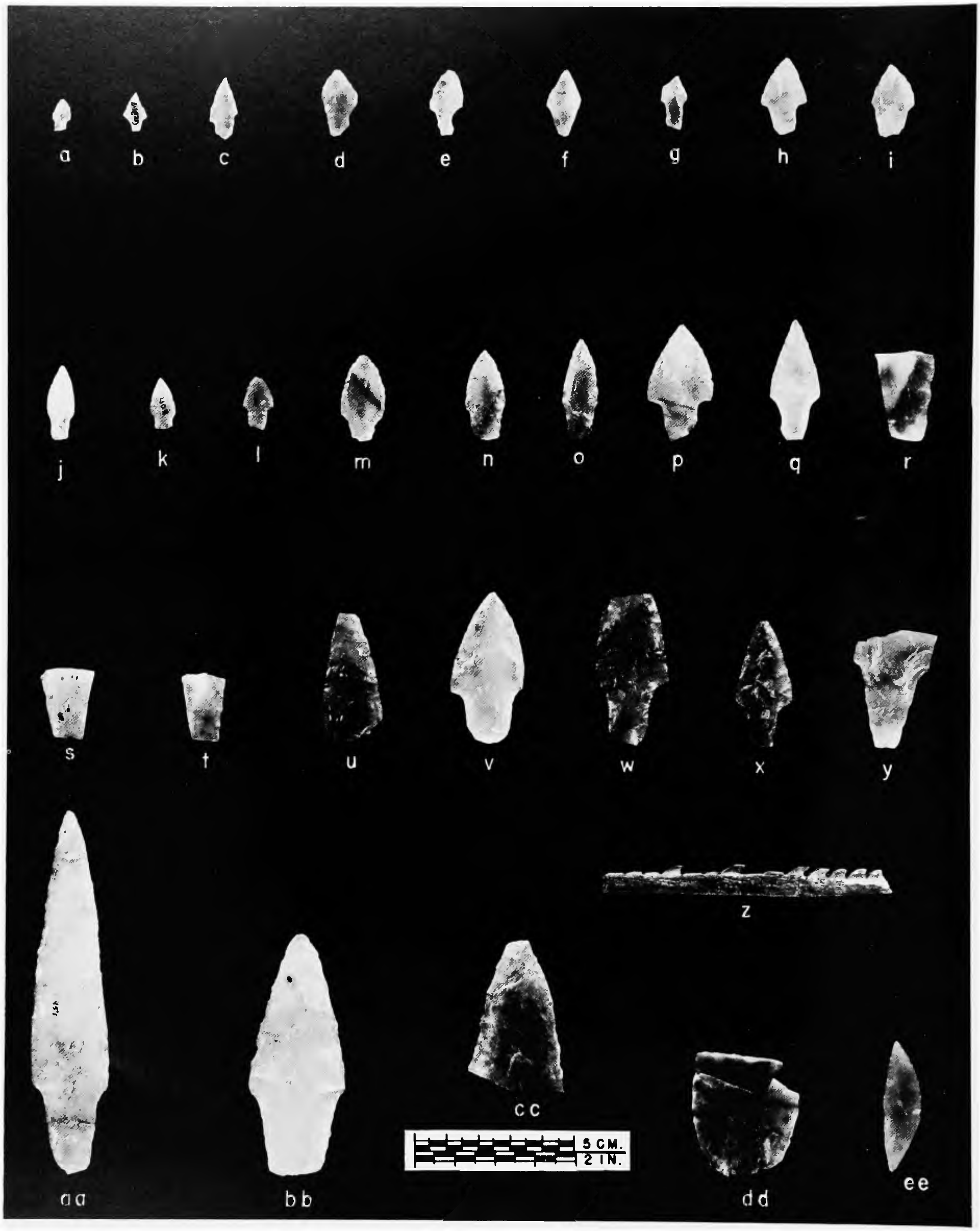


PLATE 79.—Rattlers Bight 1 (GcBi-7). *a-o,* Unifacial micro-points. *p,* Unifacial shouldered point. *q,* Bifacial point. *r-u,* Stemmed point fragments. *v,* Asymmetric lobate stemmed point. *w-y,* Flat based stemmed points. *z,* Antler leister fragment. *aa,* Lobate stemmed spear tip. *bb,* Wide stemmed biface. *cc,* Biface fragment. *dd,* Utilized flake. *ee,* Crescentic utilized flake (not a side blade). With the exception of the leister, all specimens are of Ramah chert.

