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SHELL-HEAP ARCHAEOLOGY OF SOUTHWESTERN
NOVA SCOTIA

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ABSTRACT

The excavation of ten shell-heap sites in Queens and Annapolis Counties has given us a picture of a Woodland culture ancestral to the Micmac. Half the period studied was under warmer climatic conditions when oysters were more widely distributed and white-tailed deer was the principal game animal. Under more rigorous conditions, probably after A.D. 1050, the Indians progressively abandoned winter shore-camps and adopted the historical practice of passing the winter inland, a change which may have contributed to extinction of the deer.

During the summers 1957-59 the author has been surveying the archaeology of the prehistoric period for the Nova Scotia Museum of Science. The Micmac Indians and their predecessors in the province had no agriculture and so were few in number and left inconspicuous sites. The easiest to find are the shell-heaps along the shores, though in many areas the rise of sea-level and the erosion of the coastline have destroyed them entirely. The only area that has given a fairly consistent picture thus far is the southwest of the province and that only from A.D. 800 (roughly dated) until shortly before the coming of Europeans. Nova Scotia has many artifacts of earlier "Archaic" type, but as yet no site containing these has been found. The known shell-heaps all contain "Woodland" pottery from their beginnings. In this report I shall use for convenience the following divisions of the shell-heap period.

A.D. 800. "Lower Bear River"—LBR. Characterized by heavy, stemmed points of quartzite. Known from Bear River and Port Joli No. 8. Shore camps.

A.D. 1100. "Upper Bear River"—UBR. Thin, corner-removed points of slate, still rather large. Bear River and

Port Joli No. 7 and No. 8. Shore camps, beginning to be moved into woods.

A.D. 1200. "Port Joli"—PJ. Small, corner-notched points of jasper or quartz. Winter camps inland; special clamming camps on shore in autumn.

The sites dug or sampled in this area were: Bear River, 44°37'30"N., 65°42'W., on the Annapolis Basin, Annapolis County; Port Joli No. 2, No. 3, No. 7, No. 8, No. 10 and No. 11 around Port Joli Harbour, Queens County, and Port Joli No. 6 at Timber Island Brook, Port Hebert Harbour, Shelburne County; Indian Gardens No. 1, No. 2 and No. 3 at Indian Gardens on the Mersey River, Queens County; and at Starr's Point, Kings County. Points were collected from ploughed sites at: Melanson, Kings County; and at Pleasant Lake and Tuskett Falls, Yarmouth County. The only site dug outside the area was that at Little Narrows, Victoria County.

Sites.

Bear River. This site consisted of three shelves levelled on the slope of a glacial kame, and of another lower wigwam site now eroded away except for its landward margin. The kame protected the site from north winds and provided a well-drained substrate; a beach below provided clams and a canoe-landing sheltered from the waves by a reef nearby and by Bear Island farther out. The tide here rises some fifteen feet and would have been suitable for fishing by weirs. The beach was at the mouth of the Bear River estuary which is tidal for four miles upstream and offers a canoe road to the headwaters of the Mersey and Tuskett Rivers and so to the whole southwest of the province. A spring near the site gives the only fresh water to be found for a mile in either direction.

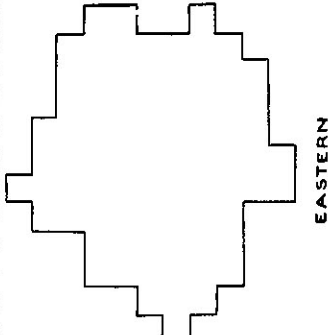
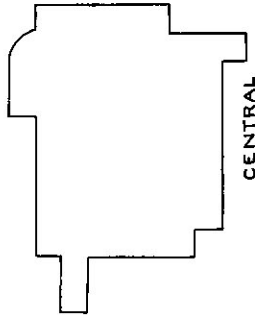
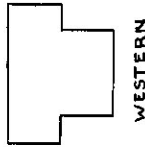
The four surviving subsites of the camp are of differing ages, levels and depths. Figure 1. The beach subsite is now touched by each high tide, but there is reason to believe that the beach was formerly much more extensive and the sea-level lower. (Carbon-datings of submerged forests in Minas Basin suggest an average rise in sea-level of about ten inches per century over the last four thousand years. (*Unpublished communication.*))) The beach subsite averaged a little more than one foot in depth of deposit, but this included one broken point of LBR type as well as many chips suggesting the IG

BEAR RIVER

NNOOPPQRRR

-A A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F G G H H

13
12
11
10
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10



BEACH

EDGE OF BEACH

Figure 1. The four surviving subsites at Bear River.



407
QUARTZITE. IN SHELL AT BOTTOM
BEAR RIVER EASTERN SUBSITE



406
QUARTZITE. IN SHELL AT BOTTOM
BEAR RIVER EASTERN SUBSITE



376
QUARTZITE 12" DEEP
BEAR RIVER EASTERN SUBSITE



359
QUARTZITE 16" DEEP
BEAR RIVER CENTRAL SUBSITE



400
DIORITE 13" DEEP (TRANSITION)
BEAR RIVER EASTERN SUBSITE



397
QUARTZITE
BEAR RIVER BEACH SUBSITE



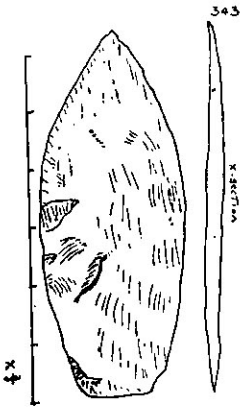
431
QUARTZITE 26" DEEP
PORT JOLI #8



378
SLATE 4" DEEP
BEAR RIVER EASTERN SUBSITE



523
GREEN SLATE 4" DEEP
BEAR RIVER EASTERN SUBSITE



343
SLATE 9" DEEP
BEAR RIVER WESTERN SUBSITE



418
BLACK SLATE
3" BELOW EROSION
PORT JOLI #8

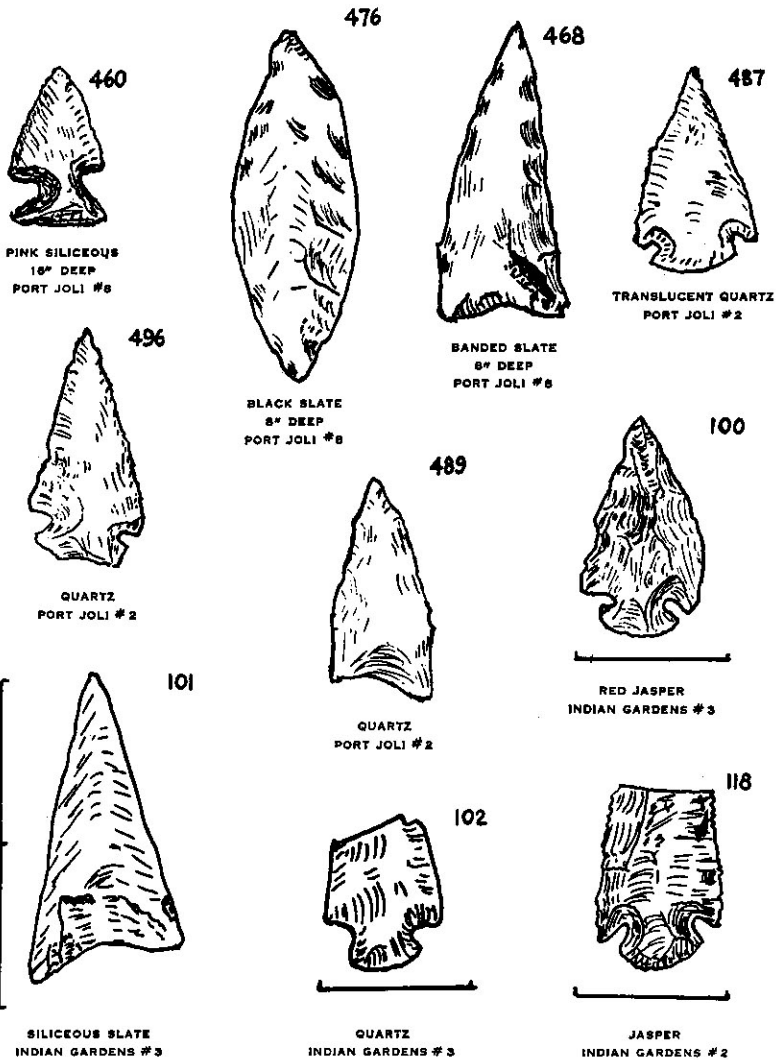


448
BLACK SLATE 18" DEEP
PORT JOLI #8



451
BLACK SLATE 16" DEEP
PORT JOLI #8

Points found at Bear River.



Points found at Port Joli and Indian Gardens.

period. The central subsite stood about ten feet higher and was roughly nine yards by seven, though it had originally been narrower and had grown outward over a talus of shell. The deposit was three feet deep at the centre and thinned to eighteen inches, chiefly of trodden shell, where excavation stopped. The lower twenty-four inches was consistently of LBR type; the upper twelve inches was chiefly of UBR but was deeply contaminated by material from Indian camps of the nineteenth century. It seems not to have held more than one wigwam. The eastern subsite stood about eight feet higher than the central one, and the southwestern edge of its marginal shell-tip merged on the slope with the northeastern tip of the central subsite. The deposit averaged two feet deep, but in the northwestern half a thick layer of hillside loam at a depth of twelve inches marked a widening and levelling of the site. This change came at about the transition from LBR to UBR types of point. Before this change, the shelf may have held only one wigwam to the south of centre; after it, there may have been three. The western subsite stood about six feet above the level of the central and was about four by four yards in area and rarely more than one foot deep. All the points found, and they were few, were of UBR type, and nineteenth-century refuse had penetrated halfway to the bottom. No remains dated between A.D. 1200-1800 were found, but Micmac traditions point to the seasonal occupation of the site during much of this time. It is quite possible that the beach offered good camping throughout this period during which wintering on the shore was unusual. We cannot, then, limit the total population of the site at any period to the wigwams traceable on the shelves.

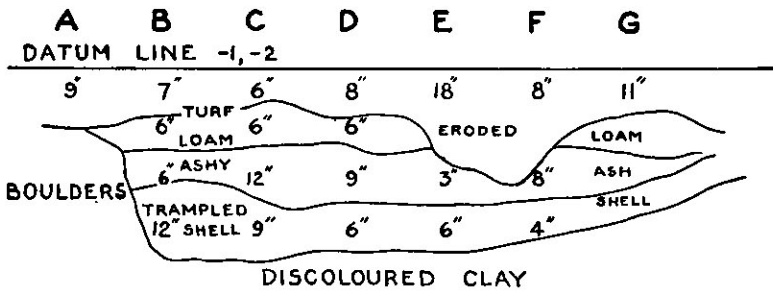
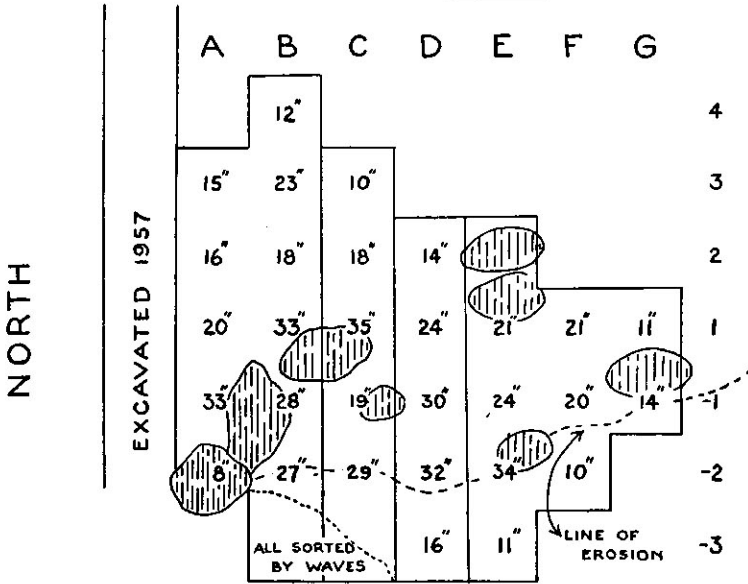
Port Joli. Where Queens and Shelburne Counties meet, there are deep harbours that protect the shores from much erosion. The tides here measure only about six feet, but they expose magnificent clam-flats and eel-grass beds beloved of geese and ducks. At all periods until a generation ago, Indians dwelt or camped along the strip of land that separates Robertson Lake from the shore. There are numbers of shell-heap camps behind the clam-flats out as far as Scotch Point where the surf begins to be heavy. These sites may be divided into: *a*, shore-camps, such as PJ No. 8; *b*, camps withdrawn into the woods, such as PJ No. 2, No. 7, and No. 10; and clamming camps, such as PJ No. 3.

Port Joli No. 8. This camp lay at the edge of the salt-marsh 30 yards south of the outlet from Robertson Lake. Figure 2. Most of it had been taken by the sea, so that the area at any period must remain uncertain. An irregular wall of yard-thick boulders ran roughly SSE along, or just behind, the margin of erosion. On the landward side, west of this, a slightly sloping semicircle of site was from 12 to 18 inches in depth and gave points of late UBR and PJ type. On the seaward side never more than a yard remained uneroded, but this strip averaged 30 inches in depth and could be found diminishingly for two to three yards outward under the marsh. When it had been dug to the discoloured clay at the bottom, fresh water flowed in, a proof that the water-table, and therefore the sea-level, had risen considerably since the bottom of the site was occupied. Directly upon the clay lay a deposit of trampled shell containing sherds and bones but little or no ash, clearly the margin of a site now destroyed by the sea. The rim of boulders must have been cleared from the area now lost. A single broken point of pink quartzite from this layer was typically LBR (E431). Above the shell was a layer of ash with many remains and little shell, the deposit inside a wigwam which must have been pitched at the extreme landward limit of the site. The bottom two inches of this layer was unusually black and contained a dozen perfect slate points of UBR type and a quantity of sherds of Owasco-type pottery. Probably the wigwam had been burned down, perhaps by accident, perhaps following the death of the owner. Occupation of the area continued without apparent interruption until the accumulated deposit overflowed the containing wall of boulders, after which the wigwam was pitched on the landward side of the boulders. Typical UBR points became rare from this point and were mixed with smaller points of varied shape, some corner-notched and typically PJ. Only four points of jasperlike stone were found, and these were not typically IG. The site seems to have been abandoned early in the PJ period and not to have been used again until the nineteenth century. A scattering of rusty wrought-iron nails and broken glass in the upper six inches of ashy loam suggested wigwams of the last century.

Port Joli No. 7. On the western side of the harbour two brooks have their source in Path Lake. The mouth of Lower Path Lake Brook is one mile from the head of the harbour.

PORT JOLI 8

7A



SECTION OF OLDER SITE

Figure 2. The site at Port Joli.

Some two hundred yards up this brook and thirty yards to one side is a large and ill-defined site. The deposit of ash with very little shell is rarely more than fifteen inches deep, shows no stratification, and is so entangled with tree-roots as to make digging difficult and inefficient. I spent four days on it and merely sampled the site. It was not possible to determine the position or the number of the wigwams. The occupied area could have held half a dozen wigwams, but over much of the site the deposit was thin and poor. At one point there was deposit fifteen inches deep at the foot of a boulder six feet high and twelve long. The deposit became shallower at about two yards from the boulder and then, at six yards, deepened again, suggesting that the nearest wigwam had been pitched well back from the boulder which may have formed the north wall of a lean-to or may merely have sheltered an open hearth. A broken adze (E492) of oval cross-section was of a type not known here before UBR, and the points were: two of quartz of no definable period, and two large corner-removed points of slate, clearly UBR. A few fragments of white chinaware and two wooden points, possibly of arrows, showed that the site had been used not too long ago.

Port Joli No. 2. Upper Path Lake Brook is only half a mile from the head of the harbour. One hundred and fifty yards upstream and forty yards to the south was a small site with a low central boulder which had served as a fireback. At the original levelling, some small boulders had been rolled eastward downhill to form a containing wall. Deposit averaging one foot in depth covered about fifty square yards, which could not have housed more than one wigwam in comfort. The points near the bottom were of slate but small; above them were small, corner-notched points of quartz; and near the top were chips of jasper and a broken point of red jasper of IG type. This is the type-site of the transitional Port Joli period.