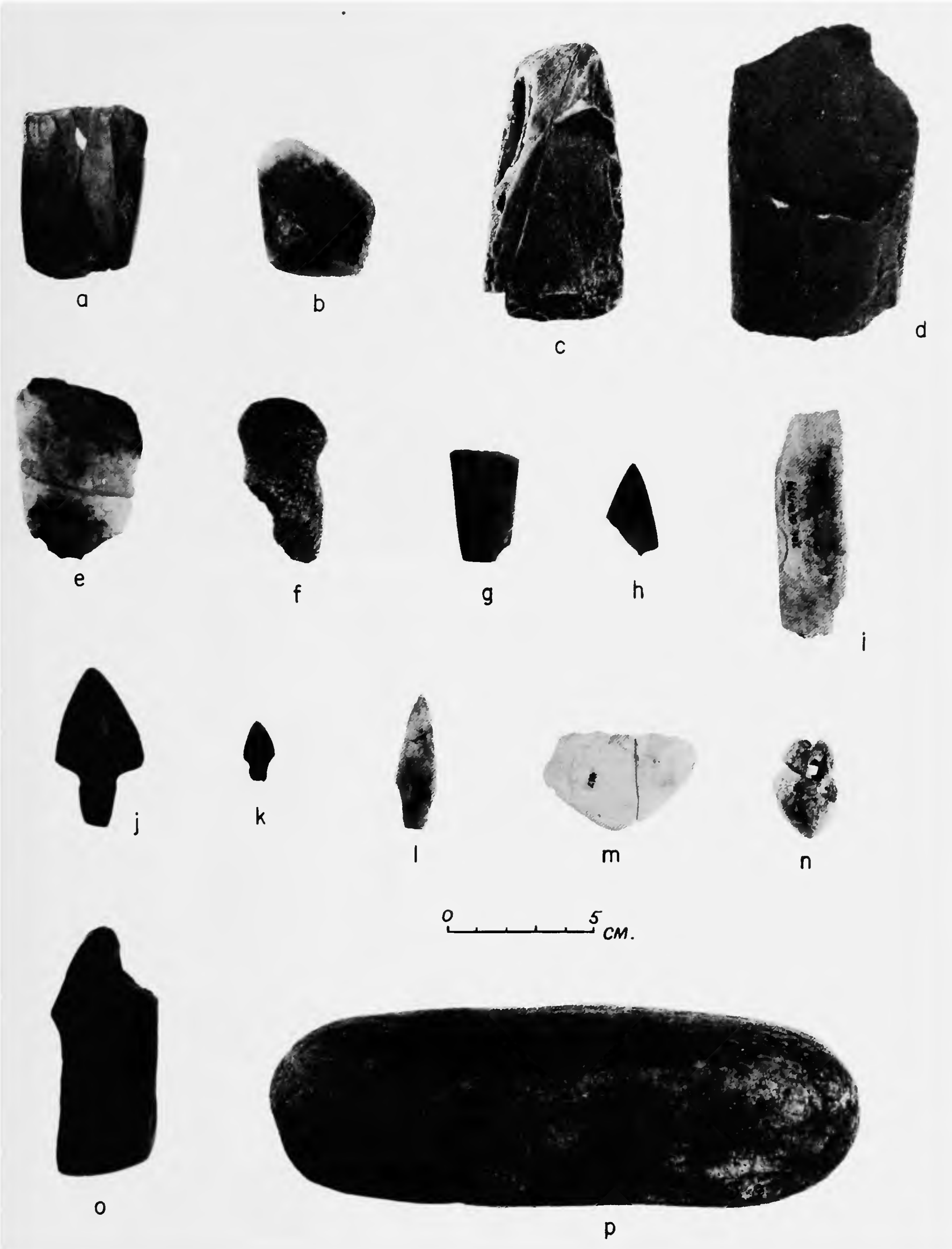


PLATE 80.—Rattlers Bight 1 (GcBi-7). *a,* Ground slate gouge. *b,* Ground slate adze. *c-e,* Celt fragments. *f,* Plummet knob. *g-h,* Bayonet fragments. *i,* Utilized flake. *j,* Ground slate knife. *k-l,* Ground slate points. *m,* Ground slate knife. *n,* Perforated and grooved plummet, soapstone. *o,* Whetstone. *p,* Maul.