Port Joli No. 3. Scotch Point lies on the west shore of the harbour about three miles from the head. Outside the point the beaches tend to be wide and surf-beaten, fringed by dunes and devoid of Indian camps; inside it almost every brook has its site. The outermost campsite found was between a large and a small brook 400 yards inside the point. It stood about fifteen yards back from the present shoreline and formed a long kidney-shaped mound with an area of 271 square yards.

In almost every respect it differed from all other shell-heaps investigated. The sampling made was a yard-wide trench across, and one along the site, and doubled transects across three spots which showed more definite occupation. 59 square yards were dug. The mound covered a low knoll of the same shape to a depth of from two to three feet. At the bottom, especially on the southern face, was a thin layer of ash and potsherds. As the slope would have been awkward for wigwams, this must have come from the open hearths or smoking fires of summer. Three spots, two of them very shallow, seemed to have been wigwam sites, all of them on the flatter places at the edge of the heap. The bulk of the mound consisted of untrampled shells with only a scanty admixture of ash and camp refuse. In all other sites the clams had been, in great part, shelled in the wigwam, and the shells, mixed with the usual hearth refuse, had been thrown onto the marginal tip. Here the clams had been shelled out of doors, probably by the women working socially. It was impossible to date the site with certainty, for the dig yielded only one broken tip of a quartz point and two unfinished points, one of quartz and one of local slate. The pottery was varied, but the big pots with thickened rims seemed to be of late date.

Other Sites at Port Joli. Another site on Port Hebert Harbour at the mouth of Timber Island Brook had been much dug about. My samplings yielded only two very small points of quartz of uncertain date. PJ No. 10, 40 yards inland from PJ No. 8, had been destroyed by the road, except for a strip about one yard wide. A broken point of siliceous slate suggested PJ period.

Indian Gardens. One of the most famous sites in Nova Scotia is that of the Indian Gardens at the foot of Lake Rosignol on the Mersey River. This seems to have been a great salmon-fishing site at all periods until it was destroyed by the damming of the river. In the dry summer of 1957 the beach was exposed and it was possible to pick out many ancient campsites from the abundance of quartz and jasper chips. However, for a quarter-century people had been collecting arrowheads along this shore, so that datable remains were scarce. I was able to find two fragmentary sites not wholly eroded by the winter high waters. IG No. 1 and No. 2 were parts of a single site which must originally have been set back in the woods some eighty yards from the river, presumably

a winter camp. It yielded only two points, one of jasper and one of quartz. It was badly confused with nineteenth-century nails, chinaware, beads and a Nova Scotia halfpenny token of 1832. There were also moose-bones, whereas the bones from the older level had been reduced to powder or chalky granules. IG No. 3 was reduced to a narrow strip of hearth on the southern side of a great boulder. The four points from it were of quartz or jasper, corner-notched or triangular and small. This type of stone and point is the most abundant in the great fishing sites which suggests a considerable increase in population after the close of the shell-heap period. I name this "Indian Gardens."

Organization of Sites.

In describing sites I have spoken of "wigwams" as though these could safely be assumed. The Micmac wigwam has now disappeared, except when archaizing Micmacs pitch wigwams of tarpaper and nails at their St. Anne's Day gatherings. The older people, however, still remember the wigwam and its conventions. It was conical as a rule—some say always, but I have seen rectangular wigwams made for children. Lescarbot mentions both these types and a third domed one, but this last has left no folk-memory. According to Rand, and old Indians confirm this, the men always sat to the right of the entrance, the women to the left, and the entrance faced whenever practical, to the south.

When I was digging a shallow but well-defined campsite at Little Narrows in Cape Breton, I noticed that on the south the potsherds had been trodden into crumbs. The points that I found in that site were all, except for one so tiny that it may have been an amulet, on the eastern side of the hearth. This suggested the Micmac wigwam with the traditional organization, but the date was IG. In digging at Bear River, in the same year I kept this horizontal distribution in mind, though only the central subsite gave a clear picture. The main hearth was marked by almost unmixed ash. The way to the beach was due south, the logical direction for the entrance. To the west of the hearth 28 square yards yielded 4 points; to the east of it 34 square yards yielded 19 points. Projectile points and knives seem to have been made, and chiefly used, by the men. It has been possible to determine the position

of five wigwams by this method, and four of these faced southward and one, PJ No. 2, eastward. The pattern remained unchanged throughout the periods from LBR until the present, one of the many factors in evidence of the unbroken continuity of Micmac culture in the area for at least a thousand years.

The central boulder as a fireback for the hearth was found only in PJ No. 7, PJ No. 2 and IG No. 2. Perhaps it was a late or local feature. In the BR central subsite the lowest central hearth had been dug several inches into the sand of the floor. Wigwam hearths seem rarely to have been rimmed with stones, but at all levels in the BR site there were stone-edged hearths scattered about, 33 in the central subsite alone. Many of these were at the outer edges of the shelf where a wigwam would not have fitted. In PJ No. 7 and IG No. 3 the hearths at the foot of boulders had stone rims often superimposed as ash buried them. I suggest that these were outdoor hearths for summer, since they seem to have been temporary. Fires for smoking meat or fish are said to have been long and narrow. We have found no evidence of these and nothing to make us postulate food-preserving before IG times.

Food.

Our soils are chiefly acid and lime-hungry. Therefore fishing sites rarely retain any bones to tell about the diet. In the shell-heaps the volume of shell changes the chemical reaction, and bones are very well preserved there. It is quite usual to find fish-vertebrae a thousand years old. In my first samplings I followed my predecessors in merely noting the animals found in each site. In BR central subsite I separated levels only for stone artifacts but began to record bones by square yard. In later digging I divided the yards into "units" which might be by stratification or by depth. Table I gives the percentage of units dug in 1958-9 in which bones or shells of this type appeared. These figures should be taken with salt. The method exaggerates the abundance of rarities, since twenty moose-bones in the unit count for one occurrence as a single tooth would. Furthermore, I have not yet found in Canada a zöologist, equipped with a collection, who is able and willing to help. Several people have named specimens for me, and from these I have built up an inadequate collection of my own, but many fragments escape identification. Thanks to Dr. Medcof, shells should be quite reliable. Fish and birds are

indicated rather than named. Probably many items do not belong in the list as food, for shells of *Cyprina* and *Spisula* may have been brought in as scrapers, while moose and beaver incisors served as chisels and bear canines as ornaments. The human teeth were casualties and do not suggest cannibalism.

It used to be assumed that shell-heaps were built up during summers by the shore. Lescarbot (1608) says of the Micmacs (Souriquois) of his day that they spent the winter inland, the summer on the shore, and the older Indians of today agree with this with some exceptions. John Prosper, chief of the Bayfield Reserve, says that the Canso band of his youth went in summer to hunt caribou on the barrens of the Cape Breton Highlands and wintered near Louisbourg where they hunted seals on the shore and speared eels in the unfreezing marshes. Champlain (1603) says that the Armouchiquois of Maine spent snowy winters inland and open winters by the clam beds. The diet in these sites should suggest the season.

The staple throughout this period was deer, though these were extinct, or virtually so, by 1600. Moose came second to deer in frequency, except in PJ No. 3 in which they were first. We have found no definite evidence of caribou in this period. The bones cannot be distinguished with certainty from those of deer, but the antlers were more serviceable for tools than deer antlers, and we have found no caribou antlers. Deer skulls were not common in the sites but they occurred, especially at Bear River. Many of them were carrying mature antlers or had just lost them; none showed the developing antlers of spring and early summer. This is valid evidence that the early shore-camps were used in mid-winter. The abundance of sturgeon plates and bones of the cod family in Bear River suggest July occupations. The abundance of unnamed shorebirds, particularly in Port Joli, could belong only to the August-October migration. Geese still spend the winter on the Port Joli eel-grass flats and visit the Fundy shore in open weather. Everything agrees that the Indians spent much of the winter on the shore and returned thither again for the summer fishing. This would have been seriously inefficient. Hunting was done at all seasons, and to hunt the same area twice in the year would have been a waste of time. Probably bands had several alternative camps for each season.

In my first summer's sampling I noticed the amazing difference in the shell: ash ratio of sites, though I have found

TABLE I (Cont'd) — FOOD, BY % OF UNITS IN WHICH OCCURRED.