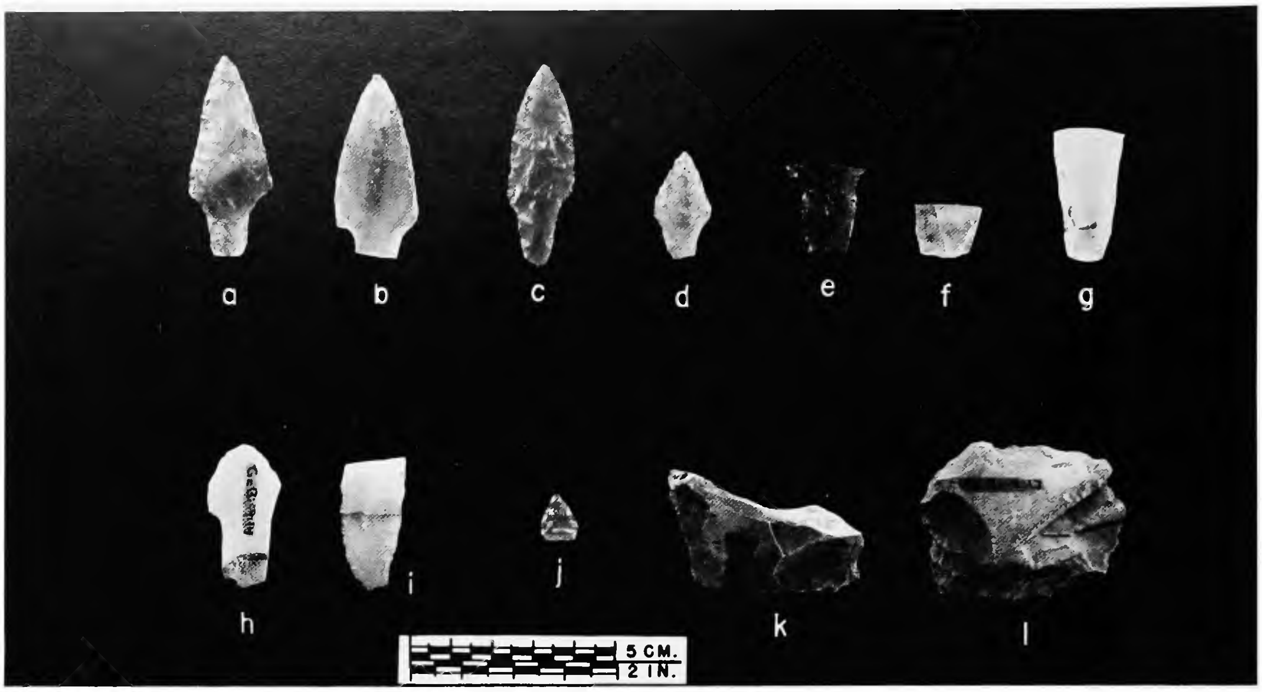


PLATE 81.—Hound Pond 2 (GcBi-9). *a,* Stemmed point, bifacial. *b,* Unifacial stemmed point. *c,* Asymmetric stemmed point. *d,* Small stemmed point. *e-g,* Stem fragments. *h,* Bayonet fragment. *i,* Utilized flake. *j,* Micropoint fragment. *k-l,* Ground slate fragments.

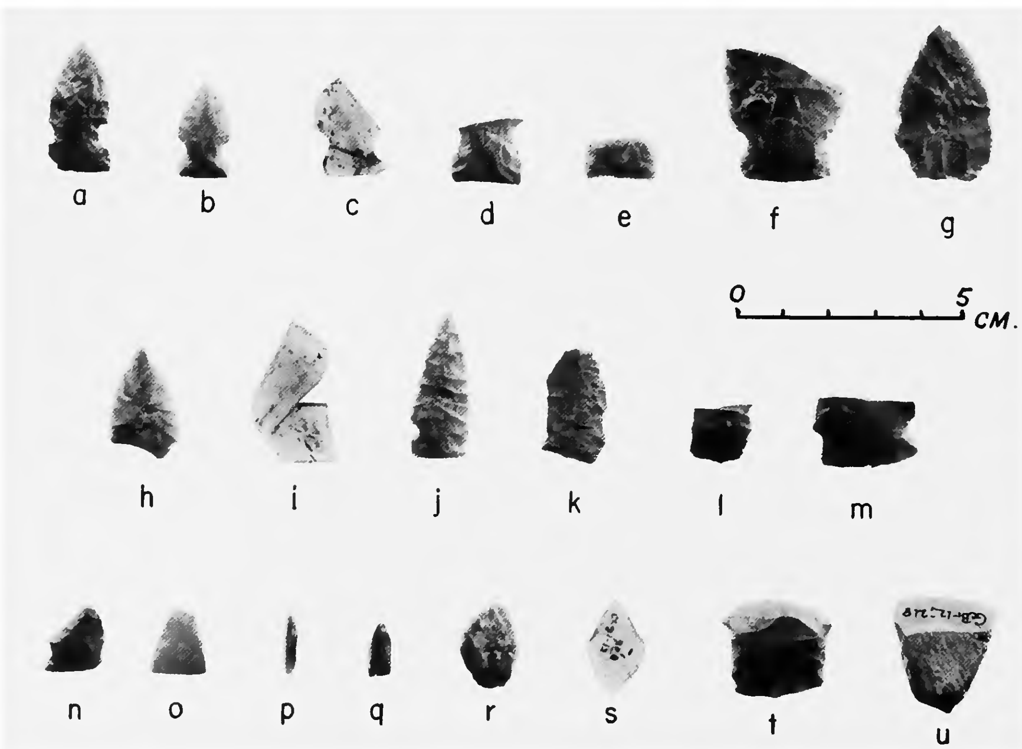


PLATE 82.—East Pompey Island 1 (GcBi-12). *a-c,* Side-notched points. *d-e,* Box-based point fragments. *f,* Corner-notched biface. *g,* Bifacial knife. *h-i,* Biface fragments. *j,* Single side-notched biface. *k-l,* Asymmetric flat-based notched biface knives. *m-o,* Burin-like tools. *p-q,* Burin spall tools. *r-s,* Side blades. *t,* Eared end scraper. *u,* Ground slate scraper.