	Sites Roughly in Order of Age									
	BRC	BRE	PJ8	BRE	BRE	PJ7	PJ8	PJ10	PJ2	PJ3
	Und	Low	Low	Und	Upp		Upp			
Cod family.....	12	40	—	26	18	25	11	—	—	55
Dogfish, spiny.....	—	—	7	5	—	—	11	—	—	—
Fish, unident.....	—	—	14	—	—	—	14	—	—	—
Hake, silver.....	1	—	—	—	—	—	—	—	—	—
Herring scales.....	—	—	29	—	—	—	11	—	—	?
Sculpin.....	1	3	7	—	—	—	14	—	—	—
Shark, manateer.....	—	—	—	—	2	—	—	—	—	—
Sturgeon.....	?	27	—	26	31	—	6	—	—	2
Amaea.....	—	3	—	—	—	—	—	—	—	—
Aporrhais.....	3	—	—	—	—	—	—	—	—	—
Astarte.....	—	5	—	—	2	—	—	—	—	—
Buccinum.....	Com.	22	—	16	18	—	3	—	—	—
Cepeia.....	—	5	7	—	2	—	6	—	—	—
Colus.....	3	3	—	—	2	—	—	—	—	—
Cyprina.....	3	—	—	5	4	—	—	—	—	—
Mya.....	100	100	100	100	100	100	100	100	100	100
Mytilus.....	Com.	11	21	11	?	—	3	—	—	5
Neptunea.....	?	5	—	5	4	—	—	—	—	—
Ostrea.....	—	3	—	—	—	—	—	—	—	—
Placopecten.....	3	—	—	5	7	—	—	—	—	—
Polinices.....	3	—	—	5	—	—	9	—	18	9
Spisula.....	—	—	50	5	—	—	37	—	45	20
Thais.....	3	—	—	—	—	—	—	—	—	—
Strongylocentrotus.....	1	13	—	5	2	—	—	—	—	—

Legend: BRC-BR Central subsite; Und—Undivided units.

Amaea testudinatis; *Astarte undata*; *Buccinum undatum*; *Cepeia hortensis*; *Colus Stimsoni*; *Cyprina islandica*; *Mya arenaria*; *Mytilus edulis*; *Neptunea decemcostata*; *Ostrea virginica*; *Placopecten magellanicum*; *Polinices heros*; *Thais lapillus*.

no satisfactory way of measuring it. By estimate, PJ No. 3 had a ratio ten times higher than any other site. I made a very dubious calculation of the ash in the central subsite of Bear River and estimated that it must have come from the burning of 150 cords of hardwood. The PJ No. 3 site was three times as bulky, yet my estimate was for 15 cords of wood. Almost certainly we are dealing with a completely different use of the shore. In PJ No. 3, the abundance of birds, cod, sturgeon and herrings, the scales of which were abundant but escaped recording, all point to summer to late summer. The frequency of rabbits, found only once in any other site, suggests that boys did much of the hunting in the absence of the men. Peter Michael, an old Micmac, told me that it was their custom not to eat clams from April to July because they were then full of eggs and sand. After that they were gathered and dried, ground up with "wild corn" and bagged for winter. We know that shellfish were dried for winter in New England, while the pemmican technique seems to have been widespread. Peter could not identify the "wild corn" which he described as "like corn but smaller." This might be some seaside grass like *Elymus* or might even be cultivated corn, although as yet no evidence has been found of agriculture.

It may be noticed that no bones of dogs have been found, unless the jaws listed as "wolf" should be those of husky dogs. Lescarbot says: "They have dogs almost like to foxes in form and bigness," and also that they did not eat wolf. It seems probable that these wolves were eaten. It was against Micmac custom to feed bones to the dogs, lest moose or beaver should feel insulted and not allow himself to be killed again. However, the heads of many bones, particularly in Bear River, seem to have been gnawed.

The picture that emerges is of shore-camps used in both summer and winter during LBR and UBR. There followed in late UBR and PJ a withdrawal into the woods behind the clam-flats. Enemies have been suggested as the cause of this withdrawal. I cannot think that enemies would not have been able to find these winter camps when I could find them a thousand years later, while such small groups would have been indefensible. In later centuries the Micmacs met the danger from the Armouchiquois by large groupings and sentries. On the other hand, the withdrawal into the woods would have given some protection from the weather while

keeping near to the clam-beds. At about A.D. 1150 the North Atlantic area suffered a serious worsening of climate which filled the Arctic Current with ice and destroyed the agriculture of Greenland. In the winter 1958-9 the beaches were iced over for four months, so that clams could not have been dug or canoes used. During a series of such winters the shore-camps would have been untenable and useless, whereas hunting inland in the deep snow would have improved. I suggest, while we still cannot afford carbon-dating, that during the latter half of the twelfth century the Micmaqs were weaned from their winter dependence upon clams and made the cultural adaptations to the IG type of life. They learned to preserve clams against the winter and to transport these inland to areas of fresher hunting. Equally tentatively I suggest that the deeper snows made it easier to hunt the deer in their yards and so contributed to their replacement by caribou.

Stone Tools.

Natural. Hammerstones and anvils are common in most sites. An anvil may be a low natural boulder or a large stone with one stable flat face and a conical or rounded top. Such stones are usually surrounded by a mixture of stone-chippings and of bones shattered for the marrow. Hammers were usually hard beach-pebbles smooth to the hand. Sharpening stones were usually of sandstone or of hard slate. Some large stones showed grooves of abrasion; many smaller ones were worn along one edge; and the smallest of all at times showed sharp scratches suggesting that they had been used to edge beaver teeth. PJ No. 3 and Indian Gardens No. 2 had numbers of two-inch balls of sandstone seemingly from the same source. The roundness of these may have been due to exfoliation, but their use would probably have been for sharpening bones.

Chipped Stone. The points which may have served as knives, spearpoints or arrowheads are always chipped. The ceremonial slate knives of the Archaic period are not found. Turtlebacks, cores and blanks occur but are not common. Stone fragments, particularly in LBR, suggest a first crude shattering, followed by percussion chipping on the anvil, and ending with irregular pressure-flaking. Douglas Byers considered the early LBR points—largish, clumsy, of quartzite and stemmed—to be very close in workmanship to those of

TABLE II. ROCKS CHIPPED IN SITE, AND POINTS FOUND.

Rocks Chipped, by % of Units Dug	BRE Low	PJ8 Low	BRE Und	BRE Upp	PJ7	PJ8 Upp	PJ10	PJ2	PJ3	Origin
Agate.....	4	—	10	5	—	—	—	9	—	Scots Bay
Basic Dyke.....	4	3	—	11	—	7	—	—	—	?
Chalcedony.....	8	—	20	13	—	—	—	—	—	Baxters Hbr
Chert.....	4	—	—	—	—	—	—	—	—	?
Fine-gr. Volcanic.....	13	3	10	3	75	7	—	45	16	?
Flint.....	—	—	5	—	—	—	—	—	—	?
Jasper.....	5	17	5	13	—	11	67	27	—	North Mtn
Quartz.....	33	79	30	63	100	97	100	91	52	General
Quartzite.....	46	7	35	21	—	11	—	27	2	South Mtn
Rhyolite.....	33	7	50	34	—	3	—	—	—	Beaches
Sandstone.....	—	—	—	3	—	—	—	—	—	?
Slate.....	4	14	—	11	50	49	—	18	9	South Mtn
Rock-types of Points Found 1957-9.										
Fine-gr. Volcanic.....	6	—	—	4	—	—	—	—	—	—
Jasper.....	—	4	—	4	—	—	—	9	—	—
Mica Schist.....	15	—	—	4	—	—	—	—	—	—
Quartz.....	9	—	—	7	38	23	—	64	67	—
Quartzite.....	64	100	—	26	—	4	—	—	—	—
Slate.....	6	—	—	56	62	69	100	27	33	—

TABLE II. (Cont'd) ROCKS CHIPPED IN SITE, AND POINTS FOUND.