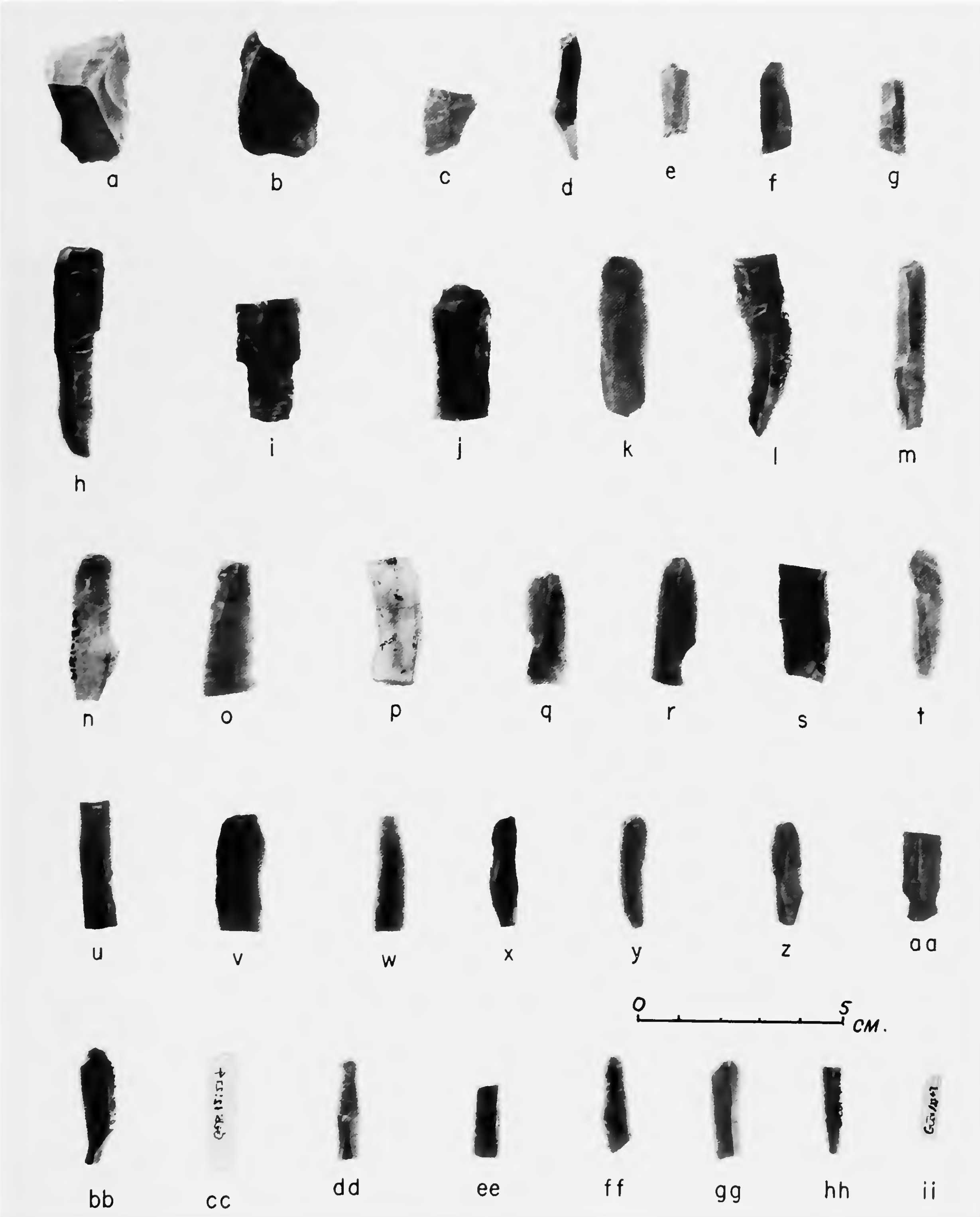


PLATE 83.—East Pompey Island 1 (GcBi-12). *a,* Microblade core. *b-c,* Core rejuvenation flakes. *d-h,* Core preparation flakes. *i,* Stemmed microblade. *j-z,* Microblades. *aa,* Notched microblade. *bb-ii,* Microblade fragments.

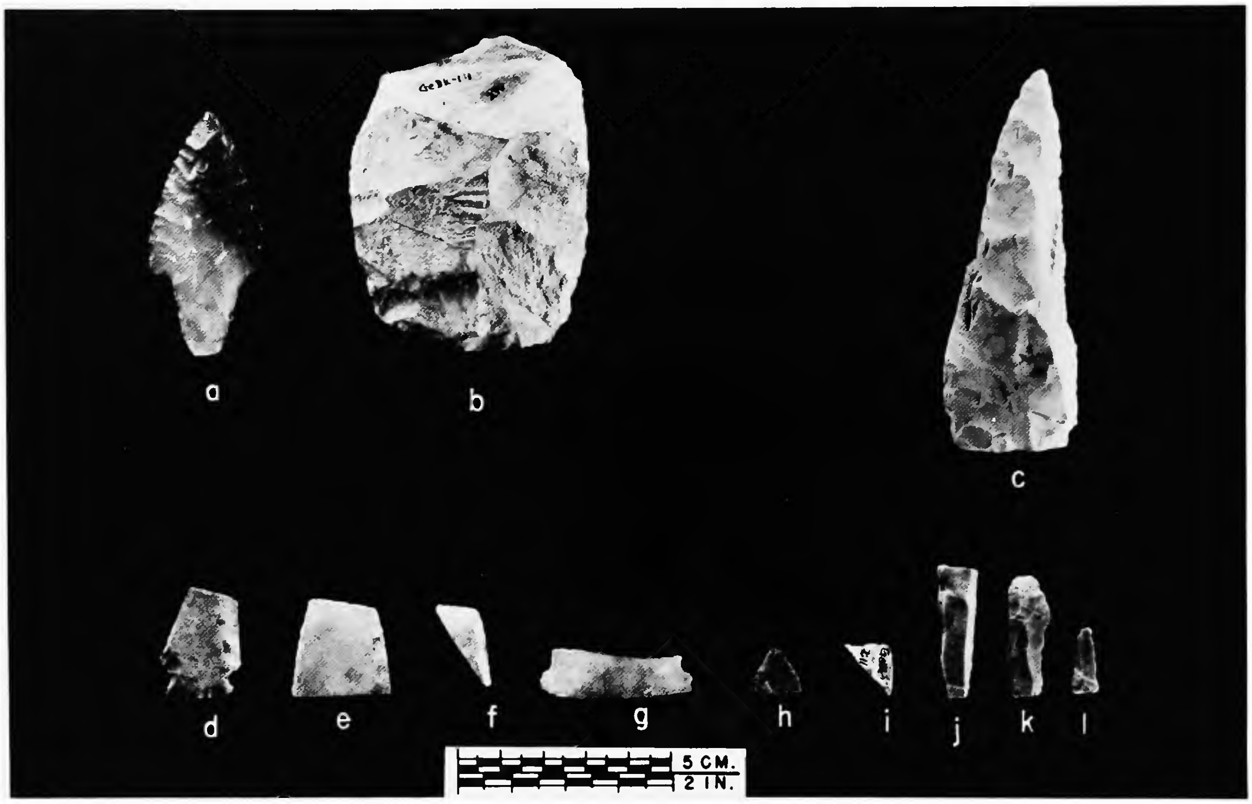


PLATE 84.—Halfway Brook 1 (GdBj-1): *a,* Stemmed point. Red Rock Point 1 (GeBk-1). *b,* Biface fragment. Red Rock Point 3 (GeBk-3): *c,* Bifacial knife. Red Rock Point 2 (GeBk-2). *d-e,* Burin-like tools. *f,* Celt fragment. *g,* Notched biface base. *h,* Biface knife tip. *i,* Microblade core fragment. *j-l,* Microblades.