	BRE Low	PJ8 Low	BRE Und	BRE Upp	PJ7	PJ8 Upp	PJ10	PJ2	PJ3	Origin
Shape of Points Where Determinable										
Corner-notched.....	—	—	—	—	—	14	—	—	—	67
Corner-removed.....	6	—	—	45	75	43	—	—	—	—
Leaf-shaped.....	23	—	—	28	25	14	—	—	—	—
Side-notched.....	6	—	—	11	—	—	—	—	—	—
Stemmed.....	65	—	—	11	—	—	—	—	—	—
Swallowtail (isosceles)	—	—	—	5	—	7	—	—	—	—
Triangular.....	—	—	—	—	—	14	—	—	—	33
Number of Complete Points.....	17	—	—	18	4	14	—	—	—	6

The fragmentary Indian Gardens sites yielded five fairly complete points: 2 quartz, 2 jasper, 1 slate; 3 corner-notched, 2 triangular.

As may be seen, points are not commonly found, and the sites PJ No. 7 and PJ No. 10 were too fragmentary or little dug to be truly comparable. The naming of rock-types is not wholly trustworthy. Professor Cameron named some sample chips for me, and the rest of the classification has been by my untrained eye.

The succession of point-types shows up consistently, the rock-types used for them nearly as clearly. There are wide discrepancies in the rocks chipped as this seems to have been affected by the types of rock locally available as well as by individual preferences.

the Late Boreal Archaic in Maine when pottery was unknown. A few LBR points were so small as to belong to arrows, but the majority suggested spears.

The transition from LBR to UBR was abrupt in the central subsite of Bear River, whereas the eastern subsite gave three points of the broader corner-removed shape but chipped from beach-pebbles and heavy, just at the level where the two periods met. The true UBR points are of siliceous slate and are largish and thin and commonly corner-removed. I have not found this very recognizable type in any of the Pictou County collections in the museum, and it may have been confined to the southwest of Nova Scotia and to about one century.

Bear River ceased to be occupied during this phase. Port Joli No. 8's second camp yielded no other type of point on the seaward side of the containing wall of boulders, but among the boulders many points were found at greater depths than the consistent UBR level and yet of later or unusual type. Perhaps the settling of the deposit between the boulders may have increased confusion. It was not possible to establish an exact boundary between UBR and PJ levels. Slate continued to be used into PJ times; corner-notching seems to appear about halfway up; a decrease in size seems to have been the earliest factor to appear. PJ No. 7 yielded nothing that was inconsistent with UBR dating and yet had the PJ factor of being withdrawn into the woods. The only corner-notched small point of jasper to be found in a shell-heap site was from the upper part of PJ No. 2, and this suggests that the transition to typical IG points was completed almost at the same time that even the withdrawn type of shore-camp was given up as a winter home.

Our knowledge of the projectile points of the important IG period is very inadequate. More of these are found in the fishing sites than of all other periods put together. The rocks used included the usual quartz and a fine bronze quartzite, but more important were red jasper, chalcedony and agate from the North Mountain. A gathering of chips from the surface of 50 square yards of ploughland at the Melanson smelting site gave 61 oz., of which white quartz amounted to 31 oz. and jasper and near jaspers to 19 oz. Byers has found North Mountain stone in the fishing sites at Blue Hills, Maine. Champlain quotes Prevert (3) as saying that the Miemaes so

feared the Armouchiquois that they were afraid to visit Cape D'Or, the source of native copper, or Ile Haute where they obtained a brown metal (jasper?) which, in the days before they had iron, they beat into knives and arrowheads by means of stones. North Mountain rocks are also common in sites near Pictou and occur even in Cape Breton.

The unanimity with which point-types changed, as contrasted to the variety and persistence of types of pottery decoration, suggests that a social factor was involved in chipping. Immense quantities of chips are found at known fishing sites, and these are so large that the gatherings must have included most of the Indians of several counties. It is quite possible that the men chipped together in their well-fed leisure and that this led to the rapid spread of new practices and to the use of new and better types of stone. Before we had established the succession of types in the Port Joli sites, Douglas Byers suggested that sequence from parallels in the Maine shell-heaps. This makes it probable that there was some interchange of culture going on at all times between the neighbouring, if inimical, tribes. The progressively larger areas in which types of rock and of point are found, should be a gauge of the gradually increasing unity of the Micmac subtribes.

Pecked Stone. In most of Nova Scotia the important tools made by pecking and grinding were adzes. We have found none of these in the LBR levels of Bear River and PJ No. 8. Two flat adzes were found at Bear River in the LBR level and a third in the UBR. These seem to have been knocked into rough shape and then chipped at the cutting edge. Heavier adzes of oval cross-section occurred in UBR levels at Bear River, PJ No. 7 and PJ No. 8. They are made of schistose slate pecked into shape and then ground to an edge. A wedge ground to a cutting edge was found in the same level at Bear River. There were also several large spalls of quartzite or siliceous slate. These had been struck from the side of boulders at a single blow and then had been bruised at the thicker edge to fit the hand. They would have been far sharper than the adzes but could not have been hafted.

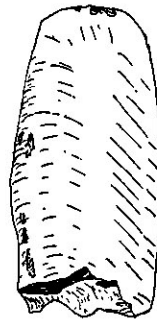
Bear River UBR yielded also a small adzeliike tool shaped like an old-fashioned shoehorn. It had been pecked into shape and then ground smooth. A similar but smoother one



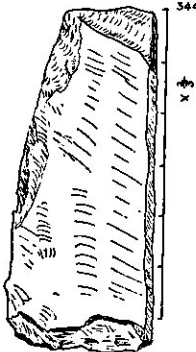
CRUDE FLAT ADZE LOR LEVEL
BEAR RIVER EASTERN SUBSITE



SEMI-CYLINDRIC ADZE UBR LEVEL
BEAR RIVER CENTRAL SUBSITE



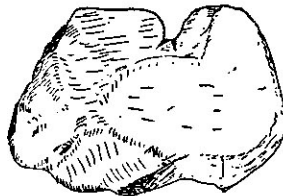
SEMI-CYLINDRIC ADZE
PORT JOLI # 7



FLAT ADZE UBR LEVEL
BEAR RIVER WESTERN SUBSITE



"CLEAVER" SILICEOUS SLATE LBR LEVEL
BR CENTRAL SUBSITE



ARROW-SMOOTHEN LOR LEVEL
BEAR RIVER EASTERN SUBSITE



WHETSTONE, SLATE
INDIAN GARDENS #2



SMOOTHER
UBR LEVEL
BEAR RIVER EASTERN SUBSITE



SMOOTHER
BEAR RIVER CENTRAL SUBSITE

Stone tools.

was picked up on the beach of Wallaback Lake by Max Rafuse. It could have been used for two-handed scraping of skins. A peculiar "whetstone", long and of triangular cross-section, showed the pecking marks that had shaped it, but its purpose remains unknown.

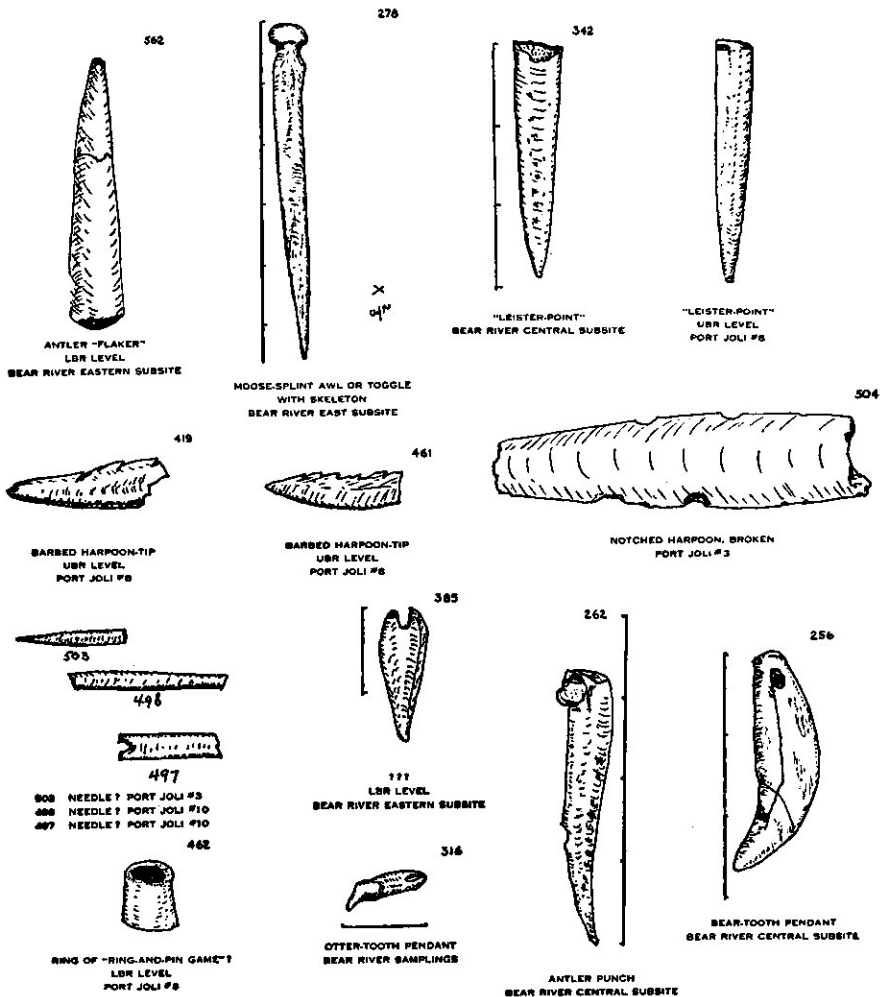
Boring. The only holes bored in stone were from Indian Gardens: a slate whetstone from IG No. 2 and a sandstone gorget or whetstone from the beach. Both had hourglass holes. A few thick clumsy points I have classified as "borers" or "awls" but without evidence that they had been used for this. Holes in tooth pendants had been gouged rather than bored.