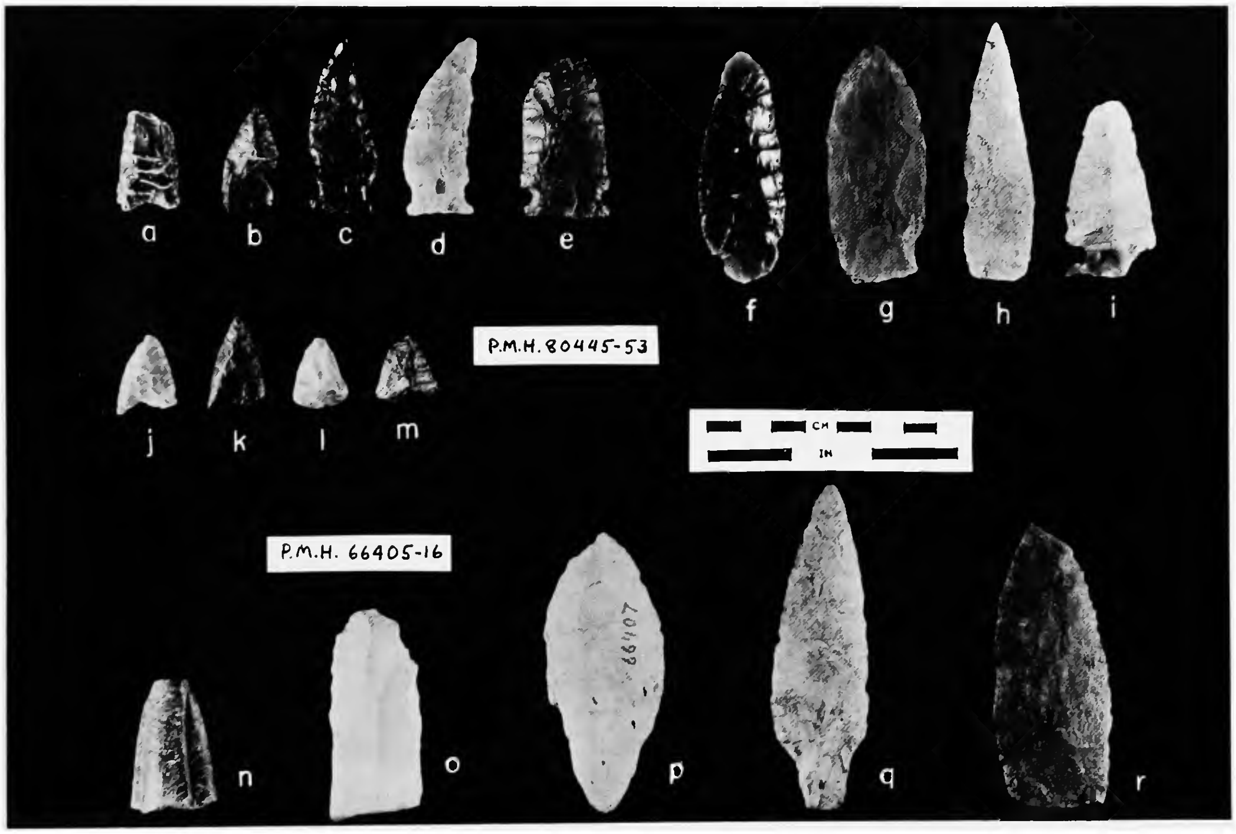


PLATE 85.—Collections from Peabody Museum, Harvard University. *a-f, j-m,* Dorset culture artifacts collected from Cow Head, Newfoundland, by A. V. Kidder in 1910 (catalog numbers 80444-53). *g-i,* Indian artifacts collected from Cow Head by Kidder (80444-53). Artifacts collected from Sunday Cove, Newfoundland, by Owen Bryant in 1906 (66403-16): *n,* Incised soapstone pipe fragment. *o,* Blade-like flake. *p,* Single-shouldered unifacial knife. *q,* Stemmed point. *r,* Biface.

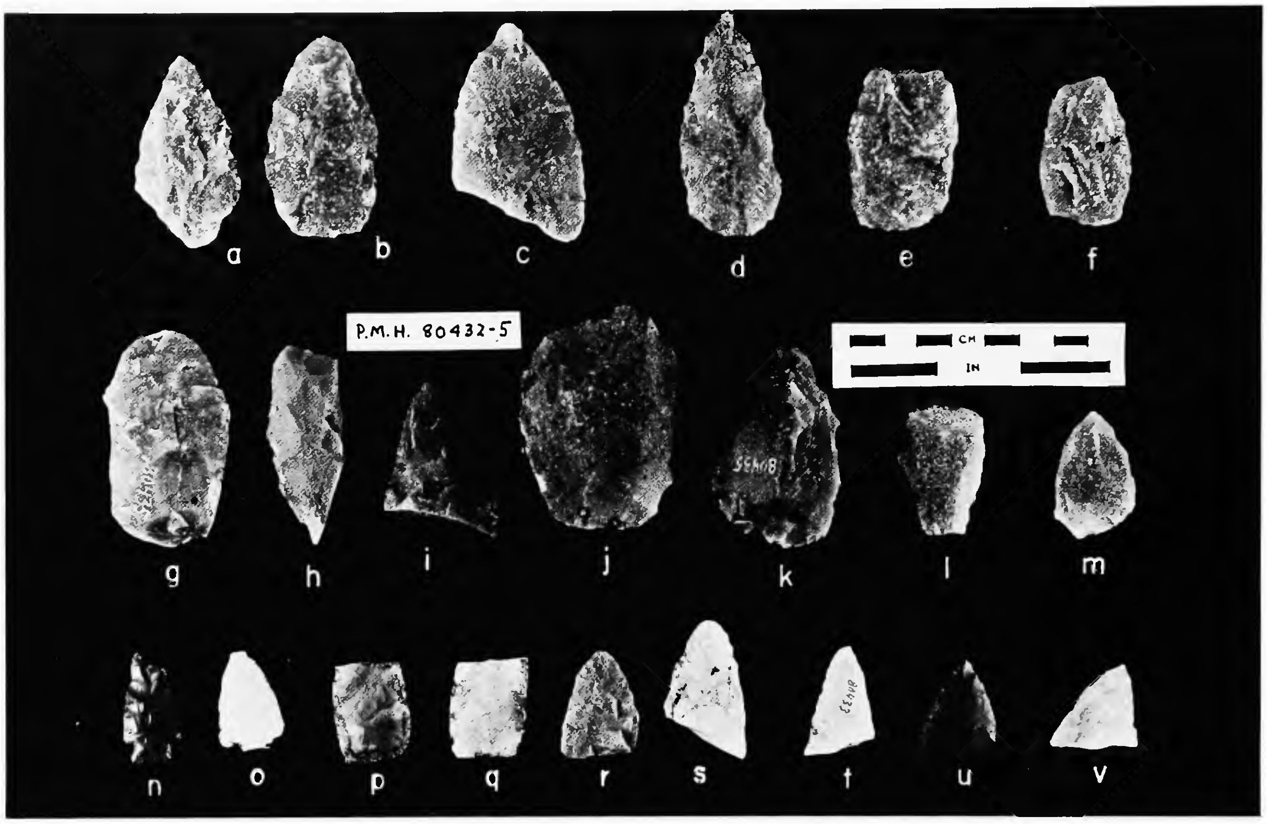


PLATE 86.—Peabody Museum collections, Harvard University. Collected by A. V. Kidder from Blanc Sablon, Labrador, in 1910 (catalog numbers 80432-35). *a-f*, Shield Archaic bifaces. *g-k*, Biface preforms. *l*, End scraper. *m*, Utilized flake. *n-o*, Corner-notched points. *p-q*, Lanceolate biface bases. *r-v*, Biface fragments.