Smoothers. A peculiar group of seven pieces of slate or quartzite, each with a rounded notch about 4 mm. wide, came from the central subsite of Bear River. A larger and much heavier one from the eastern subsite had a notch 12 mm. wide and could have been used as an arrow-smoother, but the purpose of the smaller ones is uncertain.

Bone and Antler Artifacts.

Leister-points. The commonest worked bones are a group ranging from crudely broken skewers and long slender awls to almost standardized long points made from the legbone of deer. The shape of the last is a triangle from four to eight inches long and nine-sixteenths inch broad at the base. The bone has been ground smooth, but the groove of the concave centre of the bone shows on one face. A few show at the base a groove for binding, and I have assumed that many of these were used or intended for the central points of fish-spears. The Micmacs of today still make these leisters but with a central point of iron. In 175 square yards of Bear River only five of these were found, two of them poorly made; in the dozen square yards of UBR level at PJ No. 8 there were eight perfectly finished points. Probably leisters were essential to fishing at Port Joli but were subsidiary to weirs at Bear River.

Skewers. Cylindrical pieces of bone may have been punches. Moose splint-bones necked for suspension occurred three times, two broken ones and an entire one on the breast of a dead child.



Bone and antler artifacts.

Needles. No good needles were found. There were rare splinters of bones which might have been so used. One of these was found in PJ No. 10 beside a small flat piece of bone with a semicircular notch at the end, which may have been half of a large circular eye.

Harpoons. Tips of two small finely barbed harpoons were found in the eastern subsite of Bear River in UBR level. Two much neater tips turned up in the UBR of PJ No. 8. The basal section of a recovery harpoon with the eye for attachment came from PJ No. 7. PJ No. 3 gave two broken harpoon tips, notched instead of barbed, one small and of deer bone, the other large and of a bone as yet unnamed.

Miscellaneous Bones. From the LBR level of PJ No. 8 came a cross-section of a long bone, perhaps the ring of a ring-and-pin game. Flattened chunks of whalebone, always somewhat squared and scratched, occurred on both shores, but the use of these remains unguessed. A flattened piece of deer bone just over an inch long, shaped like a squash seed but with a notch in the rounded end, had obviously been carefully made but did not suggest its use. Sections of deer antler had been sawn off, smoothed and discarded unused near the antlers from which they had come.

Flakers. Sharpened and slightly smoother tines of antler may well have been punches, but the commonest use of these tines was in the form of smooth, round-based rounded-tipped tools. Most of these found, and they were in all levels and all sites, had been broken, usually at the tip. My suggestion is that they were flakers for pushing off flint flakes in the final retouching of the implements.

Teeth. Beaver-incisors, usually broken and often re-sharpened, were found in all levels of all sites; porcupine and woodchuck incisors were occasional. It is known that these were used as blades for carving wood. In the Bear River central subsite three beaver teeth were found on the women's side of the hearth to one on the men's side, a hint as to which sex did woodwork. In the same subsite occurred two half mandibles, one of beaver, one of porcupine, which had been used as knives until the incisors had shattered.

Moose incisors were frequent, but only two were found sharpened. A single blue serrate tooth of the man-eating

shark, *Carcharodon carcharias*, its tip broken, was in the UBR level of the Bear River eastern subsite. Three bear-canines and an otter-canine had been pierced for suspension, and other canines of bear, wolf, grey seal and harbour seal were found separated from their jawbones.

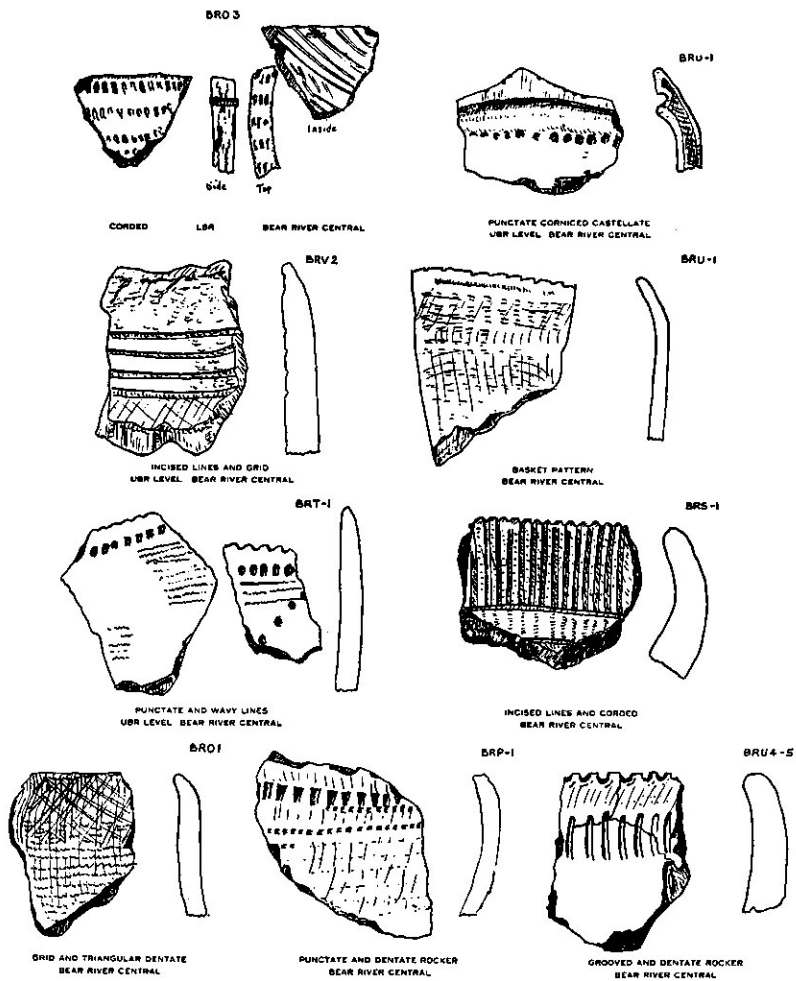
Red Ochre.

Red ochre showed rarely in the ashes of the hearth, and, on the two occasions when I could place it properly, it was on the men's side of the hearth. One arrowpoint was partly covered with red paint, and ochre had been scattered in the woman's grave.

Pottery.