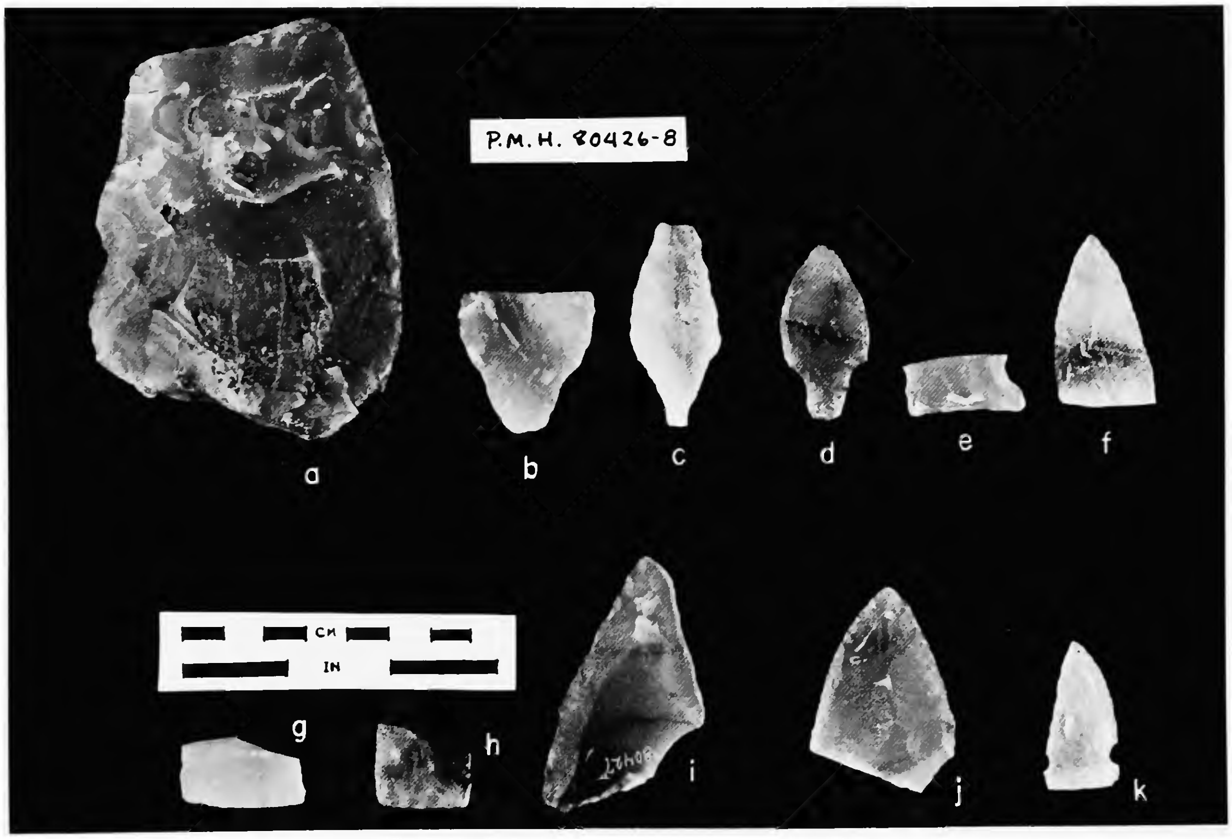


PLATE 87.—Peabody Museum Collection, Harvard University. Collected by A. V. Kidder from Blanc Sablon, in 1910 (catalog numbers 80426-8). *a,* Flake knife. *b-d,* Stemmed points. *e.* Corner-notched biface base. *f,* Biface fragment. *g-h,* Lanceolate biface bases. *i,* Utilized flake. *j,* Biface fragment. *k,* Biface fragment. All of Ramah chert.

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