Potsherds were abundant in all layers of all sites. Local clay of varying quality seems to have been tempered with grit or rarely with crushed shell. In many cases a coil technique can be demonstrated, and, as yet, we have not detected any other. Pots varied from very large to very small, but measurement of sherds from the rim of the same pot gives quite inconsistent results, for the pots were imperfectly cylindrical. The proportion of grog in the paste varied directly with the size of the pot, and the same level gave thick friable sherds and thin ones that showed no trace of temper. It was not possible to reconstruct any pots. The Bear River central subsite yielded 14 lbs. 3 oz. of sherds, roughly the weight of a dozen pots, but I was fairly sure that I had the rim-sherds from forty-five different pots of which the bulk had gone. The general shape appeared to be the bulged conical with rounded bases. H. I. Smith (5), excavating at Merigomish, found rounded and lemon-shaped bases in the proportion of 9:1. At Little Narrows in Cape Breton I found only one recognizable base-herd, and this was lemon-shaped. R. S. MacNeish saw samples of the sherds from Bear River and described them as "like Point Peninsula but not Point Peninsula." Douglas Byers described a pot from UBR level of PJ No. 8 as "Owasco gone mad." This, too, suggests that the Micmacs converged from varied sources.

In the central subsite at Bear River I tried to establish pottery types, and I thought that I had found five which covered roughly 40% of the larger sherds. In the eastern subsite only three sherds seemed to fit into the types that I



Potsherds.

had suggested, and the resemblances between the pottery from different levels of the same site was greater than that from the same level in different wigwams. This reduces my "types" to nothing more than favourite patterns of individual potters.

In 1959 in despair I tried to analyze types into the elements of decoration in the hope that I might be able to say with assurance that this or that pattern did not occur before such a period. Colour varies from pale terracotta to dark drab, but the bulk of the sherds are merely earth-brown. Seemingly colour was a minor factor in decoration, while impressed designs are primary. A fabric-like pattern was produced by rocking a curved notched tool over the surface, and this might be used as a decoration or simply to smooth the pot before decoration, a favourite device in the central subsite of Bear River. Rather similar markings were made by toothed stamps, often with triangular teeth, but I was not able to separate the two with assurance. Another pattern was made by winding a twig or a potting paddle with cord and impressing the edge to produce lines of short diagonals. Dotted lines were made by a comb or something similar, and all these could be arranged in solid blocks or in open geometrical designs or in zigzags. Lines were cut with the edge of a knife or were pressed with a blunter edge, and punctures, dots and gashes of many shapes and sizes were probably as varied as the points available. (See Table III.)

Table III does not suggest any consistent change with time. PJ No. 3, seemingly the latest shell-heap, had two forms not encountered in the others. One of these, Spaced Rockering, may have been a specialty of a family; the other, a grid of incised lines, was also a common type in the Bear River central subsite, which was not recorded by this method. The predominance of Dentate Rocker in the lowest level of PJ No. 8 was equalled by that in the BR central subsite but was not found in the BR eastern subsite. Everything suggests that pottery was not a social activity at any time of year. Lumps of clay were found in many sites, and in BR eastern subsite a foot-wide dome of clay in the marginal shell-tip showed where potting had been carried on. Occasional imprints of fir-needles suggest that the pots received their slow drying in the wigwam beside the fir-bough beds.

TABLE III. ELEMENTS OF POT DECORATION.
 Decoration in % of Units.

	BRE Low	PJ8 Low	BRE Und	BRE Upp	PJ7	PJ8 Upp	PJ10	PJ2	PJ3
Dentate Rocker.....	24	79	24	21	—	57	33	—	12
Dent. Rock. Zigzag.....	10	36	3	9	—	9	—	—	6
Corded.....	8	7	12	11	29	26	—	60	—
Fine Corded.....	—	7	—	—	14	23	—	10	3
Coarse Corded.....	—	7	—	4	—	17	—	10	—
Corded Zigzag.....	8	7	9	9	43	14	17	—	9
Comb-dotted.....	11	—	9	3	—	3	—	—	—
Comb Zigzag.....	2	—	9	3	—	—	—	10	12
Triangular Comb.....	8	21	3	9	—	26	17	—	6
Incised Lines.....	2	50	6	3	—	14	17	10	12
Wavy Lines.....	2	—	3	1	—	—	—	—	—
Thumbnail Zigzag.....	—	—	3	—	—	—	—	—	—
Polka Dots.....	2	—	3	9	—	23	17	—	—
Punctate.....	12	43	18	1	—	6	—	—	3
Gashes.....	4	7	—	—	—	6	—	—	3
Line Rocker.....	—	7	—	—	—	—	—	—	3
Spaced Rockering.....	—	—	—	—	—	—	—	—	—
Line Zigzag.....	—	14	—	—	—	3	—	—	3
Dentate Lines.....	—	—	—	—	—	3	—	—	—
Ladder Lines.....	—	—	—	—	—	9	—	—	—
Grid.....	—	—	—	—	—	—	—	—	3
Dragged Dashes.....	—	—	—	—	14	—	—	—	—

On subjective grounds I should think that LBR pots had tended to be straight-sided or with flared necks. In UBR everted and corniced necks are frequent. IG suggests thick pots with thickened rims and much bold decoration or small, very thin pots without decoration. But the exceptions to these generalizations are innumerable.

Vegetable Food.

No recognizable carbonized remains of vegetable food have yet been found. The only evidence, apart from tradition and language, has come from plants surviving around the old sites. Most numerous are native hawthorns, *Crataegus cocci-nea* L. in many microspecies, *Amelanchier* spp., "Indian pears," *Prunus virginiana* L., choke-cherry, and *Prunus serotina* Ehrh., black cherry. Seedling apple trees are also found when the sites had been occupied during the last century, and the native trees may always have been sown as recently as that. I have, however, found three sites by paying attention to these trees, and two of these had not been occupied since ancient times. I have suspected an association between Indians and reed-grass, *Phragmites communis* L., var. *Berlandieri* (Fourn.) Fern., and buckbean, *Menyanthes trifoliata* L., var. *minor* Raf. The former is cosmopolitan and has been used by other Indians for baskets and arrowshafts; the latter is a starvation food in Europe. However, the Micmacs of today do not recognize these plants, and the associations are too scanty for proof.

Burials.

Our knowledge of the racial types of early Nova Scotians is very defective. The earliest culture known in the province is the Late Boreal Archaic which is definitely that of the shell-heap and pre-shellheap people of New England and southward, and may be that of one element in the Beothuck "Red Indians" of Newfoundland. Only the lucky accident of burial under a shell-heap will preserve a skeleton for even a century in our lime-hungry soils, so we have no knowledge of the race of this period here. The early Indians of New England and the recent Indians of Newfoundland seem to have been tall, long-headed, big-boned, probably a mongoloid equivalent of the Cro-Magnon caveman.

The Micmacs belong by speech to the Northern Algonkian tribes. Linguists connect the Algonkian with the Muskogean languages of the southeastern United States and make it fairly certain that these languages were established in America in or before the Archaic period. On the other hand, the racial type of the Northern Algonkians is chiefly of the shorter, round-headed, more mongoloid strain which seems to have filtered in from Asia about 3000 B.C.

During the past three hundred and fifty years the Micmacs have been hybridizing with other tribes, with Europeans and to a small extent with Negroes. In such a period of twelve generations an individual collects a total of 4096 great-grand-parents, almost double the number of Micmacs existing at the beginning of that time, so that it is unlikely that any Micmac today has wholly escaped some admixture of blood. There is no true Micmac type now. The commonest, tending towards slim build and sharp features, probably owes this to French admixture. The type with heavy aquiline features that one associates with prairie Indians, occurs but is not common. Sturdy round-faced big-featured men of rather low stature are frequent. There are rare individuals with eyes in large round sockets and with huge Australoid noses. It is more probable that these preserve the type of coastal Archaics than that they picked up these features from Neanderthaloids among the Europeans. Then there are the obvious recent admixtures.

In 1958 I cut an exploratory trench through the eastern subsite of Bear River, along the line BB, and at 8-9 my digging tool brought up half a human mandible from the sand below the deposit. The burial turned out to be that of a girl of seven, for the massive jaw had only the first permanent molars, huge grinders with four roots joined in pairs. She was lying on her right side, head to the west. The thin skull had collapsed under the pressure of the earth. The body was so decidedly flexed as to suggest that it had been bundled. The bones lay in the glacial sand only about three inches below the lowest camp refuse, yet no trace of this was found among them. Definitely the burial had antedated the first occupation of the subsite, though the well-preserved bones could not have lain there a century without the assistance of overlying shell. The only artifact connected with the burial was a moose-splint skewer beside the breastbone. This skewer was necked for suspension, but it also showed wear about one-third of the way

down, which suggested to me that it had been used as a toggle for fastening a cloak. Small land-snails had died in the hollows of her bones. Nothing remained to show wrapper or grave-lining.

In 1959 we excavated the eastern subsite by lines of alternate yards. The square CC7, the deepest of the site, was left until the last. This remained as a pillar of a cubic yard, and we were mapping the stratification of all faces when Jane McNeill pointed out that at one point the concave strata dipped out of sight. With a mattock she scraped a groove along the edge, and the face of this groove fell away, revealing a skull. We determined that other bones lay beneath it, covered it again, and dug the remaining cubic yard. Then we scraped carefully down until we could trace the position of the body. We could find no grave-lining, so I dug a trench around the skeleton, and we set to work to lay bare the bones.

The body lay in semi-flexed posture, head to the north, on the back from shoulders to pelvis, knees bent to the right. The right arm was outstretched and had been pinned down by a boulder. The head was erect, lying upon the cervical vertebrae and the right humerus. It seemed that the grave had been dug too short. The body had been forced into the shallow trench, the head and neck almost erect and the knees somewhat raised. The collapse of the body in decay and the subsidence of the earth above had forced the head into an unnatural relationship and had crushed the pelvis and the long bones of the legs. It was clear that the grave had been dug through some three inches of camp deposit, for ash, potsherds and shells were mixed with the immediate covering of sand. The strata of the later camp had bent down into synclines with the consolidation of the grave but were unbroken.

The skull had not suffered much, and most of the teeth were in place. The molars were deeply worn, an Indian characteristic attributed to the sand in clams but perhaps telling as much of coarse and dirty food and much chewing. The wisdom-teeth were worn down to the same level with the rest, from which I judged that the owner had been approaching forty. The molars had separate roots, unlike those of the girl. In spite of a massive jaw, the skull had unpronounced angles and muscle attachments, which suggested a woman. The height had been about five feet four inches. On the right

breast was a cluster of small ribs and a shovel-shaped incisor, and another milk-incisor had slipped between the ribs of the large skeleton. Certainly this was a mother who had died in childbirth during the summer. A powdering of red ochre showed in the soil of the grave, and a lump the size of half a walnut lay with the baby's bones. Two land-snails had penetrated the body. There was no grave furniture whatever.

An interesting feature of the adult skeleton was the racial type. By our dating-scheme she should have died soon after A.D. 900. Her cephalic index, measured roughly, was 82, and she showed no characteristics of the Archaic tribes, for the massive jaws of both skeletons probably tell of much chewing rather than of a hereditary trait. This suggests a replacement of Archaic peoples rather than a mingling with them.

The burial customs of the early Micmacs must not be generalized from these two burials, since both are of females. The girl had probably died in the winter (witness the cloak), had been bundled in birchbark and placed on a scaffold or in a tree until a return to the site in summertime when the ground could be dug. The woman had been buried immediately in a winter campsite, perhaps to avoid the difficulty of roots. This suggests that at least one wigwam had been pitched on the beach, since otherwise the winter campsite would have been in use.

Apart from these, the only burials examined were on Big Island at Vogler's Cove, Lunenburg County. The sea has been eroding a gravelly point and exposing Indian skeletons. Two graves were touching the eroding face of the point. These contained only fragments of the larger bones but were surrounded by rows of coffin nails. One of the skeletons was of a child of whom nothing remained but scattered teeth. Two arrowheads of Scot's Bay agate and of IG type showed that the burial ground had been used in pre-French times, although the skeletons can have been only one or two centuries old. This type of cemetery is common around the coast, and many of them have been robbed but none excavated to find how far back this burial custom obtained.

Recent Remains in Ancient Sites.

All the sites mentioned here, except PJ No. 2, PJ No. 3 and IG No. 3, yielded evidence of nineteenth-century occupation. Bear River had by far the greatest accumulation. Under the broken glass, tin cans and bottle caps of picnickers of the atomic age were Micmac leavings of chinaware, nails, barrel hoops, broken iron cooking-pots, table knives, clay pipestems, embroidery scissors, thimbles, and buttons of silver, brass and bone. In places such material had penetrated to the bottom of the UBR level. It may be that releveling was more thorough when iron tools were available; it may even be that Indians occasionally dug for arrowheads to sell to tourists.

Nothing found suggested dates outside the nineteenth century. Wire nails were absent, glass was scarce, tins did not occur. The thimbles and embroidery scissors spoke of the embroidery taught to the girls by the French convents. The big flat buttons of brass or silver belonged to the formal coats still occasionally to be seen, successors to the ceremonial fur-cloaks. The chinaware was puzzling, for most of the many fragments belonged to a single set, elaborately decorated with scalloped edges clouded with dark blue or, in smaller pieces, with green. Many pieces had been badly chipped for long before they had been broken and discarded. I suggest that the Indians begged from the hotel at the top of the hill the plates too chipped to be used.

It was not possible to separate the refuse of food from that of the underlying UBR people, since both ate shellfish and moose. Cow-bones cut with a saw, the newly erupted molar of a horse, and some complete mussel shells could scarcely be old. Vertebrae of the common porpoise were not uncommon in the upper layer of the eastern and central subsites. During the century preceding 1900, porpoises were hunted at Digby Gut, ten miles from Bear River by water. The porpoise was shot first and then harpooned, a custom recorded in a petroglyph at Lake Kejimkujik, but, according to local evidence, they were also occasionally lanced. Probably all our remains of porpoise belong to the nineteenth century. Some vertebrae had been whittled into discs, and one had been domed like a thick button and decorated on the flat face with a six-pointed compass-rose. (The arcs fit a twenty-five-cent piece.) A squared piece of whale-bone was decorated

with the same pattern pricked clumsily. These resemble somewhat *waltes* discs, although those in the museum and those illustrated by Wallis and Wallis (6, Fig. 40) have a four-pointed pattern.

The northern side of the western subsite of Bear River had an arc of largish flat stones just below the surface. Living Indians remember the custom of piling spruce-boughs around the skirts of the wigwam during cold winds and of weighting the boughs with stones. I have found these only at this site and at Little Narrows, both camps that had been reoccupied during the nineteenth century, and have found no indication of the custom at older levels.

It is noteworthy that no site has as yet given evidence of sixteenth-century contact or of Acadian influence. Clams remained an important food in spite of Lescarbot's rather obscure statement to the contrary. I suspect that an increase in fishing and in war led to the use of a few large summer encampments placed near the mouth of the harbours, instead of many small camps near the head, and that these grew under missionary influence into the semi-permanent settlements called "Indian Gardens" which often later became reserves. Most of these have been destroyed by cultivation or development, but the items picked up by Patterson (4) and others at Pictou Landing suggest a village, large for the Micmacs, with little or no shell, with stone tools of not earlier than IG type but later with French trade goods and now with a Micmac reserve.

Summary

This slight survey has shown that the shell-heaps of the southwest were seasonal camps of the ancestors of the Micmac Indians and were used periodically in any season except probably the spring. The earliest stoneworking found in them thus far is roughly equivalent to the Late Boreal Archaic in Maine a thousand years earlier, but in Nova Scotia this is associated with pottery resembling vaguely Point Peninsula and Owaseo types. The race of this period was already modern and probably Lenapid. A change from quartzite to slate as the preferred stone, from stemmed to corner-removed in shape of point, came in abruptly about A.D. 1100. The continuity of pottery throughout makes it unlikely that there was any sudden change of population, but a social change,

perhaps a wider grouping of bands or a new fishing custom, is probable. Towards the end of this phase and century most of the shore-camps were abandoned, rather earlier in Bear River than in Port Joli. This may have been associated with the worsening of climate around A.D. 1200. At Port Joli, camps continued to depend upon the clam flats, but now the wigwams were pitched back in the shelter of the woods. Soon after this change, the typical projectile point became the small, corner-notched point of quartz, the PJ phase. This was giving way to jasper when these back-from-the-shore camps were abandoned. Afterwards clams seem to have been harvested only in short seasons in late summer and autumn, the result being shell-heaps with much shell and many fishbones but with little ash and little chipping. We still have a very fragmentary knowledge of this phase of the culture which lasted, no doubt with gradual elaboration, from A.D. 1300 until the arrival of Europeans. Equivalent types of stoneworking can be recognized in other areas of Nova Scotia, but the detail is not likely to correspond in different sections.

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